Question:

A 60-year-old gentleman is seen in the A&E department after a syncopal episode. He has a history of coronary heart disease and has recently experienced increasingly severe spells of dizziness and some shortness of breath. He undergoes an ECG which is suggestive of second-degree heart block, Mobitz type 2.

Which of the following is associated with second-degree heart block (Mobitz type 2)?

A. No relationship between P waves and QRS complexes

B. Progressively prolonged PR interval

C. Intermittently skipped QRS complexes

D. Irregular P waves

E. Irregularly irregular rhythm with no P waves

Correct Answer:Intermittently skipped QRS complexes

Explanation:

Second-degree heart block (Mobitz type 2) is characterised by intermittently skipped QRS complexes without progressive prolongation of the PR interval. There may be a regular pattern of the number of impulses that are transmitted, e.g. every second or third complex is skipped (2:1 and 3:1 block, respectively). When compared to Mobitz type 1, Mobitz type 2 is more likely to be associated with haemodynamic compromise and/or severe bradycardia and may progress to third-degree heart block. Mobitz type 2 heart block is often associated with cardiac pathologies such as coronary heart disease or cardiomyopathy. Management of typically involves the insertion of a pacemaker.

Irregular P waves are not found in second-degree heart block but may be associated with atrial fibrillation or atrial flutter, in which case the waves may not be distinct.

A progressively prolonged PR interval is seen in second-degree heart block type I. This is usually due to reversible conduction block at the AV node; cells progressively fatigue until they fail to conduct an impulse, at which point the following QRS complex is skipped.

No relationship between P waves and QRS complexes is seen in third-degree heart block. This is due to a complete absence of atrioventricular conduction, meaning no supraventricular impulses are conducted to the ventricles.

An irregularly irregular rhythm with no P waves is seen in atrial fibrillation. This is the most common sustained arrhythmia that involves a varying ventricular rate and loss of the isoelectric baseline.

Source

Further reading:

https://patient.info/doctor/ecg-identification-of-conduction-disorders

Question:

A 16-year-old male presents to his general practitioner (GP) with a week-long history of sore throat, malaise and fatigue. He has also had some difficulty swallowing but no cough. He was born in England and has kept up to date with all of his vaccinations. He has no past medical history.

Examination of his oral cavity reveals palatal petechiae and bilateral cervical lymphadenopathy is present on palpation of his neck. There is no uvular deviation. Examination of the abdomen also reveals a slightly enlarged spleen.

A blood film demonstrates atypical lymphocytes and there is also a positive heterophile antibody test. The doctor makes a diagnosis of infectious mononucleosis.

What is the most appropriate management plan for this patient?

A. Oral antibiotics

B. Corticosteroids

C. Direct admission to hospital

D. Supportive care

E. Aciclovir

Correct Answer:Supportive care

Explanation:

The diagnosis of infectious mononucleosis (IM) has been provided in the above question stem. This question focuses on the treatment of IM, which primarily involves supportive care. Paracetamol and non-steroidal anti-inflammatories can be used for the management of fever and malaise. Adequate fluid intake is also important for these patients. Importantly, approximately 50% of these patients have splenic enlargement and therefore they should be advised to avoid contact sport for 4-6 weeks following disease onset to reduce the risk of splenic rupture.

IM is typically viral in nature and therefore prescription of antibiotics has not been shown to reduce the duration of symptoms.

Aciclovir is a nucleoside analogue that has failed to show clinical benefit in the context of IM. However, aciclovir is an important medication in the management of herpes simplex virus I / II.

The patient in the above scenario is clinically stable and does not have any signs of impending airway obstruction, therefore admission to hospital would not be indicated.

Corticosteroid use has remained controversial for some time in the context of IM. Corticosteroids have demonstrated some benefit in patients who have IM-related complications such as airway obstruction (look for stridor, drooling, voice changes). However, the patient above is clinically stable and does not require corticosteroids.

Further reading:

https://cks.nice.org.uk/glandular-fever-infectious-mononucleosis#!scenario

Question:

A 56-year-old female presents to dermatology to undergo phototherapy for the treatment of her eczema. She reports the development of a rash on her chest over the past two days. On examination, there is a vesicular rash, in a clear linear distribution on the right side of her chest only.

What is the most appropriate initial management?

A. Topical capsaicin

B. Aciclovir

C. Oral steroids

D. Topical steroids

E. Continue phototherapy

Correct Answer:Aciclovir

Explanation:

Herpes zoster (a.k.a. shingles) is caused by human herpesvirus-3. Primary infection occurs in childhood, resulting in chickenpox. The virus then lies dormant in the sensory nervous system and can reactivate many years later, most often during a time of relative immunosuppression (i.e. during phototherapy in this case).

Because the virus originates from the sensory nervous system, the vesicular rash is dermatomal when it presents. NICE guidelines advise commencing oral aciclovir within 72 hours of the onset of rash. Further review and specialist advice should be considered if there is ophthalmic involvement, immune-compromise or other significant comorbidities.

Topical capsaicin is indicated in the treatment of postherpetic neuralgia but is not advised acutely in the treatment of herpes zoster.

It would seem sensible to review the extent of vesicles before deciding to continue phototherapy.

Further reading:

https://cks.nice.org.uk/shingles

Question:

A 30-year-old woman gives birth to her baby at 39 weeks gestation via elective caesarean section. The pregnancy was uncomplicated and the mother is otherwise healthy. The baby’s Apgar scores at 1 and 5 minutes are 8 and 9, respectively. An hour after birth, the baby begins to show signs of increased work of breathing, grunting slightly with associated intercostal recession.

What is the most likely cause of this baby’s presentation?

A. Small for gestational age

B. Meconium aspiration

C. Persistent pulmonary hypertension of the newborn

D. Transient tachypnoea of the newborn

E. Neonatal respiratory distress syndrome

Correct Answer:Transient tachypnoea of the newborn

Explanation:

The most likely cause here is transient tachypnoea of the newborn (TTN). This is a self-limiting condition presenting due to a delay in absorption of fetal lung fluid. It can occur in babies born at any length gestation but is more common in full-term babies and those born via caesarean section. It typically lasts no longer than 1-2 days and can be managed with supplemental oxygen.

Neonatal respiratory distress syndrome is a common cause of breathing difficulties in newborns. It is seen in babies born before 34 weeks gestation due to insufficient surfactant in the lungs; as this baby was born at 39 weeks it is unlikely to be present.

Meconium aspiration is a less likely cause here as symptoms would be present immediately at birth. As in this baby, TTN may not present until hours after birth. Meconium aspiration is also more often seen in babies experiencing distress during labour and/or delivery (e,g, due to hypoxia).

Small for gestational age babies may have respiratory problems, particularly those with intrauterine growth restriction, but there is no indication of this here.

Persistent pulmonary hypertension of the newborn occurs due to failure of the foetal circulation to adapt to respiration at birth. It may present similarly to TTN, but is less common and usually develops after a difficult labour (e.g. some degree of asphyxia during birth).

Further reading:

https://www.msdmanuals.com/en-gb/professional/pediatrics/respiratory-problems-in-neonates/transient-tachypnea-of-the-newborn

Question:

A 58-year-old man presents with abdominal pain. He has been unwell for 2 days with worsening left lower quadrant abdominal pain associated with diarrhoea and some bleeding per rectum. He is previously fit and well, on no regular medication. He weighs 83kg. His temperature is 38.5, heart rate 132 beats per minute, blood pressure 72/31 mmHg, respiratory rate 28 breaths per minute, pulse oximetry 94% in room air. On examination, he has severe left lower quadrant tenderness with guarding.

Blood tests show urea 16.9 mmol/L, creatinine 174 μmol/L, C-reactive protein 382 mg/L, lactate 5.2 mmol/L, white cell count of 24.2 x 109/L and haemoglobin 78 g/L.

What is the most appropriate next investigation?

A. Abdominal computed tomography

B. Colonoscopy

C. Blood cultures

D. Oesophago-gastro-duodenoscopy

E. Abdominal X-ray

Correct Answer:Blood cultures

Explanation:

The most likely diagnosis here is septic shock due to diverticular disease. The most appropriate next investigation is blood cultures. As per the surviving sepsis campaign's guidelines, the sepsis bundle should be completed including lactate, cultures, antibiotics, and fluids.

An abdominal computed tomography (CT) would be reasonable as a definitive investigation, but the sepsis bundle should be completed first.

An abdominal X-ray is unlikely to be of much benefit, and a CT scan should be the diagnostic test of choice in the investigation of acute abdominal pain.

Endoscopic investigation including colonoscopy or oesophago-gastro-duodenoscopy are not appropriate in the investigation of sepsis.

Further reading:

https://journals.lww.com/ccmjournal/Fulltext/2021/11000/Surviving\_Sepsis\_Campaign\_\_International.21.aspx

Question:

A 9-month-old boy is brought to the GP by his parents, who describe a 4-day history of 'runny nose' and cough.

He has no significant past medical history. His mother describes a normal pregnancy and birth. No allergies are known.

On general inspection, the boy appears slightly irritable but well-hydrated. His observations include a temperature of 38.0°C, respiratory rate of 35/min, SpO2 of 95% on room air and a pulse of 130/min. Examination of the chest reveals some evidence of intercostal retractions, some crackles and expiratory wheeze bilaterally.

What is the most appropriate initial management option?

A. Prescribe montelukast

B. Prescribe ribavirin

C. Self-care advice with safety netting

D. Refer for chest physiotherapy

E. Emergency transfer to hospital

Correct Answer:Self-care advice with safety netting

Explanation:

The most likely diagnosis in this patient is bronchiolitis - an infection of the lower respiratory tract, most commonly caused by the respiratory syncytial virus (RSV). This child does not have any features to suggest hospital admission is required; therefore, the most appropriate initial management is self-care advice with safety netting. Bronchiolitis is usually a self-limiting illness, where symptoms peak between day 3-5 of illness. Appropriate self-care measures include advice regarding paracetamol or ibuprofen to manage pyrexia, encouraging regular fluid intake and close monitoring of the child's status. Appropriate safety netting includes advising parents about signs suggesting deterioration and seeking further medical advice if these signs are shown by the child.

Children with severe respiratory distress, apnoea, central cyanosis and persistent hypoxia (SpO2 <92% on room air) should be considered for emergency transfer to hospital. This child does not have any features to suggest severe or life-threatening disease; therefore, this would not be the most appropriate management at this time.

NICE guidelines do not routinely recommend performing chest physiotherapy in children with bronchiolitis unless they have relevant comorbidities, such as spinal muscular atrophy or severe tracheomalacia, or are experiencing notable difficulty clearing secretions. Therefore, chest physiotherapy would not be the most appropriate initial management.

Montelukast is not licensed or indicated for the management of acute bronchiolitis. Montelukast is a leukotriene receptor antagonist (LTRA) used in the prophylaxis of asthma and symptomatic relief of seasonal allergic rhinitis in patients with asthma. Therefore, montelukast is not recommended at any stage of the management of bronchiolitis.

Routine use of ribavirin is not recommended in the management of bronchiolitis. In addition, ribavirin is typically only considered in an inpatient setting, in infants with severe disease or those who have certain risk factors such as bronchopulmonary dysplasia, immunodeficiency or neuromuscular disorders. Therefore, ribavirin would not be the most appropriate initial management in this patient.

Further reading:

https://cks.nice.org.uk/topics/cough-acute-with-chest-signs-in-children/management/bronchiolitis/

Question:

A 30-year-old woman presents to A&E with sudden onset shortness of breath and pleuritic chest pain. Her symptoms have been persistent for the past hour and there is no obvious precipitant.

She gave birth 5 weeks ago via normal vaginal delivery with no intrapartum or post-partum complications. She has a past medical history of varicose veins in her left lower leg and has not undergone any recent surgery.

On examination, she is tachycardic (102bpm) and has a respiratory rate of 25bpm. Her left lower limb is mildly tender on palpation and slightly red.

A Wells’ score for suspected PE is calculated and it is calculated to be 7.5. Her ECG demonstrates sinus tachycardia. Routine blood tests do not demonstrate any abnormalities and she has a serum troponin of 2ng/L.

What is the next most appropriate diagnostic test?

A. Echocardiography

B. D-dimer

C. Coagulation studies

D. ABG

E. CTPA

Correct Answer:CTPA

Explanation:

The next most appropriate diagnostic test after ECG and routine blood tests would be a CTPA in this case. The patient has a Wells’ score of 7.5 in the context of clinical signs of DVT, an alternative diagnosis being less likely than PE and a heart rate > 100. A score of >4 is indicative of a PE being likely, and this warrants a CTPA to be performed to visualise the pulmonary vessels.

D-dimer is incorrect. This would be appropriate in patients with a Wells' score of <4 (classes them as 'PE unlikely') but not in this case as the Wells' score classifies the patient as 'PE likely' and therefore a CTPA is required regardless of the D-dimer score.

Echocardiography is incorrect. Negative echocardiography does not exclude PE and therefore it is not a routine diagnostic test in investigating PE. It would only be indicated in haemodynamically unstable patients who cannot have an immediate CTPA due to being too unwell/CTPA being unavailable.

Coagulation studies would not be helpful in the initial diagnosis of PE.

ABG is not used as a diagnostic test for PE, although it may be used to inform oxygen therapy.

Further reading:

https://patient.info/doctor/pulmonary-embolism-pro

Question:

A 45-year-old woman presents with a 1-month history of progressive nausea, episodic vomiting and bloating, which usually occurs following large meals. She denies the presence of undigested food or blood in her vomit. Over a similar time period, she reports a reduced appetite and less frequent bowel motions. However, she denies weight loss

Her past medical history includes type 1 diabetes mellitus and diabetic retinopathy. She finds her diabetes difficult to control.

Blood pressure is 120/80 mmHg sitting and 90/60 mmHg standing, with the patient feeling dizzy on standing. BMI is 25.5. Abdominal examination is unremarkable. Blood tests are within normal limits, except HbA1c 66mmol/mol (<42).

What is the most likely diagnosis?

A. Ulcerative colitis

B. Gastro-oesophageal reflux disease

C. Irritable bowel syndrome

D. Cyclic vomiting syndrome

E. Diabetic autonomic neuropathy

Correct Answer:Diabetic autonomic neuropathy

Explanation:

Diabetic autonomic neuropathy involves chronic damage to the nerves of the autonomic nervous system (sympathetic and parasympathetic), resulting in eventual autonomic dysfunction. Presentation of autonomic neuropathy can vary significantly, depending on the specific nerves affected, however, the onset of symptoms is typically insidious.

Some possible symptoms of autonomic neuropathy include:

Orthostatic hypotension

Gastroparesis

Constipation

Diarrhoea

In this scenario, the patient has symptoms consistent with both gastroparesis and constipation, in addition to postural hypotension. This clinical presentation in the context of poorly controlled type 1 diabetes is highly suggestive of autonomic neuropathy.

Gastro-oesophageal reflux disease (GORD) is very common however it would not fully explain the changes in bowel habits and would not cause postural hypotension. Typically, GORD presents with epigastric burning associated with meals and being in a supine position. The absence of any improvement with the use of antacids also suggests this diagnosis is less likely.

Ulcerative colitis is a form of inflammatory bowel disease that typically presents with abdominal pain, weight loss and diarrhoea containing blood and mucous. It does not fit with this patient's clinical presentation.

Irritable bowel syndrome typically presents with cyclical constipation and diarrhoea with associated intermittent abdominal pain. Abdominal pain is often relieved after passing stools. Nausea, vomiting and postural hypotension are not associated with this condition. The failure to respond to Buscopan also suggests an alternative cause for her symptoms.

Cyclic vomiting syndrome is a rare disorder involving repeated episodes of severe nausea, vomiting and physical exhaustion. This disorder is more common in children, and there is no known cause for the condition. The patient's age and the presence of postural hypotension both make this diagnosis much less likely.

Further reading:

https://patient.info/doctor/autonomic-neuropathy

Question:

A 22-year-old male student is admitted to the acute medical unit with sudden onset severe occipital headache, photophobia and neck stiffness.

On examination, he is apyrexial, photophobic and has normal cranial nerve, upper and lower limb neurological examination. You were not able to visualize his optic discs on fundoscopy.

He undergoes a CT head, which is reported as showing 'Normal examination for age with some thickening of maxillary sinus mucosa'.

What is the most appropriate subsequent investigation?

A. Nasal endoscopy

B. Electroencephalogram

C. Lumbar puncture

D. MRI brain

E. CT cerebral angiography

Correct Answer:Lumbar puncture

Explanation:

The suspicion given this patient's presentation is of subarachnoid haemorrhage (SAH). A normal CT brain scan does not conclusively exclude SAH - in around 2% of patients with SAH, the initial CT head is negative. Lumbar puncture is recommended in cases of negative CT head and clinical picture suggestive of SAH and should be carried out at least 12 hours after the onset of the headache.

MRI brain is not indicated at this stage whilst still aiming to rule out SAH. CT cerebral angiography is used once SAH is confirmed in order to localize an aneurysm.

Nasal endoscopy is primarily a method for direct visualization of the vocal cords and surrounding structures and is of no use here despite the presence of thickened maxillary mucosa - this is likely an incidental finding unrelated to the presentation. If the history was suggestive of meningitis or sinusitis this finding may be more relevant.

Further reading:

https://patient.info/doctor/subarachnoid-haemorrhage-pro

Question:

A 58-year-old man presents with abdominal pain. He has been unwell for 2 days with worsening left lower quadrant abdominal pain associated with diarrhoea and some bleeding per rectum. He is previously fit and well, on no regular medication. He weighs 83kg. His temperature is 38.5, heart rate 132 beats per minute, blood pressure 72/31 mmHg, respiratory rate 28 breaths per minute, pulse oximetry 94% in room air. On examination, he has severe left lower quadrant tenderness with guarding.

He has been treated with intravenous co-amoxiclav and 2000ml of Hartmann’s solution. Despite this, his blood pressure is 84/35 mm Hg.

Blood tests show urea 16.9 mmol/L, creatinine 174 μmol/L, C-reactive protein 382 mg/L, lactate 5.2 mmol/L, white cell count of 24.2 x 109/L and haemoglobin 78 g/L.

What is the most appropriate next intervention?

A. Give a 500ml bolus of Hartmann's solution

B. Give a 500ml bolus of colloid fluid

C. Transfuse a unit of packed red blood cells

D. Start dobutamine as an inotrope

E. Start noradrenaline as a vasopressor

Correct Answer:Give a 500ml bolus of Hartmann's solution

Explanation:

The most likely diagnosis here is septic shock due to diverticular disease. The most appropriate next intervention would be to give a 500ml Hartmann’s bolus (otherwise known as compound lactate solution). The 2021 surviving sepsis guidelines recommend that patients with septic shock receive at least 30ml/kg of intravenous crystalloid within the first three hours. In an 83kg patient, this would equate to at least 2490ml, and so far he has only received 2000ml. They specifically recommend balanced crystalloids such as Hartmann’s solution rather than 0.9% sodium chloride.

If a patient remained hypotensive despite 30ml/kg of intravenous balanced crystalloid the next step would be to start an intravenous vasopressor, specifically noradrenaline. If a patient with sepsis had significant cardiac dysfunction with persistent hypoperfusion despite adequate volume status as vasopressor it would be reasonable to start an inotrope, such as dobutamine or adrenaline. He does not require a blood transfusion, the surviving sepsis guidelines recommend a restrictive transfusion protocol aiming to maintain a haemoglobin above 70 g/L.

Colloids have fallen out of favour due to studies showing no significant benefit and significant risk of harm including renal injury and anaphylaxis.

Further reading:

https://journals.lww.com/ccmjournal/Fulltext/2021/11000/Executive\_Summary\_\_Surviving\_Sepsis\_Campaign\_.14.aspx

Question:

A 67-year-old man was admitted six days ago with community-acquired pneumonia. He has a history of type 2 diabetes mellitus and takes metformin, and was diagnosed with prostate cancer 3 months ago, which is currently being managed with active surveillance. As an inpatient, he is receiving low molecular weight heparin for venous thromboembolism (VTE) prophylaxis.

This morning his right calf became swollen and tender, and a proximal leg venous ultrasound scan confirmed a deep vein thrombosis (DVT). The nurse also noticed an erythematous rash on the patient's abdomen.

Bloods on admission:

Result Reference Range

Haemoglobin (Hb) 157 g/L (130 – 180)

White Cell Count (WCC) 17.1 x 109/L (3.6 – 11.0)

Platelet Count 389 x 109/L (140 – 400)

Bloods today:

Result Reference Range

Haemoglobin (Hb) 159 g/L (130 – 180)

White Cell Count (WCC) 11.9 x 109/L (3.6 – 11.0)

Platelet Count 126 x 109/L (140 – 400)

What is the most likely cause of the DVT?

A. Prostate cancer

B. Essential thrombocytosis

C. Immobility

D. Immune thrombocytopenic purpura

E. Heparin-induced thrombocytopenia

Correct Answer:Heparin-induced thrombocytopenia

Explanation:

This patient is experiencing heparin-induced thrombocytopenia (HIT). This is an immune-mediated condition where IgG antibodies are produced in response to heparin. The antibodies then induce platelet activation and cause a hypercoagulable state. It is seen in under 5% of patients prescribed heparin, and most commonly occurs between days 5-10.

Features in the question indicating HIT are:

Platelet levels have fallen >50% from baseline and are now <150 x 109/L.

Features of thromboembolism

An erythematous rash around the injection site.

Essential thrombocytosis is characterised by a raised number of platelets, but this patient is thrombocytopenic.

Immobility is a risk factor for venous thromboembolism, however, it is not associated with thrombocytopenia or a skin rash.

Immune thrombocytopenic purpura is an autoimmune disorder causing isolated thrombocytopenia. It is associated with a purpuric skin rash, commonly of the lower limbs. It does not increase the risk of thromboembolism.

Malignancy increases the risk of thromboembolism. However, in localised disease, platelets are expected to be normal. As this patient is undergoing active surveillance and is not anaemic, the malignancy is not the likely cause of the thrombocytopenia. In addition, thrombocytopenia is very unlikely to occur this suddenly due to malignancy.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK482330/

Question:

A 65-year-old man attends his local hospital for abdominal aortic aneurysm screening.

He has not had any symptoms; however, he is found to have an unruptured abdominal aortic aneurysm that is 5.7cm in diameter.

He has a past medical history of hypertension, managed with amlodipine 10mg and candesartan 8mg. He drinks 20 units of alcohol a week and has a 50-pack-year tobacco history.

What is the most appropriate initial management step?

A. Begin resuscitation immediately

B. Refer to regional vascular services to be seen within 2 weeks

C. Discharge and arrange a follow-up ultrasound in 1 year

D. Refer to regional vascular services to be seen within 12 weeks

E. Emergency transfer to regional vascular services

Correct Answer:Refer to regional vascular services to be seen within 2 weeks

Explanation:

This patient has an asymptomatic, unruptured abdominal aortic aneurysm (AAA) measuring 5.7cm in diameter. NICE guidelines suggest all patients with an asymptomatic AAA measuring 5.5cm or larger in diameter should be referred to a regional vascular service to be seen within 2-weeks of diagnosis.

NICE guidelines recommend that all people with an AAA that is between 3.0 and 5.4cm should be seen within 12-weeks by the regional vascular service.

People with a suspected or confirmed ruptured AAA should undergo emergency transfer to regional vascular services. In this patient, the AAA is neither symptomatic nor ruptured; therefore, it would not warrant emergency transfer.

In patients presenting with a ruptured AAA, volume resuscitation will likely be required in the interim to emergency surgery. As this patient has not experienced a rupture, it is not indicated as the stem does not describe features of hypotension.

As this patient has been identified as having an asymptomatic but large AAA, it would not be suitable to discharge and arrange follow-up in one year. NICE guidelines recommend that all people with aneurysms >3.0cm be referred to their regional vascular services for follow-up; within 2-weeks for those ≥5.5 cm and within 12-weeks for those between 3.0-5.4 cm.

Further reading:

https://www.nice.org.uk/guidance/ng156

Question:

A 34-year-old female presents to her GP with concerns about her left breast. She has noticed redness of both the areola and nipple, with some flaking of the skin. It is now starting to become itchier and irritated. She denies any nipple discharge or nipple inversion. On examination, no lumps are palpable.

What is the next most appropriate step?

A. Advise she sees your GP colleague with a special interest in dermatology

B. Prescribe an emollient and review in two weeks

C. Advise simple analgesia and hot compresses

D. Urgent suspected cancer referral

E. Routine dermatology referral

Correct Answer:Urgent suspected cancer referral

Explanation:

This patient has changes associated with Paget's disease of the breast, and so she requires referral for assessment under the urgent suspected cancer pathway. Features of Paget's includes itching or redness of nipple/areola, flaking and thickened skin and ulceration, which is often painful and sensitive. The nipple may also be flattened and have a yellow/bloody discharge. Nearly all those with Paget's disease of the breast will have an underlying malignancy.

Paget's can be differentiated from dermatitis in that it always affects the nipple and only involves the areola, wherever dermatitis nearly always only involves the areola and spares the nipple.

All the other options would delay urgent investigation and potential treatment and so are not appropriate answers.

Further reading:

https://patient.info/doctor/pagets-disease-of-breast

Question:

A 60-year-old woman attends her general practice with fatigue. She mentions that she has felt fatigued for the past 4 months with increasing severity. On further questioning, the patient also reports palpitations at various, non-specific points throughout the day. The patient has a history of angina (diagnosed 5 years previously).

An ECG highlights the following abnormalities:

Alternating bradycardia and tachycardia

Mobitz type I sino-atrial exit block

Which of the following statements MOST APPROPRIATELY explains the underlying pathology of the condition described?

A. Dilatation of all heart chambers

B. Idiopathic fibrosis of the sinus node

C. Narrowing of the aortic isthmus

D. Accessory pathway between the atria and ventricles

E. Hypertrophy of the left ventricle

Correct Answer:Idiopathic fibrosis of the sinus node

Explanation:

The most likely diagnosis is sick sinus syndrome. Sick sinus syndrome is most commonly caused by idiopathic fibrosis of the sinus node. Other causes of this condition include amyloidosis, muscular dystrophy, Friedreich's ataxia and iatrogenic injury. The main risk factor for this condition is increasing age, however, younger individuals can also occasionally suffer from this disease. Sick sinus syndrome can present with a range of clinical features (fatigue, palpitations, syncope) or none at all, being picked up as an incidental finding. ECG changes associated with this condition include atrial bradyarrhythmias and atrial tachyarrhythmias.

The gold-standard management of sick sinus syndrome associated with symptomatic bradyarrhythmia is the introduction of a pacemaker. Complications of this condition include embolic cerebrovascular disease, myocardial infarction and heart failure.

Wolff-Parkinson White syndrome is associated with an accessory pathway between the atria and the ventricles.

Hypertrophy of the wall of the left ventricle is associated with hypertrophic cardiomyopathy, as well as severe aortic stenosis.

Dilatation of all heart chambers is associated with dilated cardiomyopathy.

Narrowing of the aortic isthmus is associated with coarctation of the aorta.

Further reading:

https://patient.info/doctor/sick-sinus-syndrome

Question:

A 26-year-old Indian woman had attended her booking appointment 4 weeks ago and it was found that her BMI was 33 kg/m2. At that time, she was offered lifestyle advice, and she was receptive to the advice given. She reattends today for a 75 g 2-hour oral glucose tolerance test. It was found that her fasting plasma glucose was 4.8 mmol/L and her 2-hour plasma glucose level was 7.0 mmol/L.

Which one of the following would be the most appropriate treatment?

A. Continue with lifestyle changes

B. Gliclazide

C. Multiple daily injections of insulin

D. Continuous subcutaneous insulin infusion

E. Metformin

Correct Answer:Continue with lifestyle changes

Explanation:

The 75 g 2-hour oral glucose tolerance test was carried out to determine if the patient has gestational diabetes. To be diagnosed with gestational diabetes, the patient must have either:

a fasting plasma glucose level of 5.6 mmol/L or above

or

a 2‑hour plasma glucose level of 7.8 mmol/L or above.

This patient's results are below the threshold; therefore, she does not have gestational diabetes.

Even though the patient does not have gestational diabetes, maintaining healthy lifestyle changes throughout the pregnancy is important for all patients.

For women with gestational diabetes who have a fasting plasma glucose below 7 mmol/L, metformin would be offered if lifestyle changes have not helped with blood glucose control.

For women with gestational diabetes who have a fasting plasma glucose of 7 mmol/L or above, they would be offered immediate treatment with insulin, with or without metformin, and diet and exercise changes. Hence, the correct answer is multiple daily injections of insulin.

Continuous subcutaneous insulin infusion is offered as an alternative treatment for pregnant women who have poor blood glucose control despite multiple daily injections of insulin.

Gliclazide is a sulfonylurea that is generally avoided in pregnancy because of the risk of neonatal hypoglycaemia.

Further reading:

https://www.nice.org.uk/guidance/ng3/chapter/recommendations#gestational-diabetes

Question:

A 4-month-old has been brought to the children’s emergency department with episodes of drawing his legs up and crying inconsolably over the past 36 hours. Initially, he was well in between these episodes but he is becoming increasingly lethargic and is more difficult to rouse. He has not been taking any of his feeds or soiled his nappy during this time but has vomited which his parents have said was green. On examination, he appears pale and his pulse is 180 bpm. Abdominal examination reveals a distended abdomen with a sausage-shaped mass on palpation. He has no past medical history of note other than a recent episode of gastroenteritis. He was born at term with no prenatal or postnatal complications. An abdominal USS shows a target sign.

What is the most likely diagnosis?

A. Infantile colic

B. Intussusception

C. Malrotation volvulus

D. Strangulated hernia

E. Necrotising enterocolitis

Correct Answer:Intussusception

Explanation:

The most likely diagnosis is intussusception, the commonest cause of bowel obstruction in infants. Intussusception occurs when one segment of bowel invaginates into another distal to it, leading to obstruction. Venous and lymphatic obstruction eventually lead to ischaemia and subsequent bowel perforation.

The condition typically presents with abdominal pain, occurring every 10-20 minutes (due to waves of peristalsis). Other symptoms include bilious vomiting, lethargy and general irritability. Clinical signs include a sausage-shaped mass (often in the right upper quadrant), dehydration, haemodynamic instability and later redcurrant jelly stools. Ultrasound typically shows a target sign.

Inconsolable crying and drawing up of the legs can be seen in infantile colic, however, the duration of symptoms is typically much shorter and the child would be otherwise well.

Both a strangulated hernia and malrotation volvulus can also cause bowel obstruction, however, the sausage-shaped mass is classically seen in intussusception. In addition, the recent gastroenteritis points more towards a diagnosis of intussusception as enlarged lymph nodes can act as ‘lead points’ allowing the bowel to telescope in on itself. Finally, the finding of target sign on abdominal USS is indicative of intussusception.

Necrotising enterocolitis usually presents within the first few weeks of life in preterm infants and presents with abdominal distension, blood/mucus in stool, acidosis with dramatic abdominal X-ray changes.

Further reading:

https://patient.info/doctor/intussusception-in-children

Question:

A 67-year-old man presents to his general practitioner for review 6-weeks after being discharged from the hospital for community-acquired pneumococcal pneumonia. His discharge summary describes right lower zone shadowing. He states that his cough and pleuritic chest pain have completely resolved, and he no longer feels short of breath. His past medical history is significant for angina pectoris and he currently smokes 15 cigarettes a day. He has a 30 pack-year smoking history.

On examination, breath sounds are vesicular and heart sounds one and two are audible with no murmurs.

Given this information, what is the general practitioner’s most appropriate action in the management of this patient?

A. Refer for a chest X-ray

B. Prescribe prophylactic azithromycin

C. Request a serum CRP

D. Refer for a CT thorax

E. Reassure and safety netting advice only

Correct Answer:Refer for a chest X-ray

Explanation:

The correct answer is refer for a chest x-ray. The British Thoracic Society recommends that certain patients with community-acquired pneumonia should have a repeat chest X-ray 6 weeks after clinical resolution in order to exclude underlying malignancy. Patients at higher risk of lung cancer (age >50, smoking history) or persistent symptoms or physical signs, in particular, should be offered a chest x-ray. This also applies to patients that do not require hospitalisation. This patient is at increased risk of lung cancer due to his 30-pack-year smoking history and age >50.

As patients with thoracic malignancies are themselves predisposed to developing pneumonia, and malignancies may be obscured by pulmonary infiltrates or pleural effusions, repeat chest x-rays may lead to earlier cancer detection. In addition, smoking cessation counselling should be offered to reduce the likelihood of lung cancer and a recurrence of pneumonia.

Prescribe prophylactic azithromycin is incorrect. Patients with frequent infective exacerbations of COPD may be considered for prophylactic azithromycin therapy, although as this patient does not have COPD this would not be clinically indicated.

Reassure and safety netting advice only is incorrect, as the British Thoracic Society guidelines state that patients with pneumonia should be offered a repeat chest x-ray 6 weeks after clinical resolution in order to increase the detection of underlying lung cancers.

Refer for a CT thorax is incorrect, as this would not be indicated in a patient whose pneumonia has improved and is no longer displaying symptoms. Although this would be likely to detect an occult malignancy, the dose of radiation is higher than for a chest x-ray, which would be a more appropriate first-line investigation.

Request a serum CRP is incorrect, as this would not change the management of a patient with clinically resolving pneumonia. A chest x-ray is a more specific screening measure for occult lung cancer than serum CRP.

Further reading:

https://cks.nice.org.uk/topics/chest-infections-adult/management/community-acquired-pneumonia/

Question:

A 31-year-old gentleman presents to his GP with a severe headache focused on the right side of his head. It is sharp in nature and he has had multiple similar episodes over the last 3 days, each lasting no longer than 3-4 hours. They seemingly began after returning from a weekend away celebrating a friend’s engagement during which time he drank significant amounts of alcohol. On examination his right eye is lacrimating but he has no focal neurological deficits.

Which treatment is most likely to be effective in the acute management of his condition?

A. Oral ibuprofen

B. Oral propranolol

C. Nasal sumatriptan

D. Oral paracetamol

E. Oro-dispersible aspirin

Correct Answer:Nasal sumatriptan

Explanation:

This gentleman describes a history of suggestive of cluster headache, likely triggered by alcohol consumption. NICE recommends referral to a neurologist or other specialist for confirmation of the diagnosis in the first instance. For confirmed acute bouts of cluster headache, sumatriptan (nasal or subcutaneous) is recommended providing there are no contraindications. High flow oxygen therapy may also be considered. NICE specifically do not recommend paracetamol, ibuprofen, propranolol or aspirin for acute cluster headache.

Further reading:

https://patient.info/doctor/cluster-headaches-pro

Question:

A 27-year-old man presents to his GP with a painless swelling in his left hemiscrotum, which he first noticed two months ago. He denies any abnormal urethral discharge, fever or weight loss, however, he has noticed some swelling under his nipples.

On examination, a firm lump is felt, which is indistinguishable from the left testis. The lump is not erythematous or tender and does not transilluminate. The patient is not sexually active.

What is the most appropriate initial investigation?

A. Sexually transmitted infection screen

B. Cancer antigen 15-3 (CA15-3) level

C. Prostate-specific antigen (PSA) level

D. Testicular ultrasound

E. Testicular biopsy

Correct Answer:Testicular ultrasound

Explanation:

This is a man presenting with a painless testicular lump and gynaecomastia, which raises the suspicion of testicular cancer. Testicular cancer typically affects men between the ages of 15 and 49 and presents with a painless nodule or swelling of the testis. It may also cause gynaecomastia through β-hCG production. According to NICE guidelines, the most appropriate initial investigation for suspected testicular cancer is a testicular ultrasound, which should be done under a 2-week wait urology referral. Depending on local guidelines and availability, tumour markers for testicular cancer (AFP, β-hCG and LDH) may also be measured in the interim.

A diagnosis of testicular cancer can be made based on ultrasound findings and blood markers alone; a testicular biopsy is not only unnecessary but risks seeding the malignancy along the biopsy tract.

Cancer antigen 15-3 (CA15-3) is a tumour marker for breast cancer. Although the patient is presenting with breast enlargement, this is more likely to be secondary to a testicular tumour, given the presence of a testicular lump, than breast cancer.

Prostate-specific antigen (PSA) is used to detect prostate cancer, which typically presents with symptoms of urinary obstruction. It would not cause a testicular lump.

Although orchitis could cause testicular swelling, a sexually transmitted infection screen is not the most appropriate investigation here, as the patient is not sexually active and denies any abnormal urethral discharge, fever or pain.

Further reading:

https://www.nice.org.uk/guidance/ng12/chapter/Recommendations-organised-by-site-of-cancer

Question:

A 48-year-old woman is seen by her GP. She has recently been diagnosed with type 2 diabetes on the basis of an elevated HbA1c done as part of a health check through her insurance company. She is slightly overweight with a BMI of 29 but otherwise fit and well. She works full time as a bus driver and does not smoke or drink.

What is the most appropriate first-line medication?

A. Gliclazide

B. Metformin

C. Pioglitazone

D. Insulin

E. Exenatide

Correct Answer:Metformin

Explanation:

First-line treatment for most people will be metformin. This has the added benefit in this case of helping with weight loss. Gliclazide and pioglitazone would usually be second-line choices. Gliclazide should be used in caution in this lady as she is a bus driver and there is a risk of hypoglycaemia. Insulin is usually a 3rd of 4th line therapy for type 2 diabetes. Exenatide is GLP-1 agonist and is typically used in people with a BMI over 35 and associated medical conditions, or those in whom insulin has significant occupational implications. It is most often used as a 3rd or 4th-line treatment.

Further reading:

https://www.nice.org.uk/guidance/ng28

Question:

A 21-year-old student presents to the GP in a visibly distraught state. A week previously she had unprotected sexual intercourse with a partner she met in a bar; she describes that this is very out of character for her and that the incident only occurred due to excessive alcohol intake. She has been in a relationship for the past four years and is terrified that her partner will find out, as she has now developed symptoms of what she assumes is a sexually transmitted infection.

The patient reports pain on urination that has developed over the last few days, as well as some foul-smelling vaginal discharge. She describes this as green in colour and is notably frothy. She has been so worried about these symptoms that she is struggling to sleep, and has been unable to attend work for the past few days.

A speculum examination is carried out by the GP, which allows the visualisation of the discharge; its appearance is very similar to what the patient described. The cervix is notably erythematous with a punctate appearance. The GP refers the patient to the nearby genito-urinary medicine clinic; he explains that they will confirm the diagnosis and treatment required, and will discuss her concerns about how to go about notifying her partner.

Which of the following organisms is most likely to be responsible for this patient's presentation?

A. Neisseria gonorrhoeae

B. Chlamydia trachomatis

C. Human papillomavirus

D. Trichomonas vaginalis

E. Gardnerella vaginalis

Correct Answer:Trichomonas vaginalis

Explanation:

This patient has presented with symptoms most likely indicating the presence of trichomoniasis; a sexually transmitted infection caused by Trichomonas vaginalis. Infection with this flagellated protozoan most commonly presents with malodorous, green discharge, as well as classic features of any sexually transmitted disease such as dysuria and vulval discomfort. Speculum examination may reveal, as in this case, a 'strawberry cervix'; a term used to describe an erythematous, punctiform appearance of the cervix, which is classically associated with this specific infection. A swab and wet microscopy will usually allow for detection of the parasite, and oral metronidazole is the first-line management option.

Human papillomavirus infection is responsible for a number of gynaecological pathologies; serotypes 16 and 18, in particular, are associated with a risk of cervical cancer, and other subtypes (6 and 11 most frequently) can lead to the development of genital warts. Infection does not normally result in discharge or dysuria, however.

Gardnerella vaginalis is an anaerobic bacteria that can disrupt the usual vaginal flora and cause bacterial vaginosis, a non-sexually transmitted infection often caused by excessive vaginal douching. This can present similarly to trichomoniasis, with foul-smelling discharge, but this is is most commonly white/grey in colour. The 'strawberry cervix' on examination is far more indicative of trichomoniasis.

Chlamydia trachomatis and Neisseria gonorrhoeae are the two most common bacteria implicated in sexually transmitted infections in the UK. These may be asymptomatic in women or may present with discharge, which is often mucopurulent. The green, frothy discharge and strawberry cervix described in this scenario point more strongly towards a diagnosis of Trichomonas vaginalis infection.

Further reading:

https://cks.nice.org.uk/topics/trichomoniasis/diagnosis/diagnosis-women/

Question:

A 66-year-old male patient undergoes an elective cholecystectomy. Although the procedure goes well, he is unable to pass urine following the operation.

Physical examination demonstrates fullness in the suprapubic region and insertion of a urinary catheter yields a post-void residual urine volume of 350 millilitres (mL).

Which of the following medications is most likely to have contributed to the patient going into urinary retention?

A. Tamsulosin

B. Doxazosin

C. Oxybutynin

D. Alfuzosin

E. Finasteride

Correct Answer:Oxybutynin

Explanation:

This patient has a post-void residual urine volume of > 100 millilitres (mL) and a distended bladder on the physical examination which is consistent with post-operative urinary retention. Urinary retention following operation is more likely when one or more of the following risk factors are present:

- Peri-operative anticholinergic use

- Peri-operative opiate use

- Age > 50 years old

- Use of general or spinal anaesthesia

- Operation length > 2 hours

- Abdominal surgery

- Intravenous fluids > 750 mL during operation

- Prostate enlargement

Oxybutynin is an anticholinergic medication which decreases the frequency of detrusor muscle contractions. It is likely to have contributed to this patient’s urinary retention.

Finasteride is a 5-alpha-reductase inhibitor used to reduce prostatic volume in patients with benign prostatic hyperplasia (BPH). Although it can decrease lower urinary tract symptoms associated with BPH, it takes approximately 3-6 months to take effect. Notable side effects of finasteride to be aware of include low libido, impotence, gynecomastia and breast tenderness.

Tamsulosin, doxazosin and alfuzosin are all alpha-blockers also used in the management of BPH. As such, they would be unlikely to contribute to acute urinary retention.

Further reading:

https://bnf.nice.org.uk/drug/oxybutynin-hydrochloride.html

Question:

Poppy Parker is a 35-year-old lady who has suffered from Crohn's disease for many years. She underwent a small bowel resection 1-day ago, due to a stricture. The nurse calls you to see her as she has not opened her bowels since the surgery and has vomited several times today.

On examination, the wound site looks mildly erythematous and her abdomen is soft and significantly distended. The patient denies any significant abdominal pain during palpation. Auscultation reveals an absence of bowel sounds. Vital signs are normal and an abdominal x-ray demonstrates wide-spread dilated loops of small bowel.

What is the most likely diagnosis?

A. Anastomotic leak

B. Gastroenteritis

C. Paralytic ileus

D. Large bowel obstruction

E. Small bowel obstruction

Correct Answer:Paralytic ileus

Explanation:

The most likely diagnosis is paralytic ileus given the clinical presentation of recent bowel surgery, vomiting, minimal pain on palpation, abdominal distension, absent bowel sounds and globally dilated small bowel loops on an abdominal x-ray.

Paralytic ileus describes the condition in which the bowel ceases to function and there is no peristalsis. Paralytic ileus is a common side effect of some types of abdominal surgery and is sometimes referred to as post-operative ileus. Other risk factors for developing the condition include hypokalaemia, hypercalcaemia, diabetic ketoacidosis and certain medications such as opioids or antimuscarinics.

Patients typically present with vomiting, abdominal distension and constipation. Clinical examination usually reveals absent bowel sounds on auscultation. Abdominal x-ray findings include globally dilated bowel loops.

Small and large bowel obstruction is possible in this patient, particularly given their history of Crohn's disease. However, the absence of abdominal pain and findings of globally dilated bowel loops make paralytic ileus more likely.

An anastomotic leak is also possible and would need to be considered given she is only 1-day post-op. However, typical presenting features of an anastomotic leak include fever, abdominal pain and peritonic features on clinical examination, making this diagnosis less likely in this scenario.

Gastroenteritis seems an unlikely diagnosis, given the recent surgical history and the absence of diarrhoea, abdominal pain or fever.

Further reading:

https://patient.info/doctor/intestinal-obstruction-and-ileus

Question:

A 4-year-old boy is brought to see the GP by his parents, who cite concerns about his development. They have been tracking his progress using the child health record (red book) and have noticed that he has been missing the majority of his milestones and that his development is increasingly lagging behind what is expected. The parents report that he was slightly late in starting walking, with this not happening until 2 years, but it is their child's speech that is most worrying to them. He still cannot construct a sentence consisting of more than 2 words and has an extremely limited vocabulary. He seems relatively uninterested in social interaction, which is a major worry, as the boy is due to start school soon.

On examination, the boy seems unwilling to interact with the doctor and avoids eye contact. He avoids speaking, instead, making incomprehensible noises that do not resemble words. The patient has a long, thin face, with extremely large ears, and when observed playing with some trains in the corner of the room demonstrates that he has hyper-flexibility of his finger joints.

The GP makes a hospital referral for global developmental delay, where further investigations are carried out, including a full range of blood tests and a microarray. Given the patient's dysmorphic features, the paediatric consultant also sends a specific genetic test for a trinucleotide repeat expansion; it is this that clinches the diagnosis.

What is the most likely reason for this patient's developmental delay?

A. Autistic spectrum disorder

B. Rett syndrome

C. Fragile X syndrome

D. Attention deficit hyperactivity disorder

E. Heller's syndrome

Correct Answer:Fragile X syndrome

Explanation:

Fragile X syndrome is a common inherited cause of intellectual disability in children, thought to affect approximately 1 in 10,000 patients. It arises due to a trinucleotide repeat expansion; mutations result in overexpression of CGG repeats - these can be detected using specific genetic screens; Fragile X syndrome cannot be diagnosed on a standard microarray.

The usual presenting features are of delayed social and speech and language milestones; with children often presenting with similar features to those with an autistic spectrum disorder. Learning disabilities are common, particularly in boys, and those with the condition often have characteristic physical features, which can include:

Large ears

Long, thin face

Large testicles

Flat feet

Hypermobility of the digits

Fragile X syndrome cannot be cured; rather management focuses on therapy to help with the intellectual disabilities that are usually present. Patients may benefit from targeted educational plans, as well as speech and behavioural therapy.

Whilst autistic spectrum disorder can present very similarly to Fragile X syndrome, the dysmorphic features on examination and the results of the investigations mean that this is not the most likely diagnosis.

The symptoms described in this scenario are not in keeping with a diagnosis of attention deficit hyperactivity disorder (ADHD). Patients with this condition usually exhibit hyperactivity, inattention and impulsive behaviour, none of which fits with this presentation.

Rett syndrome is a rare disease that can cause intellectual regression and characteristic repeated hand movements such as wringing or flapping of the hands. It is not the most likely diagnosis in this case, as the disease only affects girls; boys who develop the disease do not survive past birth.

Heller's syndrome is a rare cause of developmental delay; those with the disease initially develop normally, before undergoing a period of severe regression, where they may lose many of the skills previously acquired. This is not in keeping with the presentation in this scenario.

Further reading:

https://patient.info/doctor/fragile-x-syndrome

Question:

A 68-year-old woman presents to the emergency department with a two-day history of constant pain in the left iliac fossa and non-bloody diarrhoea. She feels otherwise well in herself. She has no significant past medical history other than a renal transplant 10 years ago.

On examination, there is mild tenderness in the left iliac fossa with no guarding or rebound tenderness. The transplanted kidney is felt in the right lower abdomen and is not tender.

Her observations are

Oxygen saturation: 99% on room air

Respiratory rate: 12/min

Heart rate: 68 bpm

Blood pressure: 122/81 mmHg

Temperature: 37.3 °C

A CT abdomen reveals diverticulosis, peri-colic fat stranding and a thickened gut wall.

What is the most appropriate treatment?

A. Laparoscopic lavage

B. Paracetamol and safety netting advice

C. Antibiotics

D. Sigmoid colectomy with primary anastomosis

E. Hartmann’s procedure

Correct Answer:Antibiotics

Explanation:

This patient has diverticulitis, but she is systemically well. According to NICE guidance, systemically well patients with diverticulitis who are immunocompromised or have significant comorbidity should be offered an antibiotic prescribing strategy. Since this patient has had a renal transplant, she will be taking immunosuppressants. Therefore, antibiotics is the correct answer.

Paracetamol and safety netting advice would be the correct treatment in systemically well patients with diverticulitis who are not immunocompromised and do not have significant comorbidity. However, as this patient has had a renal transplant, antibiotics should be offered.

Laparoscopic lavage is used when there has been a diverticular perforation. As the examination did not reveal any signs of peritonism, such as guarding or rebound tenderness, this is most likely simple diverticulitis, which can be managed non-operatively.

A Hartmann’s procedure is a sigmoid colectomy with an end colostomy and oversewn rectal stump. It is used in the treatment of complicated diverticulitis. This patient is presenting with simple diverticulitis and is systemically well, therefore, surgery is not indicated.

Similarly, a sigmoid colectomy with primary anastomosis is not indicated in simple diverticulitis.

Further reading:

https://www.nice.org.uk/guidance/ng147/chapter/Recommendations#acute-diverticulitis

Question:

A 35-year-old man presents to the A&E department with a sudden loss of vision in his left eye. He was sat working on the computer when he experienced a shower of sparks and floaters in his vision. This was quickly followed by the sensation of a ‘curtain falling down’ and covering his visual field. He had no pain or any other symptoms associated with the event. He is concerned as he has never experienced anything like this before.

His past medical history is significant for Marfan syndrome and myopia, which is corrected with lenses. He takes no medications.

On examination, there is reduced visual acuity and visual fields in the left eye only. Further neurological examination and vital signs are all within normal limits.

What is the most likely diagnosis?

A. Acute anterior uveitis

B. Retinal detachment

C. Cerebrovascular accident

D. Optic neuritis

E. Acute angle closure glaucoma

Correct Answer:Retinal detachment

Explanation:

The most likely diagnosis is retinal detachment - a cause of sudden and painless visual loss due to the separation of the neurosensory retina from the underlying retinal pigment epithelium. This patient has the four F's of retinal detachment - floaters, flashes, field loss, and fall in acuity. The underlying aetiology is likely two-fold in this patient. He has a history of Marfan syndrome and myopia, both of which are associated with an increased risk of retinal detachment. In keeping with NICE guidance, the patient should be urgently reviewed by an ophthalmologist.

Acute angle-closure glaucoma is characterised by a rapid onset of severe eye pain associated with a red eye, headache and nausea, ± vomiting.

Cerebrovascular accidents may result in visual loss; however, these are typically in a specific visual field (e.g., hemianopia, quadrantanopia) and associated with weakness of the limbs, cranial nerve abnormalities, and dysarthria or dysphasia.

Optic neuritis typically presents with a unilateral subacute loss of vision associated with pain made worse by eye movement.

Acute anterior uveitis typically presents with ocular pain worse on accommodation, discomfort and photophobia. On clinical examination there is circumlimbal conjunctival injection and a small irregular pupil due to posterior synechiae (adhesions between the pupil margin and lens).

Further reading:

https://cks.nice.org.uk/topics/retinal-detachment/

Question:

A 74-year-old man presents with a four-month history of progressive lower back pain and fatigue. The back pain is present all of the time and is not improved by any particular position. He denies any neurological or urinary symptoms and has no significant past medical history. Clinical examination reveals no obvious point tenderness on the spine and normal lower limb neurology. Vital signs are unremarkable.

Blood tests are requested:

Test Result Reference range

Haemoglobin 78 g/L (130 – 180)

Creatinine 165 μmol/ L (59–104)

Urea 14.2 mmol/L (2.5 - 7.8)

Calcium (adj) 2.81 mmol/L (2.2-2.6)

What is the most likely diagnosis?

A. Metastatic prostate cancer

B. Prolapsed intervertebral disc

C. Multiple myeloma

D. Lumbar spinal stenosis

E. Mechanical back pain

Correct Answer:Multiple myeloma

Explanation:

Multiple myeloma is the most likely diagnosis. Multiple myeloma is a disease of plasma cells (antibody-producing B lymphocytes). Normally a large variety of plasma cells produce various forms of immunoglobulin, however, in myeloma, one particular plasma cell clone begins to replicate in an uncontrolled manner, resulting in one specific type of immunoglobulin being massively overproduced by the large group of identical plasma cell clones. It can present with a wide variety of symptoms, including anaemia, bone pain, hypercalcaemia and renal impairment.

Metastatic prostate cancer can also present with anaemia and back pain, however, the absence of any urinary symptoms makes this diagnosis less likely.

Mechanical back pain is less likely, given the pain is constant and not positional. In addition, this diagnosis would not explain the fatigue, anaemia, hypercalcaemia or deranged renal function.

A prolapsed intervertebral disc would usually present with sudden onset back pain and potentially neurological symptoms secondary to spinal cord or nerve root compression. This diagnosis also fails to explain the reason for the anaemia, hypercalcaemia and deranged renal function.

Lumbar spinal stenosis would typically present with pain in the buttocks or lower extremities, with or without back pain. The pain is usually exacerbated by standing and walking.

Further reading:

https://patient.info/doctor/myeloma-pro

Question:

An 86-year-old male presents to the emergency department complaining of excruciating pain around his genitals. A week ago, he visited his GP with dysuria and urgency, and the GP prescribed seven days of trimethoprim. His past medical history includes type 2 diabetes mellitus, hypertension, gout and benign prostatic hypertrophy. He takes metformin, canagliflozin, ramipril, allopurinol and tamsulosin.

On examination, his genitals and perineum appear erythematous and inflamed. The patient says the area of erythema has extended since earlier today. On palpation, the area is extremely tender.

Based on the likely diagnosis, which of his medications is a risk factor for this condition?

A. Allopurinol

B. Canagliflozin

C. Tamsulosin

D. Metformin

E. Ramipril

Correct Answer:Canagliflozin

Explanation:

This patient has Fournier's gangrene, which is necrotising fasciitis of the male perineum and genitals. This is a life-threatening soft tissue infection caused by anaerobic or facultative anaerobic organisms (e.g. Streptococcus pyogenes). It requires urgent recognition and debridement to prevent further spread and overwhelming infection and death. Clinical features include pain out of proportion to the examination findings, with a rapidly expanding inflamed area of skin. A urinary tract infection (UTI) can precipitate Fournier's gangrene, which is relevant in this patient as he describes recent dysuria and urgency. SGLT-2 inhibitors (e.g. canagliflozin) are a risk factor for Fournier's gangrene as they increase the urinary excretion of glucose, which increases the risk of a UTI and progression to necrotising fasciitis.

Allopurinol reduces the concentration of uric acid in the blood and is a prophylactic treatment for gout. It does not increase the risk of necrotising fasciitis.

Ramipril is an angiotensin-converting enzyme (ACE) inhibitor commonly used in the management of hypertension. It does not increase the risk of necrotising fasciitis.

Metformin is generally the first-line medication in the management of type 2 diabetes mellitus. It increases insulin sensitivity, reduces hepatic gluconeogenesis and reduces glucose absorption from the small bowel. Metformin does not increase the urinary excretion of glucose or the risk of necrotising fasciitis.

Tamsulosin is an alpha-receptor blocker commonly used in benign prostatic hypertrophy. It does not increase the risk of necrotising fasciitis.

Further reading:

https://patient.info/doctor/necrotising-fasciitis-pro

Question:

A 28-year-old woman who is 24-weeks pregnant has presented to her antenatal appointment. Due to several risk factors being identified in the initial booking appointment, further investigations were carried out and she was diagnosed with gestational diabetes.

What investigation finding is diagnostic of gestational diabetes mellitus?

A. Random plasma glucose of 10 mmol/L

B. Fasting plasma glucose of 6.2 mmol/L

C. Glycosuria of 2+

D. Body mass index of 31 kg/m2

E. 2-hour plasma glucose level of 7 mmol/L

Correct Answer:Fasting plasma glucose of 6.2 mmol/L

Explanation:

At the booking appointment, pregnant patients are assessed for risk factors of gestational diabetes. If a patient is at risk of gestational diabetes, a 75 g 2-hour oral glucose tolerance test (OGTT) is offered between 24 and 28 weeks. Gestational diabetes is diagnosed if the patient has an initial fasting plasma glucose of 5.6 mmol/L and above; or if the patient has 2-hour plasma glucose of 7.8 mmol/L and above. Hence, a fasting plasma glucose of 6.2 mmol/L is diagnostic of gestational diabetes as that is above 5.6 mmol/L.

A 2-hour plasma glucose level of 7 mmol/L has not met the threshold of 7.8 mmol/L, which means that this would not be diagnostic of gestational diabetes.

Random plasma glucose is not used in the diagnosis of gestational diabetes.

Glycosuria of 2+ on routine antenatal testing would prompt further testing, OGTT, to exclude or confirm gestational diabetes, but it is not a diagnostic test for gestational diabetes.

A body mass index above 30 kg/m2 is not diagnostic for gestational diabetes, but it remains a risk factor for developing gestational diabetes. This would prompt further testing, OGTT, to assess for gestational diabetes.

Further reading:

https://www.nice.org.uk/guidance/ng3/chapter/Recommendations#gestational-diabetes

Question:

A 75-year-0ld man is brought to the emergency department after a fall. Over the last 3 weeks, he has had worsening confusion and clumsiness. Recently, he developed weakness, which led to the fall.

On examination, he is weaker on the right side and his pupils are equal and reactive to light. He is confused, has reduced concentration and poor attention, and impaired long- and short-term recall.

His blood glucose concentration is normal, and his oxygen saturations are 97% on room air. A CT head shows a hypodense crescenteric lesion on the left side, with no midline shift or effacement of the ventricl.es

Given the likely diagnosis, what is the most appropriate definitive step in his management?

A. Burr hole irrigation and drainage

B. IV mannitol

C. Conservative management

D. Decompressive craniectomy

E. Ventriculoperitoneal shunting

Correct Answer:Burr hole irrigation and drainage

Explanation:

Burr hole irrigation and drainage is correct. This patient has signs and symptoms suggestive of a raised intracranial pressure, characterised by his progressively worsening weakness, confusion, amnesia, and clumsiness. The CT scan demonstrating a hypodense (dark) crescenteric lesion suggests the presence of a chronic subdural haematoma, which can compress the brain tissue leading to these signs and symptoms. Chronic subdural hematomas are more common in infants, elderly patients, and patients with chronic excessive alcohol consumption due to fragile or taut bridging veins. The ideal management step for a symptomatic chronic subdural haematoma is burr hole drilling and drainage.

Decompressive craniectomy is incorrect. This is a treatment option for an acute subdural haematoma with a significant mass effect. The bleeding is much quicker here and requires more urgent treatment. This would present with a more acute history, preceded by a high-impact injury. The CT scan would show a hyperdense (bright) crescenteric lesion instead of hypodense lesion. Hypodense lesions suggest that the subdural haematoma is chronic instead of acute.

Conservative management is incorrect. This would be appropriate if the subdural haematoma was found incidentally and the patient was asymptomatic. Since this patient is experiencing symptoms, intervention is necessary to reduce the risk of further complications such as damage to the brain, or complications relating to the subdural haematoma (e.g. falls and their consequences).

IV mannitol can be used as an initial management option in patients with a raised intracranial pressure, as it reduces the pressure by acting as an osmotic diuretic. However, this is not a definitive management step, and evidence has shown that prolonged use can paradoxically increase intracranial pressure.

Ventriculoperitoneal shunting is incorrect. This is a treatment option for normal pressure hydrocephalus, which classically presents with a triad of dementia, gait abnormalities, and urinary incontinence. A CT scan would not show a hypo-/hyperdense crescenteric lesion and would instead show ventriculomegaly.

Further reading:

https://geekymedics.com/subdural-haemorrhage-an-overview/

Question:

A 68-year-old man has been experiencing moderate upper abdominal pain, nausea and heartburn for around six weeks, and the symptoms are worse after a large meal or when lying down. The patient has noticed some unintentional weight loss in the last month. He is not taking any prescribed medication, but often takes ibuprofen for his chronic low back pain.

On physical examination, there are signs of epigastric tenderness. His routine observations are unremarkable.

What is the most likely diagnosis?

A. Gastric malignancy

B. Irritable bowel syndrome

C. Peptic ulcer disease

D. Acute pancreatitis

E. Cholecystitis

Correct Answer:Peptic ulcer disease

Explanation:

The most likely diagnosis is peptic ulcer disease (including gastric and duodenal ulceration) which commonly presents with upper abdominal pain, dyspepsia, nausea, loss of appetite and weight loss. Risk factors include H. pylori infection, use of NSAIDs (e.g. ibuprofen) or aspirin, and age > 65 years. Symptoms are often worse after eating or when lying down, and so may wake patients up in the night.

Acute pancreatitis usually presents as sudden-onset abdominal pain with nausea and vomiting. On examination, there is often fever and tachycardia. Acute pancreatitis usually improves within a week, unlike this patient, who has experienced symptoms for six weeks. It is not associated with long-term weight loss.

Gastric malignancy is more commonly associated with mild epigastric discomfort than severe abdominal pain. In addition, gastric malignancy often produces dysphagia, early satiety, and anaemia, which is not mentioned in this case.

The main symptom of cholecystitis is severe, constant pain in the right hypochondriac region of the abdomen, which gets worse on deep inspiration and may radiate to the right shoulder. Symptoms also include fever, sweating, and jaundice. Due to the nature of cholecystitis pain, it is usually detected and treated urgently.

While irritable bowel syndrome can cause abdominal pain and nausea, it is usually accompanied by diarrhoea, constipation, or bloating. These symptoms are often relieved after bowel movements.

Further reading:

https://bnf.nice.org.uk/treatment-summaries/peptic-ulcer-disease/

Question:

A 45-year-old single male is referred with abnormal kidney function after recently moving into the area. He works night shifts in a warehouse. He reports no symptoms. His past medical history includes asthma and type 1 diabetes mellitus (diagnosed at age 7). The patient typically avoids healthcare and does not attend any diabetic eye or foot clinics. There is no family history of disease.

Urine dipstick shows:

Protein 3+

Blood 2+

Glucose 2+

Clinical examination is unremarkable, with no ankle oedema noted. Weight is 74Kg and blood pressure is 158/95 mmHg.

Blood tests demonstrate:

Na 138 mmol

K 5.4 mmol

Urea 5.0 mmol

Cr 186 umol

Phosphate 2.2 mg/dl

Hb A1c of 75 mmol

Albumin 33 g/dl

Hb 10.2 g/dl (MCV 88fl)

PTH 90 ng/L

A historical blood test demonstrated a creatinine of 156 umol approximately 6 months ago and a renal ultrasound scan at that time was reported as showing cortical loss with slightly small 9.5cm kidneys. Urine albumin to creatinine ratio (ACR) is 300 mg/mmol.

What is the most likely cause of the patient's renal impairment?

A. Atheromatous renovascular disease

B. Diabetic nephropathy

C. Membranous nephropathy

D. Myeloma kidney

E. IgA nephropathy

Correct Answer:Diabetic nephropathy

Explanation:

This patient is presenting with chronic kidney disease. The clues are the historically raised creatinine, characteristic ultrasound appearances and biochemical complications of chronic kidney disease including normocytic anaemia and secondary hyperparathyroidism. Many students confuse the presence of dipstick haematuria with a diagnosis of glomerulonephritis such as IgA nephropathy. Although glomerulonephritis is possible, longstanding diabetes together with the markedly raised HbA1c and high urine albumin-creatinine ratio make diabetic nephropathy far more likely.

Atheromatous renovascular disease is a possibility and may well be present in diabetic patients, but it would not usually present with heavy proteinuria and may demonstrate renal asymmetry on the ultrasound scan.

Membranous nephropathy would usually present with nephrotic syndrome consisting of heavy proteinuria, oedema and low serum albumin. This patient lacks oedema but does have nephrotic range proteinuria and slightly low albumin. These are characteristic features of overt diabetic nephropathy, which can itself progress to nephrotic syndrome.

Further reading:

https://patient.info/doctor/diabetic-nephropathy

Question:

A 27-year-old woman has been admitted to the intensive care unit after an intentional overdose of paracetamol. She has taken 14 g of paracetamol as a staggered overdose over 12 hours. She is confused with a GCS of 13/15. She has a previous medical history of depression for which she takes sertraline 150 mg once a day.

Investigations:

Arterial pH 7.27 (7.35-7.45)

ALT 3000 U/L (<33 U/L)

ALP 2500 IU/L (30–130 U/L)

Alb 20 g/L (35–50 g/L)

Urea 15.6 mmol/L (2.5 - 7.8 mmol/L)

Creatinine 250 μmol/L (45–84 μmol/ L)

Lactate on arrival 3.4 mmol/L (0.5 - 2.2 mmol/L)

Which of her investigations is an indication of a poor prognosis?

A. ALT

B. Arterial pH

C. Lactate

D. Albumin

E. Creatinine

Correct Answer:Arterial pH

Explanation:

The King's College criteria are used to determine who should be referred for an immediate liver transplant after a paracetamol, or acetaminophen, overdose due to the high likelihood of a poor prognosis. The criteria include:

Arterial pH <7.30

INR >6.5

Creatinine >300 μmol/L

Grade 3 or 4 hepatic encephalopathy

Anyone presenting with an arterial pH <7.30 should be immediately referred to a liver transplant service. If the arterial pH is >7.3, then to meet the criteria for referral the patient must have all of the other findings; INR>6.5, a creatinine >300 and grade 3 or 4 hepatic encephalopathy.

Other predictors of a poor outcome are:

lactate >3.5 mmol/L after fluid resuscitation during the first 4 hours or >3.0 mmol/L after 12 hours

Phosphate >1.2 mmol/L after 48 hours

Although ALT will be shown to rise in acute liver failure, its overall value does not confer a prognosis for the patient.

It is important to monitor albumin levels, as this directly affects the oncotic pressure of the vasculature and drug distribution, there is no correlation between its nadir and prognosis for the patient.

Further reading:

https://litfl.com/liver-transplantation-for-paracetamol-toxicity/

Question:

A 67-year-old woman presents to the GP, concerned about a non-healing ulcer that has been present for the last 3 weeks. She was diagnosed with type 2 diabetes more than 10 years ago and was informed by her consultant that she was at an increased risk of ulceration, and is therefore concerned about her recent symptoms. She has a past medical history of recurrent deep vein thromboses due to an underlying diagnosis of antiphospholipid syndrome, as well as hypertension and hyperlipidemia. She consumes a gluten-free diet due to a relatively recent diagnosis of coeliac disease. The patient reports taking daily ramipril, metformin and atorvastatin, as well as warfarin as prophylaxis against further venous thromboembolism.

Examination reveals an ulcer with poorly demarcated edges, located around 1cm below the medial malleolus. There is notable pitting oedema of both lower limbs, and the surrounding skin appears dry and hardened, with brown discolouration. Diabetic foot examination reveals no sensory abnormalities, and there are no ulcers detectable on the soles of the feet.

Which of the following is the most likely to account for the patient's presentation?

A. Venous ulceration

B. Warfarin necrosis

C. Neuropathic ulceration

D. Pyoderma gangrenosum

E. Arterial ulceration

Correct Answer:Venous ulceration

Explanation:

The examination findings in this patient most likely point towards a diagnosis of venous ulceration; the 'gaiter area' near the medial malleolus is a classic site of disease, and dry, hardened skin and brown discolouration are likely describing venous stasis eczema and haemosiderin deposition respectively. Both are classically associated with venous ulceration.

This patient is likely to be suffering from chronic venous insufficiency, as evidenced by the history of recurrent DVT, which can lead to valvular incompetence. Pitting oedema in the extremities is in keeping with the diagnosis. This and the subsequent ulceration will likely be diagnosed using Doppler ultrasound to confirm venous insufficiency, with management involving layered compression bandaging to encourage venous return.

Warfarin necrosis is a very rare complication that can arise in those on the medication. The pathophysiology of the condition is thought to relate to acquired Protein C deficiency from taking the drug, resulting in excessive clotting and subsequent tissue death. Whilst this patient is taking warfarin, the condition usually presents more acutely, and given its rarity, is far less likely than venous ulceration in this scenario.

Whilst this patient does have type 2 diabetes, making neuropathic ulceration a possibility, the location and examination features are far more indicative of a venous ulcer in this scenario. Neuropathic ulcers classically develop on pressure points such as the feet and are usually due to repeated trauma that is not noticed by the patient secondary to peripheral neuropathy. Examination did not reveal any evidence of sensory loss in this patient.

This patient does have risk factors for arterial disease and subsequent ulceration (hypertension, type 2 diabetes and hyperlipidemia), but the description does not point towards this as the likely diagnosis. Arterial ulcers are classically 'punched out' in appearance, and are usually accompanied by severe pain due to arterial insufficiency and ischaemia.

Pyoderma gangrenosum is a rare form of ulcer that most commonly arises in patients with underlying inflammatory bowel disease. The usual description is of an ulcer with a violaceous border, in those with coexisting gastrointestinal symptoms; the condition is not observed in those with coeliac disease.

Further reading:

https://cks.nice.org.uk/topics/leg-ulcer-venous/

Question:

A 60-year-old retired accountant presents to his GP with progressive, painless visual loss in his right eye. The patient has only recently noticed the visual loss, but on questioning thinks his vision has been deteriorating for several years. The patient is short-sighted and requires glasses, there is no other past medical history.

On examination of the right eye, peripheral fields are reduced. There is a relative afferent pupillary defect (RAPD). Ophthalmoscopy reveals an abnormal optic disc.

What is the most likely diagnosis?

A. Macular degeneration

B. Primary open angle glaucoma

C. Acute angle closure glaucoma

D. Multiple sclerosis

E. Amaurosis fugax

Correct Answer:Primary open angle glaucoma

Explanation:

The answer is primary open-angle glaucoma (POAG). This is the only option that causes tunnel vision (peripheral scotoma). Glaucoma is a chronic optic neuropathy which results in progressive peripheral visual loss with central vision only being affected in end stage disease. The scenario best fits this diagnosis.

Acute angle-closure glaucoma presents with acute painful loss of vision in the affected eye. It is more common in hypermetropic patients, as the eyeball is smaller; therefore, more likely to cause contact between the iris and trabecular meshwork and impeding outflow of aqueous humour.

Multiple sclerosis can present with optic neuritis. This results in a subacute decline in visual acuity (over hours to days). As the optic nerve is affected, multiple sclerosis can cause a relative afferent pupillary defect (RAPD). Patients may experience pain during eye movement, but the visual loss itself is painless.

Macular degeneration is typically a disease of the elderly and is highly unlikely in those under 50 years old. The condition causes gradual painless decline of central vision , which often presents as the inability to see faces. Patients may also report distortion of straight lines, tested for using an Amsler grid.

Amaurosis fugax is the fleeting loss of vision in one eye. It occurs due to transient retinal ischaemia caused by emboli. Patients describe the loss of vision as a “curtain coming down” over the eye. Vision often returns upon resolution of ischaemia. This diagnosis does not fit with the clinical scenario in this question.

Further reading:

https://patient.info/doctor/gradual-loss-of-vision

Question:

A 43-year-old man presents to the GP complaining of persistent joint pain, particularly in the back and knees, and a generalised itch. The pain is worse in the morning, but he finds that swimming helps. On further questioning, he reports suffering from diarrhoea and abdominal pain for a number of years and also describes a few occasions of self-resolving painful lesions on his shins.

Blood tests are requested:

Test Result Reference range

Alkaline phosphatase (ALP) 158 U/L (30–130)

Alanine aminotransferase (ALT) 30 U/L (<41)

Bilirubin 32 μmol/L (<21)

GGT 72 U/L (<60)

Albumin 42 g/L (35–50)

Faecal calprotectin Positive Negative

Given the likely diagnosis, which of the following investigation results is most likely to be reported?

A. Kimmesltein-Wilson nodules on biopsy

B. Dilation and beading of the bile ducts on MRCP

C. Positive anti-smooth muscle antibodies

D. Liver biopsy demonstrating inflammation confined to the intrahepatic bile ducts

E. Elevated AST:ALT ratio

Correct Answer:Dilation and beading of the bile ducts on MRCP

Explanation:

The history of arthralgia, in combination with vague abdominal symptoms and erythema nodosum (the likely explanation for the patient's shin lesions), should lead to a consideration of inflammatory bowel disease (IBD) as a possible diagnosis. Enteropathic arthritis and erythema nodosum are relatively common extra-articular manifestations of both Crohn's and ulcerative colitis, and whilst irritable bowel syndrome could account for the patient's symptoms, this is a diagnosis of exclusion, and the history given suggests that the patient has not sought medical advice for his medical symptoms previously.

The LFT results show a cholestatic picture, with a raised ALP and GGT. Considering the patient's history of likely ulcerative colitis, and reports of increasing itch, the most likely explanation for these results is primary sclerosing cholangitis (PSC); this condition is almost exclusively seen in those with the condition. The disease involves chronic inflammation of intra- and extrahepatic bile ducts, which results in issues with the passage of bile, and explains the abnormalities on LFTs. MRCP is often used to confirm the diagnosis; the characteristic finding is of dilation and beading of the bile ducts.

Inflammation confined to the intrahepatic bile ducts would be in keeping with a diagnosis of primary biliary cholangitis; this pathology only involves the intrahepatic ducts, with PSC giving inflammation of the extrahepatic ducts also. Primary biliary cholangitis is more common in middle-aged women and classically is associated with positive anti-mitochondrial antibodies. Given the patient's diagnosis of ulcerative colitis, this is not the most likely diagnosis in this scenario.

Kimmelstein-Wilson nodules are a finding associated with diabetic nephropathy seen on renal biopsy; they are of no relevance to this scenario.

An elevated AST: ALT ratio (above 2) is classically seen in alcoholic liver disease; whilst there is no disclosure of the patient's level of alcohol intake, alcoholic liver involvement would be expected to present with a hepatitic picture on LFTs, rather than an isolated raised ALP.

Anti-smooth muscle antibodies are usually positive in patients with autoimmune hepatitis; this usually presents with a hepatitic picture, rather than the cholestatic picture present in this scenario.

Further reading:

https://patient.info/doctor/primary-sclerosing-cholangitis-pro

Question:

A 32-year-old pregnant female at 34 weeks gestation presents to the emergency department due to right-sided abdominal pain. This started 18 hours ago and has become gradually more severe and is now accompanied by nausea. The patient reports no contractions or vaginal bleeding. Foetal movements are normal.

Observations: RR 20/min, SpO2 98% on room air, BP 129/80 mmHg, HR 110bpm, temp 38.8°C.

Abdominal examination reveals a mass consistent with a gravid uterus. The patient has mild tenderness on the right side of her abdomen, but there is no abdominal rigidity or guarding. Pelvic examination shows no adnexal masses. Cardiotocography shows no abnormalities or uterine contractions. Laboratory values are significant for mild leucocytosis.

What is the most appropriate initial investigation?

A. Urinalysis

B. Computed tomography (CT) scan of the abdomen

C. Chest radiograph

D. Abdominal ultrasound

E. Abdominal plain films

Correct Answer:Abdominal ultrasound

Explanation:

This patient is pregnant and has a fever, right-sided abdominal pain, leucocytosis and nausea. The most likely diagnosis is acute appendicitis. Due to the growing foetus which can displace the appendix, atypical presentations of acute appendicitis are more likely to be seen in pregnant women. Imaging in the form of abdominal ultrasound should be completed in order to confirm the diagnosis.

Abdominal plain films would be more appropriate if a small bowel obstruction was being considered in the differential. However, plain films carry the small risk of radiation exposure to the foetus, therefore should be used sparingly in the pregnant population.

CT scans should be avoided in pregnant patients due to the risk of exposing the foetus to radiation. In the non-pregnant population, however, this form of imaging is used frequently to confirm acute appendicitis.

Chest radiograph can be used to aid in the diagnosis of lung pathologies such as pneumothorax or community-acquired pneumonia. Pneumothorax is more likely to present with sharp chest pain and shortness of breath. Pneumonia would be more likely if productive cough and malaise were present.

Urinalysis would be needed if the patient had symptoms consistent with a urinary tract infection such as dysuria and urinary frequency.

Further reading:

https://patient.info/doctor/appendicitis-pro

Question:

A 21-year-old man presents after noticing a painless neck lump. On questioning, he admits to also experiencing night sweats and unintentional weight loss over the last 6 months. On examination, there is a firm, round, enlarged cervical lymph node on the left side of the neck. The rest of the examination is unremarkable. A lymph node biopsy of the enlarged node is performed, which shows the presence of Reed-Sternberg cells.

Which of the following is most associated as a risk factor for the development of this patient’s condition?

A. Human papillomavirus (HPV) infection

B. Family history of thyroid malignancy

C. Family history of autoimmune disease

D. Long term alcohol misuse

E. Epstein-Barr virus (EBV) infection

Correct Answer:Epstein-Barr virus (EBV) infection

Explanation:

This patient has Hodgkin’s lymphoma (HL), evidenced by Reed-Sternberg cells on lymph node biopsy, and systemic signs of weight loss and night sweats. History of infection with Epstein-Barr virus (EBV) is a risk factor for HL.

Although a raised erythrocyte sedimentation rate in HL is a poor prognostic factor, autoimmune disease is not associated with an increased risk of developing HL.

Thyroid malignancy and alcohol misuse are not associated with HL.

Human papillomavirus (HPV) infection is a risk factor for the development of cervical cancer. HPV-16 ad HPV-18 are the commonest high-risk subtypes.

Reference: BMJ Best Practice: Hodgkin’s lymphoma

Further reading:

https://patient.info/doctor/hodgkins-lymphoma-pro

Question:

Margaret Bond, a 73-year-old lady, presents with excessive tiredness and bruising over the past 3 months. On further questioning, she has been otherwise well and cannot think of anything that could have caused this. As part of a routine blood check, she is pancytopenic with no obvious cause. You suspect a diagnosis of chronic lymphocytic leukaemia (CLL).

Which of the following findings would be most specific for CLL?

A. Ziehl-Neelsen stain

B. Presence of auer rods

C. Presence of the Philadelphia chromosome

D. Presence of smudge cells on blood film

E. Presence of Reed-Sternberg cells

Correct Answer:Presence of smudge cells on blood film

Explanation:

The presence of smudge cells on a blood smear is pathognomonic for CLL and as such is the correct answer in this instance.

The Philadelphia chromosome is involved in the vast majority of the patients with chronic myeloid leukaemia, but can also rarely be present in those with acute myeloid leukaemia (AML) and acute lymphocytic leukaemia (ALL).

Auer rods are associated with AML and are granular needles that form in the cytoplasm of myeloid leukaemic blasts.

Reed-Sternberg cells are pathognomonic for Hodgkin’s lymphoma.

Ziehl-Nelson stain is used in the diagnosis of tuberculosis.

Further reading:

https://patient.info/doctor/chronic-lymphocytic-leukaemia-pro

Question:

A 41-year-old female presents to the emergency department with an 8-hour history of sudden-onset abdominal pain. The pain is felt in her epigastric region and radiates through to her back. She has vomited multiple times since the onset of the pain. She has had no diarrhoea and no bloating.

She has a past medical history of cholecystitis and is awaiting an appointment for a cholecystectomy. She does not drink alcohol and smokes 10 cigarettes per day.

On examination, the patient looks unwell. She is warm to touch with a pulse rate of 110 beats per minute and regular rhythm. Her blood pressure is 124/64 mmHg and her temperature is 37.8 degrees. In addition, she is requiring 2 litres of oxygen via nasal cannula to maintain an oxygen saturation of 96%. Her abdomen is soft but very tender in the epigastrium. Bowel sounds are present. There is no jaundice.

Which blood test is most likely to be helpful in establishing the underlying diagnosis?

A. Erythrocyte sedimentation rate (ESR)

B. C-reactive protein (CRP)

C. Troponin-T

D. Serum lipase

E. D-dimer

Correct Answer:Serum lipase

Explanation:

This patient is likely to have acute pancreatitis, secondary to gallstone disease. She has epigastric pain radiating through to her back, vomiting, mild pyrexia, tachycardia and hypoxaemia, all of which are hallmarks of acute pancreatitis. Serum lipase is more sensitive and specific for acute pancreatitis than serum amylase although in practice both may be used.

Troponin-T is used in the diagnosis of acute coronary syndrome and D-dimer is most useful in the investigation of possible venous thromboembolism. However, both of these are non-specific and can be raised by cardiac stress and generalised inflammatory processes respectively. Hence, they should be used with a specific diagnosis in mind and neither acute myocardial ischaemia nor venous thromboembolism are the most likely diagnosis here.

CRP and ESR are non-specific inflammatory markers. Both may be raised in this patient but do not help to establish the specific underlying diagnosis; CRP is, however, useful in prognosis.

Further reading:

https://patient.info/doctor/acute-pancreatitis-pro

Question:

A 3-year-old girl presents to the emergency department with a 3-day history of diarrhoea and vomiting. Her mother is concerned as she has blood in her stool. On examination, she appears mildly dehydrated and pale but is otherwise well. Urinalysis shows protein 3+, and is negative for blood, leukocytes and nitrites. Her blood results are as follows:

Result Reference range

Hb 72 g/l (115-165)

WCC 8 x 10⁹/l (3.6-11x109)

Platelets 69 x 10⁹/l (140–400 x10⁹)

Na+ 145 mmol/L (133-146)

K+ 61 mmol/L (3.5-5.3)

Urea 32 mmol/L (2.5-7.8)

Creatinine 219 μmol/L (45-84)

What is the most likely diagnosis?

A. Leukaemia

B. Haemolytic uraemic syndrome

C. Henoch-Schonlein purpura

D. Pyelonephritis

E. Glomerulonephritis

Correct Answer:Haemolytic uraemic syndrome

Explanation:

The most likely diagnosis given the scenario above is haemolytic uraemic syndrome (HUS) - a rare but potentially life-threatening complication of acute infectious gastroenteritis that occurs mostly in children aged less than 5 years. This 3-year-old female has presented with the diagnostic triad of acute renal failure, microangiopathic anaemia and thrombocytopenia which is characteristic of HUS. E-coli O157, Salmonella, Shigella or Campylobacter are amongst the most common causative agents. In the initial stages, children commonly present with vomiting and diarrhoea (which is often bloody), with acute renal failure occurring soon after. HUS usually has a good outcome, and although permanent renal damage is uncommon, around 50% of children will go on to develop chronic renal complications, including hypertension. A blood film is key to confirming the diagnosis, which shows microangiopathic haemolytic anaemia.

Glomerulonephritis presents as nephritic or nephrotic syndrome, acute renal failure or asymptomatic haematuria and/or proteinuria but does not normally present with anaemia and thrombocytopenia.

Henoch-Schonlein purpura similarly does not usually result in anaemia or thrombocytopenia but can lead to nephritis and, thus, haematuria and proteinuria.

Leukaemia is unlikely in this scenario as, although this child has anaemia and thrombocytopenia, she is otherwise well, with no clinical features suggestive of bone marrow suppression, and the history is relatively acute, pointing towards a likely infectious cause.

Pyelonephritis presents much more commonly in adults, usually with flank tenderness and a urine dip positive for leucocytes and nitrites indicative of infection.

Further reading:

https://www.clinicalguidelines.scot.nhs.uk/nhsggc-guidelines/nhsggc-guidelines/kidney-diseases/management-and-investigation-of-bloody-diarrhoea-and-haemolytic-uraemic-syndrome/

Question:

A 19-year-old man presents to his GP with a 3-week history of dry cough and pleuritic chest pain associated with headache, myalgia, and occasional febrile episodes. In the last 24 hours, he has noticed a rash spreading across his upper limbs and trunk.

His past medical history is significant for asthma which he controls with daily beclomethasone. He has no allergies. He is a university student and reports that his flat-mates have experienced a similar constellation of symptoms.

On examination, his respiratory rate is 21 and his temperature is 37.9⁰C. All other vital signs are within normal range. On examination of the chest, there a few fine crackles in the middle and lower zones of the lungs bilaterally. The rash on his upper limbs and trunk is composed of multiple dusky central area, a darker red inflammatory zone surrounded by a pale ring of oedema, and an erythematous halo on the extreme periphery of the skin lesion.

Which organism is most likely to explain this patient's symptoms?

A. Mycoplasma pneumoniae

B. Streptococcus pneumonia

C. Chlamydia pneumoniae

D. Legionella pneumoniae

E. Haemophilus influenza

Correct Answer:Mycoplasma pneumoniae

Explanation:

A history of persistent dry cough associated with constitutional symptoms raises the suspicion of atypical pneumonia. Atypical pneumonia tends to present insidiously, has a more protracted clinical course, and is often associated with extra-pulmonary signs and symptoms.

This patient’s subacute presentation of dry cough, pleuritic chest pain, and general malaise associated with a target lesion rash is most likely to be caused by mycoplasma pneumoniae as this organism induces atypical pneumonia and is associated with the development of erythema multiforme.

The rash on his upper limbs and trunk is composed of multiple dusky central area, a darker red inflammatory zone surrounded by a pale ring of oedema, and an erythematous halo on the extreme periphery of the skin lesion.

The description is classical of a target lesion.

Chlamydia pneumoniae and legionella pneumoniae both cause atypical pneumonia, but neither is as closely associated with erythema multiforme.

Streptococcus pneumonia and Haemophilus influenza are common causes of community-acquired pneumonia and would therefore cause a more rapid and severe clinical deterioration. Furthermore, these pathogens would likely cause focal chest signs rather than diffuse fine crackles.

Further reading:

https://radiopaedia.org/articles/atypical-pneumonia

Question:

A 70-year-old man presents to his GP with a 4-month history of progressive shortness of breath and syncope. He is currently being treated for hypertension and underwent a metallic aortic valve replacement 13 years ago for severe aortic stenosis.

Examination of his precordium reveals:

an S2 metallic click

an early diastolic murmur heard at the left sternal edge

Vital signs are unremarkable, other than a blood pressure of 155/55 mmHg.

Which one of the following is most likely to account for his symptoms?

A. Pulmonary stenosis

B. Pulmonary regurgitation

C. Aortic regurgitation

D. Tricuspid regurgitation

E. Aortic stenosis

Correct Answer:Aortic regurgitation

Explanation:

The most likely cause of the patient's symptoms is aortic regurgitation.

Typical presenting symptoms of aortic regurgitation (AR) include reduced exercise tolerance, shortness of breath on exertion, syncope and palpitations. These symptoms are not specific to AR, therefore clinical examination and further investigations are required to narrow the differential diagnosis.

As a prosthetic aortic valve degenerates it may become incompetent (i.e. begins to regurgitate). Aortic regurgitation typically causes an early-diastolic decrescendo murmur which is loudest at the left sternal edge. Additionally, aortic regurgitation causes a collapsing pulse with a wide pulse pressure (the difference between systolic and diastolic BP). The pulse pressure in the question is 100mmHg (very wide).

Pulmonary stenosis typically causes an ejection systolic murmur loudest at the left sternal edge.

Tricuspid regurgitation typically causes a pan-systolic murmur at the left sternal edge.

Pulmonary regurgitation typically causes an early-to-mid-diastolic murmur (depending on presence of pulmonary hypertension), however, the wide pulse pressure and history of aortic valve replacement make aortic regurgitation a more likely diagnosis.

Further reading:

https://patient.info/doctor/aortic-regurgitation-pro

Question:

A 64-year-old woman who is known to have rheumatoid arthritis presents with pain in her right ring finger when she flexes it. On one occasion she reports it became ‘stuck’. Clinical examination is unremarkable other than a palpable nodule at the base of the finger.

What is the most likely diagnosis?

A. Mallet finger

B. Dupuytren's contracture

C. Swan-neck deformity

D. Trigger finger

E. Boutonniere deformity

Correct Answer:Trigger finger

Explanation:

Trigger ﬁnger is thought to be caused by inﬂammation and subsequent narrowing of the A1 pulley of the affected digit, typically the third or fourth. A difference in size between the flexor tendon sheath and the flexor tendons may lead to abnormalities of the gliding mechanism by causing actual abrasion between the two surfaces, resulting in the development of progressive inﬂammation between the tendons and the sheath.

The main characteristic of trigger finger is popping and/or catching with the movement of the digit.

Dupuytren's contracture affects the palm.

Swan-neck deformity and boutonniere affect the interphalangeal joints.

Mallet finger is an extensor tendon injury.

Further reading:

https://www.physio-pedia.com/Trigger\_finger

Question:

A 30-year-old Afro-Caribbean man presents to the emergency department with severe pain in his right foot. The pain started 2 days ago, gradually worsening over several hours, and is now described as a "9/10" severity. He also complains of feeling sweaty, fevers, and general malaise. He has no history of trauma. He has a past medical history of sickle cell anaemia and type 1 diabetes mellitus.

On examination, the right foot is markedly swollen, and there is tenderness over the dorsum of the foot.

Observations:

Heart rate: 120bpm

Blood pressure: 110/65 mmHg

Respiratory rate: 18/min

Oxygen saturation: 96% on room air

Temperature 38.4° C

Osteomyelitis is suspected.

What is the most likely causative organism?

A. Staphylococcus aureus

B. Salmonella

C. E. coli

D. Staphylococcus epidermidis

E. Group A streptococcus

Correct Answer:Salmonella

Explanation:

This patient has presented with osteomyelitis, which classically presents with severe pain (often acutely but may be chronic) along with bacteraemia, fever, general malaise and potentially sepsis. The affected joint is classically swollen, tender, and erythematous, and the severe pain is exacerbated by movement. Sickle cell anaemia and diabetes are risk factors for osteomyelitis. However, it may be challenging to differentiate osteomyelitis and septic arthritis from the history and examination alone. Gout will also present with acutely severe pain, classically in the large toe, but is unlikely to cause a septic-like appearance, general malaise, or fever.

Salmonella is the most likely causative organism of osteomyelitis in patients with haematological disorders (classically sickle cell disease (SCD)) as well as patients with diabetes. Furthermore, micro-infarcts (e.g. in bones and bowel) that occur in SCD allow Salmonella to penetrate the colonic mucosa and then spread to the bone haematogenously. Salmonella is more common in patients with SCD as multiple sickle cell crises, micro-infarcts, and vaso-occlusion of the spleen result in splenic hypertrophy and eventually asplenia, thus reducing the spleen's ability to destroy encapsulated bacteria. This is because the white pulp of the spleen stores T-lymphocytes, which activate B-lymphocytes to become plasma cells, and it is these plasma cells that target encapsulated bacteria.

Classically, Staphylococcus aureus and Staphylococcus epidermidis are the causative organisms in osteomyelitis and septic arthritis. However, Salmonella is more likely in this case due to the poor splenic function as explained above.

E. coli can, very rarely, cause osteomyelitis, often as an opportunistic infection such as in premature infants but is rare in older patients.

Group A streptococcus can cause osteomyelitis but is classically associated with cellulitis and pharyngitis, and is less likely in patients with sickle cell anaemia.

Further reading:

https://pubmed.ncbi.nlm.nih.gov/15453123/

Question:

Mr Z, 65-years-old, presents with acute onset, heavy, central chest pain. He looks clammy, unwell and feels nauseous. Troponin is raised at 500 and an ECG shows ST elevation in leads I, aVL, V5 and V6.

Which is the most likely site of the occlusion?

A. Left coronary artery

B. Left anterior descending artery

C. Circumflex artery

D. Right marginal artery

E. Right coronary artery

Correct Answer:Circumflex artery

Explanation:

The most likely artery to be occluded in this pattern of ECG changes is the circumflex artery. The lateral leads reflect changes in the distribution of the circumflex artery (Cx).

An occlusion in the left anterior descending artery territory would see changes in V1-V4, whilst the left coronary artery (which supplies the LAD and left Cx) produces widespread ECG changes in I, aVL and V1-V6 as it supplies such a large territory of the heart.

Occlusions in the right coronary artery tend to result in inferior infarctions and changes are seen in II, II and aVF.

Further reading:

https://geekymedics.com/understanding-an-ecg/

Question:

A 6-year-old boy is bought into the local GP practice by his worried parents, concerned that their child has an infection. He has been itching non-stop for the past two days, and this has not been relieved with any home remedies. It is especially itchy between the finger webs and at night. He does not have a history of eczema or psoriasis, and there is no family history of such. On examination, you note his finger webs are erythematous and have small burrows.

What is the most definitive treatment for this disease?

A. Permethrin cream

B. Anti-histamines

C. Antifungals

D. Aciclovir

E. Corticosteroids

Correct Answer:Permethrin cream

Explanation:

The child is presenting with a case of scabies. Scabies is caused by sarcoptes scabiei and causes a very itchy rash. The itch is often worse at night and affects the trunk and limbs, sparing the scalp. One of the most distinguishing features is linear burrows, which appear between the finger webs, palms and wrists.

The first-line treatment for scabies is permethrin cream. Families should also be educated about good hygiene practices and advised to clean all linen. There may be a role for anti-histamines in reducing the itch symptoms. There is no role for antifungals, corticosteroids or aciclovir in the management of scabies.

Further reading:

https://www.dermnetnz.org/topics/scabies/

Question:

A 46-year-old female presents to the emergency department with mild lower back pain and dizziness. She suffers from anxiety but takes no regular medications. She had an intrauterine device inserted around two years ago. Her blood pressure is 108/75 mmHg, and her heart rate is 114 bpm.

A urinary pregnancy test is positive, and serum hCG 1024 mIU/ml (<5mIU/ml)

Transvaginal ultrasound demonstrates no intrauterine pregnancy or visible heartbeat.

Based on this patient's most likely diagnosis, what complication is this patient most at risk of?

A. Damage to the bladder

B. Uterine damage

C. Infertility

D. Ruptured fallopian tube

E. Chronic abdominal pain

Correct Answer:Ruptured fallopian tube

Explanation:

This patient's most likely diagnosis is ectopic pregnancy as she has a positive pregnancy test dip along with features of and risk factors for ectopic pregnancy, e.g. increased age and her intrauterine device. This patient will likely be treated initially with medical management as she is not in significant pain, there is no intrauterine pregnancy or visible heartbeat, and her serum hCG is <1500 IU/L.

A ruptured fallopian tube remains an important risk of ectopic pregnancy. Regular monitoring of hCG levels should be carried out while the patient is undergoing medical management. If the levels continue to rise, it is important that the management plan is reassessed to avoid complications such as this. NHS resources say around 7% of women who initially have medical management require surgical management.

Uterine damage or damage to the bladder and other surrounding structures is a risk of surgical management, however, as this patient is most likely to be initially managed medically, this is not the most likely complication.

Infertility is a potential complication of surgery where a salpingectomy or salpingotomy may be performed. Salpigotomy is preferred in patients with existing risk factors for infertility (e.g. damage to the contralateral tube) to preserve the fallopian tube. As this patient is likely to be managed with medical management, infertility as a result of surgery is not the most likely option. The question does not mention damage to the contralateral tube so the patient may remain fertile even if the fallopian tube ruptures.

Chronic abdominal pain is not a recognised consequence of ectopic pregnancy. Patients can, however, experience pain for varying lengths of time (from days to months) following an ectopic pregnancy.

Further reading:

https://geekymedics.com/ectopic-pregnancy/

Question:

The nurse bleeps the on-call doctor to review a patient on the ward about whom there is some concern amongst the nursing staff. The patient in question is a 67-year-old man who recently underwent transsphenoidal surgical resection of a somatotroph adenoma, which had been causing acromegaly. The procedure was documented as having gone smoothly with no intraoperative complications, and the patient was returned to the ward shortly after the operation. However, the patient is now complaining of excessive urine production, despite not drinking excessively; he feels that he constantly has an urge to urinate.

The doctor orders a urine dipstick, which is normal, with no signs of infection or glucose within the urine. The patient is fluid restricted and some further investigations are ordered that reveal the following:

Na+ - 150 mmol/L

K+ - 3.9 mmol/L

Urea - 6.2 mmol/L

Creatinine 100 µmol/L

Serum osmolality - 360 mOsm/kg (275 – 295 mOsmol/kg)

Urine osmolality - 150 mOsm/kg (300 – 900 mOsm/kg)

Given the likely diagnosis, which of the following is most likely to be key in the management of this patient?

A. Cabergoline

B. Desmopressin

C. Tolvaptan

D. Octreotide

E. Bromocriptine

Correct Answer:Desmopressin

Explanation:

This patient has undergone pituitary surgery, which is a significant risk factor for developing diabetes insipidus due to the potential for damage to the posterior pituitary gland. This can cause an inability to secrete anti-diuretic hormone (ADH) from the posterior pituitary (central diabetes insipidus) resulting in the classic symptom of polyuria despite normal fluid intake.

The action of ADH is to promote water reabsorption by the insertion of aquaporin-2 channels within the collecting duct of the kidney. In diabetes insipidus, there will be a lack of this action, leading to the production of excessive amounts of urine. This reabsorption of free water also has an important impact on sodium balance and osmolality; the urine will have a low sodium level due to the excess of water, giving a low osmolality, whilst the serum will have high sodium and thus high osmolality, due to the lack of water being reabsorbed into the blood. This explains the results of the investigations in the case.

The main treatment of central diabetes insipidus is simply to replace the hormone that cannot be produced and is deficient. Desmopressin is a synthetic analogue of ADH (arginine vasopressin) and is the first-line management in patients with central diabetes insipidus. The drug is usually taken orally or intranasally and is usually effective in resolving symptoms and maintaining electrolyte balance. It carries a risk of fluid retention and hyponatraemia, so it is important that adequate monitoring is in place for those on the drug.

Octreotide is a somatostatin analogue; this may be used in the treatment of acromegaly if surgery is not suitable or is rejected by the patient, as it inhibits the release of growth hormone from the anterior pituitary gland. It is not used in the treatment of diabetes insipidus.

Cabergoline and bromocriptine are both ergot-derived dopamine agonists that can be used to manage small prolactinomas, thus avoiding the need for surgery; dopamine is a major inhibitor of prolactin release.

Tolvaptan is a competitive inhibitor of the aquaporin-2 receptor within the collecting duct. It is used in severe cases of the syndrome of inappropriate ADH secretion (SIADH) and would have the opposite effect to that which is desired in the treatment of diabetes insipidus, causing the patient to reabsorb even less free water and produce more urine.

Further reading:

https://patient.info/doctor/diabetes-insipidus-pro

Question:

A 55-year-old woman presents to her GP with a 6-month history of gradually worsening pain in her right arm accompanied by weakness in finger extension and elbow extension.

Which one of the following conditions would account for her symptoms?

A. Osteophyte growth between the C5 and C6 vertebrae

B. Radial nerve palsy caused by falling asleep with her arm hanging over the armrest of a chair (i.e. Saturday night palsy)

C. Compression of the ulnar nerve by pectoralis minor

D. A herniated disc between the C8 and T1 vertebrae

E. Foraminal narrowing between the C6 and C7 vertebrae

Correct Answer:Foraminal narrowing between the C6 and C7 vertebrae

Explanation:

This lady has radiculopathy caused by a lesion that also affects both finger extension and elbow extension. These are both innervated primarily by the C7 nerve root. The C7 nerve root exits above the C7 vertebrae (the C8 nerve root exits below at C7/T1), and would be affected by foraminal narrowing between the C6 and C7 vertebrae (the correct answer). A disc herniation at this level could cause similar symptoms. Such degenerative changes are often referred to as cervical spondylosis.

Finger extension and elbow extension are also both innervated by the radial nerve; however Saturday night palsy affects only finger extension, as the branch supplying the triceps separates from the main nerve before the axilla.

There is no such thing as a C8 vertebra – in humans, there are 7 cervical vertebrae.

Pectoralis minor can compress the ulnar nerve, but this would not cause this pattern of weakness.

Osteophyte grown between C5 and C6 could affect the C6 nerve root, which might cause numbness in the thumb and second finger as well as weakness of elbow and shoulder flexion.

Further reading:

https://patient.info/doctor/cervical-spondylosis-pro

Question:

A 55-year-old man is undergoing rehabilitation in the acute stroke unit following a right partial anterior circulation stroke (PACS) 10 days ago. The patient has become unwell overnight and the nursing team request a medical review. He is disoriented to time, place and person. Last bowel movement was 1 day ago and the patient has been mobilising to the bathroom to void urine with a stroller and assistance of 2.

Past medical history is notable for hypertension, raised cholesterol and a previous transient ischaemic event (TIA). The nursing team report no recent issues and the patient has been engaging with physiotherapy and occupational therapy.

Medications: aspirin 300 mg once daily, clopidogrel 75 mg once daily, atorvastatin 80 mg once daily, ramipril 5 mg once daily

Intermittent pneumatic compression stockings are in-situ.

On examination:

The patient is lying in bed and appears confused, 4AT - 4+2+2+4

Heart rate - 110 beats / min, regular

Blood pressure - 140 / 100 mmHg

Oxygen saturations - 92% on room air

Temperature - 38.1 °C

Dullness to percussion and reduced breath sounds over the right lower zone

Abdomen soft and non-tender

Calves soft and non-tender

Left homonymous hemianopia apparent on visual field testing

Tone Power Sensation Reflexes

RUL - 5/5 Soft touch intact Brisk

RLL - 5/5 Soft touch intact Brisk

LUL ↑↑ 4/5 Soft touch intact Diminished

LLL ↑↑ 4/5 Soft touch intact Diminished

Which one of the following would be the most appropriate investigation?

A. Mid-stream urine sample (MSSU)

B. Chest X-ray

C. CT head

D. Urine dipstick

E. CT pulmonary angiogram (CTPA)

Correct Answer:Chest X-ray

Explanation:

Dysphagia (difficulty swallowing) is common in patients presenting with acute stroke. A dangerous complication of this is aspiration pneumonia, which can be identified using a chest X-ray. All patients admitted to the stroke unit should have a swallow assessment performed by a speech and language therapist so that an appropriate diet can be selected for them. The clues to aspiration pneumonia in this question include the patient's new delirium, oxygen requirement, pyrexia and positive findings on chest examination. They should be started on empirical antibiotics and regular observations should be taken in order to identify sepsis early.

Urinary tract infection is another important differential diagnosis in newly delirious patients. However, there is a clear source of infection based on the above findings, and the question stem does not describe any urinary symptoms or signs such as suprapubic tenderness. Urine dipstick and MSSU are therefore not indicated.

Deep vein thrombosis (DVT) and pulmonary embolism (PE) are important complications of acute stroke, especially in patients who have reduced mobility. CTPA is the gold standard investigation for patients deemed high risk for PE based on clinical findings and high Wells score. This is a distractor answer because a clear source of infection is evident, the patient's calves are soft and non-tender, and thromboprophylaxis (compression stockings) is in place.

The neurological findings in the question stem are in keeping with the right PACS previously described and so a CT head would not be indicated at this time.

Further reading:

https://cks.nice.org.uk/topics/stroke-tia/background-information/complications/

Question:

A 72-year-old woman is brought to the A&E with facial asymmetry and difficulty swallowing. She noticed her symptoms whilst brushing her teeth. She has a history of type 2 diabetes and hypertension.

On examination, she is noted to have:

right-sided facial ptosis and miosis

right-sided loss of facial sensation

left-sided pain and temperature loss in her limbs

What is the most likely diagnosis?

A. Wallenberg’s syndrome

B. Weber's syndrome

C. Brown-Sequard syndrome

D. Locked-in syndrome

E. Gerstmann’s syndrome

Correct Answer:Wallenberg’s syndrome

Explanation:

This woman has Wallenberg’s syndrome. This is caused by injury to the lateral part of the medulla oblongata. It causes a range of symptoms, but typically ipsilateral cranial nerve involvement (loss of facial sensation and dysphagia), with contralateral sensory loss to the limbs and trunk. Damage to the hypothalamospinal fibres can cause an ipsilateral Horner’s syndrome-like picture (ptosis and miosis).

Gerstmann’s syndrome is caused by a dominant middle cerebral artery stroke, with weakness, sensory loss, hemianopia and aphasia.

Weber’s syndrome is characterised by ipsilateral oculomotor nerve palsy and contralateral weakness.

Locked-in syndrome is characterised by complete paralysis of all voluntary muscle groups, sparing those controlling the eyes. Individuals suffering from damage to the pons are fully conscious and cognitively intact.

Brown-sequard syndrome is caused by damage to one half of the spinal cord. It results in paralysis and loss of proprioception on the same (ipsilateral) side as the injury, and loss of pain and temperature sensation on the opposite (contralateral) side to the lesion.

Further reading:

https://en.wikipedia.org/wiki/Lateral\_medullary\_syndrome

Question:

A 48-year-old woman presents to the emergency department with a two day history of a red right eye that gradually developed pain, worse at night affecting her sleep. She denies any ocular trauma and wears contact lenses on special occasions (last wore them two weeks ago). Her past medical history consists of type 2 diabetes mellitus, rheumatoid arthritis, and allergic conjunctivitis, and she takes metformin, ibuprofen, cetirizine, methotrexate and folate.

On examination, there is diffuse, violaceous injection in her right eye with severe pain with eye movements and ocular palpation. Her visual acuity is 6/9 in the affected eye and both pupils are equally reactive with no afferent pupillary defect. The examination of her left eye is normal.

Given the likely diagnosis, what element of her history is the greatest risk factor?

A. Immunosuppression

B. Allergic conjunctivitis

C. Contact lens wear

D. Rheumatoid arthritis

E. Type II diabetes mellitus

Correct Answer:Rheumatoid arthritis

Explanation:

Rheumatoid arthritis is correct. This patient has presented with an acutely red, painful eye. Diffuse, deep red or violaceous injection and pain with eye movements and on ocular palpation in the absence of pupillary abnormalities should raise suspicion of scleritis. Scleritis is strongly associated (around 50% of cases) with underlying systemic inflammatory conditions, such as rheumatoid arthritis and systemic lupus erythematosus, as is the case with this patient. Rheumatoid arthritis can be especially associated with a severe form of scleritis known as necrotising scleritis which requires prompt management to prevent significant visual morbidity.

Type 2 diabetes mellitus, allergic conjunctivitis, contact lens wear, and immunosuppression are incorrect. These do not directly increase the risk of scleritis. Contact lenses can increase the risk of infection, which may contribute to the development of scleritis, but this is much less common and the patient does not exhibit signs or symptoms of a contact lens related keratitis. Likewise, immunosuppression may increase one's susceptibility to infection, but again, systemic inflammatory conditions confer a higher risk.

Further reading:

https://geekymedics.com/painful-red-eye/

Question:

A 45-year-old woman presents to A&E complaining of severe upper abdominal pain. This began approximately 2 hours previously and has increased in severity; it initially appeared to come in waves - however, it is now present almost constantly. She is now feeling extremely unwell, and has vomited twice; she feels extremely hot and sweaty.

On examination, the patient is significantly overweight and looks pale and unwell. Her sclerae appear slightly icteric, and general observations reveal a pulse rate of 128, respiratory rate of 24 and temperature of 38.8 degrees. Abdominal examination exhibits severe tenderness in the right upper quadrant with guarding, although there are no masses, nor any evidence of rigidity or rebound tenderness. Murphy's sign is negative. Blood tests taken on admission reveal neutrophilia and an elevated CRP.

The admitting doctor is concerned about the patient's symptoms and arranges for a senior review.

Given the likely diagnosis, which of the following would be the most important next investigation?

A. Blood cultures

B. ECG

C. Liver function tests

D. Transabdominal ultrasound

E. Endoscopic retrograde cholangiopancreatography

Correct Answer:Blood cultures

Explanation:

The most likely diagnosis, in this case, is ascending cholangitis; a potentially life-threatening infection of the biliary system, arising due to bile stasis allowing for the colonisation of the tract with bacteria. The most common trigger for this stasis is choledocholithiasis (gallstones), although any pathology causing obstruction can potentially be implicated (such as biliary strictures, tumours etc...). The classic presentation is with Charcot's triad of clinical features, which consists of fever, jaundice, and right upper quadrant pain - the patient is displaying all of these, and this is therefore the most likely diagnosis.

A septic screen and initiation of the Sepsis 6 protocol is essential in ascending cholangitis, due to the severity of the infection. Therefore, the most important next investigation for this patient is a set of blood cultures; these should be taken within 1 hour alongside the commencement of IV broad-spectrum antibiotics.

Whilst a transabdominal ultrasound is an important investigation to confirm the diagnosis (this will reveal dilation of the common bile duct), antibiotic provision is the most important aspect of management, and blood cultures should be taken before arranging this. The same is true for endoscopic retrograde cholangiopancreatography; whilst this can both confirm the obstruction, and be used to manage the condition through biliary decompression, addressing the patient's sepsis is the priority.

Myocardial infarction can potentially present atypically without the classic chest pain; it would be a possible explanation for the patient's sweating. However, it is unlikely to cause neutrophilia or jaundice as are present in this particular scenario. Therefore, obtaining an ECG is less important in this case.

Liver function tests will likely reveal a cholestatic picture, with a raised bilirubin. In this case, the diagnosis can be made presumptively based on the clinical presentation, and blood cultures are a far more important priority.

Further reading:

https://patient.info/doctor/cholangitis

Question:

A 7-year-old girl is brought to the GP by her mother, who is worried about a rash that she has developed over the past few weeks. It initially started as a small area of redness over the anterior aspect of the girl's arm but has since spread to involve the elbow crease, and appears to be starting on the other arm. The patient states that it is extremely itchy, and is affecting her sleep and ability to focus at school. On examination, there are areas of poorly demarcated erythema on both flexural surfaces of the upper limb, with notable excoriations and areas of thickened skin in this area. The skin appears especially dry, with some areas of cracking and fissuring.

The patient has been otherwise well, her mother mentions that she had a rash over her face when she was very young, but this resolved with topical creams, and she has been developing well, enjoying school. There is little family history of note, although the mother explains that she has extremely bad asthma, for which she is currently taking monoclonal antibody therapy. The GP explains the likely diagnosis to the patient and her mother; prescribes two different topical agents and encourages the girl to avoid scratching at the lesions.

Which of the following genetic mutations has been implicated in the pathophysiology of the most likely diagnosis?

A. APC gene

B. Fibrillin gene

C. CDSN gene

D. Filaggrin gene

E. STK11 gene

Correct Answer:Filaggrin gene

Explanation:

The most likely diagnosis, in this case, is atopic eczema; a very common inflammatory skin dermatosis. It falls under the heading of atopic conditions along with asthma and allergic rhinitis - all three are thought to involve an underlying type 1 hypersensitivity reaction. Whilst this hypersensitivity is thought to play a role in this disease, the exact pathophysiology is more complex. Skin barrier dysfunction is thought to play a significant role, with strong links being drawn to the filaggrin gene, mutated in approximately 50% of those with eczema. This mutation can disrupt the normal skin barrier, allowing for the entry of irritants and other pathogens that can then drive the hypersensitivity reaction and worsen symptoms.

Atopic eczema affects different distributions depending on the age group suffering from the condition; in young infants, the face and scalp are most frequently affected, with the more classical flexural distribution seen in older children and adults. The pattern of disease is often a chronic one, with flare-ups occurring during periods of emotional stress or due to exposure to specific triggers. Management of mild eczema is principally via emollients to repair the skin barrier, and topical steroids to manage the underlying inflammation. Antihistamines may be used to address the underlying itch, and in more severe cases, more potent immunosuppression may be necessary, tacrolimus cream being one such option.

The CDSN gene is mutated in a number of cases of psoriasis and is thought to play a role in its pathophysiology, although the link is not as strong as that between filaggrin and eczema.

Mutations in fibrillin 1 are responsible for the development of Marfan syndrome, a connective tissue disorder that can give a number of systemic features, including elongated limbs, arachnodactyly, striae and a high-arched palate. The most worrying complication is aortic root dilatation and subsequent dissection or aneurysm.

The APC gene is mutated in patients with familial adenomatous polyposis; an inherited cancer syndrome that gives the development of numerous polyps within the colon, and a hugely increased risk of bowel cancer.

The STK11 gene may be implicated in the development of Peutz-Jegher's syndrome, another familial cancer syndrome that carries an increased risk of both bowel and breast cancer. The disease can give classical areas of hyperpigmentation, often seen on the lips as a dermatological manifestation.

Further reading:

https://cks.nice.org.uk/topics/eczema-atopic/diagnosis/diagnosis/

Question:

A 21-year-old female visits her GP to discuss termination of pregnancy. A home pregnancy test is positive. Her last menstrual period was 9 weeks ago. She wishes to undergo a medical termination.

What is the most appropriate management option?

A. Mifepristone + misoprostol immediately

B. Misoprostol + mifepristone 48 hours later

C. Mifepristone + misoprostol 48 hours later

D. Methotrexate

E. Mifepristone alone

Correct Answer:Mifepristone + misoprostol 48 hours later

Explanation:

For a medical termination of pregnancy, mifepristone is given first, followed by misoprostol 48 hours later. Medical termination can be offered at any gestation, but >20 weeks feticide is offered prior. NICE recommends that up to 9+6 weeks, women having a medical abortion are given the option to take misoprostol at home.

Mifepristone is an anti-progesterone medication that causes endometrial shedding and relaxes the cervix and misoprostol is a prostaglandin analogue that softens the cervix and stimulates uterine contraction. Anti-D prophylaxis should also be given to rhesus negative women who are ≥10 weeks gestation.

Methotrexate is used in the management of an ectopic pregnancy but has no role in the termination of pregnancy.

Further reading:

https://patient.info/doctor/termination-of-pregnancy

Question:

A 30-year-old man presents to his GP with a lesion located on his back that his wife recently noticed. He does not know how long the lesion has been present. He reports that he and his wife enjoy sunbathing together whenever possible despite admitting that his skin burns easily. He admits that he could be more vigilant regarding the application of sunscreen. He has no significant past medical history or family history. On examination, the patient has fair skin with several melanocytic nevi visible elsewhere on his body. The lesion is asymmetrical, has an uneven border, consists of more than one shade of pigment, is 15mm at its widest diameter and not raised. There is no appreciable lymphadenopathy.

What is the most likely diagnosis?

A. Malignant melanoma

B. Squamous cell carcinoma

C. Keratoacanthoma

D. Basal cell carcinoma

E. Dermatofibroma

Correct Answer:Malignant melanoma

Explanation:

The patient is most likely to have developed a malignant melanoma – a form of skin cancer in which there is uncontrolled growth of melanocytes. The patient is at increased risk of developing melanoma as he is fair-skinned, burns easily, and reports high levels of UV exposure. Additionally, the presence of multiple melanocytic nevi is a risk factor for melanoma.

The appearance of the lesion itself is typical of melanoma according to the following factors:

Asymmetry

uneven Border

multiple Colours

large Diameter (large defined as >6mm)

Evolution (i.e. change)

The lesion is less likely to be a squamous cell carcinoma as they are non-pigmented lesions.

Basal cell carcinoma would typically be described as having a pearlescent appearance with telangiectasia on examination.

Although UV exposure is a major risk factor for keratoacanthoma, the examination would more likely reveal a hard keratin-filled boil.

The lesion is less likely to be a dermatofibroma as they more commonly appear on the skin of the lower legs, are more common in women and are non-pigmented.

Further reading:

https://www.dermnetnz.org/topics/melanoma/

Question:

A 58-year-old smoker with a past medical history of diabetes and well-controlled epilepsy presents to his GP in the UK with a deformity of the ring finger of his right hand. He describes it as painless but a nuisance, having knocked over more drinks than he has picked up of late as the finger ‘snags’ on objects when he reaches out. He works in an office and finds that he is unable to type fluently, as the ring and little fingers no longer move with the others. There is no ‘triggering’ of the joint, and he is unable to straighten the finger at all. On examination, the right ring finger is held in flexion at the metacarpophalangeal joint, upon the palmar aspect of which is a non-tender palpable nodule within the skin and a tight, palpable cord running toward the carpus. He has no such nodules or thickenings elsewhere.

Having made a diagnosis of Dupuytren’s Contracture, what is the next most appropriate intervention?

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A. Refer to a hand surgeon

B. Inject the cord with collagenase clostridium histolyticum

C. Arrange for corticosteroid injections to the cord

D. Advise a trial period of night splinting and re-review

E. Refer for radiotherapy to the palmar fascia

Correct Answer:Refer to a hand surgeon

Explanation:

Dupuytren’s disease is a benign progressive fibroproliferative disorder characterised by the formation of nodules and later cords within the thickened palmar fascia, resulting in flexion contracture of the digits. Often bilateral, the ring and then little fingers are most commonly affected, followed by the middle fingers and rarely the index and thumbs. It is more common in Northern Europe and in males of middle-age and older, and is thought to affect 3-5% of the UK population. The exact cause is unclear but associations include family history (thought inherited in an autosomal dominant fashion), alcohol excess and cirrhosis, diabetes, smoking, phenytoin and/or epilepsy. Some studies suggest a correlation with repetitive microtrauma of the kind sustained with heavy manual labour. Related conditions include Ledderhose’s syndrome (fibromatosis of the plantar fascia), Peyronie’s syndrome (penile fibromatosis) and Garrod’s pads (ectopic dorsal fibromatosis of the proximal interphalangeal joints). Dupuytren’s diathesis is a more aggressive, more rapidly progressive condition encompassing any number of the above, and usually affects younger patients.

Patients in the early stages of the disease may note thickening of the palmar skin over the ring and little metacarpophalangeal joints (MCPJs). The skin is ordinarily tethered to the underlying fascia by vertical fibres, which may shorten and pucker the overlying skin. Painful nodules may form within the same plane, which are permanent but the pain usually subsides over a period of weeks. Greater deposition of type III collagen relative to type I collagen results in the formation of thicker, shorter bands of tissue palpable as rigid cords within the palmar aponeurosis, which extends to the base of the middle phalanges and can thus result in disabling flexion contractures at the MCPJ and/or PIPJ. Hueston’s table-top test is a simple way of ascertaining the presence of contractures: affected patients will not be able to lay the palmar surface of the hand and digits flat against a table-top. A good history and examination may reveal the functional effects of contractures; a 2012 European retrospective observational study by Bainbridge et al found that 57% of patients undergoing surgery for Dupuytren’s contracture reported functional limitations within the workplace, and 56% found their leisure activities limited. 44% had difficulty grasping objects, 43% experienced difficulty shaking hands and 39% struggled to attend to personal grooming.

Differentials include calluses (especially given the occupational associations of early disease), ganglia, giant cell tendon sheath tumours, stenosing tenosynovitis (trigger finger), ulnar nerve palsy and epithelioid sarcoma.

Patients with clinical evidence of contracture and/or those who describe a significant loss of function should be referred to a hand surgeon (orthopaedic or plastic, depending on local pathways) for consideration of surgical treatment. 30 degrees’ contracture at the MCPJ is often used as a threshold for significant contractures, but any contracture at the PIPJ should be referred as these are more technically challenging to correct. In very late stages of the disease, the contracture may become fixed, rendering the usual surgical strategies ineffective and potentially leaving amputation as the remaining viable option. The aim of surgical management is to disrupt or resect the diseased fascia in order to prevent progressive deformity, for which a range of procedures are available (see below).

Fasciotomy can be performed percutaneously with a needle or scalpel and is particularly useful in disrupting isolated pretendinous cord thickening to release single MCPJ contractures. Open fasciectomies involve resecting segments of the palmar fascia, having dissected out and preserved the overlying neurovascular bundles. Dermofasciectomy is, as the name suggests, a more drastic procedure whereby the fascia and tethered overlying skin are removed together. The resulting defect may be left open to heal by secondary intention but may require skin grafting. This procedure is usually reserved for recurrent or particularly extensive disease in younger patients.

Complications of surgery include infection, wound healing problems, haematoma, tendon rupture, digital neurovascular injury, stiffness and swelling, complex regional pain syndrome and failure to correct the underlying deformity. Surgery generally improves function for patients but often not to their premorbid state, and a high percentage suffer a recurrence.

Some specialists may choose to use locally injectable collagenase clostridium histolyticum (as ‘Xiapex’) in preference to fasciotomy or fasciectomy for management of patients with palpable cords, which was introduced to NICE guidance in 2011. A technology appraisal update in 2017 reported that guidance had been withdrawn as Xiapex was no longer available in the UK (www.nice.org.uk/guidance/ta459), and despite positive results and a good reputation, Xiapex’ manufacturers withdrew the drug from the European market in late 2019.

Management of early disease (i.e. that without contracture or significant loss of function, is expectant). The patient should be counselled that pain from the nodules should settle, and advised to return for consideration of surgery if contractures develop or loss of function is experienced. Interim splintage has no proven benefit, and corticosteroids are not recommended by NICE. There is some evidence to support the use of radiotherapy to delay the growth rate of fibroblasts and slow progression of the disease but there is the theoretical risk of iatrogenic malignancy. NICE does not yet advocate its use as the evidence of treatment efficacy vs. natural history of the disease is currently lacking (NICE IPG573).

Further reading:

https://cks.nice.org.uk/dupuytrens-disease#!topicSummary

Question:

An 82-year-old man is brought to the emergency department by his carer following a sudden loss of vision in his right eye. He explains that the visual loss was "completely painless". He reports no other symptoms and has never experienced anything like this before.

He has a past medical history of hypercholesterolemia, hypertension and type 2 diabetes mellitus. His medications include metformin, atorvastatin, ramipril and amlodipine. He describes himself as a "heavy-smoker", smoking approximately one pack of cigarettes a day for 50 years.

On examination, his vital signs are all recorded as normal. His visual acuity is recorded as 20/30 in the left eye and perception of light (PL) in the right. Fundoscopy reveals a pale, swollen retina in the right eye. The optic nerve appears normal. Neurological examination is otherwise normal.

Which of the following is most appropriate to include in the initial management of this patient?

A. Pneumatic retinopexy

B. High dose oral prednisolone

C. Intravitreal aflibercept

D. Sublingual isosorbide dinitrate

E. Laser photocoagulation

Correct Answer:Sublingual isosorbide dinitrate

Explanation:

The most likely diagnosis is a central retinal artery occlusion (CRAO) - the sudden occlusion of the artery supplying the inner retina leading to hypoperfusion of the retina, hypoxic damage, retinal cell death and visual loss. It is important to note that there are no official guidelines for the treatment of CRAO and many therapies have no proven benefits. However, of the options listed, sublingual isosorbide dinitrate is the most appropriate therapy to initiate, as it leads to the relaxation of smooth muscle cells and causes vasodilation, thus helping to increase blood oxygen content to the retina.

Patients with suspected giant cell arteritis (GCA) should be treated immediately with high dose oral corticosteroids. CRAO can be an ophthalmic presentation of GCA however he lacks any additional symptoms to suggest this as a likely diagnosis (e.g. myalgia, malaise, temporal headache, jaw claudication); therefore, this treatment would not be beneficial.

Patients with non-proliferative diabetic retinopathy are typically managed with a combination of therapies, including laser photocoagulation. Laser photocoagulation helps to cauterise leaky ocular vessels, reducing retinal oxygen demand and subsequent neovascularization. It is not indicated in the management of CRAO.

Pneumatic retinopexy is one of the procedures used to repair rhegmatogenous retinal detachments and retinal breaks. It is not indicated in the management of CRAO.

Anti-vascular endothelial growth factor (anti-VEGF) treatments, such as aflibercept, are a group of medications that help to reduce angiogenesis. Anti-VEGF medications may be indicated if a patient develops neovascular glaucoma secondary to CRAO; however, it is not recommended as part of the initial management.

Further reading:

https://geekymedics.com/central-retinal-artery-occlusion/

Question:

A 49-year-old man with Fitzpatrick type II skin presents to his GP with a new skin lesion on his chest, which he first noticed three months ago.

On examination, there is a flat pigmented lesion, 8mm in diameter. It is asymmetrical with irregular borders and contains areas of light brown, dark brown and black.

What is the most likely diagnosis?

A. Superficial spreading melanoma

B. Pigmented basal cell carcinoma

C. Lentigo maligna melanoma

D. Nodular melanoma

E. Acral lentiginous melanoma

Correct Answer:Superficial spreading melanoma

Explanation:

This man presents with a new pigmented lesion that is asymmetrical, has irregular borders and contains three different colours, which is highly suggestive of a melanoma. Superficial spreading melanoma is the most likely diagnosis as this is the commonest type of melanoma and presents as a flat pigmented lesion.

Acral lentiginous melanoma is a type of melanoma found on the palms, soles or under the nails. It is the commonest type of melanoma in those with dark skin.

Nodular melanomas present as rapidly growing nodules, presenting over weeks to months. They may be dark bluish-red nodules or amelanotic.

Lentigo maligna melanoma is a melanoma that develops from lentigo maligna, a slow-growing patch of discoloured skin commonly found on the head and neck in the elderly.

Pigmented basal cell carcinomas are extremely rare. They present as a raised pigmented lesion that is slow-growing, emerging over months to years.

Further reading:

https://dermnetnz.org/topics/superficial-spreading-melanoma

Question:

A 32-year-old man with no past medical history presents with an 8-day history of persistent cough. This was initially a dry cough but in the past 48 hours has become productive of clear sputum. He describes symptoms consistent with a cold initially but is now primarily troubled by his cough. He denies chest pain.

On examination he is undistressed, and there is scattered wheeze on chest auscultation but no focal chest signs. His heart rate, blood pressure and temperature are within normal limits.

What is the most appropriate next step in this patient’s management?

A. Amoxicillin

B. Furosemide

C. Prednisolone

D. Clarithromycin

E. Reassure

Correct Answer:Reassure

Explanation:

This patient is suffering from acute bronchitis. This is a typically self-limiting inflammation of the bronchi, usually secondary to viral infection. NICE guidance recommends self-care strategies such as maintaining fluid intake, and simple analgesia, as the mainstay of treatment for most patients. Smoking cessation, where relevant, is also an important consideration. As this patient is systemically well, they should be reassured and advised to seek medical attention ‘if symptoms worsen rapidly or significantly, [they] do not improve after 3 to 4 weeks, or they become systemically very unwell.’

NICE guidance is clear that ‘[you should] not routinely offer an antibiotic to treat an acute cough associated with acute bronchitis in people who are not systemically very unwell or at higher risk of complications.’ Thus, amoxicillin and clarithromycin are not the most appropriate options here. In any case, the first-line antibiotic choice, where indicated, is doxycycline. Immediate antibiotics (or hospital referral) could be considered for patients who are systemically unwell. NICE also recommend consideration of an immediate antibiotic prescription or a backup antibiotic prescription for a person at higher risk of complications, for example:

A pre-existing comorbid condition such as heart, lung, kidney, liver, or neuromuscular disease, immunosuppression, or cystic fibrosis.

CRP 20-100mg/L (consider delayed antibiotic prescription); CRP > 100mg/L (consider immediate antibiotic prescription)

Older than 65 years of age with two or more of the following, or older than 80 years with one or more of the following:

Hospital admission in the previous year.

Type 1 or type 2 diabetes mellitus.

History of congestive heart failure.

Current use of oral corticosteroids.

Prednisolone is a corticosteroid that can be used in the management of asthma/COPD exacerbations. NICE guidance is clear that you should ‘not offer an oral or inhaled bronchodilator (for example salbutamol) or an oral or inhaled corticosteroid to a person with an acute cough associated with acute bronchitis unless they have an underlying airway disease such as asthma.’

Furosemide is a diuretic used in the management of fluid overload such as occurs in patients with congestive cardiac failure. It does not have a role in the treatment of acute bronchitis.

Further reading:

https://cks.nice.org.uk/topics/chest-infections-adult/management/acute-bronchitis/

Question:

A 56-year-old man presents to his GP with exertional leg pain. Over the last four months, he has developed cramping pain in his calves whilst walking. He says both legs are affected, but it is worse on the left. The pain is quickly relieved by stopping to rest.

His past medical history is significant for hypertension and hypercholesterolaemia. He currently takes amlodipine 10mg, losartan 50mg and simvastatin 40mg. He has a 25-pack-year tobacco history.

On examination, the leg appears normal.

What is the most likely diagnosis?

A. Critical limb ischaemia

B. Acute limb ischaemia

C. Intermittent claudication

D. Spinal stenosis

E. Nerve root compression

Correct Answer:Intermittent claudication

Explanation:

The most likely diagnosis in this patient is intermittent claudication - a specific presentation of peripheral arterial disease (PAD). PAD is a term used to describe the narrowing or occlusion of peripheral arteries, reducing the blood supply to the lower limbs. Intermittent claudication classically presents with a cramp-like pain in a muscle group after walking a predictable distance and is quickly relieved by rest. It is a specific presentation of chronic limb ischaemia. This patient also has notable risk factors for atherosclerosis, including hypercholesterolaemia, hypertension and smoking history.

Acute limb ischaemia, an acute presentation of PAD, is a sudden decrease in limb perfusion, typically due to rupture of an atherosclerotic plaque, resulting in decreased perfusion and symptoms and signs that develop over two weeks or less. Patients with acute limb ischaemia classically present with the 6Ps - pain, pulseless, pallor, paralysis, paraesthesia and perishing cold. Whilst an important consideration, this patient does not have any findings consistent with acute limb ischaemia as the leg was normal on examination, and the onset has been gradual over four months.

Patients with critical limb ischaemia, a subacute presentation of PAD, typically present with chronic rest pain, which may worsen at night. This leads to them hanging their leg out of bed or sleeping in a chair to relieve the symptoms; this key symptom indicates a limb-threatening arterial occlusion. Additionally, on examination, patients with critical limb ischaemia have atrophic skin changes, absent foot pulses and pallor.

Classically, spinal stenosis presents with a history of back pain and accompanying pain in the lower extremity, usually in a dermatomal distribution. Pain is present on standing alone and relieved by stooping forwards.

Nerve root compression produces a sharp stabbing pain radiating down the leg. Nerve root involvement is typically exacerbated by sitting, standing or walking and improves by any change in position.

Further reading:

https://cks.nice.org.uk/topics/peripheral-arterial-disease/

Question:

A 4-year-old boy is brought to the emergency department by his father with persistent, severe, excruciating pain in his groin and lower abdomen since morning. He has a known past history of a right-sided reducible firm swelling in the groin, which is yet to be seen by his GP. On examination, a non-reducible, hard, red swelling with marked tenderness and increased temperature can be noted. Both the testicles can be palpated in the scrotum. He has a fever of 39.1°c, blood pressure is 100/80 mmHg, and pulse rate is 92 beats per minute.

What is the most appropriate next step in management?

A. Laparoscopic appendectomy

B. Emergency herniotomy and orchidectomy

C. Emergency herniotomy

D. Elective herniotomy

E. Reassurance

Correct Answer:Emergency herniotomy

Explanation:

This boy presented with strangulation of a long-standing inguinal hernia which is evident from the question history that he is awaiting a GP appointment. A recent change in colour, non-reducibility, tenderness and raised temperature of the swelling are characteristic signs of strangulation. An emergency herniotomy has to be performed by a paediatric surgeon to reduce the hernia and prevent bowel injury, which may also be within the hernial sac.

Orchidectomy is the surgical removal of the testis. It is the definitive management of testicular cancer and hernia with the incarceration of the testis. As this boy's testicles are palpated separately in the scrotum, orchidectomy is not performed simultaneously with emergency herniotomy.

The patient has an acute presentation of a strangulated inguinal hernia which needs to be operated on immediately. Elective herniotomy is planned in stable patients to help relieve symptoms and prevent future complications that may warrant emergency surgery.

The patient presented with a strangulated inguinal hernia, characterised by a non-reducible, tender, hot lump on the groin. Appendicitis typically presents with abdominal pain, moving from the umbilicus to the right iliac fossa. It would not account for the examination findings, and laparoscopic appendectomy would be inappropriate.

Reassurance is inappropriate given the emergency scenario. Prompt action must be taken to avert the irreversible injury to the strangulated bowel loops.

Further reading:

https://cks.nice.org.uk/topics/scrotal-pain-swelling/management/inguinal-hernia/

Question:

A 60-year-old man presents to the emergency department with two-day history of worsening shortness of breath. He usually coughs up small amounts of clear sputum, however, this has increased in volume and changed to a light green colour. His past medical history includes chronic obstructive pulmonary disease (COPD), heart failure, and lung cancer, which was successfully treated eight years ago with no signs of recurrence at his last follow-up appointment two months ago.

On examination, he has pursed lip breathing, and is bent forward with his hands on his knees. On auscultation, he has diffuse coarse inspiratory crackles and a polyphonic wheeze throughout the chest. There is mild pitting oedema below the ankle.

What is the most likely diagnosis?

A. Idiopathic pulmonary fibrosis

B. Exacerbation of heart failure

C. Infective exacerbation of COPD

D. Asthma attack

E. Lung cancer recurrence

Correct Answer:Infective exacerbation of COPD

Explanation:

The most likely diagnosis is an infective exacerbation of COPD. This typically presents with worsening dyspnoea, a change in colour of the sputum to yellow or green, and increased sputum volume in a patient with COPD. The examination findings of pursed lip breathing, tripod breathing, and diffuse wheeze also favour a diagnosis of an infective exacerbation of COPD.

An exacerbation of heart failure may cause worsening dyspnoea in the context of a cough and pitting oedema. However, given the green sputum, diffuse wheeze and pursed lip breathing, it is less likely than an infective exacerbation of COPD.

A recurrence of lung cancer can cause a range of symptoms, including cough, haemoptysis, shortness of breath and chest pain. However, given the recent normal follow-up for his treated lung cancer and the presence of symptoms characteristic of an exacerbation of COPD, a recurrence of lung cancer is less likely.

Asthma typically presents with a wheeze, cough and shortness of breath. It does not usually cause a productive cough and is diagnosed in childhood in the majority of cases.

Idiopathic pulmonary fibrosis usually presents insidiously with a dry cough and exertional dyspnoea. Patients may also experience fatigue and weight loss.

Further reading:

https://geekymedics.com/chronic-obstructive-pulmonary-disease-copd/

Question:

A 56-year-old man presents to GP with a history of progressive joint pain over the last 6 months. A recent episode of severe pain started a week ago and is still ongoing. Examination reveals swelling and tenderness over the metacarpophalangeal joints bilaterally. His face appears hyperpigmented and a palpable liver edge can be felt 2cm below the costal margin. He has no past medical history but reports his father died of liver disease.

What is the most likely diagnosis?

A. Gout

B. Haemochromatosis

C. Addison’s disease

D. Wilson’s disease

E. Alcoholic hepatitis

Correct Answer:Haemochromatosis

Explanation:

This patient with skin hyperpigmentation, arthralgia, hepatomegaly and a family history of liver disease most likely has haemochromatosis. Haemochromatosis is also associated with pseudogout.

Alcoholic hepatitis would not explain this patient’s arthralgia.

Wilson’s disease presents with movement and psychiatric disorders, as well as hepatic disease. The age of presentation is usually 10-40 years.

Addison’s disease would not explain this patient’s hepatomegaly or arthralgia.

Gout presents as an acute flare of joint pain without background pain and is not associated with haemochromatosis.

Further reading:

https://patient.info/doctor/hereditary-haemochromatosis

Question:

A 23-year-old man presents to his GP with a 3-week history of bloody diarrhoea and cramping abdominal pain. He is currently passing loose stool three times a day and frequently feels a sudden urge to defecate. He describes having mild stomach cramps and occasional loose stool over the preceding four months. Two weeks ago, he visited was referred to ophthalmology with a red eye. He denies any vomiting and has no been in contact with anyone unwell.

An abdominal examination reveals diffuse abdominal tenderness.

What is the most likely diagnosis?

A. Crohn’s disease

B. Gastroenteritis

C. Ulcerative colitis

D. Colonic polyp

E. Coeliac disease

Correct Answer:Ulcerative colitis

Explanation:

This is a typical presentation of ulcerative colitis. Ulcerative colitis most commonly presents with bloody diarrhoea and cramping abdominal pain, however, it can also cause extra-intestinal features such as iritis, anterior uveitis, erythema nodosum, pyoderma gangrenosum, gallstones, arthritis and mouth ulcers. The recent episode of a red eye is likely explained by iritis or anterior uveitis.

Crohn’s disease can also present with diarrhoea, abdominal pain and extra-intestinal features like anterior uveitis, however, it is less likely to cause blood in the stool.

Gastroenteritis is an important differential for diarrhoea, however, the absence of vomiting and the presence of extra-intestinal symptoms of inflammatory bowel disease makes gastroenteritis less likely.

Coeliac disease may cause diarrhoea, however, this is rarely bloody and would not be associated with a red eye.

A colonic polyp can bleed and cause diarrhoea, however, they are uncommon in people aged under 40 and would not cause a red eye.

Further reading:

https://geekymedics.com/ulcerative-colitis-uc/

Question:

A 43-year-old Caucasian patient presents to the GP after noticing increasing ankle swelling that has been worsening over the past few days. He had assumed that it was due to the hot weather and sitting down for prolonged periods at his office job, but the swelling appears to be worsening. He denies shortness of breath, fatigue, chest pain or orthopnoea, and has been previously well, with his only past medical history being amblyopia that was treated as a child. He takes no regular medication.

Examination reveals pitting oedema up to the mid-calf bilaterally. Cardiac and respiratory examinations are both normal, and the patient's pulse, respiratory rate and blood pressure are all within normal limits. The GP asks the patient to provide a urine sample and performs dipstick testing, this shows +++ protein, with no blood, leucocytes or nitrites.

The GP orders a set of routine blood tests and refers the patient to hospital for further investigations.

Which of the following is most likely to be present if further investigations were to be carried out in this case?

A. Apple-green birefringence on Congo red stain

B. Positive anti-ganglioside antibodies

C. Positive phospholipase A2 antibodies

D. Kimmelstein-Wilson nodules on renal biopsy

E. Low C3 levels

Correct Answer:Positive phospholipase A2 antibodies

Explanation:

This patient has presented with significant pitting oedema, for which there are a number of causes. Heart, renal and liver failure can all result in physiological imbalances that can allow for the accumulation of fluid within areas of the body; given the patient's lack of past medical history, these are unlikely in this case. The proteinuria on dipstick without blood or hypertension is indicative of a likely diagnosis of nephrotic syndrome. This is a term that encompasses a number of conditions affecting the glomerulus, that can lead to proteinuria, hypoalbuminaemia and oedema; the classical triad seen in nephrotic syndrome patients.

Given the patient's age and race, the most likely diagnosis is of membranous glomerulonephritis; this is the most common cause of nephrotic syndrome in those of European descent. The diagnosis may be made presumptively based on the patient's race and age in some cases, or further investigations may be carried out to confirm the subtype of nephrotic syndrome present. The majority of cases of membranous glomerulonephritis are associated with anti-phospholipase A2 antibodies, which can be detected in the serum, and a renal biopsy may show subepithelial dense deposits of IgG and C3.

Anti-ganglioside antibodies may be positive in certain subtypes of Guillain-Barre syndrome; an ascending motor neuropathy that usually follows an infection such as gastroenteritis due to Campylobacter jejuni.

Apple-green birefringence on Congo red stain is a classic finding seen in amyloidosis; the disease can cause a nephrotic syndrome in some cases, but there are no other features in the history to suggest that this is likely in this patient.

Kimmelstein-Wilson nodules are the classical histological appearance seen in diabetic nephropathy. The condition can cause nephrotic syndrome (although it more commonly causes subclinical proteinuria), but the patient has no features indicating underlying diabetes.

Low C3 levels can be observed in a number of glomerulonephritides; these are more commonly associated with lupus nephritis and post-infective glomerulonephritis.

Further reading:

https://patient.info/doctor/nephrotic-syndrome-pro

Question:

A 20-year-old woman presents with a 3-week history of pelvic pain and associated dysuria. During this time, she has also experienced dyspareunia. She denies any abnormal vaginal bleeding but has noticed a thicker vaginal discharge. She has recently had unprotected sexual intercourse with a new partner, and uses the combined oral contraceptive pill. There is no other past medical history.

Her temperature is 37.7°C, her heart rate is 85 bpm, and her blood pressure is 126/78 mmHg. On examination, there is diffuse lower abdominal tenderness on deep palpation, along with cervical and adnexal tenderness. A pregnancy test is negative.

What is the most likely causative agent of her presentation?

A. Candida albicans

B. Trichomonas vaginalis

C. Chlamydia trachomatis

D. Gardnerella vaginalis

E. Treponema pallidum

Correct Answer:Chlamydia trachomatis

Explanation:

Chlamydia trachomatis is correct. This patient has signs and symptoms consistent with pelvic inflammatory disease (PID), characterised by dyspareunia, dysuria, pelvic tenderness, cervical and adnexal tenderness with changes in discharge and fever. PID occurs due to infection ascending from the endocervix leading to inflammation of the endometrium, fallopian tubes, ovaries, and pelvic peritoneum. Although PID is a polymicrobial condition, the British Association of Sexual Health and HIV (BASHH) states that Chlamydia trachomatis is the most common causative agent, making up 14-35% of cases. The next most common cause is Neisseria gonorrhoeae.

Gardnerella vaginalis is incorrect. Although this can cause PID, it is much less common than Chlamydia trachomatis. This organism is normally found in the vagina and is associated with bacterial vaginosis, characterised by its overgrowth following changes in vaginal pH. This would be characterised by a 'fishy' and offensive vaginal discharge and would not explain the pelvic pain, cervical and adnexal tenderness, and fevers.

Trichomonas vaginalis is incorrect. Although this is another sexually-transmitted infection that can cause PID, it is a less common cause than Chlamydia trachomatis. It typically presents with an offensive yellow/green 'fishy' discharge and a strawberry cervix on examination. Vaginal pH testing would show an elevated pH.

Candida albicans is incorrect. This can cause vaginal candidiasis and is not associated with PID, as it is not a sexually-transmitted infection. Although this can present with dyspareunia and dysuria, the symptoms are superficial, and cervical excitation and adnexal tenderness would not be seen, nor would there be a fever. Patients also classically have 'cottage cheese-like' discharge.

Treponema pallidum is incorrect. This is the causative organism in syphilis and is not associated with PID. This would initially present with a chancre (a painless ulcer at the site of sexual contact) and non-tender lymphadenopathy. Secondary features then develop weeks following infection, which involve systemic features such as fevers and a rash on the trunk. Tertiary features develop months-years later with neuropsychiatric features.

Further reading:

https://www.bashhguidelines.org/current-guidelines/systemic-presentation-and-complications/pid-2019/

Question:

A 4-year-old girl is brought to the GP by her parents as they are concerned. She has been generally unwell for the past 5 days with a cough and sore eyes. She has also developed a rash over the last 3 days, that started behind her ears and then spread to involve the face, neck, back and chest. Her parents state that she has not been scratching at the rash.

On examination, there are several areas of red, slightly raised spots and associated blotches covering the face, neck, back and chest. The chest sounds clear, heart sounds are normal and abdominal examination is unremarkable. There is no tonsillar exudate visible, although some small red spots, each containing a bluish-white speck in the centre are visible on the buccal mucosa. Vital signs reveal a fever of 39.5 oC but are otherwise normal.

What is the most likely diagnosis?

A. Slapped cheek syndrome

B. Scarlet fever

C. Measles

D. Rubella

E. Roseola infantum

Correct Answer:Measles

Explanation:

The most likely diagnosis is measles.

Measles is a viral infection that is self-limiting for most children, however, there is a high rate of complications, with 10% of children requiring hospital admission. Immunisation programs (MMR) have drastically reduced the prevalence of the disease, however, due to misinformation about the MMR vaccine, measles has been on the rise since 2008.

Typical presenting symptoms of measles include:

Initial prodrome of fever, coryza, cough, conjunctivitis and diarrhoea lasting 2-4 days.

A morbilliform rash that begins on the forehead/neck and spreads to involve the trunk and limbs. The rash presents with red, slightly raised spots and associated blotches, which can become confluent. The rash fades after 3-4 days.

Koplik's spots are pathognomonic and appear on the buccal mucosa. They look like small red spots with a bluish-white speck in the centre.

Roseola infantum is another viral infection that typically affects children aged between 6 months and 2 years of age. It is generally self-limiting with no significant complications. Typical presenting features include fever, pharyngitis and lymphadenopathy. At day 3-4 the fever usually settles and a rose-pink macular rash develops, initially involving the trunk and then spreading to the face and extremities.

Rubella is a viral infection that is now very rare thanks to effective immunisation programs (MMR). Typical presenting features include an initial prodromal phase involving low-grade fever, headache, conjunctivitis, anorexia and coryza. A rash then develops, appearing as discrete pink macules that begin behind the ears and on the face, spreading to the trunk and finally the extremities (similar to measles). Clinical examination may reveal petechiae of the soft palate and the rash described previously. Cervical, suboccipital and postauricular lymphadenopathy is also common.

Slapped cheek syndrome (also known as parvovirus B19) typically presents with headache, rhinitis, sore throat, low-grade fever and malaise. The child then has a symptom free period of 7-10 days, after which they develop the classic "slapped cheek" rash, beginning as erythema on the cheeks with sparing of the nose, periorbital and nasal regions. This rash typically lasts 2-4 days. Finally, 2-4 days after the facial rash appears, a macular rash develops on the extensor surfaces of the extremities. Some children can also develop arthropathy.

Scarlet fever is an exotoxin-mediated disease, arising from infection with group A beta-haemolytic streptococci. Typical presenting symptoms include fever and a rash affecting the neck initially and spreading to involve the trunk and extremities. The rash has a coarse, sandpaper-like texture and appears as punctuate on a diffuse erythematous base. The rash typically lasts for several days and the skin will then start to peel.

Further reading:

https://patient.info/doctor/measles-pro

Question:

A six-week-old boy presents to the GP with non-bilious vomiting shortly after feeding. On examination, the boy appears well with no fevers. He weighs 6kg and is exclusively formula-fed (250ml every 4 hours). His bowels are opening at an appropriate frequency with normal stool being passed.

What is the most likely cause of his presentation?

A. Coeliac disease

B. Viral gastroenteritis

C. Bowel obstruction

D. Pyloric stenosis

E. Overfeeding

Correct Answer:Overfeeding

Explanation:

The most likely cause of this baby’s presentation is overfeeding. This is because of the high amount of feed he is taking for his age and weight.

The amount of feed a baby takes varies depending on their age and on their weight. Generally, you would expect a baby to have around 150-200ml per kg a day. This baby was receiving 1500ml a day when you would expect him to take around 900-1200ml.

Pyloric stenosis typically presents with progressively projective non-bilious vomiting, in addition to other findings such as an olive-shaped mass in the epigastrium and visible peristalsis. Other clinical features include persistent hunger, weight loss, dehydration, lethargy and reduced bowel movements.

There is no clear evidence of viral gastroenteritis, given the child is otherwise well, with normal observations, normal bowel habit and normal clinical examination.

Coeliac disease typically presents during the weaning process (i.e. when the child starts to eat solids containing gluten). In addition, children typically present with faltering growth, which this child does not have.

Further reading:

https://patient.info/doctor/infant-feeding

Question:

A 15-year-old male presents to his general practitioner (GP) with a week-long history of sore throat, malaise and fatigue. He has also had some difficulty swallowing but no cough. He was born in England and has kept up to date with all of his vaccinations. He has no past medical history.

Examination of his oral cavity reveals palatal petechiae and bilateral cervical lymphadenopathy is present on palpation of his neck. There is no uvular deviation. Examination of the abdomen also reveals a slightly enlarged spleen.

What is the most likely diagnosis?

A. Croup

B. Peritonsillar abscess

C. Diphtheria

D. Infectious mononucleosis

E. Acute epiglottitis

Correct Answer:Infectious mononucleosis

Explanation:

The adolescent patient above has a clinical picture that is consistent with infectious mononucleosis (IM) secondary to Epstein-Barr viral infection. Typical features include fever, pharyngitis, fatigue and adenopathy. Lymph node enlargement in these patients tends to be symmetrical and most commonly involves the posterior cervical chain. The patient above has splenomegaly, which is seen in approximately half of the patients diagnosed with IM. To confirm diagnosis a blood film demonstrating atypical lymphocytosis and/or Monospot test for heterophile antibodies is required. Complications of IM include airway obstruction, fulminant liver failure and splenic rupture and so patients should be advised to avoid contact sports for 4-6 weeks following disease onset.

Diphtheria is a bacterial infection caused by the gram-positive Corynebacterium diphtheriae which typically presents in unvaccinated patients with a sore throat, malaise and fever. A pseudomembranous lesion can also be seen on the respiratory tract in some patients. Given the above patient is fully vaccinated, this is an unlikely diagnosis.

Peritonsillar abscess typically presents with trismus (reduced jaw opening), uvular deviation and dysphonia (‘hot potato’ voice) in a young patient. The patient above has a midline uvular and no evidence of trismus.

Acute epiglottis is a medical emergency seen in very young patients who are not vaccinated against H. influenzae type B. Patients typically appear toxic appearing with fever, anorexia and restlessness. Patients must be prepared for potential intubation as soon as possible.

Croup refers to acute laryngotracheobronchitis that is usually secondary to a viral cause such as parainfluenza virus. Most patients present with a seal-like cough, stridor and subglottic swelling. The above patient’s age and lymphadenopathy are more indicative of IM.

Further reading:

https://cks.nice.org.uk/glandular-fever-infectious-mononucleosis#!topicSummary

Question:

A 29-year-old woman is brought to the GP by her partner, who reports that she has been exhibiting some strange behaviour since being started on sertraline for depression. Over the last 3 days, her energy levels have increased, she is no longer sleeping, and her speech is increasingly rapid and irrational. She has also been running through the supermarket shouting that she is “on a mission”.

The patient refuses referral to an inpatient psychiatric unit, denying that she has a mental health condition. There is no other doctor currently available that can assist in the sectioning process.

Under which section of the mental health act would it be possible for the GP to section this patient?

A. Section 2

B. Section 135

C. Section 5(2)

D. Section 4

E. Section 3

Correct Answer:Section 4

Explanation:

Section 4 allows for the compulsory hospitalisation of patients by a single appropriately qualified professional in an emergency when a second practitioner cannot be located for a Section 2 to be completed, and seeking another professional would cause an unsafe delay. Those suffering a manic episode can be a danger to both themselves and others, and it is therefore important that this patient receives a rapid psychiatric assessment.

As Section 4 is to be used in emergencies, it is only valid for 72 hours and cannot be appealed. It will usually be converted to a Section 2 once the patient has been admitted and can be assessed by the two individuals required.

Section 2 allows for the compulsory admission of patients to hospital for a mental health assessment. This would be the preferable option for this patient, but as this requires 2 personnel for it to be completed, it is not feasible in this scenario. A Section 2 can last up to 28 days, and cannot be renewed.

Section 3 of the Mental Health Act allows for the compulsory detainment of patients within the hospital to allow for treatment of their mental health condition to take place. This would not be appropriate in this scenario, as Section 3 usually follows a Section 2; a patient must have a confirmed mental health disorder for this to be utilised. The section is valid for up to 6 months and can be renewed.

Section 5(2) can be used to detain patients already admitted to hospital for a mental health assessment; as this patient is in primary care it would not be appropriate in this scenario.

Section 135 can be used by the police to enter the private property of an individual with a suspected mental health condition in order to take them to a place of safety (often a hospital).

Further reading:

https://patient.info/doctor/compulsory-hospitalisation

Question:

A mother brings her 5-year-old son into the general practice clinic. She explains he has been scratching his scalp more than normal for the past week and is complaining of ‘something crawling’ on his head. One of his friends at school recently had ‘nits’ and she is worried her son might also be affected. On examination there are no skin changes, but you can see tiny seed-shaped objects in the child’s hair.

Which organism is most likely to be causing his symptoms?

A. Taenia saginata

B. Microsporum canis

C. Cimex lectularius Linnaeus

D. Sarcoptes scabiei

E. Pediculus humanus capitis

Correct Answer:Pediculus humanus capitis

Explanation:

The correct answer is pediculus humanus capitis. This is the parasite that causes head lice (also known as ‘nits’ or pediculosis capitis). The parasites themselves are small insects that can lay eggs; ‘nits’ are hatched ‘sesame seed shaped’ eggshells left in the hair. They are often visible on close inspection or fine-tooth combing. The organisms spread through close contact and outbreaks are often seen in groups of nursery or school children who spend time in close proximity to each other.

Microsporum canis is the fungus that most commonly causes tinea capitis (ringworm of the scalp) in Europe. Though it can also cause itch, it would not tend to cause the sensation of ‘something crawling’. There would also be the classic ring-shaped appearance on the scalp, often with a scaly centre.

Sarcoptes scabiei is more commonly known as the scabies mite. It burrows into the skin and lays eggs, most commonly between the fingers or on the flexor aspect of the wrists. It presents with widespread itch that may involve the scalp. The mites themselves are not visible, however burrows and excoriations may be seen on examination.

Taenia saginata is the ‘beef tapeworm’ found in humans. It is generally ingested in undercooked beef and can persist in the gastrointestinal tract; symptoms can include abdominal pain, weight loss and loss of appetite however most people are asymptomatic. It would not cause itching or ‘seed-shaped’ objects in the hair, as in this presentation.

Cimex lectularius Linnaeus are better known as bedbugs. Similarly to pediculus capitis, they have a life cycle of eggs and insects, however these tend to live in furniture rather than on human skin. The insects may bite, sometimes causing itch, and small clusters of bite marks may be visible on the skin. They would not cause the crawling sensation or ‘seed-shaped’ objects in the hair.

Further reading:

https://cks.nice.org.uk/topics/head-lice/

Question:

A 32-year-old man with no past medical history presents with an 8-day history of persistent cough. This was initially a dry cough but in the past 48 hours has become productive of clear sputum.

On examination, there is scattered wheeze but no focal chest signs. His heart rate, blood pressure and temperature are within normal limits.

He is referred for a chest X-ray which is subsequently reported as demonstrating no acute change.

What is the most likely diagnosis?

A. Congestive cardiac failure

B. Gastro-oesophageal reflux

C. Acute bronchitis

D. Community-acquired pneumonia

E. Asthma

Correct Answer:Acute bronchitis

Explanation:

Acute bronchitis refers to a lower respiratory tract infection (differentiating it from colds and other upper respiratory infections), often viral, leading to inflammation of the bronchi (differentiating it from pneumonia, in which the lung parenchyma is affected). It is typically a clinical diagnosis, and self-limiting, with symptomatic relief strategies such as maintaining fluid intake, and simple analgesia, representing the mainstay of treatment for most patients.

In contrast to acute bronchitis, with community-acquired pneumonia there is inflammation of the lung parenchyma (usually as the result of viral or bacterial infection) and, as such, a chest x-ray would most commonly be expected to demonstrate consolidation. In addition, while bronchitis may present with systemic upset such as low fever, patients may be expected to be more systemically unwell with community-acquired pneumonia and may have focal features on chest auscultation.

While congestive cardiac failure may present with symptoms such as dyspnoea and cough, additional features such as peripheral oedema, orthopnoea/paroxysmal nocturnal dyspnoea, and a history of cardiovascular disease may be expected. An X-ray would be unlikely to be normal; there are classical changes which would be expected including alveolar oedema and upper lobe venous diversion.

Gastrooesophageal reflux disease is associated with a classical ‘burning’ chest discomfort, which may be worse on lying flat. If there is associated aspiration, there may be a cough, but this would not be expected to be associated with mucus production. Wheeze is less common and, where present, commonly only on the right side due to aspiration.

While asthma may present with wheeze and dyspnoea (often with diurnal variation in symptom severity), the acute onset of this patient’s symptoms, in addition to their age, makes a first presentation of asthma a less likely diagnosis. Chronic asthma tends to present more progressively with paroxysmal attacks, but, in cases of acute-severe attacks, can present in-extremis with increased respiratory rate, tachycardia, and increased work of breathing. Mucus production may also be associated with asthma, but, given the other features of this case, points more towards bronchitis here.

Further reading:

https://bestpractice.bmj.com/topics/en-gb/135

Question:

A patient is found to have multiple angiofibromatous papules affecting the face and scattered leaf-shaped hypopigmented macules around the body which are more obvious under UV light.

Which of the following is the most likely diagnosis?

A. Sturge-Weber syndrome

B. Xeroderma pigmentosum

C. Tuberous sclerosis

D. Neurofibromatosis II

E. Neurofibromatosis I

Correct Answer:Tuberous sclerosis

Explanation:

Tuberous sclerosis is an autosomal dominant condition characterised by complex hamartomas affecting organs, angiofibromatous papules (adenoma sebaceum), periungual fibromas, roughened plaques commonly affecting the lumbosacral region (shagreen patches) and white leaf-shaped macules (ash-leaf macules). Patients may have underlying learning difficulties or epilepsy.

Neurofibromatosis (NF) I and II are both autosomal dominant disorders. NFI is more common and characterised by often widespread cutaneous neurofibromas and café-au-lait spots (round coffee coloured macules). In NFII acoustic neuromas are typical and café-au-lait spots are less common.

Sturge-Weber syndrome is a rare, congenital neurological disorder associated with ‘port-wine’ stain of the face with underlying intracranial vascular malformation.

Xeroderma pigmentosum is a group of rare autosomal recessive skin conditions associated with photosensitivity and skin tumours due to defective DNA repair.

Further reading:

https://patient.info/doctor/tuberous-sclerosis-pro

Question:

A 24-year-old man was brought by ambulance to the emergency department. He had developed a rash, facial swelling and difficulty breathing after eating in a restaurant. He had been treated by paramedics with 2 doses of intramuscular adrenaline. On arrival at the emergency department, his facial swelling is improving and his breathing difficulty has resolved. His observations are all normal. He is given further treatment with antihistamines.

What is the most appropriate next step in his management?

A. Refer to intensive care for ongoing care

B. Observe in the emergency department for 2 hours and then discharge home

C. Admit for 12 hours of observation

D. Discharge home with 2 adrenaline auto-injectors

E. Refer to allergy clinic

Correct Answer:Admit for 12 hours of observation

Explanation:

The most likely diagnosis is anaphylaxis. It has been treated appropriately so far. The most appropriate next step in his management is to admit for 12 hours of observation. Following an episode of anaphylaxis, there is a risk of a biphasic reaction and as such NICE recommend a period of 6-12 hours observation. Those that have ingested the allergen are at higher risk and require 12 hours of observation.

Observing in the emergency department for 2 hours is too short a period of observation.

He will need a referral to an allergy clinic and 2 adrenaline auto-injectors (“EpiPens”) on discharge. but after a period of observation and so these are not the most appropriate next steps.

He does not need a referral to intensive care as he has no ongoing organ dysfunction and can be safely observed in a ward environment.

Further reading:

https://www.nice.org.uk/guidance/cg134/resources/anaphylaxis-assessment-and-referral-after-emergency-treatment-pdf-35109510368965

Question:

A 30-year-old man attends complaining of pain in the inner side of his left elbow and forearm since he built a bookcase at home 3 days ago. He is normally fit and well and on no regular medication. On examination, you elicit some tenderness of the medial elbow joint and the patient reports discomfort felt in the elbow on resisted pronation of the wrist.

What is the most likely diagnosis?

A. Olecranon bursitis

B. De Quervain’s tenosynovitis

C. Medial epicondylitis

D. Lateral epicondylitis

E. Radial tunnel syndrome

Correct Answer:Medial epicondylitis

Explanation:

Medial epicondylitis, also known as Golfer's elbow, is a common overuse injury of the elbow joint. The patient usually complains about pain of the elbow distal to the medial epicondyle of the humerus with radiation up and down the arm, most common on the ulnar side of the forearm, the wrist and occasionally in the fingers.

Local tenderness over the medial epicondyle and the conjoined tendon of the flexor group, without evidence of swelling or erythema, are also characteristics that can occur. The pain is evoked by resisted flexion of the wrist and by pronation.

Lateral epicondylitis and radial tunnel syndrome affect the ulnar aspect of the elbow.

De Quervain’s tenosynovitis affects the wrist.

A history of olecranon bursitis typically includes the classic ‘boggy’ swelling at the olecranon.

Further reading:

https://www.physio-pedia.com/Medial\_Epicondylitis

Question:

A 21-year-old lady with a background history of bipolar disorder being managed with lithium falls pregnant. She stopped taking her lithium after consulting her psychiatrist. Her anomaly scan at 20 weeks gestation shows Epstein anomaly.

The patient is then reviewed in the routine antenatal clinic at 25-weeks gestation and feels well. On examination, her symphysial-fundal height is noted to be 34 cm. A trans-abdominal scan is performed which reveals ascites, bilateral hydrocele, polyhydramnios and a thickened placenta.

What is the most likely diagnosis?

A. Multiple pregnancy

B. Hydrops fetalis

C. Placental insufficiency

D. Fetal anemia

E. Gestational diabetes

Correct Answer:Hydrops fetalis

Explanation:

The hallmark of hydrops fetalis is the abnormal accumulation of fluid in the fetus's body cavities (pleural, pericardial, peritoneal) and soft tissues. In addition, hydrops fetalis is associated with polyhydramnios and a thickened placenta (>6 cm) in as many as 30-75% of patients. Many affected fetuses also have hepatosplenomegaly.

The basic problem in hydrops fetalis is the imbalance in fluid homeostasis, with more fluid accumulating than can be resorbed. This imbalance can result from 2 broad categories of pathologies, namely, those of an immune origin and those of a nonimmune origin.

Immune-related hydrops fetalis (IHF) results from alloimmune hemolytic disease or Rh isoimmunization.

Nonimmune-related hydrops fetalis (NIHF) can result from primary myocardial failure, high-output cardiac failure, decreased colloid oncotic plasma pressure, increased capillary permeability, or obstruction of venous or lymphatic flow, among other etiologies. Fetal cardiac anomalies are the most common cause of NIHF. Chromosomal anomalies are the second-most-common cause.

Placental insufficiency occurs when the placental function does not meet the fetal needs and is often a consequence of insufficient placental blood flow. It does not usually present with maternal symptoms other than reduced fetal movements. The diagnosis is made via growth scans which identify the fetus is small for its gestational age. Placental insufficiency is associated with oligohydramnios rather than polyhydramnios.

Gestational diabetes can result in polyhydramnios and there is an associated increase in perinatal mortality, however, fetuses are typically macrosomic (rather than small for gestational age). The other abnormalities noted on ultrasound are not associated with gestational diabetes.

Fetal anaemia is a potential cause of hydrops fetalis, but in this scenario, the presence of a congenital cardiac anomaly (Epstein anomaly) makes cardiac failure a more likely cause of hydrops fetalis.

Multiple pregnancy would have been identified as part of the routine ultrasound scan. Multiple pregnancy also doesn't explain all of the abnormalities noted on the scan.

Further reading:

https://patient.info/doctor/hydrops-fetalis

Question:

Jessica, a 25-year-old history student, presents to A&E with a 3-hour history of right-sided abdominal pain which she describes as constant and sharp. She has a heart rate of 105 bpm, blood pressure of 130/80 mmHg and a temperature of 38.1 oC. On examination, she is very tender in the right iliac fossa with guarding. She tells you she has no past medical history and the only medication she takes in the combined contraceptive pill; her last period was 4 weeks ago. You take some blood tests and prescribe painkillers.

What is the next most appropriate step?

A. Arrange an ultrasound scan of the abdomen

B. Arrange a CT scan of the abdomen

C. Contact the surgical team to request a review

D. Obtain a urine sample for urinalysis and a pregnancy test

E. Arrange an urgent colonoscopy

Correct Answer:Obtain a urine sample for urinalysis and a pregnancy test

Explanation:

Given this lady’s presentation and observations, one of the top differentials would be appendicitis, however, in females of childbearing age, it is always important to rule out ectopic pregnancy for anyone presenting with abdominal pain. Having the results of a urine dip would help to guide further discussion with seniors, for example in deciding whether to call the surgical or gynaecology teams. It is important to approach every case methodically and tests such as urine dips should always be considered before more complex investigations such as CT scans. The patient may need a scan later on but you need to consider the risks of scans in terms of radiation, especially in younger people and females of childbearing age. Having the results of a urine dip would help to narrow down differentials and potentially decrease the need for a scan.

Further reading:

https://patient.info/doctor/acute-abdomen

Question:

A 56-year-old non-binary individual presents to their general practitioner with a clawing of their left hand. This has gradually worsened over the past five days and is associated with the sensation of pins and needles in their hands.

They work as a medical secretary and spend a lot of time typing at a desk. They have a past medical history of carpal tunnel syndrome and hypertension. Family history is unremarkable.

On examination, Tinel's sign is negative, and there is obvious clawing of the left hand. Sensation is reduced over the medial 1½ fingers. Otherwise, the examination is unremarkable.

What nerve is the most likely to have been damaged to cause these symptoms?

A. Median

B. Musculocutaneous

C. Axillary

D. Ulnar

E. Radial

Correct Answer:Ulnar

Explanation:

The most likely cause of these symptoms is damage to the ulnar nerve. The ulnar nerve innervates the flexor muscles of the forearm, and intrinsic muscles of the hand. Palsy of this muscle characteristically causes clawing of the hand and paraesthesia in the medial two fingers, as this patient describes.

Damage to the radial nerve is unlikely to present with these symptoms. Radial nerve damage would instead cause sensory loss to the dorsum of the hand, weakness of wrist extensor muscles and wrist drop.

Damage to the musculocutaneous nerve is a good choice, but not the most likely cause of these symptoms. Although the musculocutaneous nerve innervates flexors like the ulnar nerve, it innervates the upper arm flexors. Therefore damage to this nerve would instead cause weakness of the biceps brachii, brachialis and coracobrachialis, alongside reduced sensation of the lateral forearm.

Axillary nerve is not the best answer here. Damage to the axillary nerve is more likely to cause weakness of shoulder abduction and impaired sensation over the inferior deltoid.

Damage to the median nerve is a good guess, but not the most likely answer. Although the patient has had carpal tunnel, and therefore median nerve damage, before, damage to the median nerve would not explain the clawing of the hand. Median nerve palsy causes pain, weakness and paraesthesia to the area the median nerve supplies- the palm and lateral 3½ fingers.

Further reading:

https://geekymedics.com/nerve-supply-to-the-upper-limb/

Question:

A 72-year-old gentleman presents to the GP hoping for a change in his glasses prescription - he was unable to book an appointment with his optician. He thinks he requires new glasses, as he has noticed that his vision is notably poorer, particularly if he closes his right eye. He particularly struggles driving at night, as he says that he can be blinded by the headlights of oncoming cars. He has also noticed that colours appear less sharp when watching the television.

The patient is otherwise well and of normal BMI. The only regular medication he takes is levothyroxine after thyroidectomy for Graves' disease 10 years previously. He does not smoke and drinks alcohol only on special occasions.

Assessment of visual acuity via Snellen chart gives a score of 6/12 in the right eye and 6/36 in the left, neither of which is fully corrected by viewing the chart through a pinhole. On ocular examination, the GP notices that the fundal reflex appears dimmer in the left eye.

Given the likely diagnosis, which of the following is most likely to form part of the management?

A. Ocular steroids

B. Trabeculectomy

C. Phacoemulsification

D. Peripheral iridotomy

E. Laser photocoagulation

Correct Answer:Phacoemulsification

Explanation:

This patient has presented with a classical history of cataract; altered colour vision, glare and a reduction in visual acuity are all common complaints of sufferers of the condition. Cataracts arise due to abnormal clouding of the lens. The crystallin proteins undergo structural changes. most frequently due to age-related processes, with ocular trauma, steroid use and diabetes other relevant risk factors. The normal fundal reflex can often be dimmed in the affected eye, as the lens clouding prevents the light from being reflected by the retina. Slit-lamp examination is usually used to confirm the diagnosis.

The management of cataract is principally surgical; the decision whether or not to undergo surgery will depend on the patient's wishes and the degree to which their visual impairment affects their ability to function. If surgery is warranted, phacoemulsification is the usual technique utilised - this involves breaking up (emulsifying) the lens ('phaco' is the Latin prefix meaning 'lens-shaped') using ultrasound waves, and then inserting a prosthetic lens to replace this. The procedure has a very high success rate, although there is a risk of posterior capsule opacification (sometimes referred to as 'secondary cataracts') and a very small minority of patients may develop an intra-ocular infection as a result of the surgery.

Trabeculectomy and peripheral iridotomy are both procedures used in glaucoma, rather than in the setting of cataracts. Trabeculectomy is an option used for patients with open-angle glaucoma, often reserved for those in whom medications given to reduce levels of aqueous humour are unsuccessful. Peripheral iridotomy is a procedure that may be carried out after an episode of acute angle-closure glaucoma; the surgery creates an opening in the iris through which aqueous humour can drain, preventing repeated episodes.

Ocular steroids can be utilised in anterior uveitis in order to suppress the ongoing inflammatory processes, or possibly in allergic conjunctivitis that has failed to respond to other treatments. They are not used in those with cataracts, especially given that steroids can increase the risk of developing the condition.

Laser photocoagulation is used to manage neovascularization, a feature of diabetic retinopathy or the wet subtype of age-related macula degeneration. Neither of these is likely in this case.

Further reading:

https://cks.nice.org.uk/topics/cataracts/

Question:

A 69-year-old female presents to her GP with a longstanding productive cough and exertional dyspnoea. Her sputum is currently white, but she says that this has become green in the past. There are no red flag features present. She is a current smoker with a 50 pack-year smoking history. On examination, the chest appears hyperexpanded. A bilateral expiratory wheeze is audible, with no coarse crackles. Her observations are blood pressure 135/87mmHg, heart rate 78bpm, oxygen saturation 96%, temperature 37.1oC, respiratory rate 17/min.

The GP suspects chronic obstructive pulmonary disease and requests pulmonary function testing.

What is the most likely finding?

A. FEV1 0.72; FVC 0.69; FEV1/FVC 1.04

B. FEV1 0.43; FVC 0.72; FEV1/FVC 0.59

C. FEV1 0.56 ;FVC 0.67; FEV1/FVC 0.83

D. FEV1 0.81; FVC 0.82; FEV1/FVC 0.98

E. FEV1 0.9; FVC 0.89; FEV1/FVC 1.01

Correct Answer:FEV1 0.43; FVC 0.72; FEV1/FVC 0.59

Explanation:

Based on the history and clinical features, the most likely diagnosis is chronic obstructive pulmonary disease (COPD). COPD is an obstructive respiratory condition that results in a reduced forced expiratory volume in 1 second (FEV1), a normal or reduced forced vital capacity (FVC), and a reduced FEV1/FVC ratio. The table below summarises the different pulmonary function test findings in obstructive and restrictive lung disease.

FEV1 0.43; FVC 0.72; FEV1/FVC 0.59 = obstructive pattern

FEV1 0.9; FVC 0.89; FEV1/FVC 1.01 = normal pulmonary function test

FEV1 0.56 ;FVC 0.67; FEV1/FVC 0.83 = restrictive pattern

FEV1 0.72; FVC 0.69; FEV1/FVC 1.04 = restrictive pattern.

FEV1 0.81; FVC 0.82; FEV1/FVC 0.98 = normal pulmonary function test.

Obstructive Restrictive

FEV1

Reduced

<80% predicted

Reduced

<80% predicted

FVC

Normal/Reduced

Reduced

<80% predicted

FEV1/FVC

Reduced

<0.7

Normal/Increased

>0.7

Examples of obstructive and restrictive lung diseases include:

Obstructive lung disease Restrictive lung disease

COPD

Asthma

Emphysema

Bronchiectasis

Cystic fibrosis

Pulmonary fibrosis

Pneumoconiosis

Pulmonary oedema

Lobectomy/pneumonectomy

Parenchymal lung tumours

Further reading:

https://geekymedics.com/spirometry-interpretation/

Question:

A 61-year-old man undergoes an excision biopsy for a new pigmented skin lesion on his chest. The biopsy reveals a stage I melanoma with a Breslow thickness of 1.5mm. He is otherwise fit and well, with no significant past medical history.

What is the most appropriate next step in management?

A. Imiquimod

B. Wide local excision with a 2cm margin

C. Wide local excision with a 0.5-1cm margin

D. Wide local excision and sentinel lymph node biopsy

E. Chemotherapy

Correct Answer:Wide local excision and sentinel lymph node biopsy

Explanation:

The main treatment for melanoma is wide local excision with margins dependent on the Breslow thickness. For stages 0 to II, the excision margin can also be determined by the stage (0.5-1cm for stage 0, 1cm for stage I, and 2cm for stage II according to NICE guidelines). However, for melanomas thicker than 1mm, or those with a thickness of 0.8-1mm and one of ulceration, lymphovascular invasion or a mitotic index of 2 or more, a sentinel lymph node biopsy should also be carried out. Therefore, the most appropriate next step is wide local excision and sentinel lymph node biopsy.

Wide local excision with a 2cm margin would be appropriate if this were a stage II melanoma.

Wide local excision with a 0.5-1cm margin would be appropriate if this were a stage 0 melanoma.

Imiquimod may be used to treat stage 0 melanoma, where wide local excision with a sufficient margin would lead to unacceptable disfigurement or morbidity.

Chemotherapy is generally used only for advanced melanoma.

Further reading:

https://geekymedics.com/malignant-melanoma-of-the-skin/

Question:

A mother presents to the GP with her two-year-old girl complaining that her child has had three days of low-grade fever, nasal congestion, and rhinorrhoea. This morning she noticed that her child was tugging on her right ear more than usual. Her past medical history is notable only for an itchy rash when she took penicillin. She has no history of other ear infections or any recent antibiotic use. Her temperature is 37.3°C and the rest of her vital signs are all within normal limits for her age.

On physical examination, she is playful and interactive. Otoscopy reveals an inflamed tympanic membrane with an air-fluid level. Clinical examination is otherwise unremarkable.

What is the most appropriate treatment for this child?

A. Azithromycin (oral)

B. Ceftriaxone (IM)

C. Symptomatic relief

D. High-dose amoxicillin (oral)

E. High-dose amoxicillin/clavulanate (oral)

Correct Answer:Symptomatic relief

Explanation:

This child has a low-grade fever and signs of mild inflammation of her middle ear. She is playful and interactive with largely normal vital signs and so it is reasonable to defer antibacterial treatment for otitis media for 48 to 72 hours and limit management to symptomatic relief.

Ceftriaxone (IM) is commonly used in outpatients who cannot take oral medication or who have a non-type I penicillin allergy. It can also be used as a second-line treatment for a patient who is unresponsive to amoxicillin because of its increased efficacy against S. Pneumoniae. It should not be used without previous administration in patients with a type-I penicillin allergy, particularly in the outpatient settings, as there is a degree of cross-reactivity between cephalosporins and beta-lactam antibiotics.

Azithromycin is an appropriate first-line treatment for patients with nonsevere illness and a type-I penicillin allergy such as in this patient.

High-dose oral amoxicillin is the single most appropriate first-line therapy in the majority of patients with acute otitis media who have mild to moderate otalgia and a temperature < 39°C. It is effective against streptococci and has a narrow antibiotic spectrum of activity. It would not be appropriate in this patient due to her penicillin allergy.

In patients who have evidence of severe illness (moderate to severe otalgia or a fever >39°C) treatment should be initiated with high-dose amoxicillin/clavulanate, which provides added coverage for beta-lactamase–positive organisms like Haemophilus influenzae and Moraxella catarrhalis. It would not be appropriate in this patient due to her penicillin allergy.

Further reading:

https://patient.info/doctor/acute-otitis-media-in-children

Question:

A 3-year-old girl, who recently immigrated with her parents from a rural area in India, presents to the paediatric outpatient clinic. Her parents report that she suffered from a viral upper respiratory tract infection a couple of months ago that resulted in her loss of appetite. She subsequently did not eat for a couple of days until her viral infection cleared. However, she then began to vomit profusely, was profoundly fatigued and was taken to the emergency department, where they treated her for dehydration and severe hypoglycaemia.

Similar symptoms then reoccurred the following month after their daughter suffered from a sore throat and refused to eat due to throat pain. On further questioning, the girl is also being investigated for unexplained seizures. On examination, hepatosplenomegaly is noted.

What is the inheritance pattern of the disease described?

A. Autosomal recessive

B. Mitochondrial

C. Autosomal dominant

D. X-linked dominant

E. X-linked recessive

Correct Answer:Autosomal recessive

Explanation:

The most likely diagnosis is medium-chain acetyl CoA dehydrogenase deficiency (MCADD). This condition is caused by mutations located on the ACADM gene. Deficiency in this gene results in defective medium-chain acetyl CoA dehydrogenase enzymes that are crucial to metabolising medium-chain fatty acids. Medium-chain fatty acids are important sources of energy for many tissues.

MCADD is inherited in an autosomal recessive fashion. This condition usually presents in infancy or early childhood and symptoms are triggered by a period of fasting or viral illness. Symptoms include vomiting, hypoglycaemia and fatigue. Serious complications of this condition may include seizures, airway compromise, liver failure (e.g. associated with hepatosplenomegaly), brain damage, coma and sudden death.

This condition is usually diagnosed as part of newborn screening prior to the onset of symptoms. Diagnosis after the onset of symptoms includes genetic analysis of ACADM gene, plasma acylcarnitine, urinary organic acids and urinary acylglycine.

MCADD is not inherited in an autosomal dominant (AD) fashion. Examples of diseases that are inherited in this manner include Huntington’s disease, Marfan’s syndrome and Von Hippel-Lindau disease.

MCADD is not inherited in an x-linked recessive fashion. X-linked recessive disorders include haemophilia and Duchenne muscular dystrophy.

MCADD is not inherited in an x-linked dominant fashion. X-linked dominant conditions include Rett’s syndrome and fragile X syndrome.

Mitochondrial inheritance is a rare mode of inheritance. Mitochondrial myopathy is an example of a mitochondrially inherited disease.

Further reading:

https://rarediseases.org/rare-diseases/medium-chain-acyl-coa-dehydrogenase-deficiency/

Question:

A 62-year-old woman presents to her GP with an 18-month history of increasing dyspnoea on exertion. She sometimes wakes up at night struggling for breath, however, her dyspnoea is improved when sleeping upright in bed or chair.

On examination, a rumbling mid-diastolic murmur with an opening click is audible.

What is the diagnostic investigation?

A. Chest x-ray

B. Cardiac catheterisation

C. Dynamic exercise testing

D. ECG

E. Echocardiogram

Correct Answer:Echocardiogram

Explanation:

This case demonstrates mitral stenosis, of which rheumatic fever is the most common cause. It commonly presents with exertional dyspnoea, orthopnoea and paroxysmal nocturnal dyspnoea. Chest pain and atrial fibrillation may also be seen. An echocardiogram is diagnostic, providing confirmation and quantifying the severity of the stenosis. A hockey stick shaped mitral deformity is the typical finding.

Whilst a chest x-ray may demonstrate left atrial enlargement, it is not diagnostic for mitral stenosis.

An ECG may demonstrate features of right ventricular hypertrophy, left atrial enlargement (P-mitrale) and atrial fibrillation. However, other pathology can also cause these features.

Cardiac catheterisation is an invasive procedure used to calculate the mitral valve area and determine chamber pressures. Therefore, it is generally only performed if the echocardiogram is inconclusive, and is a less preferred investigation option.

Dynamic exercise testing uses echocardiography or cardiac catheterisation to measure the cardio-pulmonary response to exercise. Pulmonary artery pressures are monitored and can be used to guide management. It is a more complex and less commonly performed investigation.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK430742/

Question:

A 38-year-old man presents to the dermatology clinic with intensely itchy elbows and knees. He states that this has been going on for the past 2 weeks and is interfering with his life to the point that it is getting him down. History also reveals that he has had previous episodes of malabsorption relieved by a wheat-free diet. He has no known drug allergies.

What is the most likely diagnosis?

A. Atypical eczema

B. Dermatitis herpetiformis

C. Psoriasis

D. Scabies

E. Polycythaemia rubra vera

Correct Answer:Dermatitis herpetiformis

Explanation:

Dermatitis herpetiformis is a chronic autoimmune blistering skin condition, characterised by blisters filled with a watery fluid that is intensely itchy. The condition is associated with coeliac disease (it is a cutaneous manifestation of the disease). The risk of small bowel lymphoma is greatly increased by having both conditions and therefore regular surveillance is recommended.

Psoriasis does commonly affect the elbows but usually does not present with itch.

Eczema may present in such sites and with pruritus but is not strongly associated with coeliac disease.

Scabies should always be kept in mind when considering itch, usually in children in the web spaces of the hands and feet. Track marks from the burrowing mite can often be seen and harvested for microscopic diagnosis.

Further reading:

https://www.dermnetnz.org/topics/dermatitis-herpetiformis/

Question:

A 30-year-old man presents to his GP practice with a painful lump in his scrotum, which came on two days ago. He has also found that he has been going to the toilet more frequently to urinate and feels feverish.

On examination, the left hemi-scrotum is swollen and tender, and there is a solid, palpable lump separate from the testis, which does not transilluminate. The testis itself is not swollen or tender. When lifting the scrotum, the pain is relieved. Stroking the medial aspect of the left thigh causes the left testis to be elevated.

What is the most likely diagnosis?

A. Epididymal cyst

B. Testicular torsion

C. Orchitis

D. Epididymitis

E. Epididymo-orchitis

Correct Answer:Epididymitis

Explanation:

This is a young man presenting with urinary frequency, a painful scrotal lump and a fever. He also has a positive Prehn’s sign (reduction in pain upon elevation of the scrotum), which indicates epididymitis.

Orchitis is inflammation of the testis. Although it can present with similar symptoms to epididymitis, the examination would reveal a lump that was indistinguishable from the testis.

Epididymo-orchitis is inflammation of the epididymis and testis. As the testis itself is not swollen or tender, this answer is incorrect.

Although an epididymal cyst or spermatocele would be felt as a lump separate from the testis, it is usually painless and asymptomatic. Furthermore, it is felt as a fluctuant rather than a solid mass and would transilluminate.

Testicular torsion is an important differential for epididymitis. However, it typically presents over hours rather than days, has a negative Prehn’s sign and may have a loss of the cremasteric reflex (loss of scrotal elevation on stroking the medial thigh). The additional finding of a lump felt separate from the testis in this patient further goes against a diagnosis of testicular torsion.

Further reading:

https://teachmesurgery.com/urology/genital-tract/epididymitis/

Question:

A 4-year-old boy is brought to the GP by his mother, who is worried about recent symptoms that he has developed. He was sent home from school 6 days ago, as he complained of feeling hot; his temperature was taken by the teacher, and he was noted to have a fever. A COVID-19 test was taken as recommended but this was negative. He has been unable to return to school, as his temperature has remained high; he has now developed a rash over his trunk, and his mother reports that he is frequently rubbing his eyes and complaining that they are painful.

The GP carries out an examination of the child, who appears quiet and teary. The rash is visible over the entirety of the trunk and limbs, this is maculopapular and blanches with pressure. His temperature is taken, with a reading of 38.6, with pulse rate, respiratory rate and capillary refill time all being normal. No obvious sources of infection are identified, although there is significant lymphadenopathy in the left anterior cervical chain, with several lymph nodes exceeding 2cm in diameter. The boy's eyes appear painful and red.

Considering the most likely diagnosis, which of the following investigations is most likely to be warranted?

A. Chest X-ray

B. Echocardiogram

C. Skin swab

D. Bone marrow biopsy

E. Renal biopsy

Correct Answer:Echocardiogram

Explanation:

The most likely diagnosis in this child is Kawasaki's disease, a vasculitis affecting medium-sized vessels that can give a number of systemic features. A prolonged fever (greater than 5 days) is a common manifestation of the disease; a prolonged fever of unknown origin as is present in this child should warrant further consideration. Whilst infective causes are still the most common culprit, it is worth thinking about inflammatory disorders (such as vasculitis in this case), autoimmune conditions such as juvenile idiopathic arthritis (the acute-onset form of this condition is another worthwhile differential in this boy) and malignancy.

Symptoms of Kawasaki's disease can vary, but a diffuse maculopapular or morbilliform rash, conjunctivitis (an explanation for the sore eyes described by the child) and lymphadenopathy are all frequently seen. Desquamation of the palms and soles may also arise, and the classical 'strawberry tongue' (also seen in scarlet fever) may be noted. A useful mnemonic to remember the important features of the condition is 'CRASH and BURN ('Burn' referring to the prolonged fever):

Conjunctivitis

Rash

Adenopathy

Strawberry tongue

Hand and foot desquamation

The diagnosis of Kawasaki's disease is made clinically, although raised inflammatory markers can aid the diagnostic process. The most important complication of the condition is the development of coronary artery aneurysms; an echocardiogram will usually be ordered to rule this out. Management is via intravenous immunoglobulin (IVIG) and high dose aspirin (usually totally contraindicated in children due to the risk of Reye's syndrome; Kawasaki's is largely the only exception), with most children recovering well after receiving this therapy.

A skin swab is unlikely to be of much diagnostic benefit; the rash is not the most worrying feature of this condition.

A bone marrow biopsy may be used if a diagnosis of leukaemia is suspected. This is unlikely in this case, as the child would be more clinically unwell, and likely have signs of bone marrow dysfunction; petechiae and anaemia for example.

There is no indication for a chest X-ray in this scenario; there are no signs of lung involvement, and there are no features of Kawasaki's disease that can be seen on this imaging modality.

A renal biopsy is sometimes indicated in suspected glomerulonephritis, in order to confirm the diagnosis and determine the subtype present. There is no indication of any renal involvement in this case; the child has not complained of symptoms such as oedema or frothy urine.

Further reading:

https://dermnetnz.org/topics/kawasaki-disease/

Question:

A 19-year-old female attends her GP with painless, progressive loss of her peripheral vision. The patient mentions that her vision has noticeably deteriorated over the last year. No changes to central vision are reported. She also complains of impaired dark adaption at night, often resulting in her tripping over objects. On fundoscopic examination, the GP notices many hyperpigmented areas all over the retina creating a mottled appearance.

What is the MOST LIKELY diagnosis?

A. Vitreous haemorrhage

B. Central retinal artery occlusion

C. Age-related macular degeneration

D. Retinal detachment

E. Retinitis pigmentosa

Correct Answer:Retinitis pigmentosa

Explanation:

The most likely diagnosis is retinitis pigmentosa. Patients typically present with tunnel vision (reduced peripheral vision) and night vision problems. Eventually, retinitis pigmentosa leads to loss of all peripheral vision then central vision is affected. Occasionally, retinitis pigmentosa may present as part of a syndrome with non-ocular features including deafness associated with Usher’s syndrome and renal dysfunction associated with Bardet-Biedl syndrome. Fundoscopy shows characteristic hyperpigmented "bone spicules" in the peripheral retina.

Retinal detachment is less likely in this case as it usually presents with acute or subacute visual acuity and field loss. The patient will often equate their vision loss to ‘dark curtains being drawn’ over their vision.

Central retinal artery occlusion is less likely as it presents with sudden unilateral painless visual loss with an associated ‘cherry red’ spot seen on fundoscopy.

Vitreous haemorrhage is less likely in this case as it usually presents with acute, painless visual loss or haze. Additionally, the patient may also describe 'floaters' and the retina is often obscured on fundoscopy by dispersed vitreous haemorrhage.

Age-related macular degeneration presents with drusen on the retina in a much older age group.

Further reading:

https://patient.info/doctor/retinitis-pigmentosa

Question:

A 64-year-old man presents to his GP with a seven-day history of cough productive of yellow-coloured sputum with no breathlessness.

On examination of his chest, there is good air entry bilaterally, and there are no added sounds. He has normal oxygen saturation and respiratory rate, with a slightly raised temperature of 37.8ºC. He has a past medical history of type 1 diabetes mellitus and asthma, and is allergic to penicillin.

What is the most appropriate management option?

A. Reassure with safety-net advice

B. Prescribe oral phenoxymethylpenicillin

C. Admit to hospital for intravenous antibiotics

D. Prescribe oral amoxicillin

E. Prescribe oral doxycycline

Correct Answer:Prescribe oral doxycycline

Explanation:

The correct answer is to prescribe oral doxycycline. This most likely diagnosis is acute bronchitis. Given that this patient has a mild fever and pre-existing health problems, antibiotics would be the most appropriate management. Oral antibiotics would be appropriate, and doxycycline would be appropriate first-line for bronchitis.

Pneumonia is unlikely as the patient is not breathless, has normal observations (other than mild pyrexia) and has no focal signs on examination. However, even if this patient had pneumonia the management would be the same as they are allergic to penicillin and their CRB-65 score is 0.

If they were severely unwell, then admission to hospital for antibiotics may be necessary, however, this is not required here.

Oral amoxicillin would be considered if the patient was unable to take doxycycline, for example, due to an allergy or if they were a pregnant woman or child. Although it would not be suitable in this patient regardless, as they have a penicillin allergy.

Oral phenoxymethylpenicillin would also be inappropriate due to the patient's penicillin allergy

Many patients who are systemically well with acute bronchitis may not require antibiotics and could be reassured with safety netting. However, given that this patient has systemic symptoms and pre-existing medical problems, an antibiotic prescription would be most appropriate.

Further reading:

https://cks.nice.org.uk/topics/chest-infections-adult/management/acute-bronchitis/

Question:

A 56-year-old man presents to the GP complaining of problems with swallowing. He has noticed that larger pieces of food appear to get stuck, and it takes a great deal of effort to 'get them down'. This has been present for approximately 3 weeks, has not progressed. He does not have issues swallowing liquids. He denies weight loss, any change in appetite, and has not noticed any abdominal pain or blood in his stools. He admits to having suffered from acid reflux for a number of years; he believes that this is likely to be linked to the fact that he is obese and has a poor diet, and has not presented to the GP about this.

The GP ascertains that the patient meets the criteria for a 2-week-wait referral, and refers him for an upper GI endoscopy via this pathway. This reveals the presence of salmon-pink extensions of mucosa located 3cm above the gastro-oesophageal junction; biopsies are taken from this region, which reveals the presence of goblet cells. The pathologist has reported that there are no features of pleomorphism and that the architecture of the cells appears to be normal.

What is the most likely diagnosis in this scenario?

A. Barrett's oesophagus

B. Normal oesophagus appearance

C. Oesophageal adenocarcinoma

D. Squamous cell carcinoma of the oesophagus

E. Achalasia

Correct Answer:Barrett's oesophagus

Explanation:

Barrett's oesophagus is a form of intestinal metaplasia that most commonly arises due to chronic acid reflux. The cellular trauma caused by the acid results in the differentiation of some of the usual squamous cells found within the oesophagus into columnar cells that are normally found in the stomach and the remainder of the alimentary canal. The condition fits with the patient's history of prolonged dyspeptic symptoms; with the classic endoscopy appearance often described as areas of salmon-pink mucosa. Goblet cells are usually only found within columnar epithelium; the presence of these on histology makes Barrett's extremely likely.

Barrett's oesophagus is associated with an increased risk of progression to adenocarcinoma of the oesophagus; for this reason, regular surveillance via endoscopy is usually carried out in those with the condition. This patient is at a lower risk of this complication, as no dysplastic changes were identified on histology.

The presence of goblet cells within the oesophagus make a diagnosis of normal oesophageal tissue very unlikely; a normal appearance would likely be reported as stratified squamous epithelium without the presence of these cells.

The fact that there were no features of pleomorphism or abnormal cell architecture on histology makes a diagnosis of either squamous cell carcinoma of the oesophagus or oesophageal adenocarcinoma less likely. Whilst Barrett's oesophagus may progress to adenocarcinoma, there is an absence of dysplastic features to suggest that this has occurred.

Achalasia is a condition characterised by an abnormally increased tone of the lower oesophageal sphincter, which can cause dysphagia in those suffering from the disease. It is unlikely in this scenario, as it would not present with the histological features that have been reported.

Further reading:

https://patient.info/doctor/barretts-oesophagus-pro

Question:

A research group wishes to find out whether a new drug developed for chronic obstructive pulmonary disease (COPD) reduces the rate of exacerbations of COPD. They randomly select a group of 500 patients with COPD, then use a computer algorithm to randomly assign patients to either the treatment arm or placebo arm. Neither the patients nor the experimenters are aware of which patients are in the treatment arm and which are in the placebo arm.

What type of study is described?

A. Case-control

B. Ecological study

C. Single-blind trial

D. Observational study

E. Double-blind trial

Correct Answer:Double-blind trial

Explanation:

This is a double-blind trial. A double-blind trial is one in which neither the patient nor the researcher is aware of which treatment the patient is receiving. If the patient is not aware of which treatment they are receiving but the researcher is aware, this is a single-blind trial.

An ecological study compares different populations that have different rates of cases and different rates of risk factor exposure.

Studies can be divided into observational and interventional studies. An observational study is one in which no intervention is performed; data are simply gathered from the sample group without making any changes to the conditions. Here, the patients are given either the new drug or a placebo, therefore this study is an interventional study.

Case-control studies are typically used to study the cause of a condition rather than to investigate the efficacy of treatments for a condition. They involve comparing a group of cases with a group of controls and seeing if there are different rates of risk factor exposure between the two groups.

Further reading:

https://guides.himmelfarb.gwu.edu/prevention\_and\_community\_health/types-of-studies

Question:

A 74-year-old post-menopausal female presents to her GP with new vaginal bleeding. The bleeding is small volume, irregular and has persisted for two months. She is otherwise well. Her last cervical smear was aged 64-years-old, and the results have always been normal. She experienced menopause at 55 years old and has never been pregnant. Her BMI is 35 kg/m2.

What is the first line investigation?

A. CT thorax, abdomen and pelvis

B. Pipelle biopsy

C. Hysteroscopy and biopsy

D. Transvaginal ultrasound

E. Diagnostic hysterectomy

Correct Answer:Transvaginal ultrasound

Explanation:

This case demonstrates endometrial cancer, which typically presents with postmenopausal bleeding or persistent intermenstrual bleeding and menorrhagia in premenopausal patients. Obesity, nulliparity, polycystic ovary syndrome, family history, hormone replacement therapy, and oestrogen receptor agonists (e.g. tamoxifen) are risk factors.

Postmenopausal bleeding is endometrial cancer until proven otherwise.

Transvaginal ultrasound via the urgent suspected cancer pathway is the first-line investigation to measure the endometrial thickness. If there's evidence of endometrial thickening >4mm, a pipelle biopsy or hysteroscopy and biopsy (if high risk) should be performed.

A CT thorax, abdomen and pelvis is used in the staging of malignancy, once diagnosed. It is not a first-line investigation.

A diagnostic hysterectomy as a first-line investigation is unnecessary and highly invasive in this case. However, removal of the uterus may be indicated if endometrial cancer is diagnosed.

Further reading:

https://geekymedics.com/endometrial-cancer/

Question:

A 71-year-old male presents to the emergency department because of increasing right upper quadrant pain, fever and nausea for the past 12 hours. He also reports chills throughout the previous night. The patient has a past medical history of type two diabetes mellitus for which he takes metformin. He does not drink alcohol or smoke. He has no pertinent family medical history.

His observations are significant for a temperature of 38.6 degrees Celsius, blood pressure of 99/77 mmHg, a pulse rate of 112 beats/minute and respiratory rate of 21 breaths/minute.

Physical examination reveals scleral icterus and tenderness in the right upper quadrant. Laboratory results show leucocytosis with significant elevation in bilirubin and alkaline phosphatase (ALP) and mild elevations of transaminases.

What is the most likely diagnosis?

A. Acute cholecystitis

B. Pancreatitis

C. Ascending cholangitis

D. Acute diverticulitis

E. Appendicitis

Correct Answer:Ascending cholangitis

Explanation:

This patient has presented with Charcot’s triad (right upper quadrant pain, fever and jaundice) and sepsis which is consistent with a diagnosis of ascending cholangitis. Only 50-70% of patients present with Charcot’s triad, therefore other clinical manifestations such as leucocytosis, hypotension and altered mental status should also be borne in mind. Ascending cholangitis is caused by ascending infection secondary to biliary obstruction – usually due to a gallstone, malignancy or a stricture. Therefore, enteric bacteria such as Escherichia coli and Klebsiella are the most common causative agents. Ascending cholangitis is a surgical emergency which requires immediate intervention with endoscopic retrograde cholangiopancreatography (ERCP).

Acute pancreatitis is more likely to present with epigastric pain which radiates to the back in patients with risk factors such as alcoholism, gallstone disease, hypercalcemia or a pancreatic tumour. Elevated amylase levels are seen on laboratory testing.

Acute cholecystitis can also present with right upper quadrant pain with vomiting and fever but is unlikely to have haemodynamic changes and jaundice as is seen in the patient in the question stem.

Diverticulitis refers to inflammation of diverticula. Majority of patients will present with left lower quadrant pain, diarrhoea and nausea/vomiting. The patient in the above scenario has right upper quadrant pain and jaundice, which is more consistent with cholangitis.

Appendicitis typically presents with epigastric pain that later localises to the right lower quadrant, anorexia, nausea and leucocytosis.

Further reading:

https://patient.info/doctor/cholangitis

Question:

You are the Paediatric SHO on call. You are called to review a female baby located in the neonatal unit born at 28-weeks gestation 2 days previously. When you arrive, the nurse informs you that the baby has been intermittently coughing up green secretions for the last 24 hours. The baby was born via uncomplicated vaginal delivery. The mother is overweight and smoked during pregnancy.

Clinical examination of the baby reveals the following:

Oxygen saturations (88%)

Temperature - 38.9 oC

Respiratory rate - 70 breaths per min

Intercostal and subcostal recession

Expiratory grunting

Reduced breaths sounds over the left lung base

What is the MOST LIKELY diagnosis?

A. Respiratory distress syndrome

B. Pneumonia

C. Paediatric bacterial meningitis

D. Meconium aspiration syndrome

E. Transient tachypnoea of the newborn

Correct Answer:Pneumonia

Explanation:

Pneumonia is the most likely diagnosis in this case. This condition may be categorised into:

true congenital pneumonia (i.e. pneumonia present at birth)

intrapartum pneumonia (i.e. pneumonia acquired from passage through the birth canal)

postnatal pneumonia (i.e. development within the first 24 hours of life)

Major risk factors for the development of pneumonia in infants include:

maternal chorioamnionitis

prematurity

early membrane rupture prior to the onset of labour

maternal fever

breech presentation

maternal obesity

maternal smoking

meconium-stained amniotic fluid

Clinical features of this condition include cough, irritability, fever, tachypnea, hypoxaemia, expiratory grunting, accessory muscle use and excessive airway secretions.

Respiratory distress syndrome (RDS) is less likely in this case. RDS is caused by insufficient production of surfactant in the alveoli. It typically affects pre-term infants and presents as respiratory distress soon after birth.

Paediatric bacterial meningitis would more likely present with fever, irritability, poor feeding, bulging fontanelle and seizures.

Transient tachypnea of the newborn (TTN) is a benign, self-limited condition that can present in infants of any gestational age, shortly after birth and is commoner in term babies or babies delivered via Caesarian. It is caused due to delay in clearance of fetal lung fluid after birth which leads to ineffective gas exchange, respiratory distress, and tachypnea. This condition is not associated with features of infection (e.g. pyrexia).

Meconium aspiration syndrome typically presents acutely with respiratory distress in those with a birth history involving meconium-stained amniotic fluid. It is commoner in post-term babies.

Further reading:

https://patient.info/doctor/congenital-perinatal-and-neonatal-infections

Question:

A 39-year-old woman is seen in A&E with a 2-day history of fatigue, breathlessness on exertion and palpitations. She reports experiencing mild flu-like symptoms 2 weeks ago that resolved.

On examination, she is tachycardic (120bpm) with an audible S3 gallop on auscultation of the precordium. Otherwise, her observations are stable.

An ECG is conducted which demonstrates sinus tachycardia. Blood tests demonstrate a creatinine kinase of 250U/L, and her serum troponin is 25ng/ml. An echocardiogram is conducted which does not demonstrate any obvious motion abnormalities or valve problems.

What is the most appropriate next step in the management of this patient?

A. Repeat serum troponin and provide supportive conservative care

B. Endomyocardial biopsy

C. Give systemic corticosteroids to suppress inflammation

D. Commence ACE-inhibitor and a beta-blocker

E. Commence beta-blocker therapy

Correct Answer:Repeat serum troponin and provide supportive conservative care

Explanation:

The most appropriate next step would be to repeat serum troponin and provide supportive conservative care. In a patient presenting with a mildly raised troponin (>14ng/ml, depending on local guidelines) it is appropriate to monitor serum troponin. In this patient the most likely diagnosis is myocarditis and there are no ECG findings in support of initiating treatment for ACS, and therefore supportive measures (the treatment for suspected myocarditis in the absence of haemodynamic instability) are most appropriate at this stage.

Commencing an ACE-inhibitor and a beta-blocker is not appropriate. Although this may form part of the long-term management in a patient with suspected cardiac failure, it is not the most appropriate management of acute myocarditis.

The use of corticosteroids in myocarditis is not supported by trial evidence.

Commencing beta-blocker therapy is not appropriate in the acute management of myocarditis.

Endomyocardial biopsy is not appropriate. Although this provides a way of confirming a histological diagnosis in myocarditis, it is not routinely performed as it rarely would alter management.

Further reading:

https://patient.info/doctor/myocarditis-pro

Question:

A 59-year-old alcoholic presents with a week history of cough and worsening shortness of breath. His cough is productive of redcurrant jelly sputum.

What is the most likely finding of sputum MC&S (microscopy, culture and sensitivity)?

A. No growth after 2 days

B. Gram-negative rods

C. Gram-positive cocci in clusters

D. Gram-negative cocci

E. Gram-positive cocci in pairs

Correct Answer:Gram-negative rods

Explanation:

The most likely micro-organism is Klebsiella (a gram-negative rod). Klebsiella pneumonia can present with ‘redcurrant jelly sputum’ and this micro-organism commonly causes community-acquired pneumonia in alcoholics.

Streptococcus pneumoniae is the most common organism causing community-acquired pneumonia, however, it is typically associated with rust coloured sputum (MC&S of gram-positive cocci in pairs).

Staphylococcus aureus (MC&S of gram-positive cocci in clusters) can also cause community-acquired pneumonia.

Further reading:

https://en.wikipedia.org/wiki/Klebsiella\_pneumoniae

Question:

A 73-year-old man presents to the emergency department with central chest pain and dyspnoea, which started 1 hour ago whilst at rest. His 35-year-old son died 3 weeks ago from an undetermined cause. He is a non-smoker. An ECG shows ST-elevation and blood tests are taken, including troponin T, which is moderately elevated.

He is urgently transferred for primary percutaneous coronary intervention, but angiography demonstrates no obstruction of the coronary arteries. The patient is transferred to the cardiac care unit for monitoring. Echocardiography shows dilation of the apex of the left ventricle.

Based on the clinical findings, what is the most likely diagnosis?

A. Prinzmetal angina

B. Hypertrophic obstructive cardiomyopathy

C. Myocardial infarction

D. Aortic dissection

E. Takotsubo cardiomyopathy

Correct Answer:Takotsubo cardiomyopathy

Explanation:

This patient has had a significant bereavement in the last 2 months. Takotsubo cardiomyopathy, or broken heart syndrome, can mimic a myocardial infarction, but angiography will reveal no obstruction. Troponin T may be mild-moderately elevated. An echocardiogram will show the pathognomonic feature of apical ballooning (dilation of the ventricular apex).

Aortic dissection would usually present with tearing chest pain radiating to the back and most patients present with no or non-specific changes on ECG.

Hypertrophic obstructive cardiomyopathy is a good differential, especially with his son recently dying from unknown causes. However, troponin T would not be elevated and echocardiography would demonstrate obstruction and impaired ventricular function.

Evidence of occlusion of the coronary arteries would be seen during angiography in myocardial infarction, and so excludes this option.

Prinzmetal angina (or coronary artery spasm) would present with chest pain at rest and an ECG may show ST-elevation. However, troponin T would not be increased and the features seen on echocardiography in this patient are not consistent with this diagnosis.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK430798/

Question:

A 29-year-old caucasian woman (G3P3) presents with a 6-month history of heavy menstrual bleeding.

She describes having to change sanitary products every 2-hours. Her menstrual cycle is regular (29 days) and she does not currently use any long-acting contraception. There is no intermenstrual bleeding, post-coital bleeding or significant dysmenorrhoea.

There is no significant past medical or family history. Her only regular medication is a combined oral contraceptive pill.

On examination, her BMI is 31.2 kg/m2 and there are no features of anaemia. Speculum and bimanual examination are normal.

Outpatient pelvic ultrasound and hysteroscopy reveal a 2.3 cm fibroid with an otherwise healthy uterus.

Which aspect of this patient's history and examination is a risk factor for uterine fibroids?

A. Multiparity

B. Current combined oral contraceptive pill use

C. BMI of 31.2 kg/m2

D. Age

E. Caucasian ethnicity

Correct Answer:BMI of 31.2 kg/m2

Explanation:

The correct answer is a BMI of 31.2kg/m2 - this BMI would fall into the obese category.

NICE CKS lists the following risk factors for uterine fibroids:

Obesity

Increasing age

Early puberty

Black ethnicity

Family history

Caucasian ethnicity is incorrect as black ethnicity is a risk factor; black premenopausal women have a 2-3x higher incidence of uterine fibroids than their caucasian counterparts.

This patient is only 29-years-old, therefore age is incorrect.

Multiparity is incorrect - there is actually a reduction in the risk of fibroids in women who have had children compared to nulliparous women.

Current combined oral contraceptive use is incorrect. The current use of oral contraception is associated with a reduced risk of uterine fibroids.

Further reading:

https://cks.nice.org.uk/topics/fibroids/

Question:

A 78-year-old man is found to have orthostatic hypotension during an inpatient stay following a fall at home proceeded by blurry vision and dizziness.

His medical history includes hypertension, for which he takes lisinopril and amlodipine, and chronic back pain for which he takes regular co-codamol.

He is followed up in an outpatient falls clinic, and given lifestyle advice including improving his fluid and salt intake, and his anti-hypertensive medications are rationalised and reduced where possible.

However, at a follow-up appointment, he has had no improvement in his symptoms.

What is the most appropriate next step in the management of this patient?

A. Octreotide 0.5 μg/kg OD SC

B. Desmopressin 200μg ON PO

C. Bisoprolol 2.5mg OD PO

D. Fludrocortisone 0.1mg OD and midodrine 2.5mg TDS PO

E. Midodrine 2.5mg TDS PO

Correct Answer:Midodrine 2.5mg TDS PO

Explanation:

Midodrine is recommended as first-line pharmacological therapy following lifestyle advice and rationalisation of hypotensive medications in orthostatic hypotension. It is an alpha-agonist and thus aids peripheral vasoconstriction in patients with autonomic failure.

Midodrine and fludrocortisone are both appropriate drugs for use in orthostatic hypotension, but should not be started at the same time. Patients should be trialled on mono-therapy before adjunct drugs are added.

Bisoprolol is a beta-blocker and can be used in the treatment of hypertension. In this patient, this will exacerbate his hypotension and symptoms.

Octreotide is a splanchnic vasoconstrictor that has been shown to be effective for the treatment of postprandial hypotension. It is not recommended as first-line therapy in orthostatic hypotension.

Desmopressin can be used in the treatment of nocturnal polyuria, thus potentially helping reduce early morning orthostatic drop in blood pressure. It is not currently recommended for the treatment of orthostatic hypotension.

Further reading:

https://academic.oup.com/eurheartj/article/39/21/1883/4939241

Question:

A 5-year-old boy is brought to the GP by his father for a persistent fever lasting approximately ten days. His father explains that the child has also had several "bad coughing fits" during this time, afterwards resulting in gagging and vomiting. He recounts that a week before the fever started, the child had "cold-like symptoms", including a runny nose and excessive sneezing.

A review of his medical records indicates this child has not received any of the recommended childhood vaccinations. He has no known allergies and is otherwise normally fit and well.

On examination, the child has a temperature of 38.3°C; the remaining vital signs are within normal limits. The respiratory examination reveals no abnormalities.

During the examination, the boy begins to cough. There are a series of approximately ten coughs, followed by a loud inspiratory gasp.

What is the most appropriate initial management in this patient?

A. Prescribe co-trimoxazole

B. Prescribe ciprofloxacin

C. Administer nebulised salbutamol

D. Prescribe azithromycin

E. Administer outstanding vaccinations

Correct Answer:Prescribe azithromycin

Explanation:

The most likely diagnosis in this patient is whooping cough, also known as pertussis, an infectious disease caused by the bacterium Bordetella pertussis. Highly suggestive clinical features include the fact this child has not received any childhood vaccinations, including the DTaP vaccination, and has presented with paroxysmal coughing following a reported catarrhal phase ("cold-like symptoms"). Importantly, from history and examination, this child does not have any features to suggest complications of whooping cough. In clinically stable patients, the NICE recommended first-line management of whooping cough is a macrolide antibiotic, such as azithromycin or clarithromycin. Both azithromycin and clarithromycin are considered equally effective and are well-tolerated; they are indicated in all patients aged one month or older and non-pregnant adults when the onset of cough is within the previous 21 days. For pregnant women from 36 weeks gestation, erythromycin is the recommended macrolide antibiotic of choice.

NICE guidelines recommend administering outstanding vaccinations when the patient has recovered from the acute illness phase. Therefore, as this child is still systemically unwell, this would not be the most appropriate initial management.

Ciprofloxacin is not an appropriate antibiotic to treat whooping cough.

The combination antibiotic of trimethoprim and sulfamethoxazole, known as co-trimoxazole, is only indicated in patients for whom macrolides are contraindicated, not tolerated or those who have a confirmed macrolide resistance. As this patient does not meet these criteria at this time, this would not be the most appropriate initial management.

The quality of evidence for nebulised salbutamol in the management of whooping cough is low, and the trials investigating this treatment do not suggest a reduction in cough severity or duration. Therefore, salbutamol is not indicated in the management of whooping cough, even if a patient is symptomatic.

Further reading:

https://cks.nice.org.uk/topics/whooping-cough/diagnosis/clinical-features/

Question:

You are called to see a 30-year-old female post-laparoscopic investigation for endometriosis. She is complaining of severe central chest pain that started gradually 2 hours after her laparoscopy. She states that the pain is sharp in nature and sometimes radiates to her upper abdomen. She states that the pain is worsened by deep breathing, coughing and lying flat. The only thing that seems to improve the pain is leaning forward. She has taken paracetamol and 5mg of oramorph neither of which has helped to alleviate the pain. She has no other associated symptoms and otherwise feels well in herself. She has never had any issues like this previously.

She has no significant past medical history or drug allergies. She takes the combined oral contraceptive pill but no other regular medications. She has no significant family history and does not smoke. Vital signs are unremarkable.

Clinical examination reveals a mildly distended abdomen in keeping with her recent procedure, but no other abnormal findings in any major body system. Her BMI is within the normal range. Urinalysis is normal. An ECG shows concave ST-segment elevation in leads V1-V6.

What is the most likely diagnosis?

A. Spontaneous pneumothorax

B. Costochondritis

C. Myocardial infarction

D. Pulmonary embolism

E. Pericarditis

Correct Answer:Pericarditis

Explanation:

The most likely diagnosis here is pericarditis.

The sharp pain worsened by deep inspiration and improved by leaning forward is fairly typical of pericarditis. Often there is very little to find on clinical examination, although a pericardial rub and signs of right ventricular failure can sometimes be present. Her ECG shows ST elevation in most of the leads, in a concave or saddle shape, which is typical of pericarditis.

Myocardial infarction is highly unlikely given the patient's age, gender and the absence of risk factors. The ECG does show ST elevation, but this is not localised to a particular vascular territory and this in combination with her background, make pericarditis much more likely.

A pulmonary embolism is possible considering the patient’s symptoms and drug history. However, the history of the pain improving when leaning forwards in combination with normal vital signs, absence of evidence of deep vein thrombosis and ECG findings make pericarditis more likely.

Although she may be at risk of a pneumothorax as she was under general anaesthetic for surgery, it is unlikely as her respiratory examination is completely normal. With a pneumothorax, you would expect to hear reduced air entry and increased resonance on percussion. The ECG findings and history of the pain improving on leaning forwards both favour a diagnosis of pericarditis.

Costochondritis is another plausible answer as it is common in young people, however, the ECG findings, history of pain improving on leaning forwards and the absence of tenderness on palpation of the chest wall make pericarditis more likely.

Further reading:

https://patient.info/doctor/acute-pericarditis

Question:

A 64-year-old man with stable stage 4 chronic kidney disease is admitted for elective transfemoral coronary angiography after suffering from exertional chest pains for 3 months.

His past medical history includes type 2 diabetes, hypertension, atrial fibrillation, chronic obstructive pulmonary disease and gout. He smokes 30 cigarettes per day and drinks 10 pints of beer a week. His medications include atenolol, indapamide, lisinopril, insulin and allopurinol.

Angiography demonstrated severe three-vessel disease so it was decided to keep the patient in the hospital for a subsequent coronary artery bypass surgery. 5 days post angiography he becomes confused.

On examination, he has a new diffuse, non-itchy skin rash.

Serum creatinine is noted to have increased by 180umol and other blood tests demonstrate:

Hb 12.5

Pl 200

WBC 8.7

Neut 7.9

Eosinophils 3.5

Low C3 and C4

Urine dipstick is free of protein and blood.

What is the most likely cause of this patient's deterioration?

A. Cardiorenal syndrome

B. Embolic complications of angiography

C. Contrast-induced nephropathy

D. Acute tubular necrosis

E. Acute interstitial nephritis

Correct Answer:Embolic complications of angiography

Explanation:

This patient has suffered atheroembolic events as a result of instrumentation to heavily diseased blood vessels. It classically presents with livedo reticularis, hypocomplementaemia, acute kidney injury and eosinophilia 1-2 weeks after coronary angiography. Further clinical manifestations include confusion, necrotic or ulcerated digits, accelerated hypertension and clinical eye findings.

Whilst contrast-induced nephropathy and acute tubular necrosis are possible diagnoses, they would not be expected to produce the extrarenal signs, eosinophilia or low complement levels.

Acute interstitial nephritis remains a possibility and can present with eosinophilia, rash and acute kidney injury. However, there is usually a clear precipitant such as the introduction of a new medication (for example proton pump inhibitor or an antibiotic). The heavily diseased atheromatous vessels make embolic complications more likely in this case.

Cardiorenal syndrome is a possibility here, but we are not given information regarding cardiac function and it wouldn't account for the eosinophilia and rash.

Further reading:

https://www.acc.org/education-and-meetings/patient-case-quizzes/when-to-consider-cholesterol-emboli-after-cardiac-catheterization

Question:

Mrs A is an 87-year-old patient who has presented to the Emergency Department with a fractured neck of femur. So far she has received paracetamol 500mg PO, morphine 10mg IV and oxygen whilst in the ambulance. You go to assess her in a cubicle however you soon notice that she has a respiratory rate of 6 and her pupils appear pinpointed.

What is the most appropriate antidote that Mrs A should receive?

A. N-acetylcysteine

B. Naloxone

C. Oxygen

D. Activated charcoal

E. Flumazenil

Correct Answer:Naloxone

Explanation:

This patient appears to have had been administered an overdose of morphine. Although the dose of 10mg is correct in clinical practice, this should be titrated in elderly patients as it may otherwise lead to an accidental overdose. The most appropriate antidote for morphine is naloxone. Oxygen has already been administered and would not be helpful as an antidote. Flumazenil is the antidote used for benzodiazepine overdose whilst N-acetylcysteine is used in paracetamol overdose. Finally, activated charcoal is used to treat poisoning that occurred orally.

Further reading:

https://patient.info/doctor/opiate-poisoning

Question:

A 46-year-old woman presents to her GP complaining of palpitations. She has lost weight and has been feeling more anxious lately. Her periods have been lighter and more irregular. She has noticed a large, smooth lump in the centre of her neck and a rash on her shins.

What investigation would reveal the likely diagnosis?

A. Antineutrophil Cytoplasmic Antibodies (ANCA)

B. Serum angiotensin converting enzyme (ACE)

C. Anti-cyclic citrullinated peptide (anti-CCP) antibodies

D. Anti-thyroid stimulating hormone (TSH) receptor antibodies

E. Anti-nuclear antibodies (ANA)

Correct Answer:Anti-thyroid stimulating hormone (TSH) receptor antibodies

Explanation:

This case demonstrates hyperthyroidism, specifically Graves' disease, which typically presents with features of hyperthyroidism alongside a diffuse goitre, pre-tibial myxoedema and exophthalmos. Anti-TSH receptor antibodies are diagnostic of Graves' disease.

Anti-cyclic citrullinated peptide (anti-CCP) antibodies are typically present in rheumatoid arthritis.

Antineutrophil cytoplasmic antibodies (ANCA) are typically present in granulomatosis with polyangiitis (GPA), eosinophilic granulomatosis with polyangiitis (EGPA) and polyarteritis nodosa (PAN).

Serum angiotensin-converting enzyme (ACE) is typically elevated in sarcoidosis.

Anti-nuclear antibodies are typically present in systemic lupus erythematosus.

Further reading:

https://cks.nice.org.uk/topics/hyperthyroidism/

Question:

A 70-year-old man presents to the emergency department with chest pain. The pain came on suddenly one hour ago, and is severe, tearing, and getting worse. He has a past medical history of hypertension, for which he takes ramipril (5mg, once daily). He has no surgical history.

Basic observations are taken and are all normal, except for a raised blood pressure, at 180/100 mmHg. An ECG demonstrates normal sinus rhythm with no ischaemic changes.

What is the pathophysiology of the most likely diagnosis?

A. Complete occlusion of the left anterior descending coronary artery

B. Obstruction of pulmonary vasculature, by a thrombus.

C. Tear in the tunica intima of the aorta, creating a false lumen

D. Reflux of acid from the stomach into the lower oesophagus

E. Partial occlusion of the left anterior descending coronary artery

Correct Answer:Tear in the tunica intima of the aorta, creating a false lumen

Explanation:

Sudden onset, worsening, severe, tearing chest/back pain, should raise the suspicion that this patient may be experiencing an aortic dissection, in which there is a tear in the tunica intima of the aorta, creating a false lumen. The normal ECG, in combination with a pain profile more consistent with aortic dissection than acute coronary syndrome (ACS), may be reassuring that the patient is not experiencing ACS, however it cannot exclude it; serial ECGs will be needed for this. Similarly, the normal observations (with the exception of high blood pressure) and ECG may help to rule out a pulmonary embolism, but cannot completely; bloods (D-dimer) and/or imaging (CTPA/VQ scan) would be needed for this. The pain profile is more consistent with aortic dissection than reflux of acid from the stomach, or indeed any of the other answers.

Tears in the tunica intima of the aorta occur due to high pulsatile pressure of blood flow, and increased shear stress. When a tear in the tunica intima occurs a gap is created, known as a false lumen, into which blood can flow. The accumulation of blood in this false lumen can lead to blood being diverted away from systemic circulation, leading to hypotension and shock. Additionally, the accumulation of blood in the false lumen can lead to the formation of an aneurysm, with the associated risk of rupture.

Hypertension is the most common risk factor for aortic dissection, occurring in around 70% of patients with the condition. Connective tissue disorders, such as Marfan’s and Ehlers-Danlos syndrome, are also associated with an increased risk of aortic dissection.

It is important to note that whilst aortic dissection can lead to hypotension and shock, these are generally later stage presentations, with poorer outcomes. In earlier and/or less severe cases, hypertension is commonly found in the presenting patient.

Reflux of acid from the stomach into the lower oesophagus presents with burning, retrosternal chest pain, often after eating or when laying flat. The pain is often associated with nausea, and an unpleasant taste in the mouth.

Partial occlusion of the left anterior descending coronary artery refers to acute coronary syndrome (ACS), and more specifically non ST-elevation myocardial infarction. ACS presents with central, crushing chest pain, that may radiate to the shoulder, arm or jaw. ECG changes would typically be seen, inlcluding T-wave inversion or ST-depression.

Complete occlusion of the left anterior descending coronary artery: also refers to ACS, in this case ST-elevation myocardial infarction (STEMI). ACS presents with pain that is described as central, crushing, and may radiate to the shoulder, arm or jaw. An ECG would demonstrate ST-elevation in one or more vascular terrorities.

Obstruction of pulmonary vasculature, by a thrombus: refers to a pulmonary embolus (PE). The pain associated with PE is generally described as sharp, and with associated symptoms such as tachycardia, tachypnoea, and low oxygen saturations. There may also be ECG changes in PE, most commonly sinus tachycardia.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK441963/

Question:

Frank Stevenson, a 14-year-old boy, presents to A&E with a painful testicle. The pain started two days ago but has suddenly worsened. His testicle is now red and swollen. He has had no nausea or vomiting but does have a fever. Clinical examination reveals a normal cremasteric reflex. He has no past medical history, but his parents decided against vaccinating him as a child.

Which of the following diseases is most likely responsible for this clinical presentation?

A. Varicella

B. Mumps

C. Measles

D. Human papilloma virus (HPV)

E. Rubella

Correct Answer:Mumps

Explanation:

This patient most likely has epididymo-orchitis caused by mumps, suggested by the clinical presentation and lack of adequate vaccination. Other causes of epididymo-orchitis include urinary tract infections and sexually transmitted infections.

Mumps is rare in developed countries because of vaccinations, however, in those vulnerable, it can cause fever, myalgia, parotitis and eventually epididymo-orchitis. More severe complications include hearing loss, meningoencephalitis and pancreatitis. Mumps is managed with paracetamol and rest, along with notifying the public health department (as it is a notifiable disease).

The HPV vaccine is offered to young people to protect against HPV-associated genital warts, anal cancer, oral cancer and cervical cancer.

The measles vaccine is given with mumps and rubella vaccinations as part of the MMR vaccination (given at 1-year-old and 3-4 years old). Measles presents with fever and irritability along with Koplik spots (white spots on the buccal mucosa) followed by a more generalised rash. Its complications are encephalitis, subacute sclerosing panencephalitis, febrile convulsions and pneumonia.

The rubella vaccine is given as part of the MMR vaccine. Rubella presents with fever and lymphadenopathy along with a rash starting on the face. It can lead to arthritis, thrombocytopenia, encephalitis and myocarditis.

The varicella vaccine is not offered as a routine vaccination in the UK. It protects against chickenpox and is given to those who are susceptible to developing serious complications (i.e. immunocompromised individuals). Complications of chickenpox can include pneumonia, encephalitis, haemorrhage, arthritis and pancreatitis.

Further reading:

https://patient.info/doctor/mumps-pro

Question:

An 18-month-old boy is brought into the GP by his father with a cough in the month of June. The father reports that his son developed typical cold-like features (malaise, nasal congestion, rhinorrhoea, sneezing, and mild fever) around 3 weeks previously. These symptoms apparently lasted for 2 weeks prior to the onset of his son’s cough 1 week ago. The father mentions that his son coughs for several minutes at a time and does not cough between episodes. He explains that these episodes are followed by a loud inspiratory noise, his son's face turning red and sometimes vomiting. There is no significant family history and the child is otherwise well.

Clinical findings are as follows:

conjunctival haemorrhages

facial petechiae

equal air entry throughout his lungs with no added sounds

Which of the following is the MOST LIKELY diagnosis?

A. Asthma

B. Croup

C. Whooping cough

D. Bronchiolitis

E. Epiglottitis

Correct Answer:Whooping cough

Explanation:

The most likely diagnosis, in this case, is whooping cough. Whooping cough is a highly contagious respiratory infection caused by the organism bordatella pertussis. The condition most commonly occurs in infants under the age of 2 years.

Clinical features of pertussis can be divided into 3 distinct categories:

catarrhal phase (characterised by coryzal features)

paroxysmal phase (characterised by episodes of dry coughing lasting several minutes followed by an inspiratory ‘whoop’, facial redness and sometimes vomiting)

convalescent phase (characterised by a chronic cough – termed the ‘100-day cough’).

There are often few clinical signs present on examination, with the exception of conjunctival haemorrhages and facial petechiae (induced by coughing).

Bronchiolitis is less likely in this case. This condition typically affects children aged 3-6 months in the winter months. Bronchiolitis usually presents with coryzal features accompanied by a low-grade temperature, followed by the onset of a persistent cough, dyspnoea, tachypnoea and wheeze.

Asthma patients may have a personal (or family) history of atopy. The condition typically presents with wheeze, chest tightness and nocturnal cough.

Croup most commonly affects children in their second year of life and usually presents within the autumn and spring months. Patients with croup suffer coryzal features, followed by a harsh, barking cough (that is worse at night) accompanied by stridor.

Epiglottitis is less likely in this case. This condition usually presents in children aged 2-5 years with sore throat, fever, ‘hot-potato’ voice, drooling and odynophagia.

Further reading:

https://patient.info/doctor/whooping-cough-pro

Question:

A 4-year-old boy has been referred to the emergency department with fever, rash and peeled-off palmar skin for the past five days. His body temperature is 39.1 °C, and he has a heart rate of 110 beats per minute. On examination, there is a conjunctival injection, red-coloured enlarged tongue, bilateral swelling of the anterior cervical lymph nodes, and a polymorphous rash over the upper and lower extremities

Which among the following is most likely to develop if his condition is untreated?

A. Coronary artery aneurysm

B. Loss of vision

C. Renal failure

D. Pulmonary embolism

E. Leukemia

Correct Answer:Coronary artery aneurysm

Explanation:

This boy presented with an autoimmune disorder called Kawasaki disease, diagnosed by the presence of fever for at least five days in addition to four out of five of the following criteria (CRASH): conjunctivitis, rash, aneurysms, strawberry tongue, and hand and feet erythema. It is associated with vasculitis of the coronary arteries, with subsequent aneurysm formation in up to one-third of untreated patients. Therefore, serial echocardiography is advised to detect the development of coronary artery abnormalities.

During the acute phase of illness, FBC may show normocytic anaemia and thrombocytosis. It does not result in leukaemia.

Kawasaki disease is an autoimmune-mediated systemic vasculitis that affects small- and medium-sized arteries. Whereas loss of vision is a complication of large-vessel vasculitis called temporal arteritis.

Thromboembolic complications such as pulmonary embolism are common in nephrotic syndrome due to a hypercoagulable state.

An acute kidney injury or renal failure is caused by a rapid deterioration in renal function resulting in dysregulation of extracellular volume and electrolytes and subsequent retention of urea. It is uncommon to witness any renal complications in Kawasaki disease.

Further reading:

https://patient.info/doctor/kawasaki-disease-pro

Question:

A 68-year-old man presents to his general practitioner with a 3-month history of difficulty swallowing. He reports progressive difficulty swallowing both solids and liquids, often choking and spluttering at mealtimes. This is not associated with any retrosternal pain and the patient does not report heartburn. His past medical history is significant for hypertension and type 2 diabetes mellitus only. He reports that his father developed motor neurone disease aged 76.

On examination, the patient appears cachectic and speaks with moderate dysarthria. Palpation of the abdomen reveals no masses or organomegaly. Examination of the lower limbs reveals bilateral upgoing plantars and fasciculations are observed in both feet.

The patient is referred for electromyography, which is normal, and a structural cause of the patient's difficulty swallowing is ruled out.

What is the most likely genetic defect in this patient?

A. CAG trinucleotide expansion

B. SMN1 mutation (survival motor neuron 1)

C. C9ORF72 (chromosome 9 open reading frame 72)

D. HEXA mutation (hexosaminidase A)

E. CTG trinucleotide expansion

Correct Answer:C9ORF72 (chromosome 9 open reading frame 72)

Explanation:

The correct answer is C9orf72. This patient's presentation is consistent with motor neurone disease, characterised by concomitant upper and lower motor neurone signs and normal electromyography. Patients with motor neurone disease commonly experience dysphagia and may require parenteral nutrition. Although most cases of motor neurone disease are sporadic and a genetic cause is not found, C9orf72 mutations are present in 40% of familial cases. Notably, Given this patient's family history of motor neurone disease, the most likely genetic defect is a C9ORF72 mutation.

SMN1 mutations are associated with spinal muscular atrophy, a neuromuscular disorder that characteristically presents in childhood when children do not meet their motor developmental milestones. This patient's family history of motor neurone disease and mixed upper and lower motor neurone signs are in keeping with motor neurone disease, which is associated with C9orf72 mutation.

CAG trinucleotide expansion is associated with Huntington's disease, a movement disorder characterised by a strong family history of neuropsychiatric symptoms developing in later life. This patient's family history of motor neurone disease and mixed upper and lower motor neurone signs are in keeping with motor neurone disease, which is associated with C9orf72 mutation.

CTG trinucleotide expansion is associated with myotonic dystrophy, a neuromuscular disorder characterised by progressive muscle weakness, commonly affecting the hands. This patient's family history of motor neurone disease and mixed upper and lower motor neurone signs are in keeping with motor neurone disease, which is associated with C9orf72 mutation.

HEXA mutations are associated with Tay Sachs disease, a rare inherited neurological disorder that causes seizures and death in infancy. This patient's family history of motor neurone disease and mixed upper and lower motor neurone signs are in keeping with motor neurone disease, which is associated with C9orf72 mutation.

Further reading:

https://www.ouh.nhs.uk/services/departments/neurosciences/neurology/mnd/support/is-mnd-hereditary.aspx

Question:

A newborn male infant, delivered at term to a 32-year-old woman, is undergoing a newborn infant physical examination (NIPE).

The mother reports that the pregnancy and delivery were uncomplicated. She has one previous child with a diagnosis of Down syndrome and personal a history of two miscarriages. She mentions that she opted out of having antenatal scans and further testing during pregnancy due to personal beliefs.

The child is on the 10th percentile for weight and length. On general inspection, he is noted to have a flat nasal bridge and low-set ears. On further examination of the limbs, a single palmar crease is found.

Which of the following investigations would be recommended to reach a definitive diagnosis in this patient?

A. Developmental evaluation

B. Clinical diagnosis only

C. Chromosomal karyotyping

D. Quantitative fluorescence-polymerase chain reaction

E. Interphase fluorescent in situ hybridisation

Correct Answer:Chromosomal karyotyping

Explanation:

The most likely diagnosis in this patient is Down syndrome (DS), also known as trisomy 21, the most common chromosomal abnormality affecting liveborn infants. There are three genetic mechanisms responsible for DS - full trisomy 21 (three complete copies of chromosome 21 present in all cells, e.g. 47, XY, + 21), translocation trisomy 21 (presence of Robertsonian translocation chromosome, e.g. 46, XY,+ 21t(14;21)) and mosaic trisomy 21 (two cells lines present, e.g. 46, XY/47, XY,+21). The mother of this infant has one previous child with DS and a history of recurrent miscarriages, suggesting the likely aetiology is an unbalanced Robertsonian translocation. In patients with suspected DS, chromosomal karyotyping is indicated to confirm the syndrome and differentiate between the different genetic mechanisms.

Whilst dysmorphic facial features and malformations (e.g. congenital heart defects) are key indicators of Down syndrome; clinical features are not considered sufficient for definitive diagnosis alone.

Genetic testing methods such as quantitative fluorescence-polymerase chain reaction [QF-PCR] and interphase fluorescent in situ hybridisation [FISH] are commonly used during pregnancy to screen samples (e.g. chorionic villus, amniotic fluid); however, they are not widely used to screen for DS in newborn infants. Guidelines suggest that if testing with QF-PCR or FISH is performed, these investigations should always be followed up with chromosomal karyotyping to ensure DS due to translocations or mosaicism are accurately detected.

Children with DS often have global developmental delay, with difficulties in gross motor, fine motor and language areas. Whilst developmental evaluation is required, it is not considered diagnostic of DS.

Further reading:

https://patient.info/doctor/downs-syndrome-trisomy-21

Question:

A 55-year-old male presents to the emergency department after several episodes of vomiting bright red blood over the previous 2 hours. His past medical history and family medical history are not known. He states that he has been prescribed some medications but does not know what they are and is not compliant with his regime. His vital signs are as follows:

Temperature: 36.5 degrees Celcius

Blood pressure: 102/64 mm Hg

Respiratory rate: 18 breaths/minute

Heart rate: 109 beats/minute

SpO2: 99% on room air

Physical examination is significant for dry mucous membranes, hepatomegaly, palmar erythema and several spider angiomata.

The patient is resuscitated with intravenous fluids. After examining the patient and requesting laboratory markers, the gastroenterology (GI) team are concerned about bleeding oesophageal varices. An upper gastrointestinal endoscopy is performed which confirms the diagnosis.

Which medication is most likely to prevent further cases of oesophageal varices in this patient?

A. Omeprazole

B. Atenolol

C. Propranolol

D. Furosemide

E. Spironolactone

Correct Answer:Propranolol

Explanation:

The patient in the above scenario has been diagnosed with oesophageal varices and the question focuses on secondary prophylaxis for this condition. Non-selective beta-blockers such as propranolol are typically chosen for this as they decrease portal venous flow and have been shown to reduce the likelihood of variceal recurrence. Studies suggest that after a first oesophageal variceal bleed, 60% of patients will re-bleed within one year; prophylaxis is, therefore, an important part of the management plan for these patients.

Atenolol is a specific beta-blocker which is not typically used in the management of oesophageal bleeding.

Diuretics such as oral furosemide are often used in patients with ascites secondary to liver cirrhosis but are not indicated in the management of an upper GI bleed, especially in the patient above who has signs of haemodynamic instability.

Spironolactone is a potassium-sparing diuretic that is used in the management of ascites secondary to liver cirrhosis, however, it is not recommended in the prophylaxis of oesophageal variceal bleeding.

Omeprazole is a proton-pump inhibitor used in the management of reflux disease and also in the management of upper GI bleeding secondary to peptic ulcer disease. The endoscopy performed in the above patient did not demonstrate peptic ulcers.

Further reading:

https://patient.info/doctor/oesophageal-varices

Question:

A 54-year-old man presents to his GP with profuse diarrhoea. The diarrhoea began 1 week ago and has been persistent since. The patient’s past medical history includes gout, with his first attack the day before the diarrhoea started. He also has stage 2 chronic kidney disease. His GP had prescribed him medication for his gout at the time of presentation. On examination, the patient appears mildly dehydrated, with some residual pain and erythema of the 1st metacarpophalangeal joint.

What is the most likely medication causing the diarrhoea?

A. Morphine

B. Colchicine

C. Paracetamol

D. Allopurinol

E. Naproxen

Correct Answer:Colchicine

Explanation:

The correct answer is colchicine. This question requires you to assess the appropriateness of treatment for gout and then evaluate the side effects of these medications. Colchicine is an effective treatment for the treatment of gout, with a common side effect (particularly at higher doses) of diarrhoea.

Naproxen is incorrect. Although NSAIDs are the first-line treatment of gout they are best avoided in chronic kidney disease. NSAIDs can cause diarrhoea.

Allopurinol is a xanthine oxidase inhibitor. It is prescribed as gout prophylaxis and is not effective in an acute attack. Therefore, the patient is not going to be prescribed allopurinol at this stage. If he has repeated attacks he may be prescribed allopurinol, provided more than 6 weeks have passed since the last attack.

Paracetamol does not cause diarrhoea. It also has no significant anti-inflammatory effect in gout, as it is broken down in peripheral tissues by peroxides.

Morphine is not used in the treatment of gout, nor does it cause diarrhoea. It actually causes constipation via the inhibition of gut motility.

Further reading:

https://patient.info/doctor/gout-pro#nav-5

Question:

A 26-year-old G2P2 presents to the emergency department with vaginal bleeding 10 days following the delivery of her second child. The bleeding started 4 hours ago. She describes it as spotting with occasional clots. Both of her pregnancies have been uncomplicated vaginal deliveries.

Her observations are stable and she is apyrexial. On examination, the abdomen is non-tender and a bulky uterus is palpable.

Based on the diagnosis, what is the most likely cause?

A. Thrombophilia

B. Endometritis

C. Perineal tear

D. Retained placental tissue

E. Uterine atony

Correct Answer:Retained placental tissue

Explanation:

This case demonstrates a secondary postpartum haemorrhage (PPH). Secondary PPH is defined as blood loss >500ml between 24 hours to 12 weeks after delivery, most commonly after 7 days. The most common causes are retained products of conception and endometritis (infection of the endometrium). The secondary PPH in this patient is most likely to be caused by retained placental tissue, as this typically presents with a bulky, palpable uterus.

Endometritis is less likely in this patient, as she is afebrile and the abdomen is non-tender. Endometritis typically leads to a tender uterus and features of sepsis.

Uterine atony is the most common cause of primary PPH, defined as blood loss >500ml within 24 hours of delivery. Other causes of primary PPH include thrombophilia and perineal tears. In these cases, vaginal bleeding would be present soon after delivery, rather than beginning 10 days postpartum.

The four causes of primary PPH can be remembered as the 4 T’s:

Tone: uterine atony

Tissue: retained products of conception

Thrombin: bleeding disorders affecting haemostasis

Trauma: perineal tears, instrumental delivery etc

Further reading:

https://geekymedics.com/postpartum-haemorrhage/

Question:

A 45-year-old man presents to general practice with a 3-month history of intermittent headaches and fatigue. He states his most recent headache came on when he was blowing up balloons for his daughter's birthday party yesterday. A CT head is organised, which shows multiple supratentorial space-occupying lesions, confirming the suspected diagnosis of cancer.

What type of cancer is most likely to be seen on a brain biopsy?

A. Triple negative invasive ductal carcinoma

B. Clear cell carcinoma

C. Glioblastoma

D. Melanoma

E. Small cell lung cancer

Correct Answer:Small cell lung cancer

Explanation:

The correct answer is small cell lung cancer. Lung cancer is the most common type of cancer to metastasise to the brain. This patient has a few notable symptoms of brain cancer, including a headache that worsens with Valsalva manoeuvres (blowing up balloons).

While glioblastoma is the most common type of primary brain tumour, most brain cancers are metastatic in origin, making this an unlikely cause of the patient's symptoms. Glioblastomas carry a poor prognosis. The presence of multiple space-occupying lesions also increases the likelihood of metastatic spread, over a primary brain cancer.

Clear cell carcinoma is the most common type of renal cancer and renal cancers are one of the more common cancers to metastasise to the brain, however, lung cancers are more likely to be the cause of metastatic brain cancer.

Melanoma is also associated with spread to the brain. However, it is again a less common cause than lung cancer, which spreads given its locality to the brain.

Triple negative invasive ductal carcinoma is a breast cancer, which is a common cause of brain metastases. Triple negative breast cancer is especially aggressive and difficult to treat. However, breast cancer is much rarer in men, making this an unlikely aetiology of metastatic brain cancer.

Further reading:

https://radiopaedia.org/articles/brain-metastases

Question:

A 34-year-old woman is brought into the Accident & Emergency resuscitation bay with a 2-day history of nausea, right flank pain and high fevers.

Clinical examination reveals the following:

Temperature: 39.6 oC

Pulse: 132 bpm

Blood pressure 72/55 mmHg

Respiratory rate: 26

SpO2: 92% room air

She feels hot peripherally and appears drowsy

What is the primary type of shock this patient is suffering from?

A. Neurogenic shock

B. Cardiogenic shock

C. Obstructive shock

D. Hypovolaemic shock

E. Distributive shock

Correct Answer:Distributive shock

Explanation:

This lady is clinically septic, most likely secondary to pyelonephritis. She is tachycardic and hypotensive indicating that she is shocked. Sepsis causes a distributive shock due to inappropriate vasodilation and leaking of capillaries. The patient may also be hypovolaemic due to reduced fluid intake but here the predominant cause is sepsis.

Cardiogenic shock is due to failure of the heart to pump enough blood to the body – for example, in massive myocardial infarction or dysrhythmia.

Neurogenic shock is rare and specifically associated with spinally-mediated vasodilation.

Obstructive shock is seen in conditions such as pulmonary embolism and cardiac tamponade.

Further reading:

https://lifeinthefastlane.com/ccc/shock-ddx/

Question:

A 48-year-old female is reviewed in the endocrinology outpatient clinic. She has been referred to the clinic with a history of heat intolerance, weight loss and tremor. She has vitiligo but no other medical problems.

On examination, she has a smooth goitre, fine tremor and rapid heartbeat. She also has exophthalmos.

Recent blood tests performed by her GP show a low thyroid-stimulating hormone (TSH) level, raised free thyroxine (T4) level and positive thyroid-stimulating antibodies.

What is the most likely diagnosis?

A. Toxic adenoma

B. De Quervain's thyroiditis

C. Toxic multinodular goitre

D. Graves' disease

E. Amiodarone-induced hyperthyroidism

Correct Answer:Graves' disease

Explanation:

Graves’ disease is the most likely diagnosis here and indeed the most common cause of hyperthyroidism in the UK. The patient has biochemical evidence of primary hyperthyroidism with raised T4 and suppressed TSH, as well as positive thyroid autoantibodies. In addition, she has clinical signs of Graves' disease including diffuse thyroid enlargement and thyroid eye disease. The presence of other autoimmune conditions is also common.

Toxic multinodular goitre and toxic adenoma are less common causes of hyperthyroidism. Evidence of these will often be apparent on examination and may be confirmed with imaging.

De Quervain’s thyroiditis is an illness characterized by painful swelling of the thyroid, fever and hyperthyroidism and is usually precipitated by a preceding viral illness. It is self-limiting and occurs predominantly in females between the ages of 20 and 50.

Amiodarone may cause either cause hypothyroidism or thyrotoxicosis. Amiodarone-induced thyrotoxicosis (AIT) has two types; type I is thought to happen in patients with pre-existing thyroid abnormalities and occurs due to iodine-induced excessive thyroid hormone synthesis. Type II is thought to happen in those with a normal thyroid gland and occurs as a result of damage to the gland by amiodarone itself with subsequent release of pre-formed thyroid hormones.

Further reading:

https://patient.info/doctor/hyperthyroidism

Question:

A 10-month child is brought to the hospital by his mother after she went to wake him from an afternoon nap and discovered the presence of blood in his nappy. She has been concerned about him for several hours; he has had uncontrollable bouts of crying that seem to come and go and has been generally lethargic, refusing to feed at breakfast. She reports that she put him to sleep, in the hope that this would help, as she was not sure what else to do; when she checked on him, his nappy contained a significant amount of bloody stool.

Whilst sat in triage, the baby begins vomiting profusely; this has a tinge of green mixed within it. The paediatric consultant is called, who quickly examines the child; he notes a mass in the upper portion of the abdomen. The doctor obtains IV access and provides fluids, given the likely losses suffered by the child. He requests urgent investigations to attempt to confirm the diagnosis, and based on the results of these, contacts the on-call paediatric surgeon, informing the patient's mother that there is a possibility that surgery may be necessary for their child.

Which of the following investigation results are most in keeping with the likely diagnosis?

A. 'Corkscrew' appearance on upper GI contrast study

B. Portal venous gas on abdominal X-ray

C. Hypertrophy of the pyloric sphincter on ultrasound

D. Pneumatosis intestinalis on abdominal X-ray

E. 'Target sign' appearance on abdominal ultrasound

Correct Answer:'Target sign' appearance on abdominal ultrasound

Explanation:

The most likely diagnosis, in this scenario, is intussusception; an abdominal pathology that most commonly affects children under the age of 1. It arises due to the invagination of a section of the bowel into a more distal section. This 'telescoping' can obstruct the lumen of the bowel, preventing the movement of faecal matter and eventually compromising the venous supply to this portion, resulting in ischaemia. Children with the condition can present with colicky abdominal pain, usually demonstrated through bouts of crying, as well as general lethargy. 'Redcurrant jelly stools' are a classical feature that can develop due to the sloughing of the intestinal mucosa.

As the condition progresses, vomiting can occur; this may become bilious. Investigations to confirm the diagnosis include an ultrasound, which may demonstrate the 'target sign', as well as general blood tests and possibly an X-ray of the abdomen. A 'drip and suck' approach to management is often established, with IV fluid provision and decompression of the bowel via the insertion of an NG tube. Definitive treatment is via an initial air enema, with the aim of reducing the section of invaginated bowel. If this fails, then laparotomy and resection of the segment involved will be necessary.

A 'corkscrew' appearance on upper GI contrast study would be in keeping with a diagnosis of midgut malrotation with volvulus; another cause of bilious vomiting worth considering in the paediatric population. However, it usually presents well before 1 year of age, and bloody stools are a less common feature.

Pneumatosis intestinalis and portal venous gas on abdominal X-ray are both features of necrotising enterocolitis. This can cause abdominal pain and bloody stools in an infant; however, it usually affects those who are born significantly preterm, and normally presents between 2-4 weeks. Therefore, it is less likely than intussusception in this scenario.

Hypertrophy of the pyloric sphincter on ultrasound (in keeping with pyloric stenosis) is unlikely, as this usually presents in the first month of life, and due to the fact that the obstruction is proximal to the sphincter of Oddi, will not result in bilious vomiting.

Further reading:

https://patient.info/doctor/intussusception-in-children

Question:

A 16-year-old girl and her grandmother have presented to the GP because her grandmother is concerned about her behaviour. She describes being constantly worried about weight, feeling like she is overweight and ‘out of control’ with food. She reports making herself sick multiple times and feeling the impulse to eat lots of food if she is stressed. Her grandmother states that her daughter, the patient's mother, has always had issues with food. Her past medical history is unremarkable and she lives at home with her parents and no siblings.

On examination, she is well hydrated, alert with normal vital signs. Her BMI is 18.5. There is evidence of significant dental erosion.

What is the most likely diagnosis?

A. Bulimia nervosa

B. Binge eating disorder

C. Anorexia nervosa

D. Prader–Willi syndrome (PWS)

E. Generalised anxiety disorder

Correct Answer:Bulimia nervosa

Explanation:

The most likely diagnosis is bulimia nervosa given her preoccupation with her weight, binge eating and likely self-induced vomiting.

Bulimia nervosa is an eating disorder characterised by repeated episodes of uncontrolled overeating followed by compensatory weight loss behaviours. Common clinical features include a preoccupation with body weight, a feeling of lacking control overeating and compensatory weight-control mechanisms. These weight control mechanisms can include self-induced vomiting, fasting, exercise and abuse of medications.

Anorexia nervosa is an eating disorder characterised by low body weight secondary to a preoccupation with weight. Despite being thin, these individuals believe they are fat. Typical clinical features include a weight that is 85% below what would be expected for the individual, dieting, rapid weight loss, fear of weight gain. The normal BMI and binge eating in this scenario make this diagnosis less likely.

Generalised anxiety disorder is a syndrome of ongoing anxiety and worries about many events or thoughts that the patient is aware are excessive. There is a wide range of symptoms associated with the condition, relating to general symptoms of anxiety, however, the presence of binge eating and vomiting in this scenario do not fit with this diagnosis.

Binge eating disorder lacks the purging (i.e. self-induced vomiting) element of bulimia nervosa, resulting in sufferers usually having a raised BMI.

Prada-Willi syndrome is a complex genetic disorder that presents in childhood with hypotonia, developmental delay, learning disability, behavioural problems, hyperphagia and obesity. This is not a condition that would present this late in a child's life.

Further reading:

https://patient.info/doctor/bulimia-nervosa-pro

Question:

A 22-year-old man presents to the A&E with shortness of breath. He has a history of depression.

Vital signs are as follows:

RR 30

SpO2 99%

HR 110

BP 140/85

An ABG on room air shows:

pH 7.52

PCO2 3.1 kPa

PO2 18.2 kPa

HCO3 24 mmol/L

What is the most likely diagnosis?

A. Appendicitis

B. Diabetic ketoacidosis

C. Panic attack

D. Pneumonia

E. Pulmonary embolism

Correct Answer:Panic attack

Explanation:

This gentleman is suffering from a panic attack and the arterial blood gas is typical of this presentation. The presence of a respiratory alkalosis demonstrates that he is tachypneic, the lack of hypoxia (an elevated PaO2 in room air) suggests that the tachypnea is not driven by a respiratory problem (such as PE or pneumonia). There is no metabolic drive (such as DKA or appendicitis; see below) for the tachypnea and therefore it must be centrally driven, for instance by anxiety.

The human body never “over-compensates” and there is no metabolic acidaemia, which rules out respiratory compensation as the reason for the tachypnea. So the primary problem here is respiratory alkalosis.

Further reading:

https://geekymedics.com/abg-interpretation/

Question:

A researcher wishes to know if beta blockers reduce mortality in patients with heart failure caused by congenital heart disease. They search the published literature and identify all relevant studies, then combine the data and run a statistical analysis on the pooled data.

What form of research is described here?

A. Meta-analysis

B. Case series

C. Retrospective cohort

D. Cross-sectional study

E. Prospective cohort

Correct Answer:Meta-analysis

Explanation:

This researcher is conducting a meta-analysis. This is when a statistical analysis is run on pooled data from several independent trials so that an overall trend can be seen from the overall larger dataset.

A cross-sectional study collects data at a single point in time and often assesses numerous characteristics at once.

A case series identifies a group of people with a known exposure and follows them up to see if they develop the condition being studied.

A prospective cohort study identifies a group of people with a known exposure and a group without the exposure, then follows them up to see if they develop the condition being studied.

A retrospective cohort study compares different populations that have different rates of cases and different rates of risk factor exposure.

Further reading:

https://himmelfarb.gwu.edu/tutorials/studydesign101/metaanalyses.cfm

Question:

A 21-year-old man presents to his GP with a 2-week history of fatigue. Over the last 7 days, he has also developed fevers and a sore throat. He has no significant past medical history, recently started at university and is in a long term relationship. Clinical examination reveals tender cervical lymphadenopathy, exudative tonsilitis, bilateral upper eyelid oedema and splenomegaly. Vital signs are unremarkable, other than the presence of fever.

What is the most likely diagnosis?

A. Sarcoidosis

B. HIV

C. Group A streptococcus (GAS) tonsillitis

D. Infectious mononucleosis

E. Hodgkin's lymphoma

Correct Answer:Infectious mononucleosis

Explanation:

The most likely diagnosis is infectious mononucleosis (IM). IM is caused by the Epstein-Barr virus and commonly presents with fever, fatigue, malaise, exudative tonsilitis, painful lymphadenopathy (typically affecting the neck), nausea, anorexia and bilateral upper eyelid oedema.

Clinical findings include lymphadenopathy, exudative pharyngitis, fine macular non-pruritic rash and hepato-splenomegaly.

The virus is typically self-limiting but fatigue can persist for several months after the infection has resolved.

HIV can cause a seroconversion illness very similar to infectious mononucleosis 1-6 weeks after infection. There is typically fever, fatigue, sore throat and lymphadenopathy; as well as, headaches, diarrhoea and neuropathy. HIV is much less likely than IM and there is no mention of any significant risk factors for HIV infection.

Hodgkin's lymphoma presents with severe fatigue, painless lymphadenopathy, night sweats, fever and weight loss (>10% over 6 months).

GAS tonsillitis is a possible cause of this patient’s symptoms. However, the timescale of the illness, with the general malaise preceding the sore throat, make it less likely. Amoxicillin, the treatment of GAS can cause a generalised erythematous rash in people with infectious mononucleosis.

Sarcoidosis typically presents with non-specific symptoms including fever, fatigue, cachexia and generalised lymphadenopathy. Other specific features include dry cough, skin lesions (erythema nodosum, generalised maculopapular rash, lupus pernio), anterior uveitis and neurological deficits.

Further reading:

https://patient.info/doctor/infectious-mononucleosis

Question:

A 42-year-old is called to see the GP after some abnormalities were detected in blood tests taken before departure on a 6-month business trip to Africa. He has previously been well, with no past medical history of note; he takes no regular medication. He has never smoked and drinks approximately 8 units of alcohol per week. There is no family history of autoimmune disease.

Liver function tests reveal the following:

ALP - 145 U/L

ALT - 63 U/L

Bilirubin - 24 μmol/L

GGT - 60 U/L

Albumin - 36 g/L

Iron studies are normal, and a liver screen shows no abnormalities with the exception of elevated serum copper levels. On examination, there is a palpable mass measuring approximately 4 finger-widths under the right costal margin. When the patient is distracted, the GP notices a fine resting tremor in the patient's left hand. Inspection of the eyes using fundoscopy reveals no Kayser-Fleischer rings, nor any other abnormalities. The GP is concerned about the patient's symptoms and refers them to hospital for further management.

Given the likely cause of the patient's symptoms and investigation results, which of the following is most likely to form part of the management plan for their condition?

A. Methotrexate

B. Desferroxamine

C. Penicillamine

D. Levodopa

E. High salt diet

Correct Answer:Penicillamine

Explanation:

The most likely diagnosis, in this case, is Wilson's disease, an autosomal recessive condition that is characterised by copper accumulation, principally within the liver, but possibly within other body organs - the basal ganglia being another common site. The disease arises due to an ATP7B mutation that results in low ceruloplasmin levels being present. Ceruloplasmin is the transport protein for copper, and therefore, those with the disease have difficulties excreting the metal, allowing for levels to rise.

The most common manifestation of the condition is chronic hepatitis that may progress to cirrhotic disease; this may, as in this scenario, go undetected for a number of years, until complications begin to arise. This patient's LFTs show a chronic hepatitic picture, with low-level abnormalities in both ALT and ALP; hepatomegaly on examination also makes Wilson's more likely. If cerebral involvement is present, a resting tremor or other symptoms of Parkinsonism are possible; again, the presence of the tremor makes the diagnosis more probable. Kayser-Fleischer rings are a pathognomonic ophthalmological sign associated with the condition; these were not detected on fundoscopy in this scenario, however, in less advanced disease, a slit-lamp is often required for the visualisation of this clinical sign. Therefore, this should not detract from the elevated copper and clinical features that make Wilson's the most feasible diagnosis.

Wilson's disease is managed via chelation of the excess copper, to prevent further damage from being caused. There are various chelation agents available, including penicillamine, zinc acetate or trientine. General conservative management of liver disease should be encouraged, including reducing alcohol intake and a healthy diet. If the condition progresses to cirrhosis, a more stringent approach may be necessary, with fluid restriction and a low salt diet (a high salt diet would certainly not be something to recommend to this patient) as well as screening for complications related to portal hypertension.

Desferrioxamine is another chelation agent, however, this binds to iron rather than copper, and is sometimes used in the setting of hereditary hemochromatosis; another inherited syndrome that can cause chronic hepatitis. The normal iron studies make the diagnosis far less likely in this case.

Methotrexate is a disease-modifying anti-rheumatic drug that can be used in a number of autoimmune conditions. Autoimmune hepatitis is a possible explanation for chronic hepatitis in a young patient; however, this would not explain the elevated copper levels, nor the resting tremor.

Levodopa is the principal medication used to treat Parkinson's disease. Whilst this patient has a resting tremor, Parkinson's would not explain the LFT abnormalities described in this scenario.

Further reading:

https://patient.info/doctor/wilsons-disease-pro

Question:

Ben is a 4-year-old child who has been brought into his local GP practice by his concerned mother due to the development of a red, blotchy rash that began on his face but has now spread down to the rest of his body.

Ben's mother also reports that he has been suffering from a fever for the past three days, and he has been complaining of itchy eyes and a runny nose.

Upon examining Ben, the GP finds white spots on the inside of his cheek.

Based upon the patient's history and the clinical findings, what is the most likely diagnosis?

A. Parvovirus B19

B. Measles

C. Rubella

D. Scarlet fever

E. Meningococcal disease

Correct Answer:Measles

Explanation:

Based on the clinical findings, the most likely diagnosis is measles. The symptoms of measles can be remembered using the 3 C's (cough, conjunctivitis, coryza). The rash seen in measles is a maculopapular rash, that starts at the head and neck before spreading to the rest of the body. The small white spots found on the inside of the cheek are known as Koplik’s spots and are pathognomonic for measles.

Rubella typically presents with milder symptoms than those observed in measles.

Parvovirus B19 infection typically presents with a rash on the cheeks, (i.e. 'slapped cheek appearance), followed by a lace-like, reticular rash on the extremities and trunk.

Meningococcal infection typically presents with a maculopapular rash which often then evolves into larger purple lesions. Other clinical features include neck stiffness, headache, vomiting, and photophobia.

Scarlet fever typically presents with a maculopapular rash, however, other symptoms such as a sore throat and a 'strawberry tongue' help differentiate it from measles.

Further reading:

https://cks.nice.org.uk/topics/measles/diagnosis/differential-diagnosis/

Question:

A 67-year-old patient, Mr Peter Parker, attends the General Practitioner complaining of a rash. Mr Parker states that his rash appeared over 2-3 days and that it is itchy and extremely painful to touch. He explains that he has been feeling very ‘run down’ recently with fevers and flu-like symptoms. Mr Parker adds that he recently started a new tablet for his diabetes 6 weeks ago and he wonders if it may have caused the rash.

His past medical history includes non-insulin dependent diabetes mellitus, gout, and carpal tunnel syndrome. Mr Parker’s medications include Colchicine, Aspirin, Simvastatin and Metformin.

On examination, Mr Parker looks tired but well perfused. His respiratory and cardiovascular examinations are unremarkable. A rash is noted on the right side of his back (an image is included below).

His vital signs are as follows:

O2 96% on air

HR 94 bpm

RR 14

BP 140/85 mmHg

Temp 37.4 oC

What is the most likely diagnosis?

Source: Fisle [CC BY-SA 3.0]

A. Contact dermatitis

B. Dermatitis herpetiformis

C. Impetigo

D. Herpes zoster

E. Adverse drug reaction

Correct Answer:Herpes zoster

Explanation:

The most likely diagnosis is herpes zoster (HZ) also known as ‘shingles’.

HZ is caused by reactivation of the dormant varicella-zoster virus and presents with a characteristic blistering and painful rash which is confined to a dermatomal distribution. The clinical image demonstrates a classic blistering crop of reddish papules in a dermatomal distribution, some of which have become crusted over. The patient’s prodromal symptoms of ‘fever’ and being ‘run down’ are common prior to HZ. Patients may also experience severe pain over the affected area due to sensory nerve involvement.

Impetigo is a common superficial bacterial skin infection usually caused by staphylococcus aureus. The infection classically manifests with arcuate honey coloured crusting erosions and is more common on the hands and face. Impetigo is a reasonable differential in this patient however the prodromal fevers and lethargy point more toward a systemic viral infection such as HZ.

Contact dermatitis is an eczematous rash associated with the presence of a causative agent. Contact dermatitis is less likely in this patient because of the absence of a clear trigger, the localised confinement to a single area of skin, and the presence of fever.

Dermatitis herpetiformis (DH) is a rare blistering dermatological disease that is linked to coeliac disease. DH commonly presents with itchy papules that appear in clusters bilaterally on buttocks, elbows and knees. HZ is more likely in this case because of the unilateral presentation and the associated prodromal features.

Metformin can rarely cause a dermatological adverse reaction (usually urticaria or pruritus) however in this case, the rash appeared 5 weeks after the initiation of this new medication and therefore is less likely to be associated.

Further reading:

https://www.dermnetnz.org/topics/herpes-zoster/

Question:

A 34-year-old woman presents to her GP with a 6-month history of slowly worsening non-productive cough and shortness of breath. She has had no temperatures, haemoptysis or weight loss. She has no significant past medical history and takes no regular medications. She is a non-smoker, drinks occasional alcohol and has no relevant family history.

On examination, she is comfortable at rest and talking in full sentences. Her observations are within normal limits and auscultation of her chest reveals occasional wheeze.

Routine blood tests are taken which subsequently show the following:

Hb 145 g/L, WCC 5.8 x 109/L, platelets 421 x 109/L.

ALT 548 U/L, ALP 291 U/L, AST 464 U/L, bilirubin 14 micromol/L, albumin 42 g/L.

Na+ 139 mmol/L, K+ 3.9 mmol/L, Urea 5.6 mmol/L, Cr 71 μmol/L (60–110).

What is the most likely diagnosis?

A. Alpha-1-antitrypsin deficiency

B. Idiopathic pulmonary fibrosis

C. Cystic fibrosis

D. Tuberculosis

E. Bronchogenic carcinoma

Correct Answer:Alpha-1-antitrypsin deficiency

Explanation:

Alpha-1-antitrypsin deficiency is a genetically-linked condition characterised by low serum levels of the enzyme alpha-1-antitrypsin (A1AT). Accumulation of A1AT in the liver may cause hepatitis, cirrhosis, fibrosis and liver failure at worst, and the lack of A1AT in lung tissue typically causes emphysema in patients in their 30s-40s, often with no history of smoking.

Bronchogenic carcinoma is unlikely in a younger patient with no history of smoking and would not explain diffuse wheeze on examination. Tuberculosis may cause cough and shortness of breath but would often be associated with constitutional symptoms. In addition, although LFTs may be deranged as a result of treatment, pulmonary TB would not usually cause liver dysfunction.

Cystic fibrosis can cause progressive lung disease and liver dysfunction. It is usually characterised by thick sputum and frequent infections, however, rather than a dry cough. Idiopathic pulmonary fibrosis usually presents in slightly older patients and features fine basal crackles as an examination finding.

Further reading:

https://patient.info/doctor/alpha-1-antitrypsin-deficiency-pro

Question:

A 25-year-old male rugby player is brought to the emergency department with severe bilateral leg pain, having been on the receiving end of a particularly hard tackle several hours previously. On examination, both thighs are grossly tender to touch, and he is unable to flex either hip due to pain. Both lower legs are sensate, but capillary refill time is prolonged and the digits feel cool. He is tachycardic and tachypnoeic, but observations are otherwise unremarkable. He passes urine in the emergency department, which is notably dark in colour and tests positive for blood on urinalysis. Blood tests reveal a creatine kinase (cK) of 15,000 units/L.

Given the likely diagnosis, which one of the following abnormalities is also most likely to have been found on blood tests?

A. Hyponatraemia

B. Hypocalcaemia

C. Hypophosphataemia

D. Metabolic alkalosis

E. Hypokalaemia

Correct Answer:Hypocalcaemia

Explanation:

Rhabdomyolysis describes the rapid breakdown of skeletal muscle, marked by gross elevations in serum creatine kinase (cK) levels. Causes include blunt trauma, thermal and electrical injuries, any of which may also precipitate compartment syndrome where muscle injury is perpetuated through a vicious cycle of ischaemia, necrosis and swelling. Atraumatic causes include heat stroke, serotonin syndrome, epileptic seizures, myositis, abuse of illicit stimulant drugs, and complications of statin use. Symptoms include those of the causative insult, in addition to general myalgia and weakness. Acute kidney injury is commonly seen, the magnitude of which is dependent on a number of mechanisms outlined below. Patients’ urine is typically tea- or dark amber coloured by the presence of myoglobin, but they may be anuric.

Muscle injury, in the form of direct trauma or energy depletion, results in myocyte uptake of calcium via sequential failing of sodium/potassium, sodium/calcium and calcium active transporters, resulting in toxic intracellular hypercalcaemia which induces apoptosis and necrosis. Sufficient deposition of calcium within damaged muscle gives rise to early serum hypocalcaemia. There are case reports in the literature of rhabdomyolysis due to severe hyponatraemia, which is rare but generally associated with psychogenic polydipsia and potentially due to failure of the same sodium/calcium exchange pump.

Cell lysis results in the efflux of potassium, phosphate, creatine kinase, myoglobin, lactate, uric acid and other solutes, resulting in hyperkalaemia, hyperphosphataemia, myoglobinaemia and metabolic acidosis. These electrolyte imbalances, particularly hyperkalaemia, may be worsened in the setting of renal injury and can induce life-threatening cardiac dysrhythmias. The causative insult may also be sufficient to induce life-threatening disseminated intravascular coagulopathy (DIC).

Renal injury is multifactorial in origin: sequestration of circulating volume into damaged tissues results in activation of the renin-angiotensin-aldosterone system to conserve volume by reducing renal blood flow, causing “pre-renal” injury. Metabolism of myoglobin yields free iron, which reacts with peroxides to form compounds directly toxic to renal tubules causing “intra-renal” damage. Metabolic acidosis provides the ideal environment for the formation of myoglobin casts and uric acid crystals, which add an obstructive “post-renal” element to the injury.

Investigations for rhabdomyolysis include urinalysis, which is unable to differentiate myoglobinuria from haematuria and may be supplemented by myoglobin assay or urine microscopy for pigmented granular casts. Serum urine and electrolytes, phosphate, urate and cK should be sent along with a coagulation profile and full blood count to check platelet count in case of DIC (and haemoglobin, particularly following trauma). Arterial blood gas samples may demonstrate high anion-gap metabolic acidoses. There is no established cK threshold for the diagnosis of rhabdomyolysis but levels more than five times the upper limit of normal (i.e. >1000 units/L) are generally accepted.

Treatment should be initiated promptly, and by addressing the causative pathology in the first instance. Hyperkalaemia should be corrected as an emergency, but treatment of hypocalcaemia risks worsening the muscular injury and exacerbating the situation. Aggressive fluid resuscitation forms the mainstay of treatment for rhabdomyolysis in replacing functional hypovolaemia, restoring renal perfusion and increasing the excretion rate of nephrotoxins by maintaining tubular volume and urinary flow. Recommendations vary, but a systematic review in 2013 concluded that fluid resuscitation commenced within 6 hours of presentation to maintain a urine output over 300ml/hr helped to prevent AKI. A urinary catheter should be inserted to accurately assess output, and central venous catheterisation may be performed to more accurately assess fluid status and reduce the risk of iatrogenic overload.

Administration of intravenous sodium bicarbonate may be of value in raising urinary pH to reduce the formation of myoglobin casts and reduce myoglobin toxicity, but there is little randomised-controlled trial evidence of benefit. Some clinicians may administer mannitol to stimulate diuresis, but this should be avoided in anuric patients. Continuous renal replacement therapy (CRRT) may help in clearing myoglobin from the circulation, but has not yet been demonstrated to reduce mortality.

Further reading:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4908773/

Question:

A 2-year-old girl presents to the paediatric emergency department, with a two-day history of a dry cough, sore throat, runny nose, and reduced oral intake. She is still passing urine and had a full nappy this morning.

She was born at term via uncomplicated vaginal delivery, is up to date with routine immunisations, takes no regular medications and has no known drug allergies.

On examination, the child is reluctant to cooperate and screams on attempts to auscultate her chest. Tympanic membranes and auditory canals are unremarkable bilaterally. The image below demonstrates her oropharynx.

Vital signs are: HR 120/min, RR 30/min, BP 100/60 mmHg, SpO2 96% on air, temperature 37.4 oC

What is the most appropriate management option?

Source: Author: Dake (CC 3.0 SA)

A. Local anaesthetic spray

B. Phenoxymethylpenicillin

C. Clarithromycin

D. Self-care and monitoring

E. Phenoxymethylpenicillin to use if symptoms don’t resolve within 24 hours

Correct Answer:Self-care and monitoring

Explanation:

The most appropriate management option is self-care and monitoring.

Most children presenting with a sore throat are likely to be suffering from a viral upper respiratory tract infection with pharyngeal involvement. This patient has attended with a convincing history of coryzal symptoms, cough and a sore throat, all of which may present in tonsilitis. The diagnosis of a viral illness versus bacterial tonsillitis can be difficult to make clinically, and therefore NICE has created a visual summary which includes the use of clinical scoring systems (FeverPAIN or Centor criteria) for managing patients with suspected tonsillitis.

This girl's ‘FeverPain’ score is 1 for ‘attends rapidly’, she is not feverish, she has no purulent ‘pus points’ on her tonsils, and she presents with coryzal and cough symptoms in addition to her sore throat.

Her Centor score is 0. These clinical scores confer that she has a low risk for streptococcal tonsillitis and, therefore, at this stage, antibiotic therapy is not indicated but rather ‘self-care’ (analgesia and oral fluids), and monitoring should be advised.

If a patient’s FeverPain score is 2-3 this indicates a higher risk of bacterial tonsillitis, and a ‘backup’ prescription of antibiotics is recommended, with advice to monitor symptoms and only take them if no improvement in 3-5 days or symptoms worsen. Although a review of the literature concurs that antibiotics confer no benefit for the majority of patients with a ‘sore throat’ and they make little difference to the longevity of symptoms.

Occasionally patients will present with streptococcal bacterial tonsillitis and will score highly on the FeverPain score 4-5 or Centor score 3-4 in which case the management is prescription of immediate antibiotics (the first-line being phenoxymethylpenicillin or clarithromycin if penicillin-allergic)

If the patient is systemically unwell or has high-risk complications, an inpatient admission is recommended in addition to antibiotic therapy.

The research concurs that there is no evidence for the use of local anaesthetic spray such as Difflam in simple viral tonsillitis.

Further reading:

https://www.nice.org.uk/guidance/ng84/resources/visual-summary-pdf-4723226606

Question:

A 21-year-old man presents to the emergency department having taken an overdose of paracetamol. He now regrets his actions and asks for help.

He is unsure how many tablets he has taken. He reports taking the tablets 2 hours ago and has vomited once since then.

On examination, his observations are:

Respiratory rate: 12 breaths per minute

Oxygen saturation: 98% (room air)

Heart rate: 88 beats per minute

Blood pressure: 128/86 mmHg

Temperature: 36.8°C

Cardiovascular, respiratory and abdominal examinations are normal.

What is the most appropriate initial management step?

A. Immediately start an intravenous infusion of N-acetylcysteine

B. Immediately administer activated charcoal

C. Measure serum paracetamol level at 4-hours and consider sodium bicardbonate infusion based on paracetamol levels

D. Immediately start an intravenous infusion of sodium bicarcbonate

E. Measure serum paracetamol level at 4-hours and consider N-actylcysteine infusion based on paracetamol levels

Correct Answer:Measure serum paracetamol level at 4-hours and consider N-actylcysteine infusion based on paracetamol levels

Explanation:

N-acetylcysteine (NAC) is the antidote of choice for paracetamol poisoning. It acts as a glutathione donor, which conjugates metabolites of paracetamol - preventing damage to the liver.

The correct answer here is to measure serum paracetamol level at 4-hours and consider N-acetylcysteine infusion based on paracetamol levels. Measuring the serum paracetamol level from 4 hours onwards allows the result to be plotted on a paracetamol nomogram. If a patient's results fall above the treatment line then NAC should be commenced. If NAC is administered correctly within 8 hours of paracetamol ingestion it is highly effective and can prevent serious liver damage.

Immediately starting an intravenous infusion of N-acetylcysteine is not the most appropriate course of action given the history. NAC should be commenced immediately if there is a history of a staggered overdose, overdose >15 hours ago or if ingestion time is unknown.

The BNF's treatment summary "Poisoning, Emergency Treatment" recommends activated charcoal if a patient presents within 1 hour of a paracetamol overdose. This patient presented 2 hours after his overdose.

Infusions of sodium bicarbonate are used in the management of salicylate (e.g. aspirin) overdoses.

Further reading:

https://cks.nice.org.uk/topics/poisoning-or-overdose/

Question:

A 56-year-old gentleman with severe connective tissue disease-related interstitial lung disease is undergoing intensive treatment with pulsed cyclophosphamide in an attempt to slow the rate of progression of his disease.

Which of the following complications of cyclophosphamide therapy is the patient most at risk of?

A. Hyperkalaemia

B. Weight gain

C. Haemorrhagic cystitis

D. Splenic infarction

E. Tinnitus

Correct Answer:Haemorrhagic cystitis

Explanation:

Acrolein is a urinary metabolite of cyclophosphamide that is recognised to cause haemorrhagic cystitis. Increased fluid before and after the cyclophosphamide infusion is recommended, as is mesna to reduce the risk of this occurring.

Anorexia is a common side effect of cyclophosphamide and weight loss is, therefore, more often seen than weight gain.

Hyperkalaemia, tinnitus and splenic infarction are not recognised complications of cyclophosphamide treatment.

Further reading:

https://bnf.nice.org.uk/drug/cyclophosphamide.html#cautions

Question:

A 74-year-old man presents to his GP with a 1-year history of dysphagia that is limited to certain bulky foods, such as steak or bread. Endoscopy showed an oesophageal stricture in the lower third of the oesophagus. A stool-antigen test was negative for H. pylori.

His past medical history includes atrial fibrillation, type 2 diabetes, and osteoarthritis. His medications include bisoprolol, warfarin, paracetamol, and metformin.

Which of the following is the most appropriate treatment for his dysphagia?

A. Oesophageal dilatation

B. Nasogastric tube insertion

C. Changes to his drug regime

D. Watch and wait

E. H. pylori eradication

Correct Answer:Oesophageal dilatation

Explanation:

This man has an oesophageal stricture, which could be either benign or malignant. Its location in the lower third of the oesophagus suggests that it may be secondary to gastro-oesophageal reflux disease (GORD). It is currently preventing him from eating certain foods. Oesophageal dilatation can be considered a treatment for a benign lesion, however, there is an associated risk of rupture, especially in the elderly.

Watch and wait option will mean that the dysphagia will progress.

Irritation of the oesophagus by drugs such as NSAIDs, oral bisphosphonates, or potassium tablets can cause strictures, however, none of these man’s medications are associated with oesophagitis.

As this patient's H. pylori stool antigen test is negative, H. pylori eradication is not indicated.

NG tube insertion could be resorted to if the man was struggling to consume soft foods or liquids, however, his problems are currently restricted to bulky foods only.

Further reading:

https://patient.info/doctor/oesophageal-strictures-webs-and-rings

Question:

A 23-year-old man is being investigated for dysuria and urethral discharge. Over the past three months, he has had unprotected sexual intercourse with eight male partners. He is currently on pre-exposure prophylaxis. His most recent sexual health screen was negative.

On general inspection, he is alert, afebrile, and hemodynamically stable. On examination of the external genitalia, there are multiple painful, non-exudative, umbilicated ulcers on the glans penis. The ulcers are circular, with sharp, erythematous margins and appear to evolve from groups of vesicles. There is also painful inguinal lymphadenopathy.

Given the likely diagnosis, what is the most appropriate treatment?

A. Benzathine penicillin

B. Ceftriaxone

C. Doxycycline

D. Metronidazole

E. Aciclovir

Correct Answer:Aciclovir

Explanation:

Genital herpes causes tender, umbilicated, circular, well-defined ulcers that evolve from groups or "crops" of vesicles alongside tender lymphadenopathy. The patient in the vignette is at risk of sexually transmitted infection (STI) because he is relatively young and has a history of unprotected sexual intercourse with multiple partners (both men and women). Anogenital herpes is most likely due to herpes simplex virus-2 (HSV-2) and can be asymptomatic or cause dysuria, discharge, proctitis, and painful ulcers alongside painful lymphadenopathy. Therefore this is the correct answer. Genital herpes is treated with antiviral medication; therefore, aciclovir is the most appropriate treatment for this patient.

Benzathine penicillin is a penicillin antibiotic used in the treatment of syphilis. Syphilis results in painless lymphadenopathy and a characteristic indurated, shallow, painless ulcer during the primary stage of the infection (known as a chancre). Benzathine penicillin does not play a role in the management of anogenital herpes.

Ceftriaxone is a cephalosporin antibiotic used in the treatment of gonorrhoea. Gonorrhoea may result in urethritis, discharge, orchitis; however, it is not associated with lymphadenopathy or ulcers. Ceftriaxone does not play a role in the management of anogenital herpes.

Doxycycline is a tetracycline antibiotic used in the treatment of chlamydia. A complication of chlamydia is lymphogranuloma venereum (LGV). LGV can result in tender lymphadenopathy and ulcers. However, LGV typically causes a firm, shallow, smooth, painless ulcer. Doxycycline does not play a role in the management of anogenital herpes.

Metronidazole is an antiprotozoal medication used to treat candida infections (such as candida balanitis). Candida balanitis is not associated with sexual transmission and is primarily related to poor hygiene in uncircumcised males. Candida balanitis results in blotchy erythema of the glans penis and a characteristic "creamy-white" discharge without lymphadenopathy. Metronidazole does not play a role in the management of anogenital herpes.

Further reading:

https://geekymedics.com/sexually-transmitted-infections-stis/

Question:

A 65-year-old man presents to his GP with a progressive, bilateral, diffuse fine touch and proprioception sensory loss. He has no loss of power and can feel pain and temperature throughout his body.

Investigations are undertaken based on the GP's clinical suspicions and a diagnosis of tertiary syphilis is confirmed.

Based on this man's symptoms, which part of the spinal cord is most likely to be affected?

A. Ventral (anterior) spinal cord

B. Anterolateral spinal cord

C. All regions of the spinal cord

D. Dorsal (posterior) spinal cord

E. No spinal cord involvement

Correct Answer:Dorsal (posterior) spinal cord

Explanation:

The dorsal spinal cord is the correct answer in this case. This man's symptoms suggest he has a sensory deficit (fine touch and proprioception loss). Fine touch and proprioception are carried down the dorsal horns of the spinal cord by the dorsal column medial lemniscus (DCML) pathway, so his neurosyphilis must affect this part of the cord.

As a revision recap, the three main pathways in the spinal cord to remember are the spinothalamic, the DCML, and the corticospinal pathways. Simply put, the spinothalamic tract senses pain and temperature, decussates (crosses over) in the spinal cord, and is found in the anterolateral spinal cord. The DCML is responsible for sensing fine touch and proprioception, decussates in the medulla, and runs down the dorsal spinal cord. The corticospinal pathway sends impulses to contract muscles, decussates in the medulla, and runs anterolateral to the DCML.

All of the spinal cord would give complete paralysis below the level of the lesion as well as complete loss of fine touch, pain and temperature.

The anterolateral spinal cord is where the spinothalamic tract runs, and isolated pathology to this area gives loss of pain and temperature with preserved fine touch and proprioception. Therefore, his sensory deficits aren't accounted for.

No spinal cord involvement would not account for his sensory derangement.

The ventral spinal cord contains extrapyramidal pathways beyond the scope of this question as well as some of the anterior spinothalamic pathways, which as discussed do not account for fine touch or proprioception.

Further reading:

https://bestpractice.bmj.com/topics/en-gb/50?q=Syphilis%20infection&c=suggested

Question:

The coroner is informed that a 1-month-old child has died. She was discovered unresponsive by her parents at home earlier that morning and brought into A&E where unfortunately it was found that she had already passed away. On discussion with the parents, there is no history of trauma, and there is not significant suspicion of child abuse or neglect. As per protocol, an investigation is launched to determine the likely cause of death.

The baby was previously well, and born by spontaneous vaginal delivery at 39 weeks. There is no family history of any medical conditions. She slept in a cot in her parents' bedroom and did not bed-share with the parents. Neither parent smokes. At autopsy, no bruises, retinal haemorrhages or bony injuries were found.

A diagnosis of sudden infant death syndrome (SIDS) is made.

Which of the following criteria would be vital for a diagnosis of SIDS to be made?

A. Parental denial of traumatic events

B. Occurs between 2 and 4 months of age

C. Absence of metabolic disease

D. History of co-sleeping

E. Occurs under 3 years of age

Correct Answer:Absence of metabolic disease

Explanation:

It would be essential to establish an absence of metabolic disease before a diagnosis of SIDS could be made. SIDS is generally defined as sudden death in an infant less than 1 year, which remains unexplained following the autopsy, death scene examination and clinical history review. Certain metabolic disorders (e.g. fatty acid metabolism and mitochondrial disorders) can also result in sudden infant death, particularly those that are not routinely tested for at birth with the Guthrie spot test. Clinical history suggestive of metabolic disease may include faltering growth and a history of prior unexplained death / metabolic disease in siblings. To rule out metabolic diseases, serum and urine tests will be performed after a sudden infant death that will look at amino acid and ammonia concentrations. Assays for specific enzymes may also be performed, as well as muscle biopsies for certain mitochondrial disorders.

SIDS is generally made as a diagnosis for children under the age of 1 year, rather than under 3 years of age or between 2 and 4 months of age. The peak incidence is 1 to 3 months of age.

Although SIDS has previously been linked to sleeping and certain risk factors associated with sleeping increase the likelihood of SIDS, it can happen when the baby is awake and this is not essential for diagnosis. Risk factors include co-sleeping and babies being placed to sleep in positions other than flat on their back. It is advised that babies should be placed in the ‘feet to foot’ position with feet touching the end of their cot, using a firm flat mattress and babies sleeping in the same room as parents for the first 6 months.

Parental denial of traumatic events would be useful to assess whether any adverse events had occurred to explain the death, but it is not sufficient alone to rule out trauma and a full assessment will require autopsy and death scene examination to fully assess whether any trauma had occurred.

Further reading:

https://patient.info/doctor/sudden-infant-death-syndrome

Question:

Anti-cyclic citrullinated peptide antibody (anti-CCP) is a commonly used diagnostic test for rheumatoid arthritis. One study showed that it has a sensitivity of 70%, specificity of 97%, positive predictive value of 37% and negative predictive value of 93%.

When used in another study conducted on a population with a higher proportion of patients with rheumatoid arthritis, what change in parameter would most likely be observed?

A. The negative predictive value will be higher

B. Sensitivity, specificity and positive and negative predictive values are not affected by changes in prevalence

C. The specificity will be higher

D. The positive predictive value will be higher

E. The sensitivity will be higher

Correct Answer:The positive predictive value will be higher

Explanation:

It is important to remember that the positive and negative predictive values change when the prevalence of the condition being tested changes, whereas sensitivity and specificity remain constant. When the prevalence of the condition is higher, the positive predictive value will be higher and the negative predictive value will be lower.

Further reading:

https://geekymedics.com/sensitivity-specificity-ppv-and-npv/

Question:

A 78-year-old male presents to his primary care doctor with pain and stiffness in his neck, shoulders and hips for the last 4 months. His stiffness usually lasts about 1 hour every morning. He also complains of weight loss of about 2.5 kilograms and occasional mild fevers. He has no past medical history.

Laboratory results are significant for an elevated erythrocyte sedimentation rate (ESR). Rheumatoid factor and antinuclear antibody levels are normal.

What is the most likely diagnosis?

A. Osteoarthritis

B. Rheumatoid arthritis

C. Fibromyalgia

D. Polymyalgia rheumatica

E. Systemic lupus erythematosus

Correct Answer:Polymyalgia rheumatica

Explanation:

This elderly patient has presented with proximal muscle pain and stiffness and constitutional symptoms of weight loss and fevers. He also has raised inflammatory markers. This is consistent with a diagnosis of polymyalgia rheumatica (PMR). PMR in a non-articular rheumatic disease that predominantly affects proximal muscle groups with pain and stiffness. Muscle weakness and atrophy are usually absent. Treatment for PMR involves low dose oral steroids. It is important to note that PMR is closely related to giant cell arteritis – a vision-threatening vasculitis that presents with jaw claudication, scalp tenderness and monocular vision loss.

Rheumatoid arthritis (RA) causes polyarticular, symmetric arthritis that typically involves the joints of the wrists and hands. It usually presents with prolonged morning stiffness which improves throughout the day.

Systemic lupus erythematosus (SLE) is a multi-system autoimmune disease that can present in various ways including photosensitive malar rash, oral ulcers, pleuritis, arthritis, neurological signs (seizures and psychosis) and proteinuria. Although inflammatory markers are often elevated in patients with SLE, pain and stiffness in proximal joints in an elderly male patient is more concerning for PMR.

Fibromyalgia is a chronic, widespread disease characterised by many trigger points around the body and is typically associated with psychiatric comorbidities. Low dose tricyclic antidepressants can be useful for these patients.

Osteoarthritis (OA) is a non-inflammatory condition usually involving the weight-bearing joints and is unlikely to present with constitutional signs such as fevers and weight loss.

Further reading:

https://patient.info/doctor/polymyalgia-rheumatica-pro

Question:

Mr Crow, a 72-year-old gentleman, presents to his GP a little embarrassed because he feels he has developed breast tissue. On examination, there is a small amount of breast tissue bilaterally.

He has a past medical history of hypertension, heart failure and type 2 diabetes. His regular medications include ramipril, amlodipine, spironolactone, furosemide and metformin.

Which of this gentleman’s medications is most likely to have caused this side effect?

A. Spironolactone

B. Metformin

C. Ramipril

D. Amlodipine

E. Furosemide

Correct Answer:Spironolactone

Explanation:

This patient has developed gynaecomastia, a well-recognised side effect of spironolactone. This is because spironolactone is an aldosterone antagonist and therefore reduces levels of androgens (testosterone), in addition to blocking androgen receptor activity. It can also cause hyperkalaemia as it is “potassium-sparing” blocking the reabsorption of potassium from the distal convoluted tubule.

Ramipril is an ACE inhibitor and its side effects include hyperkalaemia and dry cough.

Amlodipine is a calcium channel blocker and its side effects include peripheral oedema.

Furosemide is a loop diuretic and its side effects include hypokalaemia, hypotension and hyperuricaemia

Metformin is the first-line treatment for type 2 diabetes and can cause gastrointestinal upset and lactic acidosis in the context of renal failure.

Further reading:

https://bnf.nice.org.uk/drug/spironolactone.html

Question:

A 64-year-old male presents to the emergency department with a 2-day history of acute abdominal pain and bilious vomiting. His past medical and drug history are unremarkable, apart from an open appendectomy 15 years ago.

His observations are stable and he is afebrile. On examination, his abdomen is generally tender and tinkling bowel sounds are audible on auscultation. A 3-inch scar is visible in the right iliac fossa.

Which of the following investigations would be most useful in reaching a definitive diagnosis?

A. Barium enema

B. Erect chest x-ray

C. CT abdomen

D. Abdominal x-ray

E. Colonoscopy

Correct Answer:CT abdomen

Explanation:

This patient is likely presenting with small bowel obstruction (SBO). It typically presents with early vomiting and late constipation, with adhesions being the most common cause. CT abdomen with contrast is the diagnostic investigation for SBO and is highly sensitive; it may also reveal the cause of the obstruction and guide further management. It is a quick investigation, although radiation exposure must be taken into consideration.

An abdominal x-ray (AXR) is commonly used as the first-line investigation for bowel obstruction; however, it is not diagnostic. Multiple dilated loops of bowel are typically seen. In addition, AXRs have a lower sensitivity in demonstrating bowel obstruction and cannot reliably identify the location and cause of the obstruction.

A barium enema can demonstrate a caecal or sigmoid volvulus but is not the definitive investigation for bowel obstruction. Barium enemas are not typically involved in investigating small bowel obstruction and may convert a non-complete bowel obstruction to a complete obstruction.

Colonoscopy may be helpful for further investigation if malignancy is suspected or in the management of a sigmoid volvulus. However, colonoscopy is not typically involved in the investigation of a small bowel obstruction.

An erect chest x-ray can demonstrate free air under the diaphragm, if the bowel has perforated. However, it will not provide a definitive diagnosis for bowel obstruction.

Further reading:

https://emedicine.medscape.com/article/374962-overview

Question:

A 10-year-old boy is brought to the general practitioner with a rash on his abdomen. This has been present for the last 7 days and the boy is otherwise well.

Physical examination reveals a round, well defined, erythematous scaly rash on his abdomen. The borders of the skin lesion are raised.

What is the most likely diagnosis?

A. Tinea corporis

B. Cherry haemangioma

C. Erythema multiforme

D. Impetigo

E. Congenital dermal melanocytosis (Mongolian spot)

Correct Answer:Tinea corporis

Explanation:

This erythematous, scaly raised lesion presenting in a child is consistent with tinea corporis. This is caused by the Microsporum and Trichophyton species of ringworm. The lesions produced are typically circular, scaly and well defined. Secondary bacterial infections can complicate the clinical picture and should be treated promptly. First-line treatment includes topical antifungals.

Erythema multiforme is a dermatological disorder characterised by macules and papules that resemble target signs. It is typically associated with infection such as Mycoplasma pneumoniae or medications such as sulfa- drugs.

Impetigo is a bacterial infection caused by group A beta-haemolytic streptococci or S. aureus which typically yields ‘honey-crusted’ lesions.

Mongolian spots are benign and present in the neonatal population. They typically fade in the first year or two of life.

Cherry haemangiomas are benign vascular tumours of the skin that are classically seen in the elderly population. They typically blanch with pressure. Cherry haemangiomas are unlikely to be seen in a young child.

Further reading:

https://patient.info/doctor/dermatophytosis-tinea-infections

Question:

A 74-year-old woman attends her General Practitioner (GP) for a medication review. She has a history of breast cancer with skeletal metastases and is being treated palliatively for this. She has hypertension but no other significant medical problems.

Her current concern is a slowly worsening history of constipation which seems to have coincided with her use of morphine for bone pain. She opens her bowels once every few days but finds this uncomfortable.

Her medications are as follows:

Modified-release morphine 20mg twice per day

Short-acting liquid morphine 5mg as required

Paracetamol 1g four times per day

Amlodipine 5mg once per day

Docusate sodium 100mg twice per day

She has no medication allergies and takes her prescribed medications regularly.

What would be the most appropriate medication to add to help manage her constipation?

A. Sodium phosphate enema

B. Senna

C. Naloxegol

D. Ispaghula husk

E. Prucalopride

Correct Answer:Senna

Explanation:

This patient has constipation likely related to opioid use. The recommended management of opioid-induced constipation is a combination of osmotic/stool-softening and stimulant laxatives. She is already taking docusate, which primarily works as a stool softener, and so it would be appropriate to add in a stimulant laxative such as senna.

Sodium phosphate enemas are used in faecal impaction and are not an appropriate choice at this point for this patient.

Ispaghula husk is a bulk-forming laxative, which should be avoided in opioid-related constipation as it can make stools more difficult to pass.

Naloxegol is an effective laxative for constipation due to opioids but its use is only recommended once other laxatives have proved ineffective.

Prucalopride is a selective serotonin 5HT4-receptor agonist with prokinetic properties used in the management of chronic constipation in women. It is not recommended first-line or specifically for opioid-related constipation.

Further reading:

https://bnf.nice.org.uk/treatment-summary/constipation.html

Question:

A doctor wishes to determine if taking oral antibiotics in childhood increases the risk of irritable bowel syndrome (IBS). He recruits 1000 participants and looks back at their medical records to determine which participants received a course of oral antibiotics before the age of 18. He then determines which patients have been diagnosed with IBS and analyses the data to determine if there is a link between the two.

What type of study is described?

A. Case series

B. Retrospective cohort

C. Ecological

D. Case-control

E. Prospective cohort

Correct Answer:Retrospective cohort

Explanation:

This is a retrospective cohort study. A retrospective cohort study involves looking back into the past to determine if a group of people have been exposed to the risk factor. The exposure status was measured in the past, and some people may have already been diagnosed with the disease of interest.

An ecological study compares different populations that have different rates of cases and different rates of risk factor exposure.

A case series identifies a group of people with a known exposure and follows them up to see if they develop the condition being studied.

Case-control studies involve comparing a group of cases with a group of controls and seeing if there are different rates of risk factor exposure between the two groups.

A prospective cohort study identifies a group of people with a known exposure and a group without the exposure, then follows them up to see if they develop the condition being studied.

Further reading:

https://guides.himmelfarb.gwu.edu/prevention\_and\_community\_health/types-of-studies

Question:

You are the Paediatric SHO on-call. A 12-year-old boy was started on chemotherapy 3 days previously for acute lymphoblastic leukaemia. He is currently being monitored on the Paediatric oncology ward. You are alerted that he has just suffered a seizure. On review of the patient’s bloods, you notice that his serum urate, lactate dehydrogenase, potassium and phosphate are all high. His calcium appears to be low. The patient has no significant past medical or family history.

What is the MOST LIKELY diagnosis?

A. Tumour lysis syndrome

B. Brain metastases

C. Malignant spinal cord compression

D. Epilepsy

E. Superior vena cava obstruction

Correct Answer:Tumour lysis syndrome

Explanation:

The most likely diagnosis is tumour lysis syndrome. Tumour lysis syndrome is a severe metabolic disturbance caused by the sudden release of large quantities of cellular components into the blood following the rapid lysis of malignant cells. Typical investigative changes seen in the condition include hyperuricaemia, hyperkalaemia, hyperphosphataemia and hypocalcaemia. Raised LDH may also be observed. The metabolic disturbances seen in tumour lysis syndrome may result in seizure, acute kidney injury and cardiac arrhythmias.

Major risk factors for tumour lysis syndrome include haematological malignancies, such as acute lymphoblastic leukaemia and Burkitt’s lymphoma, as well as certain treatments (like chemotherapy, radiotherapy, surgery and ablative procedures).

A diagnosis of epilepsy is less likely to explain this scenario as the patient has no history of seizures. Epilepsy would also not cause the previously discussed metabolic disturbances.

Acute lymphoblastic leukaemia is a haematological malignancy that does not result in brain metastases.

Superior vena cava obstruction is another example of an oncological emergency in which blood is prevented from exiting the SVC due to tumour obstruction. It would induce severe headache, blurred vision and distended neck veins but is unlikely to result in seizures and is unlikely to occur in ALL.

Similarly, malignant spinal cord compression is another example of an oncological emergency. It would provoke paralysis, not a seizure and again, is unlikely to occur in ALL.

Further reading:

https://patient.info/doctor/oncological-emergencies

Question:

A 6-year-old girl is brought to the GP by her concerned parents. The girl's teacher reports that she frequently stops paying attention in class, and stares into space with a vacant expression. Often when this occurs, the girl's eyelids begin to flutter. When the teacher calls her name, she is unresponsive. The girl is not aware of these events occurring.

After referral to neurology, an EEG is performed, which reveals a pattern typically seen in absence seizures.

Given the diagnosis, what is the first-line treatment of this condition?

A. Carbamazepine

B. Phenytoin

C. Lamotrigine

D. Ethosuximide

E. Levetiracetam

Correct Answer:Ethosuximide

Explanation:

Ethosuximide is the first-line treatment of absence seizures. Sodium valproate can also be used as a first-line treatment.

Levetiracetam may be considered as a treatment for absence seizures by a tertiary epilepsy specialist if adjunctive treatment fails.

Lamotrigine is used as a treatment for absence seizures if ethosuximide and sodium valproate are ineffective or not tolerated.

Phenytoin is contraindicated in the treatment of absence seizures.

Carbamazepine is contraindicated in the treatment of absence seizures.

Further reading:

https://bnf.nice.org.uk/treatment-summary/epilepsy.html

Question:

A 30-year-old female patient attends her GP with vaginal discharge. She describes the discharge as ‘frothy and yellow’ with an ‘offensive’ odour which varies from being thin in texture to thick. The discharge has been present for the past couple of weeks. On further questioning, the patient also reports suffering from vulval itchiness, dysuria and suprapubic discomfort. On speculum examination, her cervix has the appearance of the surface of a strawberry.

What is the GOLD-STANDARD pharmacological management for the condition described?

A. Oral tinidazole

B. Intramuscular ceftriaxone

C. Oral fluconazole

D. Oral metronidazole

E. Oral azithromycin

Correct Answer:Oral metronidazole

Explanation:

The condition described in this scenario is most likely trichomonas vaginalis. The gold-standard management for this condition is oral metronidazole. Treatment for trichomonas vaginalis should also include treatment of both partners and avoidance of sexual intercourse for around one week after receiving treatment. Trichomonas vaginalis may occur in both men and women. Women typically present with vaginal discharge that is frothy and yellowish in colour with an offensive odour, vulval pruritus, dysuria, a ‘strawberry cervix’ that is indicative of cervicitis and, occasionally, suprapubic pain.

Oral fluconazole is not appropriate for the treatment of trichomonas vaginalis. This management would instead be used in the treatment of a vulval or vaginal candidal infection.

Oral azithromycin is used in the treatment of chlamydia infections.

IM ceftriaxone would instead be used in the management of gonorrhoea along with azithromycin.

Oral tinidazole is used as second-line therapy in the management of trichomonas vaginalis.

Further reading:

https://patient.info/doctor/trichomonas-vaginalis

Question:

A 54-year-old woman admitted to the hospital for acute pancreatitis two days ago suddenly develops hypotension and fever.

On examination, her temperature is 39.4°, her pulse is irregularly irregular at 110 beats per minute, and her blood pressure is 85/62mmHg. Whilst measuring her observations, blood is noted to be oozing around her IV sites, and her abdomen is covered in a number of non-blanching macules.

Urgent haematological investigations show:

Haemoglobin 98g/L

Prothrombin time (PT) - 34 seconds

Partial thromboplastin time (PTT) - 64 seconds

D-dimer - >500 ng/dl

Fibrinogen - 1.9g/L

Platelets - 100 x 109/L

A peripheral blood smear also identifies schistocytes.

She has no other significant past medical history.

Which of the following is the most appropriate initial management of this patient?

A. Low weight molecular heparin

B. Cryoprecipitate

C. Platelet transfusion

D. Vitamin K

E. Fresh frozen plasma

Correct Answer:Fresh frozen plasma

Explanation:

The most likely diagnosis in this patient is disseminated intravascular coagulation (DIC) - a dysregulated blood clotting syndrome that leads to paradoxical bleeding and thrombosis. DIC occurs due to systemic activation of coagulation pathways, resulting in the formation of microvascular thrombi, which deplete levels of platelets and coagulation factors. The treatment of DIC involves two stages: treatment of the underlying disorder, which stops the triggering process, and supportive treatment to restore normal coagulation. It is important to get urgent senior support and input from a haematologist. The most concerning blood parameter in this patient is the PT of more than >1.5x normal; therefore, fresh frozen plasma (FFP) is the most appropriate initial management option to correct this coagulopathy.

In patients with DIC and active bleeding, the platelet level should be maintained above 50 x 109/L. Whilst this patient has evidence of bleeding, a platelet transfusion would not be indicated at this time as the platelets are 100 x 109/L.

In patients with DIC where thrombosis is a prominent feature, therapeutic doses of low weight molecular heparin (LMWH) should be considered. It is important to note that if thrombosis and bleeding co-exist, unfractionated heparin is often preferred as it has a significantly shorter half-life and is more readily reversible than LWMH. However, as this patient has evidence of significant bleeding, no form of heparin would be advised at this stage.

Typically, vitamin K is not recommended in an acute coagulopathy such as DIC, as it takes hours to days to take effect. This patient is unstable and needs prompt management to stabilise her condition.

Cryoprecipitates are typically only indicated as a second-line alternative when fibrinogen levels are not maintained using FFP alone or when fibrinogen levels are low initially (<1.5 g/L).

Further reading:

https://geekymedics.com/disseminated-intravascular-coagulation-dic/

Question:

A 72-year-old woman presents to the emergency department with a two-day history of productive cough, fever, and shortness of breath.

She has a past medical history of type II diabetes, ischaemic heart disease and hypertension. She takes metformin, ramipril, bisoprolol, and atorvastatin. She is allergic to penicillin.

Her observations are shown below.

Vital sign Result

Respiratory rate 23 breaths per minute

Oxygen saturations 93% on air

Blood pressure 110/65 mmHg

Heart rate 80 beats per minute

Temperature 37.9⁰C

On examination of the chest, bronchial breath sounds are heard on the left side associated with crackles and dullness to percussion. She is orientated in time, place, and person with no signs of confusion.

Her blood results are shown below.

Blood test Result

Haemoglobin 115 g/L

Platelet count 450 x109/L

WCC 14.2 x109/L

Na+ 137 mmol/L

K+ 4.5 mmol/L

Urea 5.4 mmol/L

Creatinine 85 μmol/L

CRP 50 mg/L

Her chest X-ray shows focal consolidation of the left middle and lower zones.

Given the most likely diagnosis, which antibiotic is most appropriate to start?

A. Doxycycline

B. Co-amoxiclav

C. Levofloxacin

D. Clindamycin

E. Amoxicillin

Correct Answer:Doxycycline

Explanation:

This patient’s symptoms of productive cough, dyspnoea, and fever coupled with focal consolidation are typical of community-acquired pneumonia (CAP). Her pneumonia is low severity (evidenced by a CURB-65 score of 1) and she is allergic to penicillin, therefore, the most appropriate antibiotics are doxycycline, clarithromycin, or erythromycin.

Amoxicillin and co-amoxiclav are inappropriate due to her penicillin allergy. Levofloxacin is used as an alternative to co-amoxiclav in high severity CAP with penicillin allergy. NICE does not support the use of clindamycin in the management of CAP.

Further reading:

https://www.nice.org.uk/guidance/ng138/chapter/recommendations#choice-of-antibiotic

Question:

A 46-year-old man presents to his GP with a sudden onset right-sided headache. This came on whilst he was lifting weights in the gym the day before and he describes it as a ‘painful pressure’ on the right side of his head and neck (although he reported no associated trauma). He sought medical attention after his partner noted he had a ‘droopy eyelid’ on the same side. On examination, he has right-sided ptosis and miosis but no other focal neurology. He smokes 20 cigarettes a day and has done so for the last 25 years. He is sent to the emergency department for further investigation.

Which of the following investigations is most appropriate to rule out a potentially life-threatening diagnosis?

A. Chest x-ray

B. CT carotid angiogram

C. CT chest/abdomen/pelvis

D. Plain CT head

E. Nerve conduction studies

Correct Answer:CT carotid angiogram

Explanation:

The patient has a right-sided Horner’s syndrome, due to a ‘classical’ presentation of a right-sided internal carotid artery dissection. There are multiple modalities to investigate this but of those listed a CT carotid angiogram would be most appropriate.

A chest x-ray would be first-line if Horner’s syndrome due to a Pancoast tumour was suspected, likewise, a CT chest/abdomen/pelvis would be used to stage the malignancy. The lack of anhidrosis on the affected side suggests the third-order neuron is affected, making a Pancoast tumour less likely.

A CT head would be useful to assess for stroke/intracranial haemorrhage although neither of these would explain the Horner’s syndrome (however it would likely be performed alongside the CT carotid angiogram to investigate thrombus distal to the dissection site).

Nerve conduction studies would not be useful in the initial investigation of acute Horner’s syndrome.

Further reading:

https://eyewiki.aao.org/Horner's\_syndrome

Question:

An 8-year-old male presents to the emergency department with abdominal pain. He has been unwell with coryzal symptoms for the past 2 days but is otherwise fit and well.

On examination, he is mildly tender in the right iliac fossa but has no guarding or signs of peritonism. His temperature is 37.9oC. A urine dip reveals: leucocytes 1+, nitrites negative, and blood negative.

What is the most likely diagnosis?

A. Pneumonia

B. Constipation

C. Urinary tract infection

D. Appendicitis

E. Mesenteric adenitis

Correct Answer:Mesenteric adenitis

Explanation:

The most likely diagnosis in the above scenario is mesenteric adenitis – a syndrome characterised by right lower quadrant pain secondary to inflammation of the intrabdominal (specifically mesenteric) lymph nodes. Classically this most commonly presents in paediatric and young adult populations and is usually associated with, or follows, an upper respiratory tract infection or gastroenteritis. Common symptoms include fever, vomiting, and periumbilical and/or right lower quadrant abdominal pain. Crucially, mesenteric adenitis is an important mimic of acute appendicitis, which can often lead to misdiagnosis due to their similarity in presentation. Clinical features that may be helpful in distinguishing the two (and favour a diagnosis of mesenteric adenitis) include a high-grade fever (>38.5oC), shifting tenderness, a lack of rebound tenderness on palpation of the abdomen, and absence of anorexia (often a very specific presenting feature of appendicitis). There is no specific investigation to diagnose mesenteric adenitis, which is often a diagnosis of exclusion but a full diagnostic work-up typically includes investigations to confirm or exclude appendicitis, such as a full blood count (WBC may be elevated), C-reactive protein (may be elevated) and urinalysis (to rule out UTI). As a self-limiting condition, treatment is usually conservative and involves a combination of analgesia and antipyretics.

Constipation often presents with abdominal pain, which can come on acutely in children and is often associated with overflow diarrhoea but rarely presents with fever-like symptoms.

Appendicitis is a key differential but usually presents with low-grade fever (<38oC), reduced appetite and anorexia and migratory pain starting in the periumbilicus which shifts to the right iliac fossa.

Pneumonia can present with pain that is poorly localised, and in children, lower lobe pneumonia can present with abdominal pain; however, the absence of infective symptoms, including a productive cough or signs of respiratory distress, suggests this is less likely as a diagnosis.

Urinary tract infection can present with abdominal pain, most commonly suprapubic tenderness, but the urine dip findings – which would usually be positive for leukocytes and nitrites for a confirmed UTI - are not supportive of the diagnosis.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK560822/

Question:

A 55-year-old man attends his GP with a 4-month history of intermittent chest pain. He describes the pain as burning and comments that it occurs in the retrosternal region. The patient explains that the pain usually occurs around 30 minutes after consuming a large meal, and is particularly bad if he lies down.

His past medical history is insignificant, and he has a 40-pack-year smoking history.

On examination, the GP records the patient’s body mass index (BMI) at 32.1. Gastrointestinal examination reveals halitosis and enamel erosion of the teeth. A cardiac examination is normal, and a set of vital signs is unremarkable.

Given the likely diagnosis, which of the following is most likely to occur as a complication?

A. Tracheoesophageal fistula

B. Barrett’s oesophagus

C. Hiatus hernia

D. Oesophageal varices

E. Mallory-Weiss tear

Correct Answer:Barrett’s oesophagus

Explanation:

Patients who have gastro-oesophageal reflux disease (GORD) are at risk of developing Barrett’s oesophagus, which describes the transition of cells in the lower part of the oesophagus from squamous epithelium to columnar epithelium. It is a premalignant condition and has a high risk of developing into an oesophageal carcinoma if not treated.

Oesophageal varices refer to pathologically enlarged sub-mucosal veins that usually develop due to hypertension in the portal venous system and are not related to GORD.

A hiatus hernia is a condition that refers to the abnormal protrusion of the stomach through the diaphragm at the site of the gastro-oesophageal junction. This can affect the functioning of the lower oesophageal sphincter. As a result, a hiatus hernia is a strong risk factor for the development of GORD rather than a complication secondary to it.

Persistently violent coughing and vomiting can lead to a tear near the gastro-oesophageal junction, known as a Mallory-Weiss tear. While some patients with GORD may develop a mild, intermittent cough it is unlikely to be severe enough to cause a Mallory-Weiss tear.

A tracheoesophageal fistula describes an abnormal connection between the oesophagus and the trachea. It is nearly always a congenital condition, and not recognised as a complication of GORD.

Further reading:

https://patient.info/doctor/barretts-oesophagus-pro#nav-1

Question:

A 52-year-old man presents to his GP with upper abdominal pain, constantly feeling tired, and nausea and vomiting after meals, which has caused him to lose 5kg over the past month. He denies any yellowing of his skin or changes to the colour of his urine or stool. He has no significant past medical history and has never had surgery.

On examination, the abdomen is distended, and a succussion splash is heard.

What is the most likely cause of his symptoms?

A. Gastric cancer

B. Duodenal ulcer

C. Adhesional small bowel obstruction

D. Pancreatic cancer

E. Coeliac disease

Correct Answer:Gastric cancer

Explanation:

This man is presenting with vomiting after meals, fatigue and weight loss, which are red-flag symptoms of gastric cancer. Furthermore, the examination findings of distension and a succussion splash (a sloshing sound heard on sudden movements during abdominal auscultation) indicate gastric outlet obstruction, the commonest cause of which is gastric cancer.

Since the development of proton pump inhibitors, the commonest cause of gastric outlet obstruction has shifted from peptic ulcer disease to gastric cancer. Therefore, a duodenal ulcer is not the most likely cause of this patient’s symptoms.

Although pancreatic cancer is an important cause of gastric outlet obstruction to consider, it is not as common as gastric cancer, and the absence of jaundice makes this diagnosis less likely.

Although Coeliac disease can cause nausea, vomiting, fatigue, and weight loss, it would not cause gastric outlet obstruction.

Adhesional small bowel obstruction typically presents acutely with abdominal pain, absolute constipation, and vomiting. It is also unlikely in someone who has never had surgery.

Further reading:

https://teachmesurgery.com/general/gastric/stomach-cancer/

Question:

A 58-year-old male presents with mild abdominal distension, abdominal pain and jaundice. He has no change in bowel habit and is oriented to time, place and person. There is shifting dullness on percussion of the abdomen and mild pitting oedema to the mid-shin. He is known to hepatology for liver cirrhosis secondary to alcohol excess but has no other medical problems.

What is the most appropriate drug to help alleviate his abdominal distension?

A. Indapamide

B. Furosemide

C. Spironolactone

D. Lactulose

E. Thiamine

Correct Answer:Spironolactone

Explanation:

This patient has symptomatic ascites and is in need of diuresis to offload the ascitic fluid. Spironolactone (an aldosterone antagonist) is the first-line treatment for ascites and furosemide (a loop diuretic) is used as an adjunct if there is an insufficient response to spironolactone.

Ascites is a pathological collection of fluid in the abdominal peritoneal cavity and can occur for a number of different reasons. Cirrhosis is the cause in ~75% of cases.

Lactulose is an osmotic laxative which is useful in treating hepatic encephalopathy, however, there were no signs of encephalopathy in this patient (oriented to time place and person).

Indapamide is a thiazide-like diuretic which is not used in the management of ascites.

Thiamine may be of some benefit to this patient as he has a history of alcohol misuse and may be deficient, however, it would not be useful in the management of his abdominal distension.

Further reading:

https://www.bsg.org.uk/resource/bsg-guidelines-on-the-management-of-ascites-in-cirrhosis.html

Question:

A 40-year-old male attends his GP with a spreading rash on the posterior aspect of his thigh. He has recently returned from a camping trip. On examination, there is an erythematous, target-like rash with a central area of erythema.

What is the most appropriate initial treatment?

A. Doxycycline

B. Oral prednisolone

C. Topical hydrocortisone

D. IV Tazocin

E. Monitoring and conservative management

Correct Answer:Doxycycline

Explanation:

The target-like rash, known as erythema migrans and the history of a camping trip suggest a likely diagnosis of Lyme disease. Lyme disease is caused by the bacterium Borrelia burgdorferi and transmitted via tick bite.

The characteristic presenting sign of Lyme disease is erythema migrans, a circular rash at the site of the initial bite that radiates outwards over the course of 30 days. The rash is typically round and can be pink, red or purple. Many patients will clear the infection without any further symptoms, however some patients develop more disseminated Lyme disease if left untreated. Symptoms of disseminated Lyme disease vary significantly, but flu-like symptoms are the most common manifestation. Rarely, neuroborreliosis can develop, which can cause facial nerve palsy, meningitis and encephalitis.

Current NICE guidance recommends the use of oral doxycycline as a first-line treatment in those with suspected Lyme disease.

Oral prednisolone, Tazocin and topical hydrocortisone are not indicated in the treatment of Lyme disease.

Further reading:

https://patient.info/doctor/lyme-disease-pro

Question:

A 25-year-old man arrives by ambulance at the emergency department following a fall from his bicycle. He is clinically stable but complains of pain in his right leg which is swollen and has several abrasions and cuts.

An X-ray confirms a fractured tibia. The patient is admitted overnight, put in a cast, and given liquid morphine. During the night, the patient complains of increasing pain and requires regular liquid morphine which doesn't seem to settle the pain. The cast is removed but the patient still complains of pain. Pain is worst on passive movement, the right leg is colder than the left, and there is numbness and tingling in the common fibular region.

Given the most likely diagnosis, what is the definitive management for this patient?

A. Analgesia

B. Elevate the leg

C. Surgical repair of fracture

D. Antibiotics

E. Fasciotomy

Correct Answer:Fasciotomy

Explanation:

The most likely diagnosis is compartment syndrome because of the increasing pain that is not relieved by analgesia, paraesthesia, and pain worse on passive movement. Compartment syndrome presents with the 6 P's: pain, paraesthesia, perishingly cold, pallor, pulseless, and paralysis. The latter three symptoms are a late (and ominous) sign. Therefore, this patient will likely require a fasciotomy as definitive management if conservative measures fail to address the problem.

Analgesia and elevating the leg are conservative measures that should be tried until orthopaedics can get involved to rule out compartment syndrome and/or perform a fasciotomy to help alleviate swelling and pain. However, only a fasciotomy can cure the underlying problem, especially as removing the cast and analgesia have failed to address the pain.

Antibiotics are only indicated if you suspect infection, e.g. necrotizing fasciitis or cellulitis. While these are possible, it is unlikely to be the cause of his problems as it is so acute and morphine should address the pain.

The fractures may need to be repaired while in theatre to treat the underlying problem, but the immediate issue is to release the pressure via a fasciotomy to preserve nerve function and reduce ischaemia.

Further reading:

https://geekymedics.com/compartment-syndrome/

Question:

A 51-year-old female with a past medical history of several mood disorders presents to the emergency department with a 36-hour history of confusion and slurred speech. Her medications include lithium, sertraline and quetiapine. She was also recently started on ramipril for hypertension.

Her observations are within normal limits. Physical examination is significant for a bilateral hand tremor and ataxic gait.

What is the most likely diagnosis?

A. Neuroleptic malignant syndrome

B. Lithium toxicity

C. Serotonin syndrome

D. Cerebrovascular accident

E. Drug-induced parkinsonism

Correct Answer:Lithium toxicity

Explanation:

This patient’s insidious onset of neurological symptoms (confusion, slurred speech, tremor and ataxia) and the recent addition of ramipril to her medication list is concerning for lithium toxicity. Lithium is a commonly used medication for mood disorders that has a narrow therapeutic index (0.4-0.8 mmol/L). Risk factors for lithium toxicity include low fluid status, concurrent medical illness, thiazide diuretic use, non-steroidal-anti-inflammatory use and angiotensin-converting enzyme inhibitor use. The patient above has recently been prescribed ramipril and therefore is at increased risk of lithium toxicity. Clinical manifestations of lithium toxicity include:

Gastrointestinal: nausea, vomiting and diarrhoea

Cerebral: myoclonus, delirium and coma

Cerebellar: ataxia, slurred speech and poor coordination

Management involves saline infusion, discontinuation of lithium and haemodialysis in severe or refractory cases.

Neuroleptic malignant syndrome is a potentially fatal condition seen mainly in patients taking antipsychotic medications and typically presents with fever, muscular rigidity, altered mental status, leucocytosis and elevated creatinine kinase levels. The patient above has normal observations and no rigidity is appreciated on physical examination.

Serotonin syndrome is classically seen in patients who are taking several agents which increase serotonin levels. Hyperthermia, tachycardia, myoclonus and restlessness are commonly seen.

Although antipsychotic agents do cause dopamine receptor antagonism thereby increasing the possibility of drug-induced parkinsonism, the above patient’s presentation and the recent addition of ramipril to her medication regimen are more concerning for lithium toxicity.

Cerebrovascular accidents are more likely to present with sudden onset of a focal neurological deficit as opposed to a 36-hour history of slurred speech and confusion.

Further reading:

https://patient.info/doctor/lithium

Question:

A 35-year-old obese female is admitted to the acute medical ward with a headache. She has had a constant throbbing headache for around 9 days which is worse in the mornings. In addition, she has felt nauseous for the last 24 hours. She has no other medical problems and takes no regular medications although informs you that she thinks she needs investigation for an underactive thyroid.

On examination, she is of large body habitus. There is papilloedema present on fundoscopy but no other focal neurological findings. She is afebrile.

A CT brain and CT venogram are performed which show no acute abnormalities. A lumbar puncture is also performed which shows an opening pressure of 35 cm H2O. The subsequent CSF analysis is normal and the patient reports some improvement in the headache following the procedure.

What is the most likely diagnosis?

A. Idiopathic intracranial hypertension

B. Cluster headache

C. Tension-type headache

D. Migraine

E. Glioblastoma multiforme

Correct Answer:Idiopathic intracranial hypertension

Explanation:

This patient has raised intracranial pressure and papilloedema in the context of a headache and normal cerebral imaging, therefore the most likely diagnosis is idiopathic intracranial hypertension. The diagnosis is one of exclusion. The 2013 diagnostic criteria include:

papilloedema

an otherwise normal neurological examination

normal neuroimaging

normal CSF composition

elevated CSF opening pressure (over 25 cm H2O)

Attempting fundoscopy on patients with headache is important especially if idiopathic intracranial hypertension is a possibility - the visual loss can be severe and permanent if untreated. Note also the normal CT venogram here which specifically excludes venous sinus thrombosis as a serious and treatable cause of this clinical presentation.

The presentation would not be in keeping with migraine, cluster headache or tension-type headache as none of these would cause raised intracranial pressure.

Glioblastoma multiforme is a cerebral malignancy and is excluded with a normal CT scan.

Further reading:

https://pn.bmj.com/content/14/6/380

Question:

A 54-year-old man presents to the accident and emergency department with pain and swelling in his left leg. The pain and swelling have been worsening since he woke up yesterday morning. He has a history of chronic lymphoedema in both legs, hypertension, and type 2 diabetes mellitus only. He has been generally well recently and is mobile with a walking stick.

Observations:

Temperature 37.1°C

Heart rate 82 bpm

Blood pressure 132/98

Respiratory rate 18/min

Oxygen saturations 96% on room air

On examination, you identify that the left calf is erythematous anteriorly up to the mid-shin, and is hot and tender to the touch over this area. Bilaterally you identify mild pitting oedema up to the knees. Both legs demonstrate scattered varicose veins.

You measure the left calf to be 40 cm in circumference and the right calf to be 35 cm in circumference.

What is the best initial management step?

A. Discharge to the community with oral antibiotic therapy

B. Admit to hospital for treatment dose low-molecular weight heparin

C. Arrange urgent ultrasound imaging of the left leg

D. Admit to hospital for intravenous antibiotic therapy

E. Measure d-dimer

Correct Answer:Measure d-dimer

Explanation:

This question describes a common scenario in clinical practice - differentiating between a deep vein thrombosis (DVT) and cellulitis. The diagnosis, in this case, is likely to be cellulitis. The localised erythema, warmth and tenderness on the anterior calf is in keeping with infection. The calf swelling and leg pain, however, is a red flag for a DVT and as per NICE guidelines, a Wells' score must be performed to risk stratify for DVT.

This patient's Wells' score can be calculated as follows:

Active cancer (treatment/palliation within 6 months): +1

Bedridden recently >3 days/major surgery within last 12 weeks: +1

Calf swelling >3cm compared to other leg: +1

Collateral (non-varicose) superficial veins present: +1

Entire leg swollen: +1

Localised tenderness along the deep venous system: +1

Pitting oedema confined to the symptomatic leg: +1

Paralysis, paresis or recent plaster immobilisation of the lower extremity: +1

Previously documented DVT: +1

Alternative diagnosis to DVT as likely or more likely: -2

This patient's Wells' score is -1 (+1 point for calf swelling >3cm, and -2 points for an alternative diagnosis as likely or more likely).

A score of 0 or less is considered low risk for DVT. As such, the correct next step, in this case, is to perform a d-dimer test. Prevalence of DVT in patients with a score of 0 or less is around 5%; with a negative d-dimer also this drops to <1%.

Scores of 1-2 are considered moderate risk for DVT- patients should have high-sensitivity d-dimer testing and if negative no imaging is required.

A score of 3 or higher is high risk for DVT and all patients should have imaging of the limb. D-dimer should also be performed for risk stratification. A negative ultrasound with a negative d-dimer is sufficient to rule out DVT. A negative ultrasound with a positive d-dimer is still concerning for DVT- ultrasound should be repeated in a week and in the interim, treatment should be initiated.

This patient does not have a Wells' score high enough to warrant urgent ultrasound imaging of the leg. Admitting for treatment-dose low-molecular weight heparin is also not appropriate given the low pre-test probability of a diagnosis of DVT.

Management of cellulitis in the well patient with oral antibiotics in the community is appropriate, but a DVT must be ruled out first. IV antibiotics are used for managing the systemically unwell cellulitis patient.

Further reading:

https://cks.nice.org.uk/cellulitis-acute#!topicsummary

Question:

A 78-year-old female presents to her GP with worsening bone pain and tenderness. She also feels like her muscles are becoming weaker and she has noticed some weight loss. She has a past medical history of hypertension and type 2 diabetes mellitus and takes amlodipine and metformin. Her mobility is poor and she receives support with cooking, shopping and household cleaning.

Blood tests are taken, and the bone profile reveals the following results:

Laboratory test Value Reference Range

Calcium (corrected) 2.06 mmol/L 2.2–2.6

Phosphate 0.6 mmol/L 0.8–1.4

Parathyroid hormone (PTH) 228 ng/L 10–65

Alkaline phosphatase (ALP) 202 U/L 30–130

Based on the likely diagnosis, what is the most appropriate management option?

A. Prednisolone

B. Alendronic acid

C. Vitamin D supplementation

D. Calcitonin

E. Hormone replacement therapy

Correct Answer:Vitamin D supplementation

Explanation:

This patient has osteomalacia. Osteomalacia is the inadequate mineralisation of the osteoid with normal bony tissue caused by vitamin D deficiency. This is known as rickets in children, whose epiphyseal growth plates have not yet fused. This patient has reduced mobility and likely does not leave her home or get enough sunlight, making her high risk for vitamin D deficiency. Vitamin D is essential for calcium and phosphate homeostasis and deficiency leads to reduced bone mineralisation and decreased bone strength. Therefore, vitamin D supplementation is the most appropriate answer. Calcium supplementation can also be offered if dietary calcium intake is adequate.

Alendronic acid is a bisphosphonate and has no role in the management of osteomalacia. Bisphosphonates can be used in the management of osteoporosis and Paget's disease of the bone.

Calcitonin is a calcimimetic that activates calcium-sensing receptors on the parathyroid gland, lowering parathyroid hormone (PTH). PTH levels are raised in this patient due to hypocalcemia. However, calcitonin is not used to manage osteomalacia as vitamin D supplementation will correct the hypocalcemia and thus lower PTH levels. Calcitonin can be used in the management of primary and secondary hyperparathyroidism and parathyroid malignancy.

Hormone replacement therapy has a role in the management of osteoporosis for women who have undergone premature menopause. However, it has no role in osteomalacia.

Prednisolone increases the risk of osteoporosis and does not have a role in the management of osteomalacia. In addition, corticosteroids increase the excretion of calcium, which would further exacerbate this patient's hypocalcaemia.

Further reading:

https://cks.nice.org.uk/topics/vitamin-d-deficiency-in-adults/

Question:

A 63-year-old woman presents to her GP with a 2-month history of a painless lump in her left breast. On examination, there is a craggy lump in the upper outer quadrant of the left breast, which appears tethered to the overlying skin. Following triple assessment, the mass is found to be malignant.

She began her periods at age 14 and went through menopause at 51 years old. She has never been pregnant, and does not smoke or drink alcohol.

Based on the history, what is the biggest risk factor for the likely diagnosis?

A. Lack of smoking

B. Age of menopause

C. Nulliparity

D. 2-month history

E. Age of menarche

Correct Answer:Nulliparity

Explanation:

This patient has breast cancer. Nulliparity is the only aspect of the history provided that is a risk factor for breast cancer. Early age of menarche or late age of menopause would also be risk factors however, this patient started and ended her periods at a normal age. Smoking is another risk factor; lack of smoking is not. Finally, having a 2-month history is not a risk factor, as many benign breast lumps may present within a similar timeframe.

There are many risk factors for breast cancer, and it can be useful to group them into those common to all cancers and those specific to breast cancer.

Common to all cancers:

Older age

Smoking

Alcohol

Irradiation (specifically mantle irradiation)

Specific to breast cancer:

Previous breast cancer

Family history of breast cancer or genetic predisposition

Uninterrupted oestrogen exposure

Early menarche, late menopause or nulliparity

First pregnancy after age 35

Not breastfeeding

Obesity

COCP (combined oral contraceptive pill) use

HRT (hormone replacement therapy) use

Further reading:

https://www.cancer.net/cancer-types/breast-cancer/risk-factors-and-prevention

Question:

A 78-year-old man with a past medical history of myocardial infarction and hypertension presents to his GP. He gives a recent history of fatigue and breathlessness on exertion over the past week, with an episode of syncope the previous day.

An ECG is performed, and the rhythm strip is shown below.

Npatchett, CC BY-SA 4.0, via Wikimedia Commons

What is the most likely diagnosis?

A. Sinus arrhythmia

B. Third-degree heart block

C. Second-degree heart block (Mobitz II)

D. Second-degree heart block (Mobitz I/Wenckebach)

E. First-degree heart block

Correct Answer:Second-degree heart block (Mobitz II)

Explanation:

This patient’s ECG demonstrates second-degree heart block (Mobitz II). In Mobitz II heart block, the PR interval is prolonged, but remains the same length for each conducted beat, before failure of conduction of a P wave leading to a ‘missed, or ‘dropped’ beat. Mobitz II is often the result of structural heart damage such as occurs following myocardial infarction. It is significantly more likely to be symptomatic than Mobitz I block, and significantly more likely to degenerate to complete heart block or asystole.

In first-degree heart block, there is prolongation of the PR interval (> 200ms), but the length of the PR interval remains constant, and each P wave is conducted to the ventricles (i.e. there are no dropped beats). In the absence of underlying disease or symptoms, usually, no action is required.

Sinus arrhythmia describes significant variation in the time between successive P waves (P-P interval), with a constant, non-prolonged PR interval. It is a normal finding, often seen in young, healthy patients. The P-P interval often varies with the respiratory cycle, with inspiration increasing the heart rate, and expiration decreasing the heart rate.

Second-degree heart block (Mobitz I/Wenckeback) demonstrates a prolonged PR interval which, in contrast to Mobitz II, grows progressively longer between beats before failure of conduction leading to a ‘dropped’ beat. There is no progressive prolongation of the PR interval seen on this patient’s ECG, it is constant from beat to beat, before failure of conduction of beat 4.

In third-degree heart block, there is complete dissociation between atrial and ventricular activity, such that P waves do not correspond to QRS complexes in any way. None of the atrial activity is conducted to the ventricles, and ventricular activity is maintained by pacemaker cells distal to the atria (i.e. in the AV junction or ventricles). These ventricular ‘escape’ rhythms are often markedly slower (e.g., 20-60bpm) than normal ventricular activity driven by the SA and AV nodes.

Further reading:

https://litfl.com/heart-block-and-conduction-abnormalities/

Question:

A mother presents to the GP with her 4-year-old infant. She stated that her infant has been having intermittent diarrhoea over the past two weeks. It has been occurring most days at nonspecific times, usually after meals. She has also noticed that he is passing more wind than usual and will sometimes complain of his ‘tummy hurting,’ after having foods. She has noticed that his symptoms seem the worst after consuming full-fat milk, porridge and cheese. He is otherwise his usual self, with no fevers or other symptoms. He is passing good volumes of urine.

The child has a past medical history of eczema which is well controlled with simple emollients. He also had an episode of gastroenteritis 3 weeks ago which has since resolved. He is not taking any regular medication.

Clinical examination is unremarkable and vital signs are normal.

What is the most likely diagnosis?

A. Coeliac disease

B. Mesenteric adenitis

C. Lactose intolerance

D. Gastroenteritis

E. Appendicitis

Correct Answer:Lactose intolerance

Explanation:

The most likely diagnosis is lactose intolerance, likely secondary to his recent episode of gastroenteritis.

Lactose intolerance is the reduced ability to digest milk sugars, due to insufficient amounts of the gut enzyme called lactase. Symptoms include bloating, gas, abdominal pain and diarrhoea. Symptoms occur from one to several hours after ingestion of milk or dairy products.

This child likely has secondary lactose intolerance, which occurs after damage to the intestinal mucosa (i.e. after gastroenteritis, coeliac disease, inflammatory bowel disease). The lactose intolerance resolves a few weeks after the primary pathology resolves.

Gastroenteritis is less likely given the absence of vomiting, fevers or abdominal tenderness on clinical examination.

Coeliac disease is a possibility, although, given the lack of any correlation between symptoms and gluten-containing foods in this scenario and the absence of faltering growth, secondary lactase deficiency is much more likely.

Appendicitis should always be considered in children with abdominal pain, however, the absence of any clinical signs on examination and normal vital signs makes this diagnosis less likely.

Mesenteric adenitis typically causes abdominal pain, but the association of diarrhoea with ingestion of lactose-containing foods would not be explained by this diagnosis.

Further reading:

https://patient.info/doctor/lactose-intolerance-pro

Question:

A 50-year-old man presents to A&E with left-sided flank pain that started early this morning. The pain is described as severe, coming in waves and radiating to his scrotum. He states he cannot get comfortable with the pain and paracetamol has not helped. Alongside the pain, he reports some nausea, dysuria and mild haematuria.

His past medical history is unremarkable and he does not take any regular medications.

Vital signs are as follows:

Temperature 37.3 oC

HR 107 bpm

BP 135/98 mmHg

RR 19

SpO2 98% on room air

Abdominal examination reveals tenderness in the left flank, with no associated guarding or rebound tenderness. Bowel sounds are normal. Testicular examination reveals no erythema, pain or swelling.

Based on the above clinical presentation and most likely diagnosis, what is the most important diagnostic investigation?

A. CT KUB

B. X-ray KUB

C. Ultrasound KUB

D. MAG-3 renogram

E. Urine sample for dipstick, microscopy and culture

Correct Answer:CT KUB

Explanation:

The most important diagnostic investigation in this scenario is a CT KUB. This patient has presented with loin to groin pain associated with lower urinary tract symptoms. He has no infectious features and mild tachycardia, most likely secondary to pain. The most likely diagnosis is renal colic secondary to a renal calculus.

An ultrasound KUB is not as sensitive or specific as a CT KUB at picking up calculi. It is a more appropriate investigation when pyelonephritis is being considered. However, pyelonephritis is unusual in men.

X-ray KUB is not the most appropriate investigation as only approximately 80% of calculi are radio-opaque.

A urine sample would be part of your work up to check for any possible infection but is not the most important investigation.

A MAG-3 renogram would not be appropriate here, this is used to assess kidney function and to assess obstruction downstream from the kidneys.

Further reading:

https://patient.info/doctor/urinary-tract-stones-urolithiasis

Question:

A 17-day-old baby is brought into the hospital by his mother, who is concerned about the fact that he is jaundiced. This initially began around day 5 after birth, but she was reassured that this was likely due to the initiation of breastfeeding and should resolve. However, she believes that her son has become more yellow, and is worried about him.

She describes the birth as being an uncomplicated vaginal delivery, with both her and the baby able to go home very shortly after. Since then, her baby has been feeding and sleeping well, with the heel prick test revealing no abnormalities. She has however noticed that recently his urine appears darker than normal; this appears to have coincided with the increase in apparent jaundice. She wonders if he is dehydrated and whether she needs to encourage him to feed more often.

The paediatric consultant examines the baby; the jaundice is easily visible, and transcutaneous bilirubin measurement reveals that levels are significantly above the normal range for the baby's age. He also notes the presence of an ejection systolic murmur, heard loudest on the left-hand side of the sternum. The consultant orders serum bilirubin levels, which demonstrate an elevated concentration of conjugated bilirubin and based on this result, orders an abdominal ultrasound scan and an echocardiogram. He informs the mother that his concerned about the presence of an underlying congenital syndrome.

What is the most likely diagnosis in this case?

A. Edward's syndrome

B. Patau's syndrome

C. Alagille syndrome

D. Noonan syndrome

E. Williams' syndrome

Correct Answer:Alagille syndrome

Explanation:

The likely explanation for this baby's jaundice is biliary atresia; a congenital failure of the biliary tree to develop, leading to a build-up of bilirubin, as it cannot be excreted into the intestine. The important features in the history that point towards this as a likely diagnosis are the darkening of the urine (pale stools can often accompany this) and increased conjugated bilirubin fraction - these both indicate a post-hepatic origin of the pathology. The liver is still able to conjugate the bilirubin; thus, the problem must lie beyond this, with the biliary system implicated.

The murmur heard on auscultation raises the possibility of structural heart disease; when combined with biliary atresia, the most likely explanation for the two pathologies is Alagille syndrome. This is an autosomal dominant condition (although in this case is likely to have resulted from a de novo mutation given the absence of a family history of the disease) that can present with both biliary atresia and cardiac anomalies; Tetralogy of Fallot, pulmonary stenosis and ventricular septal defect are all possible. Management involves addressing the two pathologies separately - Kasai's procedure can be used to address the biliary problems and consideration of cardiac surgery may be required in the setting of more severe heart defects.

Noonan syndrome is an autosomal dominant condition that can present with heart defects such as pulmonary stenosis (this would fit the murmur in this scenario) as well as a phenotype very similar to that of Turner's syndrome. However, it is not associated with biliary atresia.

Williams' syndrome can cause the development of a characteristic 'elfin' facies in those with the condition, as well as heart defects such as supravalvular aortic stenosis. It would not explain this baby's jaundice, however.

Patau's syndrome and Edward's syndrome are both trisomic disorders affecting chromosomes 13 and 18 respectively. Whilst these can result in a number of abnormalities including heart defects, they are not known to be linked with biliary atresia. Additionally, most individuals do not survive long after birth - this baby has been otherwise well up to this point.

Further reading:

https://rarediseases.org/rare-diseases/alagille-syndrome/

Question:

An 85-year-old woman is referred to a respiratory clinic with shortness of breath. She has an 8-week history of shortness of breath, haemoptysis and associated weight loss. She is a lifelong smoker but has no significant past medical history. Her chest x-ray is reported as normal.

What is the most appropriate next step in her management?

A. CT chest and abdomen

B. Trial of antibiotic therapy and review in 1 month

C. Pulmonary function tests

D. Positron Emission Tomography (PET)

E. Repeat chest x-ray in 6 weeks

Correct Answer:CT chest and abdomen

Explanation:

This woman has several features concerning for lung cancer (haemoptysis, weight loss, smoking history) and needs urgent investigation. The investigation most likely to identify the primary location and the disease staging of her cancer is a CT scan. Trial of antibiotic therapy or a repeat chest x-ray is inappropriate and will delay her diagnosis. Pulmonary function tests and positron emission tomography have a role in the management of cancer, but she needs a diagnosis first.

Further reading:

https://www.nice.org.uk/guidance/ng122

Question:

An 82-year-old man presents to the GP with symptoms of urinary frequency and urgency that have become particularly troublesome at night time. He has not experienced any haematuria. His past medical history includes chronic kidney disease and glaucoma, for which he takes regular latanoprost eye drops.

On examination, the patient’s prostate is found to be appreciably asymmetrical, with one side enlarged and hard. Blood tests are done, including prostate-specific antigen, which is 7 ng/ml. After a referral to a tertiary centre for suspected prostate cancer, imaging of the prostate is done which is evaluated as clinical stage T2.

What Gleason score would indicate, alongside the biochemical and imaging findings, that the patient’s prostate cancer is of low risk?

A. More than 7

B. 8 or less

C. Between 5 and 9

D. 4 or less

E. 6 or less

Correct Answer:6 or less

Explanation:

In patients with prostate cancer, those with serum PSA less than 10ng/ml, clinical stage T1 to T2a disease, and a Gleason score of 6 or less are considered low risk. This has implications for management of the patient, as those in the low-risk group can opt for active surveillance of their cancer rather than upfront surgery or radiotherapy.

The Gleason score is a histological scoring system of prostate biopsies. The most dominant cell type in the biopsy is given a score between 1 and 5 based on its morphology, and this is added to the score of 1 to 5 of the second most dominant cell type. The aggregate score of up to 10 indicates the stage of the disease. A score of 8-10 indicates advanced prostate cancer.

Further reading:

https://www.nice.org.uk/guidance/ng131/chapter/Recommendations

Question:

A 28-year-old female patient attends her GP with new-onset skin lesions. She reports that her hands developed circular skin lesions around 2 weeks previously and have been getting progressively more pronounced. She has a past medical history of autoimmune thyroiditis.

Findings on clinical examination include:

hyperpigmented circular lesions on the dorsal surfaces of the hands over her knuckles

the lesions are comprised of many 1-2mm papules

each circular lesion measures around 3 cm in diameter and is depressed centrally

A skin biopsy reveals the following:

necrobiotic degeneration of dermal collagen with surrounding inflammatory changes

What is the MOST LIKELY diagnosis?

A. Pityriasis rosacea

B. Rheumatoid nodules

C. Lichen planus

D. Sarcoidosis

E. Granuloma annulare

Correct Answer:Granuloma annulare

Explanation:

The most likely diagnosis is granuloma annulare (GA). This skin disorder is common and can be identified by smooth, ring-shaped hyperpigmented plaques (usually located on the dorsal surface of the hands). Risk factors for this condition include diabetes, autoimmune thyroiditis, malignancy and hyperlipidaemia.

There are several forms of this condition, including localised, generalised, subcutaneous, perforating, atypical and interstitial. GA is usually diagnosed clinically, but skin biopsy may be performed which typically reveals necrobiotic degeneration of dermal collagen surrounded by an inflammatory reaction. Management is usually unnecessary as patches are often self-limiting and disappear within a few months.

Lichen planus is unlikely in this case. This condition presents acutely with lesions on the flexor surfaces of the forearms, wrists and legs. Lesions are multiple, violaceous and shiny. Each lesion typically has a diameter of 2-5mm and associated Wickham’s striae (white streaks).

Sarcoidosis is a highly variable disease involving abnormal collections of inflammatory cells that form lumps known as granulomas. It may present with constitutional upset (fever, night sweats, fatigue, weight loss), lung disease (dry cough, fever, dyspnoea), skin manifestations (facial papules, erythema nodosum, lupus pernio) and eye problems (uveitis, dry eyes, glaucoma).

Rheumatoid nodules are less likely in this case as they would most likely be associated with a polyarthritis.

Pityriasis rosacea is less likely in this case. Pityriasis rosea is a viral rash which lasts about 6–12 weeks. It is characterised by a herald patch followed by similar, smaller oval red patches that are located mainly on the chest and back.

Further reading:

https://patient.info/doctor/granuloma-annulare-pro

Question:

A 37-year-old woman is seen in the antenatal clinic for a routine appointment. She is 28 weeks pregnant and has had no problems throughout her pregnancy. On review, she complains of veins on her legs which have developed over the last 2 months which she finds 'unsightly'.

On examination, she has small varicose veins present on both lower limbs. There are no signs of bleeding or scarring.

What is the most appropriate initial management option?

A. Reassure and offer compression stockings

B. Arrange foam sclerotherapy

C. Arrange venous stripping

D. Arrange Duplex ultrasound scan

E. Arrange endothermal ablation

Correct Answer:Reassure and offer compression stockings

Explanation:

It is appropriate to reassure and offer compression stockings for pregnant women with varicose veins in the first instance, as long as there is no significant bleeding. Varicose veins are common in pregnancy and will often improve significantly after delivery.

Investigations such as Duplex ultrasound scanning may be arranged by a vascular service and this is the imaging investigation of choice to help guide management. However, interventions are unlikely to be carried out in pregnancy and so it is appropriate to observe and review after delivery to establish whether referral may be needed. Endothermal ablation and foam sclerotherapy are examples of minimally invasive procedures which are recommended first-line for symptomatic varicose veins following initial investigation. Stripping is the preferred invasive procedure.

Further reading:

https://cks.nice.org.uk/varicose-veins#!scenario

Question:

You are a junior doctor working in General Practice. You are reviewing a 56-year-old woman who has been treated for recurrent urinary tract infections. She is concerned about her increasing urinary urgency and frequency and has had 4 successive courses of antibiotics from several GPs with no real benefit. She reports feeling bloated every day for the last month, has lost her appetite and even when she feels hungry can only manage a very small amount of food before feeling full. She has also been feeling increasingly fatigued. She is usually well with no medical problems and takes no regular medications.

The patient has brought a urine sample to the appointment which, upon dipstick testing, shows no abnormalities. You are able to see her recent microbiology results which show 2 negative urine cultures from the past month.

What is the most appropriate tumour marker to measure in consideration of a potentially serious underlying condition?

A. Carcinoembryonic antigen (CEA)

B. CA 125

C. CA 19-9

D. Chromogranin A

E. CA 15-3

Correct Answer:CA 125

Explanation:

The differential diagnosis is quite broad for this presentation however there should be a significant concern for ovarian cancer, which is often diagnosed relatively late due to initially subtle symptoms. CA 125 is therefore appropriate to test in the investigation of the patient's symptoms.

NICE guidance states that CA 125 should be tested in women '(especially if 50 or over) who report having any of the following symptoms on a persistent or frequent basis – particularly more than 12 times per month'

Persistent abdominal distension - women often refer to this as 'bloating'

Feeling of fullness and/or loss of appetite

Pelvic or abdominal pain

Increased urinary urgency and/or frequency

Unexplained weight loss

Unexplained fatigue

Unexplained changes in bowel habit or symptoms that suggest irritable bowel syndrome

CA 19-9 is associated with pancreatic cancer. Carcinoembryonic antigen is associated with colorectal cancer. CA 15-3 is associated with breast cancer and chromogranin A is associated with neuroendocrine tumours.

Further reading:

https://www.nice.org.uk/guidance/cg122

Question:

A 43-year-old male presents with impaired concentration, confusion and feeling unsteady on his feet. His wife has noticed these symptoms developing over the past 2 weeks. He works as a banker. He is a non-smoker and drinks 80 units of alcohol per week.

On examination, he has an ataxic gait, and on ocular exam nystagmus is noted. He scores 4/10 on the Abbreviated Mental Test.

What is the most likely vitamin deficiency that would explain these symptoms?

A. Vitamin C (ascorbic acid)

B. Vitamin B12 (cobalamin)

C. Vitamin B3 (niacin)

D. Vitamin D (calciferol)

E. Vitamin B1 (thiamine)

Correct Answer:Vitamin B1 (thiamine)

Explanation:

Wernicke's encephalopathy is a degenerative brain disorder caused by the lack of vitamin B1 (thiamine). It may result from alcohol abuse, dietary deficiencies, prolonged vomiting, eating disorders, or the effects of chemotherapy. Wernicke's syndrome is characterised by three main clinical symptoms:

Mental status changes (e.g., confused state)

The inability to coordinate voluntary movement (ataxia)

Eye abnormalities (double vision, nystagmus, ophthalmoplegia or ptosis).

Vitamin C deficiency can cause scurvy which leads to symptoms of weakness, anaemia, gum disease, and skin problems.

Vitamin D deficiency can lead to loss of bone density which can contribute to osteoporosis and fractures. In children, it can cause rickets which causes bones to become

Vitamin B3 (niacin) deficiency can result in a condition called pellagra which consists of a triad of dermatitis, dementia, and diarrhoea.

Vitamin B12 deficiency can manifest as weakness in muscles, nerve problems such as numbness or tingling, fatigue, depression, or memory loss.

Further reading:

https://rarediseases.org/rare-diseases/wernicke-korsakoff-syndrome/

Question:

You are asked to see a 64-year-old gentleman with jaundice. He first noticed his skin turning yellow last week. This change is associated with pale, chalky stools and mild pain just under his right costal margin. His wife accompanying him adds that he has gone off his food and his trousers no longer fit him due to weight loss. He has a past medical history of primary sclerosing cholangitis (PSC).

On examination he is jaundiced. Palpation reveals tenderness in his right upper quadrant and the liver edge is 2 cm below the costal margin. He is normothermic.

Blood tests reveal microcytic anaemia, hyperbilirubinaemia and deranged LFTs (obstructive pattern).

What is the most likely diagnosis?

A. Ascending cholangitis

B. Obstructive choledocholithiasis

C. Pancreatic cancer

D. Hepatocellular carcinoma (HCC)

E. Cholangiocarcinoma

Correct Answer:Cholangiocarcinoma

Explanation:

Cholangiocarcinoma is the most likely diagnosis.

Cholangiocarcinoma is a carcinoma arising in any part of the biliary tree from the small intrahepatic bile ducts to the ampulla of Vater at the distal end of the common bile duct. More than 90% of cholangiocarcinomas are ductal adenocarcinomas and the remainder are squamous cell tumours.

This case describes a patient with jaundice and pale stools signifying biliary obstruction. All of the answer options could cause obstructive jaundice, however, the presence of weight loss and anorexia are more suggestive of malignancy. Of the 3 answer options involving malignancy, cholangiocarcinoma is most likely due to its association with primary sclerosing cholangitis (PSC). PSC has a strong association with cholangiocarcinoma, with 10-20% of patients developing cholangiocarcinoma in their lifetime. Other cholangiocarcinoma risk factors include liver flukes, hepatitis C, HIV and liver cirrhosis.

Ascending cholangitis is an infection of the biliary system caused by obstruction. This obstruction can be due to biliary stones, strictures (as in PSC) or tumours. The condition is diagnosed by a triad of jaundice, right upper quadrant pain and fever (Charcot’s triad). This diagnosis is unlikely in this scenario given the presence of weight loss, absence of fever and absence of a neutrophilia on the full blood count.

Cancer of the head of pancreas causes painless obstructive jaundice. This diagnosis is less likely given the presence of abdominal pain (a rare late sign of pancreatic cancer) and the association of cholangiocarcinoma with PSC.

Obstructive choledocholithiasis involves the blockage of the biliary system by a gallstone. It typically presents with right upper quadrant pain and jaundice (but not weight loss). There is often a history of gallstones (i.e. intermittent colicky right upper quadrant pain).

Hepatocellular carcinoma (HCC) is a type of primary liver cancer. It is associated with chronic liver disease (viral hepatitis, non-alcoholic fatty liver disease, alcoholic liver disease and primary biliary cirrhosis). HCC typically presents with jaundice, weight loss and decompensated liver failure.

Further reading:

https://patient.info/doctor/cholangiocarcinoma

Question:

A 27-year-old woman is admitted to the high dependency unit with a life-threatening exacerbation of her asthma. She has been slowly improving when she develops sudden onset hypotension and hypoxia.

What is the most likely mechanism for her hypotension?

A. Neurogenic shock

B. Cardiogenic shock

C. Hypovolaemic shock

D. Obstructive shock

E. Distributive shock

Correct Answer:Obstructive shock

Explanation:

This lady has most likely developed a tension pneumothorax as a complication of her asthma with associated obstructive shock.

Potential causes of obstructive shock include:

Massive pulmonary embolus

Atrial thrombus or myxoma

Other emboli (e.g. air, amniotic fluid)

Cardiac tamponade

Abdominal compartment syndrome

Tension pneumothorax

Caval compression

Further reading:

https://lifeinthefastlane.com/ccc/shock-ddx/

Question:

A 37-year-old gentleman is seen for follow-up in general practice. He has recently undergone investigation for bilateral hand paraesthesia which has shown bilateral carpal tunnel syndrome.

On further questioning, he reports that his wedding ring no longer fits and his favourite pair of work shoes now also seem too small. He is also awaiting an appointment with his dentist as he feels his bite has changed.

What is the most likely diagnosis?

A. Rheumatoid arthritis

B. Hypothyroidism

C. Osteoarthritis

D. Acromegaly

E. Prolactinoma

Correct Answer:Acromegaly

Explanation:

Acromegaly is a rare but notable cause of carpal tunnel syndrome, particularly when this is bilateral. In addition to this, patients may present with a range of symptoms including:

amenorrhea

loss of libido

increased sweating

snoring

arthralgia

growth of hands and feet

malocclusion of teeth and macroglossia

coarsening of facial features

weight gain

Osteoarthritis and rheumatoid arthritis cause joint pains and although there is a relationship between rheumatoid arthritis and carpal tunnel syndrome, this would not explain the other features. Hypothyroidism can also be associated with carpal tunnel syndrome but would not account for the other symptoms present. A prolactinoma classically causes bi-temporal hemianopia if large enough alongside symptoms of increased serum prolactin levels.

Further reading:

https://patient.info/doctor/acromegaly-pro

Question:

A 32-year-old woman (gravida 3, para 2), at 33-weeks gestation, presents to the emergency department with vaginal bleeding. She also describes some mild to moderate abdominal pain of a few hours' duration. She describes the vaginal bleeding as "dark" and "continuous" for about two hours. She does not report any trauma to her abdomen and was resting when the pain began.

She has no past medical history but reports her blood pressure has been "running high" at her recent antenatal checks.

On examination, her temperature is 37.0°C, pulse 91/min, blood pressure 140/92mHg and SpO2 98% on room air. The fundal height measures 35cm. The uterus is hard and tender to palpation.

Continuous maternal and foetal monitoring are started.

Which of the following investigations should be performed initially in this patient?

A. Transvaginal ultrasound

B. Speculum examination

C. Placental pathology

D. CT pelvis

E. MRI pelvis

Correct Answer:Transvaginal ultrasound

Explanation:

The most likely diagnosis in this patient is placental abruption - a condition characterised by partial or complete separation of the placenta from the uterus before delivery. Placental abruption is an important cause of antepartum haemorrhage (APH). This patient has several suggestive features of placental abruption, including recent hypertension, multiparity, abdominal pain and vaginal bleeding. Additionally, her uterus is hard and tender on examination. It is important to exclude other causes of antepartum haemorrhage in this workup; therefore the most suitable initial investigation is a transvaginal ultrasound (TVUS). It is important to note that the detection rate of placental abruption is often low with TVUS. Therefore, TVUS has a good positive predictive value but a poor negative predictive value; it can be used as an initial test but should not be used to exclude abruption.

In some cases, placental pathology may help give insight into the underlying cause of the abruption, especially if there is a long-standing pathological process. However, as this patient is currently stable and pre-term, the placenta should not be sampled at this time.

Whilst the most likely diagnosis in this patient is placental abruption, owing to the painful nature of the bleed, speculum examination should be avoided until placenta praevia has been excluded through TVUS.

An MRI pelvis is typically only considered in patients where TVUS findings are negative or inconclusive. MRI imaging can accurately detect placental abruption; however, it should not be considered part of the initial investigations.

A CT pelvis may be considered to evaluate the placenta and pelvic structures in patients with a suspected placental abruption secondary to traumatic injury. However, as this patient does not have a history of trauma, CT imaging would not be deemed appropriate as an initial investigation.

Further reading:

https://www.rcog.org.uk/globalassets/documents/guidelines/gtg\_63.pdf

Question:

A 15-year-old girl presents to her GP with a history of worsening painful facial ‘spots’ over the past year. She states these are not improving despite hygiene measures, and are causing increasing psychological distress. On examination, there are a number of open and closed comedones. In some cases, the spots have resolved to leave behind some residual scarring. There is no overt evidence of associated inflammation. She has no significant past medical history, takes no regular medications, and has no allergies. She is otherwise systemically well.

She is diagnosed with acne vulgaris of moderate severity.

What is the most appropriate next step in the management of this patient?

A. Topical adapalene

B. Erythromycin

C. Combined oral contraceptive pill

D. Doxycycline

E. Isotretinoin

Correct Answer:Topical adapalene

Explanation:

NICE recommends consideration of topical treatment such as adapalene (a topical retinoid), topical antibiotics, or topical azelaic acid as the first-line choice in the management of moderate-severe acne vulgaris. It is important to note that retinoids are contraindicated in pregnancy.

Combined oral contraceptives, in combination with topical agents, can be considered as an alternative to systemic antibiotics in women with moderate-severe acne which is not responding to topical therapy. It may be particularly useful in patients experiencing flares of acne associated with menstrual periods if other treatments are ineffective.

Tetracycline antibiotics (such as doxycycline) are indicated in the treatment of moderate-severe acne with inflammation, in combination with topical retinoids. Tetracyclines are contraindicated in pregnancy, as they can affect tooth and bone development.

Macrolide antibiotics (such as erythromycin) should generally be avoided due to high levels of P. acnes resistance but can be used if tetracyclines are contraindicated (for example in pregnancy if treatment is felt to be necessary).

Isotretinoin (‘Roaccutane’) is an oral retinoid that can only be commenced on the recommendation of a consultant dermatologist to treat severe acne resistant to other forms of treatment. Retinoids are strictly contraindicated in pregnancy due to the extremely high risk of significant birth defects. Patients should have a pregnancy test prior to commencing oral isotretinoin, and monthly while taking treatment.

Further reading:

https://cks.nice.org.uk/topics/acne-vulgaris/management/primary-care-management/

Question:

A 54-year-old man presents with progressive weakness of his arm and legs. This started 3-months ago with weakness initially worse in the arms. He describes episodes of muscle twitching and cramping and is increasingly fatigued.

On examination of the upper limbs, there is noticeable small muscle wasting, reduced tone, reduced power and hyperreflexia. Sensation is intact throughout. Fasciculations of the tongue are also noted.

What is the diagnostic investigation for this condition?

A. Electromyography

B. Nerve conduction studies

C. Lumbar puncture

D. MRI spine

E. Repetitive nerve stimulation

Correct Answer:Electromyography

Explanation:

This case demonstrates motor neurone disease (MND), specifically amyotrophic lateral sclerosis (ALS). It is characterised by progressive limb, trunk and facial muscle weakness, increased fatigue, dysarthria, small muscle wasting, and fasciculations. On examination, a mixture of upper and lower motor neurone features are seen, and sensation remains unaffected. The aetiology is unknown, but the condition commonly affects the anterior horn cell body. Electromyography is the diagnostic investigation and demonstrates a reduced number of action potentials with increased amplitude and fibrillation at rest.

Nerve conduction studies are normal, as the pathology is in the anterior horn cell meaning peripheral nerves remain intact.

Whilst an MRI spine can help to exclude alternative pathologies (e.g. cervical cord compression and myelopathy), it is not diagnostic for MND.

Repetitive nerve stimulation is the diagnostic investigation for myasthenia gravis and demonstrates a diminished response to repetitive stimulation. It can be used if there is clinical doubt between MND and myasthenia gravis, and whilst it may be abnormal in >50% of patients with MND, it is not diagnostic.

Lumbar puncture is typically normal in MND and has no diagnostic value.

Further reading:

https://patient.info/doctor/motor-neurone-disease-pro

Question:

A 54-year-old lady presents with a few months history of difficulty swallowing. She describes the difficulty as ‘’on and off’’ and she has noticed that she has lost some weight during this time. She also reports a sensation of bringing food back up into her mouth, which is worse at night. She is otherwise fit and well, her past surgical history includes a cholecystectomy at the age of 48. She has never smoked and only drinks alcohol very occasionally.

What is the gold standard investigation for the likely diagnosis?

A. Oesophageal manometry

B. Barium swallow

C. CT cervical spine

D. Chest X-ray

E. Upper GI endoscopy

Correct Answer:Oesophageal manometry

Explanation:

This lady most likely has a diagnosis of achalasia. Achalasia is a disorder of lower oesophageal motility, in which peristalsis and the function of the lower oesophageal sphincter become impaired. This ultimately results in functional stenosis of the lower oesophagus. The condition presents with intermittent dysphagia, fluid regurgitation (worse at night) and weight loss. Patients may also develop aspiration pneumonia.

Manometry of the oesophagus is the gold standard investigation and can detect up to 90% of cases. It may show diagnostic features, such as a high resting pressure in the cardiac sphincter, incomplete relaxation on swallowing and absent peristalsis.

An upper GI endoscopy is typically performed first-line to exclude malignancy, however, it has a low sensitivity for the diagnosis of early achalasia.

A barium swallow shows characteristic signs, with a classic ‘bird beak’ appearance from the dilated proximal oesophagus and narrow distal oesophagus. However, in early disease, this may be reported as normal.

A chest x-ray may show a very dilated oesophagus, with a small or absent gastric bubble, but is not diagnostic.

CT of the cervical spine has no role in the diagnosis of achalsia. The gastroesphageal junction is around T10/T11.

Further reading:

https://patient.info/doctor/achalasia-pro#nav-2

Question:

A 64-year-old male presents to the emergency department with a 2-day history of acute abdominal pain and bilious vomiting. His past medical and drug history are unremarkable, apart from an open appendectomy 15 years ago.

His observations are stable and he is afebrile. On examination, his abdomen is generally tender and tinkling bowel sounds are audible on auscultation. A 3-inch scar is visible in the right iliac fossa.

What is the most appropriate initial management step?

A. IV antibiotics

B. Urgent laparotomy

C. VTE prophylaxis

D. IV fluids and nasogastric decompression

E. Flatus tube insertion

Correct Answer:IV fluids and nasogastric decompression

Explanation:

This patient is likely presenting with small bowel obstruction (SBO). It typically presents with early vomiting and late constipation, with adhesions being the most common cause. Patients with SBO generally undergo initial non-surgical treatment and continued resuscitation, unless there are signs of shock or bowel strangulation/ischaemia. These patients are typically dehydrated and require resuscitation with large volumes of IV fluids and a nasogastric (NG) tube to decompress the stomach and prevent further vomiting and potential aspiration. This is known as 'drip and suck'.

Whilst antibiotics should be given if there are clinical features of bowel perforation or before surgery, this is not the most appropriate initial management in this stable patient. Antibiotics may be prescribed later, but first, urgent resuscitation with IV fluids and NG tube decompression is required.

Urgent laparotomy may be required in SBO with signs of haemodynamic instability, bowel strangulation or perforation, or if the patient does not improve with non-surgical management. However, following the ABCDE algorithm, IV fluids and NG tube insertion would be carried out first.

Sigmoid volvulus (a cause of large bowel obstruction) can be managed with sigmoidoscopy and the insertion of a flatus tube. However, the initial principles of ABCDE take priority here whilst stabilising the patient. In addition, this history indicates small bowel obstruction, making a sigmoid volvulus unlikely.

VTE prophylaxis is an important consideration as this patient will likely require prophylaxis as an inpatient. However, stabilising the patient using an ABCDE approach should be prioritised before performing a VTE risk assessment.

Further reading:

https://www.rcemlearning.co.uk/reference/bowel-obstruction/#1568203212729-dfe98ef4-f07c

Question:

A 50-year-old woman has just arrived in the UK from Nigeria and is complaining of a 1-day history of muscle aching and fever. She emigrated to the UK 5 years ago and has just spent the last month visiting family in her home town. Whilst she was away, she did not take malaria chemoprophylaxis.

On examination, she is pyrexial with a temperature of 38.1, and she is experiencing rigors. She has a blood pressure of 110/90mmHg. She is alert and able to answer questions. Abdominal examination demonstrates right upper quadrant tenderness and organomegaly. Otherwise, her examination is normal, with no signs of jaundice, bleeding or respiratory distress. She is able to swallow.

A rapid diagnostic test for malaria is conducted and is positive. Giemsa-stained thick and thin blood films confirm a diagnosis of Plasmodium falciparum malaria, with a parasitaemia of 2%. An arterial blood gas is obtained and is normal. Blood tests demonstrate Hb 100g/dL and eGFR >90.

A diagnosis of uncomplicated malaria is made.

What is the single most appropriate option for the management of this patient?

A. Doxycycline

B. Quinine

C. Artemisinin-based combination therapy (ACT)

D. Artesunate (oral)

E. Artesunate (IV)

Correct Answer:Artemisinin-based combination therapy (ACT)

Explanation:

The most appropriate management of this patient would be artemisinin-based combination therapy (ACT) for 3 days. This patient appears to have uncomplicated malaria based on her haemodynamic stability, examination findings and investigations. Severe malaria would be indicated by clinical signs that may include impaired consciousness, convulsions, respiratory distress, circulatory collapse (including systolic BP <80mmHg), jaundice, signs of bleeding or pulmonary oedema; or laboratory findings including renal impairment, hyperparasitaemia (i.e. >10%) and metabolic acidosis. This patient is also able to swallow, and therefore oral treatment can be given rather than the need for parenteral treatment. Multiple oral regimens are available, including artemisinin-based combination therapy (e.g. artemether/lumefantrine) or quinine (in combination with another agent such as doxycycline or clindamycin). Artemether/lumefantrine is usually given for 3 days.

Although quinine (oral) for 3 days is a regimen that can be used in the treatment of uncomplicated malaria, in non-pregnant patients it needs to be given in combination with another agent, usually doxycycline or clindamycin. Quinine can be given for 3-7 days depending on local guidelines, and the secondary agent will usually be given for 7 days. This is also the reason why doxycycline is incorrect.

Artesunate (IV) is contraindicated at this stage. Artesunate is indicated in severe malaria infection rather than uncomplicated malaria infection. Artesunate IV is given in the treatment of severe malaria until the patient can tolerate oral artesunate. Artesunate (oral) is also incorrect as this patient has uncomplicated rather than severe malaria. Even in severe malaria IV artesunate will usually be given initially before switching to oral artesunate.

Further reading:

https://patient.info/doctor/malaria-pro

Question:

An 18-year-old female presents to her GP with abnormal vaginal discharge. She reports a foul-smelling, green discharge for the past three days. She has also experienced pain whilst urinating. The patient reports having unprotected sex with two new sexual partners in the last month. She has no known allergies.

A vulvovaginal swab is taken. Microscopy reveals gram-negative intracellular diplococci.

What is the most appropriate management option?

A. Oral metronidazole

B. Oral doxycycline

C. Oral azithromycin

D. IM ceftriaxone

E. IM benzathine benzylpenicillin

Correct Answer:IM ceftriaxone

Explanation:

This patient's vulvovaginal swab has identified gonorrhoea. Gonorrhoea is caused by the Neisseria gonorrhoeae bacteria, which are gram-negative intracellular diplococci. The first-line treatment for gonorrhoea is a single dose of IM ceftriaxone.

IM benzathine benzylpenicillin is used in the management of syphilis.

Oral azithromycin or oral doxycycline are used in the management of chlamydia. A single dose of azithromycin or a one week course of doxycycline is commonly used.

Oral metronidazole is indicated in the management of trichomonas vaginalis

Further reading:

https://bnf.nice.org.uk/treatment-summary/genital-system-infections-antibacterial-therapy.html

Question:

A 50-year-old male presents to his general practitioner with complaints of shakiness in both of his hands for the past 2 months. He states that only his hands are affected and denies any limb weakness or sensory change. The shakiness worsens when he is using a knife and fork or when he holds a cup in his hand. He states that drinking alcohol seems to make the tremor better. The patient denies recent night sweats, weight loss, gastrointestinal symptoms, skin changes or any falls.

His observations are normal. Physical examination reveals a fine tremor in both hands, however, there is no bradykinesia or rigidity. Examination of the patient’s gait reveals a normal stepping pattern with no shuffling or wide-stepping.

What is the most likely diagnosis?

A. Huntington's disease

B. Alcohol withdrawal

C. Parkinson’s disease

D. Hyperthyroidism

E. Essential tremor

Correct Answer:Essential tremor

Explanation:

The patient in the above scenario has a bilateral tremor that is dampened by the effects of alcohol. This is consistent with a diagnosis of essential tremor (ET). ET is a benign condition that becomes more common as patients get older. Most patients are likely to present with bilateral tremor (unlike in Parkinsonian tremor). Patients typically do not have other neurological findings such as rigidity, bradykinesia or gait abnormalities.

Parkinson’s disease (PD) is an unlikely diagnosis in the above patient as he does not present with other findings (bradykinesia, rigidity, gait abnormalities) that are likely to be seen in patients with PD. Additionally, PD typically presents with a pill-rolling tremor that is unilateral or markedly worse on one side.

Hyperthyroidism can present with tremor, however other systemic findings of an overactive thyroid gland are also likely to be seen such as weight loss, anxiety, diarrhoea, heat intolerance and irritability.

This patient is highly unlikely to be experiencing alcohol withdrawal. Clinical findings of AW include tachycardia, sweating, anxiety and hallucinations. The patient in the above question has stable vital signs and appears to be comfortable.

Huntington's disease is a fatal, autosomal dominant disease that presents in young patients with chorea, personality changes, psychosis, progressive dementia and gait abnormalities. Neuroimaging classically demonstrates caudate nuclei atrophy.

Further reading:

https://patient.info/doctor/tremor-pro

Question:

A 23-year-old man presents to the emergency department with a painful red eye. He drove himself to the department but with difficulty due to a change in his vision. On examination, visual acuity is 6/30 on the right, with proptosis and painful eye movements. The left eye remains unremarkable. Past medical history is relevant for type 1 diabetes mellitus, managed with inuslin.

Given the most likely diagnosis, what is the most appropriate management option?

A. Send home with oral antibiotics

B. Admit for intravenous antibiotics

C. Prescribe chloramphenicol eye drops

D. Admit for observations for four hours

E. Organise optician review for reduced visual acuity

Correct Answer:Admit for intravenous antibiotics

Explanation:

The most appropriate management option here is to admit the patient for intravenous antibiotics with the most likely diagnosis being orbital cellulitis. Orbital cellulitis is a bacterial infection of the eye that spreads behind the orbital septum. Patient's typically present with a swollen red eye, reduced visual acuity, and pain on moving the eye. This is a sight and life-threatening condition and needs prompt referral to the emergency department.

Sending the patient home with oral antibiotics is not a suitable option here. This patient has orbital cellulitis and needs intravenous antibiotics as this can target the infection quickly. Oral antibiotics may be used after certain doses of the intravenous antibiotics have been given, but initially, this patient needs intravenous antibiotics to treat this serious infection.

Admitting the patient for observations is a suitable step in this patient’s management plan; however, it is not the most appropriate out of all the options. This patient will need to be admitted and firstly given intravenous antibiotics. Alongside this, he will also need close monitoring, including monitoring his observations. So although this is a correct answer, it is not the most important next step for this patient.

Prescribing chloramphenicol eye drops is not a suitable next step for this patient. Chloramphenicol eye drops are antibiotic eye drops that can be used in some eye infections such as conjunctivitis. However, topical eye drops are not an appropriate management option for orbital cellulitis.

Organising an optician review for reduced visual acuity is not a suitable next step for this patient. The reason this patient has reduced visual acuity is due to orbital cellulitis, and so the aim of treatment should be to manage the infection and monitor the visual acuity. An optician review may be appropriate at a later date if reduced visual acuity remains a problem.

Further reading:

https://geekymedics.com/orbital-and-periorbital-cellulitis/

Question:

A 65-year-old male attends the emergency department complaining of generalised abdominal pain. He explains that it started suddenly 1 hour ago, and describes the pain as severe and constant. The patient has vomited once since the pain began, and he comments that he has also experienced an episode of diarrhoea mixed with blood.

His past medical history is significant only for atrial fibrillation and a cholecystectomy 20 years ago. The patient is a current smoker with a 40-pack-year history and denies any recent alcohol use.

On examination, the abdomen is non-distended and there is moderate tenderness across all abdominal regions.

An arterial blood gas is performed which shows the following results:

pH: 7.33

PaCO2: 5.2 kPa

PaO2: 12 kPa

HCO3:17 mEq/L

Base excess: -4 mmol/L

Which of the following is the most likely diagnosis?

A. Acute mesenteric ischaemia

B. Irritable bowel syndrome (IBS)

C. Acute pancreatitis

D. Diabetic ketoacidosis

E. Sigmoid volvulus

Correct Answer:Acute mesenteric ischaemia

Explanation:

The most likely diagnosis is acute mesenteric ischaemia, a surgical emergency where the vascular supply to the small bowel is compromised. Patients with atrial fibrillation are at an increased risk of developing thromboembolism that can lead to an acute occlusion of one of the mesenteric arteries. The subsequent ischaemia leads to intense pain, and damage to the intestinal mucosa can present as rectal bleeding with diarrhoea. An arterial blood gas in patients with acute mesenteric ischaemia typically reveals metabolic acidosis.

Irritable bowel syndrome (IBS) is a chronic condition that includes a spectrum of otherwise unexplained gastrointestinal symptoms such as abdominal pain, bloating and constipation. An arterial blood gas abnormality would not be expected in a patient presenting with IBS, and the acute nature of this patient’s presentation suggests an alternative diagnosis.

Diabetic ketoacidosis is a metabolic complication of type 1 diabetes mellitus, and can also present with abdominal pain, vomiting and metabolic acidosis. This is unlikely in this scenario given the patient's age and would not explain the presence of bloody diarrhoea.

Acute pancreatitis is an important differential in this case, as it also often presents with sudden-onset, severe abdominal pain accompanied by vomiting. The pain from acute pancreatitis is typically more localised to the epigastric region, and it would be very unusual for pancreatitis to cause bloody diarrhoea. Also, the patient’s abstinence from alcohol and history of cholecystectomy further lowers the likelihood of this diagnosis.

Sigmoid volvulus occurs when part of the sigmoid colon twists on its mesentery, leading to an obstruction of the large bowel. Typical presenting features include abdominal pain/distension, vomiting and constipation (rather than diarrhoea).

Further reading:

https://patient.info/doctor/bowel-ischaemia

Question:

A 5-year-old boy is brought to the general practitioner with multiple honey-crusted lesions on his face and forearms. The mother of the child states the first lesion appeared on the child's face 10 days ago and the lesions have since spread to his arms. He does not have any other medical problems and is up to date with his vaccinations. He takes no medications.

The child has a mild fever, but his other observations are normal

What is the most likely diagnosis?

A. Erythema multiforme

B. Staphylococcal scalded skin syndrome

C. Stevens-Johnson syndrome

D. Impetigo

E. Dermatitis herpetiformis

Correct Answer:Impetigo

Explanation:

Impetigo is a contagious bacterial infection that is most commonly seen in the paediatric population. The infection is classically caused by group A Streptococcus and Staphylococcus aureus. Children living in warm, humid climates are most commonly affected. Skin lesions typically begin as papules and vesicles which eventually break down to give a characteristic golden or honey-coloured crusted appearance. Lesions typically occur on the face and limbs and systemic manifestations are minimal. Topical treatment can be used for localized disease, however, an oral antibiotic like flucloxacillin should be prescribed for severe infections.

Stevens-Johnson syndrome is a life-threatening dermatological problem characterised by fever and skin necrosis that typically involves more than one mucous membrane. It is most commonly associated with adverse drug reactions to drugs such as allopurinol, lamotrigine and other anti-epileptic medications. Treatment involves referral to a specialist unit, aggressive intravenous hydration with electrolyte correction and withdrawal of the offending agent.

Dermatitis herpetiformis is a skin disease characterised by grouped vesicles or papules that cause severe pruritus, burning or stinging. Of note, it is strongly associated with coeliac disease.

Staphylococcal scalded skin syndrome is a condition characterised by a generalised erythematous rash caused by certain strains of Staphylococcus aureus. Patients typically present with fever, irritability, skin lesions and a positive Nikoslky sign (separation of the epidermal layer with gentle rubbing).

Erythema multiforme is a dermatological disorder characterised by macules and papules that resemble targets. It is typically associated with infections such as Mycoplasma pneumoniae or medications such as sulfa- drugs.

Further reading:

https://patient.info/doctor/impetigo-pro

Question:

A 45-year-old woman is admitted to the surgical ward to undergo a sigmoid colectomy for diverticular disease. Her past medical history includes type 1 diabetes, for which she is prescribed a basal-bolus regime. Her blood glucose is usually poorly controlled. The surgery is scheduled for the following morning and she is kept nil by mouth from midnight before.

How should her insulin be managed?

A. Continue as normal

B. Stop long-acting insulin the day before surgery

C. Double long-acting insulin

D. Start variable rate insulin infusion

E. Stop long-acting insulin the day of surgery

Correct Answer:Start variable rate insulin infusion

Explanation:

Variable-rate insulin infusion (VRII) should be commenced for insulin-dependent patients fasting for more than one meal or whose diabetes is poorly controlled. This patient fulfils both of these criteria. VRII rate is determined by regular capillary blood glucose measurements, with the aim to control glucose levels within a specified range. Its indications are specific, but generally, it is used to manage patients with known diabetes who are unable to eat or drink, who are vomiting, acutely unwell, or where adjusting their own insulin regimen isn't possible.

Continuing as normal would likely lead to hypoglycaemia in this fasting patient, and so is incorrect.

Doubling long-acting insulin would not be appropriate, as this would almost certainly lead to severe hypoglycaemia.

As this patient is on a basal-bolus regime and is currently administering long-acting insulin, this should be continued alongside starting the VRII. However, the long-acting insulin dose should be reduced by 20% during the peri-operative period. This is in order to reduce the risk of rebound hyperglycaemia once the VRII is stopped. Therefore, stopping the long-acting insulin is incorrect.

Further reading:

https://bnf.nice.org.uk/treatment-summary/diabetes-surgery-and-medical-illness.html

Question:

A 70-year-old man presents with a 4-month history of vague epigastric discomfort. He has lost 10 kg and has had pale stools, dark urine, and pruritus. He has no medical history and smokes 30 cigarettes daily. He has no nausea, vomiting, or changes in bowel habits.

On examination, he is jaundiced, and a non-tender right upper quadrant mass is present.

An abdominal CT scan demonstrates simultaneous dilatation of the common bile and pancreatic ducts with liver metastases. A multidisciplinary discussion reveals that the extent of the disease is unresectable.

What is the most appropriate management option to offer?

A. Pancreaticoduodenectomy

B. Endoscopic duodenal stenting

C. Analgesia and medical supportive care for symptoms only

D. Palliative gastrojejunostomy

E. Endoscopic biliary stenting

Correct Answer:Endoscopic biliary stenting

Explanation:

Endoscopic biliary stenting is correct. Any patient presenting with painless jaundice and unexplained weight loss should raise suspicion of pancreatic cancer. Courvoisier's law states that in painless jaundice, a palpable gallbladder is unlikely to be due to gallstones and should raise suspicion of malignancy, such as pancreatic cancer. The CT scan showing simultaneous dilatation of the common bile and pancreatic ducts (known as the ‘double duct sign’) supports this diagnosis. As the multidisciplinary team have decided that this is unresectable, palliative care measures should be offered. One of these options is endoscopic biliary stenting. This can relieve jaundice and its associated pruritus, improving the quality of life for the patient.

Although analgesia and medical supportive care for symptoms form an important part of palliative care, there is nothing to suggest that this patient is unsuitable for endoscopic biliary stenting, to manage the jaundice and pruritus. It would be inappropriate not to offer this option as it leaves the patient unnecessarily suffering.

A pancreaticoduodenectomy (Whipple procedure) is a form of pancreatic resection, in which the head of the pancreas, the duodenum, the bile duct, and the gallbladder are removed. As it has been decided that the disease is unresectable, this would not be appropriate to offer.

A palliative gastrojejunostomy is a surgical procedure in which an anastomosis is formed between the stomach and jejunum to bypass the duodenum. It is considered in patients with gastric outlet or duodenal obstruction caused by the malignancy. This patient has no nausea, vomiting, abdominal pain or distention, or changes in bowel habit, therefore at this point, it would not be necessary as it carries its own risks such as infection and failure.

Endoscopic duodenal stenting would be considered if this patient had signs and symptoms of small bowel obstruction due to pancreatic cancer. As they have no changes in bowel habits, and no nausea or vomiting, this step is not necessary. It may be considered as another palliative measure should a bowel obstruction arise in the future.

Further reading:

https://geekymedics.com/pancreatic-cancer/

Question:

Malachi, an 8-month-old baby boy, is brought into the GP practice by his parents as he has been vomiting after meals. He has also been constipated for the last few days and his growth has slowed. He was previously a fit and well baby, with an uncomplicated pregnancy and birth in the UK. He is up to date with his vaccinations and is on no regular medications.

Malachi was exclusively breastfed until 6 months, at which point mum started weaning him with soft foods and bottles of cow's milk.

On examination, he is active and alert, though quite pale. He appears well hydrated and his abdomen is soft and not tender. There is an eczematous rash around his mouth. Malachi is afebrile, and his observations are all within normal limits.

In his red book, you see that he has dropped from the 75th centile to below the 50th centile in terms of weight.

What is the most likely diagnosis for Malachi?

A. Cystic fibrosis

B. Pyloric stenosis

C. Hirschsprung disease

D. Cow's milk protein allergy

E. Colic

Correct Answer:Cow's milk protein allergy

Explanation:

Malachi has a cow's milk protein allergy (CMPA), suggested by the atopic rash, vomiting and the faltering growth associated with a change in his milk intake. These babies can have a colicky pain and are therefore often diagnosed initially with simple colic. However, simple colic would not cause any problems with weight gain.

Cystic fibrosis (CF) is an important diagnosis to consider in the context of faltering growth. However, Malachi was born in the UK and therefore should have already been screened for the common subtypes of CF, making the diagnosis unlikely. However, if changing the milk did not resolve the symptoms it may be worth doing a sweat test to exclude CF.

Pyloric stenosis often presents with non-bilious projectile vomiting at a younger age. Typical findings on clinical examination include an olive-shaped mass in the epigastrium and visible peristalsis.

Hirschprung's disease presents with severe constipation and sometimes bowel obstruction as a result. The diagnosis is unlikely in this scenario given the very brief history of constipation (it would typically be from birth in children with Hirschprung's). The rash and timing of the symptoms also support a diagnosis of CMPA.

Further reading:

https://patient.info/doctor/cows-milk-protein-allergy-pro

Question:

A 68-year-old woman presents to the local ophthalmology department. She describes a 2-week history of "very blurry vision" in her right eye, which is also associated with a "constant black smudge" in the middle of her vision, and notes that some lines appear wavy.

She has a past medical history of hypertension, hypercholesterolemia and type 2 diabetes. She takes losartan, amlodipine, atorvastatin and metformin. She also reports a heavy smoking history of approximately 40 pack years.

Ophthalmic examination reveals visual acuity is reduced at 20/80 in the right eye and 20/40 in the left eye. Intraocular pressure, pupils and extraocular muscle movements are normal bilaterally. Dilated fundus examination reveals subretinal haemorrhage in the macular region in the right eye and scattered drusen; the left eye also shows scattered drusen.

What is the diagnostic investigation?

A. Optical coherence tomography

B. Amsler grid

C. Gonioscopy

D. Autofluorescent imaging

E. Fluorescein angiography

Correct Answer:Fluorescein angiography

Explanation:

The most likely diagnosis in this patient is wet age-related macular degeneration (AMD) - a degenerative disease of the retina characterised by the presence of choroidal neovascularisation. In contrast to dry AMD, wet AMD leads to a more rapidly progressive loss of vision, driven by the formation of exudate or subsequent haemorrhage from the newly formed choroidal vessels. This patient has evidence of drusen bilaterally and subretinal haemorrhage in the left eye, suggesting choroidal neovascularisation. Fluorescein angiography is imperative in patients when choroidal neovascularisation is suspected from history or clinical examination and is considered the definitive process to detect this pathology.

In patients with suspected glaucoma, gonioscopy is performed to evaluate the internal drainage system and the assess anterior chamber angle. Gonioscopy is therefore used to help differentiate between angle-closure and open-angle glaucoma. This patient does not have a history or examination findings (e.g. raised intraocular pressure, optic disc cupping) suggestive of glaucoma; therefore, gonioscopy would not be suitable for diagnosing this patient.

The Amsler grid can be used to assess the presence of metamorphopsia in patients AMD; however, whilst it is a good adjunct to examination, it cannot be used to make a definitive diagnosis or clinically distinguish between wet AMD and dry AMD.

High-resolution imaging of the retina is achieved with modalities such as optical coherence tomography (OCT); OCT can be used to assess the thickness of the retinal layers and the presence of retinal fluid. OCT is commonly recommended in the workup of patients with AMD. However, this patient most likely has wet AMD; therefore, fluorescein angiography is considered preferential as the definitive test for confirmation of choroidal neovascularisation and active vessel leakage.

In patients with late dry AMD, autofluorescent imaging is used to help identify areas of geographic atrophy. However, this patient most likely has wet AMD; therefore, this would not be the most suitable investigation to make a definitive diagnosis.

Further reading:

https://geekymedics.com/age-related-macular-degeneration-armd/

Question:

A 30-year-old man presents to his GP complaining of colicky abdominal pain which started 4 hours ago in the right upper quadrant (RUQ). He reports experiencing a similar type of pain last weekend, after eating a large takeaway, which was relieved with the use of paracetamol.

On examination, he is tender in the RUQ and elicits a negative Murphy's sign. There is no guarding on examination, and he does not appear to be jaundiced.

What is the most likely diagnosis?

A. Biliary colic

B. Acute cholecystitis

C. Cholangitis

D. Acute pancreatitis

E. Gastro-oesophageal reflux disease (GORD)

Correct Answer:Biliary colic

Explanation:

Biliary colic is characterised by colicky pain in the right upper quadrant (RUQ), usually after consuming foods rich in fat. Patients will not present with any signs of inflammation, such as fever or lethargy, and are usually not jaundiced. On examination, patients may often be asymptomatic, especially if they have not eaten recently or if they have taken painkillers.

Acute cholecystitis is characterised by constant pain in the RUQ alongside signs of inflammation, such as fever or lethargy. On examination, patients will be tender in the RUQ and may elicit a positive Murphy's sign (indicates an inflamed gallbladder). To elicit Murphy's sign, apply pressure in the RUQ whilst asking the patient to inspire. If Murphy's sign is positive, there will be a sudden halt in inspiration due to the pain, and the pain will not be reciprocated on palpation of the left upper quadrant (LUQ). Patients are usually not jaundiced.

Cholangitis is characterised by Charcot's triad (RUQ pain, signs of inflammation such as fever, and jaundice). On examination, patients may also be confused or hypotensive. In addition, patients may also have pruritus (itching) due to the accumulation of bile within the biliary tract.

Gastro-oesophageal reflux disease (GORD) is characterised by burning retrosternal chest pain, exacerbated by eating or lying down. Examination of patients with GORD is usually unremarkable. It is important to treat GORD effectively, as it can lead to Barrett's oesophagus if the symptoms are not controlled.

Acute pancreatitis is characterised by severe epigastric pain accompanied by nausea and vomiting. Patients will usually have epigastric tenderness on examination. Clinical signs to be aware of are Cullen's sign (bruising around the umbilicus) and Grey Turner's sign (bruising around the flanks), both indicating retroperitoneal haemorrhage.

Further reading:

https://patient.info/doctor/gallstones-and-cholecystitis

Question:

A 26-year-old female presents to her GP with abdominal pain. She explains that the pain occurs diffusely across her abdomen, and is present for much of the day. The patient explains that she also frequently experiences constipation and that she often feels bloated.

She comments that her symptoms have been persistent for around 1 year and that they are made worse after drinking caffeine. The patient denies any diarrhoea but mentions that sometimes her stools are mixed with mucus. There is no history of weight loss or dyspareunia.

A gastrointestinal exam and routine blood tests (FBC, U&E, CRP, LFTs) are unremarkable.

Which of the following is the most likely diagnosis?

A. Diverticular disease

B. Crohn’s disease

C. Irritable bowel syndrome (IBS)

D. Endometriosis

E. Colorectal cancer

Correct Answer:Irritable bowel syndrome (IBS)

Explanation:

A diagnosis of irritable bowel syndrome (IBS) may be made in patients who present with abdominal pain and bowel dysfunction that is not explained by an alternative diagnosis. Patients with IBS often complain of pain, bloating, and constipation which may be related to the consumption of certain items. Mucus may also be present in the patient’s stool. The duration of symptoms must be for at least 6 months for a diagnosis of IBS to be made.

Crohn’s disease is an inflammatory bowel condition that can affect any region of the gastrointestinal tract from the mouth to the anus. It typically presents with chronic diarrhoea and weight loss alongside abdominal pain. Blood may be present in the diarrhoea, and some patients may have oral ulcers as well as perianal lesions.

Endometriosis describes a chronic condition where endometrial tissue is present outside of the uterine cavity. The pain from endometriosis usually worsens in relation to the menstrual cycle, and patients may also complain of dyspareunia. Endometriosis would not account for the presence of mucus in this patient’s stool.

Diverticular disease refers to the symptomatic presentation that results from the presence of small herniations of the colonic mucosa through the bowel wall, known as colonic diverticula. It usually affects patients over 50 years of age and has a range of presentations including an altered bowel habit and pain affecting the left lower quadrant.

Colorectal cancer characteristically presents with a change in bowel habit, rectal bleeding and weight loss. It rarely affects patients before the age of 40, and so is unlikely to be the diagnosis in this patient.

Further reading:

https://patient.info/doctor/irritable-bowel-syndrome-pro#nav-2

Question:

A 34-year-old woman is referred to hospital by the GP, who is concerned about her recent presentation. She initially attended her local practice, complaining of a headache that had been present for 2 weeks; this was described as being constant and poorly localised. The patient denied fever, neck stiffness, visual changes and other neurological symptoms, and reported that over-the-counter analgesia had not been of benefit. She stated that she is currently suffering from hayfever, and that sneezing makes her headache far worse, as does lying for a prolonged period of time. On examination, the patient was morbidly obese, having gained a significant amount of weight during the recent COVID-19 lockdowns. Neurological examination revealed no focal pathology, but on fundoscopy, bilateral blurring of the optic disc margins was noted.

Further investigations carried out in hospital included an MRI, which was reported as normal, and a lumbar puncture. CSF analysis showed no abnormalities, but the opening pressure was measured at 34cm H20; significantly above the normal range. The consultant communicates the likely diagnosis to the patient; she wishes to know why she has developed the disease. The doctor explains that whilst the pathophysiology is unknown, obesity is a major risk factor, along with certain medications.

Given the likely diagnosis, which of the following medications is most likely to represent a risk factor for the patient's symptoms?

A. Acetazolamide

B. Progesterone-only contraceptive pill

C. Mannitol

D. Oxytetracycline

E. Clozapine

Correct Answer:Oxytetracycline

Explanation:

Idiopathic intracranial hypertension (previously referred to as pseudotumour cerebri); the pathophysiology of which still remains unknown. However, several risk factors have been identified, the most important being obesity, particularly in women. Links have also been drawn to several medications, with the most frequent including:

Vitamin A derivatives

Tetracyclines

Lithium

Recombinant growth hormone

The usual presentation is with signs and symptoms of raised intracranial pressure, including headache, often worse on bending, lying or sneezing, and possibly tinnitus, visual disturbance and nausea. Due to the rise in intracranial pressure, bilateral papilloedema is often seen on examination.

Lumbar puncture is an important investigation in the setting of suspected IIH; the fluid itself will be normal, but the opening pressure is likely to be markedly raised. Carrying out this procedure will often be of therapeutic relief to patients, as this in itself will reduce the CSF volume and thus the intracranial pressure. Definitive management is usually with acetazolamide (used to treat the condition and not a risk factor for its development), a carbonic anhydrase inhibitor that has diuretic effects, and helps to return the intracranial pressure to normal.

A weak association has been observed between oestrogen-containing contraceptives and IIH; however, there have not been any reported links between contraceptives without oestrogen as an active ingredient such as the progesterone-only pill.

Mannitol is an osmotic diuretic that can be used to manage raised intracranial pressure due to any cause - it is very unlikely to cause IIH due to its mechanism.

Clozapine is an atypical antipsychotic medication that can have a number of side effects, most notably the risk of agranulocytosis. It has not been linked with idiopathic intracranial hypertension.

Further reading:

https://patient.info/doctor/idiopathic-intracranial-hypertension-pro

Question:

A 9-year-old boy presents with a painful knee after colliding with another child during a game of football. On examination, his left knee is tender, swollen, and has a limited range of motion. His past medical history includes recurrent nosebleeds and a cold three weeks ago.

His temperature is 37.1°C, BP 100/60 mmHg, HR 85bpm, and SpO2 96%.

Blood results are below:

Test Result Reference Range

Haemoglobin 110 g/L 130 – 180 g/L

Total white cell count 3.8 x10⁹/L 3.6 – 11.0 x 10⁹/L

Platelet count 300 x10⁹/L 140 – 400 x10⁹/L

Prothrombin time (PT) 12 secs 10 – 14 seconds

Activated partial thromboplastin time (APTT) 50 secs 24 – 37 seconds

Alkaline phosphatase (ALP) 50 U/L 30 – 130 U/L

Alanine aminotransferase (ALT) 30 U/L < 41 U/L

Bleeding time Normal -

Factor IX Reduced -

What is the most appropriate management?

A. Desmopressin

B. Cefotaxime

C. Tranexamic acid

D. Vancomycin

E. Recombinant factor IX

Correct Answer:Recombinant factor IX

Explanation:

The correct answer is recombinant factor IX as the patient likely has a severe bleed into the joint after trauma. The patient’s past medical history and blood test results indicate that he likely has a bleeding disorder, specifically a coagulation disorder such as haemophilia. This is due to the normal prothrombin time (PT) and bleeding time, prolonged activated partial thromboplastin time (APTT), and reduced factor IX levels, which point towards haemophilia B rather than haemophilia A (where there is a deficiency in factor VIII).

In other bleeding disorders, such as Von Willebrand’s disease (VWD), the bleeding time is prolonged as platelet function is abnormal. The symptoms of VWD also tend to be milder, presenting with mucosal bleeding and no bleeding into the joints. As the patient currently has a bleed into the joint (i.e., a severe bleed), desmopressin is an incorrect answer, as it is more suitable for managing minor bleeds such as bleeding from the gums or epistaxis. Similarly, tranexamic acid is also more suitable for minor bleeds in VWD.

Whilst septic arthritis is another very important diagnosis to rule out in children presenting with joint pain, the normal paediatric vital signs of the patient, normal white cell count, and reduced factor IX levels point towards a bleeding disorder like haemophilia B being the most likely cause of his joint pain. As such, antibiotics like cefotaxime and vancomycin are incorrect.

Further reading:

https://geekymedics.com/haemophilia/

Question:

A 3-year-old boy is brought to the emergency department by his mother due to a 6-day history of fever. He has no past medical history, no recent unwell contacts and does not take any medications. His immunisations are up to date.

The child's observations are normal. On physical examination, both eyes are red with normal pupils that are reactive to light. The lips are fissured and the tongue has a red, friable appearance. Cervical lymphadenopathy is present on the right side. Respiratory and cardiac exam is normal. The abdomen is soft and non-tender. Examination of the skin reveals a polymorphous rash on the extremities and trunk.

Which investigation is most appropriate to monitor for complications in this patient?

A. Electrocardiogram (ECG)

B. Urinalysis

C. Echocardiography

D. Renal biopsy

E. Chest radiograph

Correct Answer:Echocardiography

Explanation:

The patient above has a fever for longer than 5 days, bilateral conjunctival injection, unilateral cervical lymphadenopathy, mucous membrane changes and a polymorphous rash on the trunk. This clinical picture is consistent with a diagnosis of Kawasaki disease – an acute vasculitis of unknown aetiology which has a predilection for the coronary arteries. It has the potential to cause coronary aneurysms in approximately 20% of untreated children. This percentage drops to less than 5% if children receive treatment (usually with aspirin and intravenous immune globulin) within 10 days of fever onset. Nonetheless, echocardiography is an important investigation to monitor for coronary aneurysms in patients with Kawasaki disease.

A renal biopsy is indicated in certain cases of systemic lupus erythematosus nephritis and nephritic syndromes, however, it is not required in children with Kawasaki disease.

ECG is a useful investigation if an arrhythmia is being considered in the differential. The patient in the above scenario has a typical presentation consistent with Kawasaki disease.

Chest radiographs would be important if a community-acquired or atypical pneumonia were being considered. It is not necessary for patients presenting with typical features of Kawasaki disease.

Although urinalysis is usually obtained in patients with Kawasaki disease at the time of presentation, this is not something that is routinely monitored for complications after the acute phase of the disease has subsided. Serial urinalysis is important in children who have had a recent diagnosis of Henoch-Schönlein purpura (HSP) as these patients can develop renal disease months after being diagnosed.

Further reading:

https://patient.info/doctor/kawasaki-disease-pro

Question:

A 64-year-old female presents with symptoms of right-sided pneumonia and unintentional weight loss over the past four months. She has a history of recurrent pleural effusions but has never smoked and has recently retired after working as a primary school teacher for the last 40 years.

A chest X-ray reveals a 4cm irregular peripheral mass abutting the pleural surface. Fluid aspirated from the right pleural cavity shows numerous highly pleomorphic cells, some of which contain intracytoplasmic mucin. The cells are positive for epithelial markers on immunohistochemistry.

What is the most likely diagnosis?

A. Mesothelioma

B. Benign hamartoma

C. Adenocarcinoma

D. Small cell carcinoma

E. Squamous cell carcinoma

Correct Answer:Adenocarcinoma

Explanation:

Given this patients history, radiological and histological findings, the most likely diagnosis in this scenario is adenocarcinoma. It is important to remember that adenocarcinoma is the most common lung carcinoma in non-smokers, even though most patients who develop adenocarcinoma are smokers. Typically, adenocarcinoma occurs peripherally, where it can be associated with pleural effusions and malignant cells may be present (and, therefore, detectable) in pleural fluid. Adenocarcinomas arise principally from glandular tissue and are diagnosed pathologically by intra-cytoplasmic mucin production, which points towards glandular differentiation of the native tissue. The incidence of adenocarcinoma in the general population is increasing and now constitutes approximately 30-40% of lung cancers in comparison to about 5% of lung cancers in the 1950s. A subgroup of adenocarcinomas harbour an epidermal growth factor receptor (EGFR) activating mutation and may be responsive to EGFR tyrosine kinase inhibitors, such as gefitinib or erlotinib (a step towards more personalised cancer treatment).

Squamous cell carcinomas are usually central, most strongly associated with smoking and thought to arise from areas of squamous metaplasia. Haemorrhage and necrosis are not uncommon.

Small cell carcinomas usually arise in a hilar bronchus, have the propensity to metastasise early and can be associated with paraneoplastic syndromes, including syndrome of inappropriate secretion of antidiuretic hormone (SIADH), ectopic ACTH secretion, and Lambert-Eaton myasthenic syndrome.

Mesothelioma (a malignant tumour of the pleura strongly associated with asbestos exposure) may be associated with recurrent pleural effusions (and malignant cells may also be detectable in the pleural fluid), but imaging typically reveals a thickening of the pleura. Furthermore, mesothelioma does not present solely as a mass within the lung parenchyma, although in the late stages of mesothelioma there may be metastatic deposits of tumour within the lungs and lymph nodes.

Lung hamartoma is a relatively common benign lesion which is usually discovered as an incidental rounded and well-circumscribed focus on routine chest X-ray (often termed “coin” lesion). Most lung hamartomas are peripheral, solitary and less than 3 cm in diameter.

Further reading:

https://geekymedics.com/lung-cancer/

Question:

A 13-year-old boy is brought the general practitioner by his mother. He reports a skin rash on his buttocks, nausea and joint pains for the last 4 days. He suffered from an upper respiratory infection about six days ago. The patient does not have any past medical history, does not take any medications and has no known drug allergies.

Physical examination reveals a mildly tender abdomen and palpable purpura on the sacral region, lower limbs and buttocks. Blood tests have been performed and the results are pending.

The clinician suspects Henoch-Schönlein purpura (HSP).

Following the resolution of the acute course of this disease, which follow-up investigation is the patient most likely to require?

A. Serum platelets

B. Urinalysis

C. Echocardiography

D. Renal biopsy

E. Serum white cell count

Correct Answer:Urinalysis

Explanation:

The patient in the above scenario is suffering from Henoch-Schönlein purpura (HSP) – a common vasculitis that primarily affects the paediatric population. HSP can affect many organ systems, leading to articular complaints (typically migratory and nondeforming), gastrointestinal complaints (nausea, vomiting and rarely, bowel ischemia or intussusception), dermatological problems (palpable purpura which is typically on the sacral region and buttocks) and renal issues (IgA nephropathy). Management is usually supportive, however, patients do require follow-up urinalysis for several months to monitor for nephritis.

Follow-up platelets are not required in these patients as although they do present with purpura, their platelet counts are typically normal.

Echocardiography is not indicated in patients with HSP as the heart is not commonly affected. Echocardiography, however, is needed for patients suffering from Kawasaki disease to monitor for the development of coronary aneurysms.

Renal biopsy is reserved for severe cases of IgA nephropathy or other forms of nephritis. It is not routine to perform a biopsy in patients with HSP.

Although the serum white cell count may be raised in these patients, it is not a test that is monitored in patients suffering from HSP.

Further reading:

https://patient.info/doctor/henoch-schonlein-purpura-pro

Question:

A 40-year old man presents with a one-week history of back pain that radiates to his left leg. He was previously fit and well, and has been taking ibuprofen for the pain.

Which of the following examination findings would provide evidence for an L5-S1 disc herniation?

A. Hypoaesthesia over the medial aspect of the lower leg and ankle

B. Loss of knee jerk reflex

C. Weakness of knee extension

D. Weakness of hip flexion

E. Weakness of ankle plantarflexion

Correct Answer:Weakness of ankle plantarflexion

Explanation:

A herniation of the disc between the L5 and S1 vertebrae is most likely to cause compression of the S1 nerve root. The myotomes, dermatomes and reflexes associated with the S1 nerve root include:

Hip extension (sciatic nerve - L1/2)

Knee flexion (sciatic nerve - S1)

Ankle platarflexion (tibial nerve - S1/2)

Sensory supply to the dorsum and lateral aspect of the little toe (S1)

Ankle-jerk reflex (S1)

As a result, of the options presented, the most likely clinical finding would be weakness of ankle plantarflexion.

Weakness of hip flexion is associated with neural compression at L1/2 (ileofemoral nerve).

Weakness of knee extension is associated with neural compression at L3/4 (femoral nerve).

Loss of the knee jerk reflex is associated with neural compression at L3/4.

Hypoaesthesia affecting the medial aspect of the lower leg and ankle is associated with neural compression at L4.

Further reading:

https://geekymedics.com/dermatomes-and-myotomes/

Question:

A scientist would like to learn more about the rate of cardiovascular disease and the factors associated with it. She collects data on the whole population of the United Kingdom, including the rate of cardiovascular disease, age, sex, ethnicity and smoking status.

What type of study is described?

A. Retrospective cohort

B. Case series

C. Cross-sectional

D. Prospective cohort

E. Case-control

Correct Answer:Cross-sectional

Explanation:

This is a cross-sectional study. A cross-sectional study collects data at a single point in time and often assesses numerous characteristics at once.

Case-control studies involve comparing a group of cases with a group of controls and seeing if there are different rates of risk factor exposure between the two groups.

A case series identifies a group of people with a known exposure and follows them up to see if they develop the condition being studied.

A prospective cohort study identifies a group of people with a known exposure and a group without the exposure, then follows them up to see if they develop the condition being studied.

A retrospective cohort study involves looking back into the past to determine if a group of people have been exposed to the risk factor. The exposure status was measured in the past, and some people may have already been diagnosed with the disease of interest.

Further reading:

https://guides.himmelfarb.gwu.edu/prevention\_and\_community\_health/types-of-studies

Question:

A 60-year-old male presents to the emergency department with a one-week history of shortness of breath. He states that he has been having trouble lying down and has also had a worsening cough for the past 2 days.

His past medical history is significant for hypertension, type 2 diabetes mellitus (T2DM), hyperlipidaemia and major depressive disorder. His medications include amlodipine, metformin, pioglitazone, simvastatin and citalopram. He does not smoke or drink alcohol.

On examination, he is hypertensive, tachycardic and has an elevated respiratory rate. His oxygen saturations are 94% on room air. Auscultation reveals bilateral crackles at the lung bases. He also has bilaterally pitting oedema.

An electrocardiogram (ECG) is normal. A chest radiograph is awaited.

Which medication has most likely contributed to this patient’s condition?

A. Metformin

B. Amlodipine

C. Simvastatin

D. Citalopram

E. Pioglitazone

Correct Answer:Pioglitazone

Explanation:

The patient above is experiencing congestive heart failure. His chest radiograph will most likely show pulmonary oedema. Out of the medications that the patient is taking, pioglitazone is the medication most likely contributing to his heart failure. Pioglitazone belongs to the class of medications known as the thiazolidinediones which are often added to patients on metformin monotherapy for improved glycaemic control. Approximately 5% of patients taking this medication will suffer from congestive heart failure and peripheral oedema. Other notable side effects of this medication include weight gain, skeletal fractures, bladder cancer and hepatotoxicity.

The main side effects of metformin include gastrointestinal problems (metallic taste in the mouth, nausea, diarrhoea), lactic acidosis (particularly in patients with renal or hepatic disease) and poor vitamin B12 absorption. The patient above has heart failure, which is unlikely to be caused by metformin.

Amlodipine belongs to the dihydropyridine class of calcium channel blockers that mainly act to dilate peripheral arteries (with minimal effect on the heart). Common side effects of amlodipine include reflex tachycardia, ankle oedema, flushing and headaches.

Simvastatin is a commonly used cholesterol-lowering medication that has a well-known side effect profile of myopathy, myositis and hepatotoxicity.

Citalopram is a selective-serotonin-reuptake inhibitor (SSRI) and can commonly cause gastrointestinal side effects, suicidal ideation (particularly in younger adults), hyponatremia and sexual dysfunction.

Further reading:

https://bnf.nice.org.uk/drug/pioglitazone.html

Question:

A 4-year-old boy is brought to the emergency department by his father as he has been refusing to bear weight on his left leg for the last 24 hours. The patient has recently had a puncture wound to the left hip region for which he did not receive medical attention. He has no past medical history and has not been unwell recently. The child was born in England and his vaccinations are up to date.

His vital signs demonstrate a temperature of 38.6 degrees Celsius, tachycardia and hypotension. On physical examination of the left leg, the child complains of pain during passive movement of the left hip joint.

Blood tests reveal elevated inflammatory markers. The patient is given a dose of broad-spectrum antibiotic in the emergency department.

What is the best next step in management for this patient?

A. Joint aspiration of the left hip

B. Discharge the patient

C. X-ray of left hip joint

D. Immediate surgical intervention

E. Blood cultures

Correct Answer:Joint aspiration of the left hip

Explanation:

The young child above has presented with an inability to bear weight and systemic signs like fever, tachycardia and low blood pressure following a recent puncture wound. These findings along with the physical examination findings are concerning for a diagnosis of bacterial septic arthritis of the left hip joint. Septic arthritis is a joint threatening condition which requires immediate aspiration for synovial fluid analysis. Early diagnosis and treatment are associated with improved outcomes.

X-ray of the left hip could be completed to rule out a fracture, however, the affected joint must be aspirated immediately. Additionally, plain films in the setting of septic joints are typically normal for the first 48-72 hours.

Immediate surgical intervention is not necessary for this patient as the diagnosis needs to be clarified first with a left hip joint aspiration.

Transient synovitis is a benign, self-limiting disease that often affects children following an upper respiratory tract infection or acute otitis media. Systemic signs are usually absent. Discharging the patient would be appropriate if transient synovitis was being considered as a differential.

Blood cultures are important in these patients, however, given the likely diagnosis of septic arthritis, joint aspiration is the most appropriate next step in management.

Further reading:

https://patient.info/doctor/septic-arthritis-pro

Question:

A 67-year-old man is brought into the emergency department with severe chest pain and shortness of breath, and during initial assessment in resus, he becomes unresponsive with no palpable pulses or effort of breathing.

A cardiac arrest call is put out and during the initial rhythm check, ventricular fibrillation (VF) is identified.

Which drugs, at what timings, are indicated in this situation?

A. Adrenaline 1mg and amiodarone 300mg, following the 1st shock

B. Adrenaline 1mg and amiodarone 600mg, following the 3rd shock

C. Adrenaline 1mg and amiodarone 300mg, following the 3rd shock

D. Adrenaline 1mg and isoprenaline 20 micrograms, following the 1st shock

E. Adrenaline 1mg, following the 3rd shock

Correct Answer:Adrenaline 1mg and amiodarone 300mg, following the 3rd shock

Explanation:

Current Resus Council UK guidelines recommend the use of adrenaline 1mg and amiodarone 300mg after the 3rd shock for shockable rhythms (VF and pulseless VT). Further boluses of adrenaline 1mg can then be given after alternative further shocks.

If VF/VT persists repeat steps 6 - 8 above and deliver a third shock. Resume chest compressions immediately and then give adrenaline 1 mg IV and amiodarone 300 mg IV while performing a further 2 min CPR.

Repeat this 2 min CPR - rhythm/pulse check - defibrillation sequence if VF/VT persists.

Give further adrenaline 1 mg IV after alternate shocks (i.e., approximately every 3 - 5 min).

Evidence for the use of drugs in cardiac arrest is not conclusive, partly owing to the practical difficulties of trial design. The recent PARAMEDIC2 trial (N Engl J Med 2018; 379:711-721) showed that adrenaline increased 30-day survival compared to placebo in out-of-hospital cardiac arrest. Conversely, however, severe neurological outcomes in survivors were higher than amongst patients in the adrenaline group.

Isoprenaline is used in the treatment of bradycardia and not recommended in cardiac arrest.

Further reading:

https://lms.resus.org.uk/modules/m25-v2-als-algorithm/11118/resources/chapter\_6.pdf

Question:

A 35-year-old female, with no significant past medical history, presents to her GP concerned that her face looks odd. She woke up with the symptoms yesterday and things have remained the same since. On examination, there is left-sided facial droop, including the forehead. Her face is not tender to touch and all other cranial nerves are normal. She has normal motor and neurological function of both the upper and lower limbs. She has normal visual acuity, normal function of her eyelid and no eye pain.

She is otherwise well, with no systemic symptoms.

What is the most appropriate next step for this patient?

A. Reassure and send home

B. Prescribe a course of prednisolone

C. Admit for IV hydrocortisone

D. Refer immediately to the local hospital for an urgent CT head

E. Prescribe acyclovir

Correct Answer:Prescribe a course of prednisolone

Explanation:

The most likely diagnosis in this scenario is Bell’s palsy. Bell's palsy is a type of facial paralysis that results in the inability to control the muscles on the affected side. This results in unilateral facial weakness and ptosis (the degree of paralysis varies significantly between patients). Onset is typically over 72 hours and most patients regain normal facial function within 3 weeks (even without treatment). However, recover for some patients can take several months and in some cases, recovery is not complete.

NICE advises that patients presenting with symptoms of uncomplicated Bell's palsy can be managed in primary care. However, patients presenting with ongoing progressive neurological symptoms, the involvement of other cranial nerves, signs of upper motor neurone involvement (e.g. forehead sparing) or systemic symptoms (e.g. weight loss) need urgent secondary care review.

The first-line treatment for Bell's palsy (particularly in the first 3 days) is oral corticosteroids (usually prednisolone). Steroids have been shown to improve the probability of recovery by 14% when taken within 3 days of symptom onset.

Even though there is occasionally overlap between Bell’s palsy and herpes simplex virus (Ramsay-Hunt syndrome), NICE does not recommend the prescription of acyclovir.

IV hydrocortisone would be inappropriate in this scenario, as there is no evidence intravenous steroids provide any added benefit over oral prednisolone.

Referral for a CT head would not be indicated given the patient is young, has no past medical history and has no evidence of an upper motor neurone lesion (e.g. no forehead sparing).

Further reading:

https://cks.nice.org.uk/bells-palsy

Question:

A 32-year-old male patient has just been admitted to the gastroenterology ward with a myriad of symptoms. He arrived in an ambulance to A&E 3 hours ago. On inspection, he has a coarse bilateral tremor, is sweating profusely and seems very agitated. He is unable to give any history.

On examination, he is tachycardic and slightly hypotensive, smelling heavily of alcohol. As part of the in-patient management of this patient the consultant requests that he is prescribed chlordiazepoxide and an anti-emetic. The patient will also be prescribed some nutritional supplements.

Which of the following nutritional supplements is the most important for this patient to receive?

A. Folate

B. Vitamin B3 (nicotinic acid)

C. Vitamin D

D. Vitamin B1 (thiamine)

E. Vitamin C

Correct Answer:Vitamin B1 (thiamine)

Explanation:

As part of the management of alcohol detoxification or alcohol withdrawal, it is important to consider nutritional supplementation. This is given either as oral thiamine or IV Pabrinex (thiamine plus other B vitamins and vitamin C). Factors which may influence the route of administration include whether the patient is showing signs of malnourishment or if they have any symptoms suggestive of Wernicke Korsakoff syndrome.

All of the vitamins of Pabrinex are important, but the thiamine is critical as heavy drinking can deplete levels of this vitamin. Prolonged deficiency can lead to Wernicke-Korsakoff syndrome. Wernicke’s encephalopathy is a triad of confusion, ataxia, ophthalmoplegia and Korsakoff’s psychosis is a chronic sequela of Wernicke encephalopathy.

All the other vitamins may be relevant but aren’t as important. Folate may be relevant if the patient is deficient (alcoholic patients may show a macrocytic anaemia), but there are no details in this particular vignette to suggest this.

Further reading:

https://patient.info/doctor/alcoholism-and-alcohol-misuse-management

Question:

A 56-year-old female presents to the optician with sudden onset right eye pain and red-eye. Visual acuity is reduced in the right eye. The right pupil appears semi-dilated and does not react to light. The left eye appears normal.

What is the most significant risk factor for the likely diagnosis?

A. Hypermetropia

B. Myopia

C. Brightly lit room

D. Topical pilocarpine

E. Smoking

Correct Answer:Hypermetropia

Explanation:

This case demonstrates acute angle-closure glaucoma (AACG). A history of sudden onset eye pain, reduced visual activity and a semi-dilated pupil is highly suggestive of AACG. Hypermetropia (longsightedness) is a risk factor for the condition as the anterior chamber depth and volume are smaller.

Other risk factors for AACG are:

Female sex

Advanced age

Family history

Pupil mid-dilation, leading to narrowing of the iridocorneal angle (e.g. topical atropine/tropicamide or a dark room)

Further reading:

https://geekymedics.com/acute-angle-closure-glaucoma/

Question:

A 66-year-old male attends for routine review in general practice. He recently commenced pharmacological treatment for essential hypertension and this has since improved.

He has no personal history of cardiovascular disease. His QRISK2 score is calculated and his 10-year risk is found to be 19.5%.

What is the most appropriate medication for the primary prevention of cardiovascular disease in this patient?

A. Pravastatin 40mg

B. Aspirin 75mg

C. Atorvastatin 80mg

D. Ezetimibe 10mg

E. Atorvastatin 20mg

Correct Answer:Atorvastatin 20mg

Explanation:

The NICE guidance states that this patient should be offered lipid-lowering therapy as his 10-year cardiovascular risk score (QRISK2) is greater than 10%. Atorvastatin 20mg daily is an appropriate initial choice. Atorvastatin 80mg daily is used in secondary prevention.

Pravastatin or ezetimibe may be used as alternative lipid-lowering agents if atorvastatin is not tolerated or effective. Aspirin no longer has a role in the primary prevention of cardiovascular disease.

Further reading:

https://cks.nice.org.uk/lipid-modification-cvd-prevention

Question:

A 26-year-old woman is admitted to the emergency department with chest pain and dizziness. This came on 45 minutes previously and is associated with a racing pulse.

On examination, she looks unwell, is tachycardic at roughly 180 beats per minute and has a blood pressure of 79/49 mmHg. An ECG is performed and the rhythm strip is shown below.

What is the most appropriate management option?

A. Verapamil 5mg IV

B. Adenosine 6mg IV

C. Encourage vagal manoeuvres

D. Amiodarone 300mg IV

E. Direct current (DC) cardioversion

Correct Answer:Direct current (DC) cardioversion

Explanation:

Her rhythm strip shows a regular, narrow QRS complex rhythm known as supraventricular tachycardia. When presented with this condition the patient must be assessed for signs of haemodynamic instability. These features are:

Shock

Syncope

Myocardial ischaemia

Severe heart failure

In this case, hypotension and dizziness suggest that this patient is unstable and as per the Resuscitation Council 2021 Guidelines up to 3 synchronised direct current shocks are recommended, followed by amiodarone loading if required.

In stable patients with supraventricular tachycardia, vagal manoeuvres are tried first. If this is unsuccessful adenosine 6mg IV bolus is recommended, followed by 12mg and then 18mg further if required. Verapamil is an alternative to adenosine.

Further reading:

https://www.resus.org.uk/resuscitation-guidelines/peri-arrest-arrhythmias/#tachycardia

Question:

A 70-year-old man presents to his GP with worsening chest pain on exertion and syncopal episodes.

Examination of the precordium reveals an ejection systolic murmur which can be heard loudest over the carotid arteries.

What is the most likely finding on examining the patient's pulse?

A. Pulsus paradoxus

B. Collapsing pulse

C. Slow rising pulse

D. Irregularly irregular pulse

E. Bounding pulse

Correct Answer:Slow rising pulse

Explanation:

The examination findings are consistent with a diagnosis of aortic stenosis.

A slow rising pulse is associated with aortic stenosis.

A collapsing pulse is seen in aortic valve incompetence/regurgitation.

A bounding pulse is typically seen in sepsis and hypercapnia.

An irregularly irregular pulse would typically indicate atrial fibrillation.

Pulsus paradoxus (a large decrease in pulse pressure of >10mmHg during inspiration) is seen in several conditions, including cardiac tamponade, constrictive pericarditis, pulmonary embolism and acute asthma.

Further reading:

https://patient.info/doctor/aortic-stenosis-pro

Question:

A 22-year-old man is referred to dermatology with a painful ulcer on his leg and is diagnosed as having pyoderma gangrenosum secondary to an adverse drug reaction.

Which of the following drugs is most likely to have caused this?

A. Isotretinoin

B. Heroin

C. Propylthiouracil

D. Sunitinib

E. Cocaine

Correct Answer:Cocaine

Explanation:

Pyoderma gangrenosum is a neutrophil dermatosis characterised by the formation of enlarging ulcers, usually on the lower limbs, with a characteristic yellow purulent surface and black/ blue outer edge.

This condition is commonly associated with several systemic diseases (e.g. inflammatory bowel disease); however, it can also be drug-induced.

A recent systematic review identified that cocaine was definitively linked with pyoderma gangrenosum and that there was a probable link with isotretinoin, propylthiouracil and sunitinib.

Heroin use may lead to superficial skin infections and abscess formation at injection sites but is not linked to pyoderma gangrenosum.

Further reading:

https://www.ncbi.nlm.nih.gov/pubmed/28624960

Question:

A 20-year-old male presents to his GP with a 2-week history of jaundice. He recently underwent surgery for a tendon repair following a tennis injury. He has not had alcohol since the accident and previously used to drink 4-5 pints of beer per week. He notes that he has been very fatigued since the accident. He has no travel history, does not use intravenous drugs, and there is no relevant past medical or family history. On examination, he is noted to be jaundice, but otherwise has no clinical findings of note.

His LFTs are as follows:

Bilirubin: 70 (0-17)

ALP: 120 (40-125)

AST: 25 (0-35)

GGT: 15 (0-40)

What is the most likely diagnosis?

A. Gilbert's disease

B. Hepatitis B

C. Gallstones

D. Alcoholic hepatitis

E. Paget's disease

Correct Answer:Gilbert's disease

Explanation:

Gilbert's disease usually presents as jaundice with an isolated rise in bilirubin, in an otherwise asymptomatic patient. It often occurs after a period of stress or insult to the body (such as recent surgery) and is usually self-limiting.

Alcoholic hepatitis and hepatitis B often present with a significant rise in transaminases (i.e. AST and ALT). ALT is more specific to the liver, whereas AST is also found in skeletal and cardiac muscle. In this scenario, AST is normal which makes both of these diagnoses unlikely. Furthermore, GGT is normal which means alcohol is unlikely to be the cause of this patient's deranged LFTs and clinical symptoms. The patient also has no risk factors for either of these diseases (no IV drug use, no excessive alcohol intake and no foreign travel).

Paget's disease is usually asymptomatic or presents with vague symptoms such as bone pain or, in some cases, pathological fractures. It is normally associated with an isolated increase in ALP. ALP, in this case, is normal, making it very unlikely.

Gallstones present with an ‘obstructive’ LFT pattern (i.e. raised ALP and bilirubin). In this case, there is only an isolated rise in bilirubin, and no corresponding rise in ALP making the diagnosis very unlikely. Furthermore, clinically patients typically present with abdominal pain along with jaundice.

Further reading:

https://patient.info/doctor/gilberts-syndrome-pro

Question:

A 61-year-old woman who has a history of chronic bilateral venous leg ulcers presents with a 4-day history of increasing pain, swelling and redness of her right leg which has limited mobility. The leg ulcer on the same side has also become more “sloughy” and “weepy” over a similar period. On examination, there is a poorly healed venous ulcer in the gaiter region of the right leg which is warm to the touch. She is treated with intravenous flucloxacillin and over the following 2 days she starts to feel better and the signs of inflammation in the leg are noted to decrease. On the third day, a swab of the ulcer taken on admission grows Pseudomonas aeruginosa.

What is the most appropriate management in response to this result?

A. Re-swab ulcer to confirm whether this is a contaminant

B. Continue intravenous flucloxacillin but add oral ciprofloxacin

C. Stop antibiotics as there is no evidence of true infection

D. Ignore swab result and continue flucloxacillin treatment

E. Change intravenous flucloxacillin to intravenous piperacillin-tazobactam

Correct Answer:Ignore swab result and continue flucloxacillin treatment

Explanation:

The most appropriate management in response to this result is to ignore the swab result and continue flucloxacillin treatment. This is a common clinical scenario. Chronic venous ulcers rapidly become colonised by bacteria, including normal skin commensals such as staphylococci and streptococci, and sometimes other bacteria such as Pseudomonas and Enterobacteriaceae which would not normally colonise healthy skin. Colonisation itself does not cause clinical symptoms, but if the bacteria invade the surrounding tissues, clinical infection ensues. The diagnosis of infection is clinical, based on the presence of local (+/- systemic) signs of inflammation. In this case, there are clear local signs of inflammation including pain (dolor), swelling (tumor) and increased exudate, redness (rubor), warmth (calor) and loss of function (function lata – in this case reduced mobility). The clinical diagnosis is, therefore, an infected leg ulcer with surrounding cellulitis.

Change intravenous flucloxacillin to intravenous piperacillin-tazobactam – empiric treatment is typically targeted at the most common pathogens causing infected ulcers – streptococci and staphylococci – both of which are usually susceptible to flucloxacillin (with the exception of methicillin-resistant Staphylococcus aureus – MRSA). NICE states that the choice of antibiotic should be reviewed and changed according to swab results if symptoms or signs of the infection are not improving. Since the patient makes a good clinical response to treatment, we can be confident that the Pseudomonas aeruginosa isolated from the admission swab merely represents colonisation, so no change to her treatment is necessary at this stage.

Continue intravenous flucloxacillin but add oral ciprofloxacin – as explained above, intravenous flucloxacillin appears to be working well given the good clinical response and therefore the addition of further anti-microbial agents is not indicated at this point. Should the patient’s condition deteriorate then revisiting the antimicrobial strategy, e.g. to provide broader coverage, would certainly be indicated.

Re-swab ulcer to confirm whether this is a contaminant – in general, superficial swabs are of minimal value clinically since one cannot be sure whether the results represent colonisers or true pathogens, and they are therefore discouraged in most clinical situations. One exception is screening for MRSA, which is currently done for all patients admitted to hospital, and should include a swab of any ulcers since these provide an ideal habitat for S. aureus.

Stop antibiotics as there is no evidence of true infection – given the clinical context, there is no indication for antibiotics to be stopped; there is clear clinical evidence of infection, and withdrawing antibiotics prematurely risks worsening the current infection and causing further deterioration of the patient’s condition. Continuing antibiotics is, therefore, the utmost priority.

Further reading:

https://www.nice.org.uk/guidance/ng152

Question:

Louis is a 5-month-old boy who has presented to the paediatric assessment unit with noisy breathing. Three days ago, he developed fever, cough and coryza. Today, you note he has increased work of breathing, audible expiratory wheeze and crackles. Vital signs are normal, except for a temperature of 38.5°C.

What is the most likely underlying pathogen?

A. Respiratory syncytial virus

B. Adenovirus

C. Haemophilus influenza

D. Streptococcus pneumoniae

E. Parainfluenza virus

Correct Answer:Respiratory syncytial virus

Explanation:

Bronchiolitis is a common viral lower respiratory tract disease that typically occurs in the first 2 years of life. It usually presents initially with a 2-3 day prodrome of fever, cough and coryza. This then progresses to respiratory symptoms, including increased work of breathing and possibly signs of respiratory distress. On examination, there is often widespread wheeze and/or crackles.

The most common causative pathogen is the respiratory syncytial virus. Bronchiolitis can also be caused by parainfluenza virus and adenovirus.

The diagnosis of bronchiolitis is made based upon the presenting symptoms and clinical signs. The infection is usually self-limiting and the management is mostly supportive.

Further reading:

https://patient.info/doctor/bronchiolitis-pro

Question:

A 25-year-old man presents with a 5-week history of a painful, hot, and swollen right knee, with associated lower back pain that radiates into his buttocks. His symptoms were sudden in onset, and he denies any fever or trauma. During this time, he has had morning stiffness that lasts for 2 hours and improves throughout the day, along with episodes of dysuria and eye irritation. In the last week, he has noticed painful lesions on the soles of his feet. He has a past medical history of depression for which he takes sertraline, asthma for which he uses salbutamol and beclometasone inhalers, and an episode of gastroenteritis treated with antibiotics eight weeks ago.

On examination, there is a large effusion of the right knee with warmth and slightly reduced motion. Tender, thickened skin and scaly patches are noted on the soles of the feet and on the lower legs.

What is the most likely diagnosis?

A. Rheumatoid arthritis

B. Behçet's syndrome

C. Reactive arthritis

D. Ankylosing spondylitis

E. Psoriatic arthritis

Correct Answer:Reactive arthritis

Explanation:

Reactive arthritis is correct. This patient has presented with inflammatory arthritis (characterised by joint pain and stiffness that improves throughout the day), dysuria, and irritation of the eyes. This combination of symptoms suggests a diagnosis of reactive arthritis (whose features can be remembered by 'can't see, pee, or climb a tree'). One of the complications of reactive arthritis is the development of a skin rash known as keratoderma blennorrhagica, which is characterised by the presence of tender, thickened skin and scaly patches on the soles of the feet and lower legs. A previous history of gastroenteritis is a risk factor for the development of reactive arthritis, as it has a post-dysenteric form and a post-sexually-transmitted infection form.

Psoriatic arthritis is incorrect. Although psoriatic arthritis can present with skin manifestations, it is not associated with keratoderma blennorrhagica. The rash tends to be well-demarcated red, scaly patches as opposed to tender, thickened skin. As well as this, a diagnosis of psoriatic arthritis would not explain his associated dysuria.

Rheumatoid arthritis and ankylosing spondylitis are incorrect. Although these both present with inflammatory arthritis, rheumatoid arthritis tends to be a symmetrical polyarthritis affecting the small joints of the hands and feet and does not affect the spine or sacroiliac joints. Ankylosing spondylitis does affect the sacroiliac joints but does not typically affect other joints such as the knees. These diagnoses would not explain the associated dysuria, and rash on the soles of his feet.

Behçet's syndrome is incorrect. Although this can cause inflammatory arthritis and eye redness or watering, one of its hallmark symptoms is the presence of oral and genital ulcers, which do not apply to this patient. Dysuria is not a recognised feature.

Further reading:

https://patient.info/doctor/reactive-arthritis-pro

Question:

A 50-year-old lady of Jewish descent presents to A+E with a 2-day history of widespread bullous skin lesions – many of which had burst – occupying ~2% of her body surface area. She also reports a 2-week history of painful mouth lesions. She denies any other symptoms. She was previously fit and well. She has not started any new medication recently.

On examination, she has a positive Nikolsky sign and has erosions and one intact bulla inside her mouth.

What is the most likely diagnosis?

A. Pemphigoid

B. Scalded skin syndrome

C. Kawasaki disease

D. Pemphigus

E. Steven Johnson syndrome

Correct Answer:Pemphigus

Explanation:

This lady has presented with a classical case of pemphigus. Easily-burst bullous lesions appear first in the mouth before later appearing on the skin. It is an autoimmune disease with a peak incidence in the 6th decade that is more prevalent in Ashkenazi Jews. Be aware that it is a medical emergency that is treated with steroids and supportive measures.

Pemphigoid is a similar autoimmune disease that presents with a prodrome of eczematous/urticarial skin lesions before bullae develop. These bullae are less likely to burst as they arise at the epidermal-dermal junction. Pemphigoid does not affect the mucous membranes.

Steven Johnson syndrome is usually associated with the initiation of medication and/or HIV infection (or less commonly another infection). It is associated with a flu-like prodrome and round rashes that develop into blisters. Like Pemphigus, it does affect the mucous membranes.

Scalded skin syndrome is caused by a bacterial infection (usually S. aureus), typically affects children, and does not affect mucous membranes.

Kawasaki disease usually affects children and is associated with fever, conjunctivitis, and lymphadenopathy. Desquamation of the palms, soles, and perineum usually occurs as the disease is resolving.

Further reading:

https://patient.info/doctor/pemphigus

Question:

A 30-year-old man is seen in general practice with low back pain and stiffness. This has been ongoing for 3 months, is worst in the mornings and improves with exercise. It responds little to oral paracetamol. In addition to this, the patient describes sporadic aches and pains in his lower limb joints and fatigue. Past medical history is notable for inflammatory bowel disease.

On examination:

Tenderness over the sacroiliac joints

Reduced forward flexion of the lumbar spine

The patient has raised inflammatory markers and demonstrates sacroiliitis on a spine X-ray.

Which of the following genes is strongly associated with this condition?

A. BCR-ABL

B. HLA-DR4

C. HLA-DRB1

D. HTT

E. HLA-B27

Correct Answer:HLA-B27

Explanation:

This patient presents with ankylosing spondylitis (AS), an inflammatory arthropathy which is strongly associated with the HLA-B27 gene. While the gene is relatively common in the general population (8 in 100 individuals), 9 out of 10 AS patients have a positive HLA-B27 blood test. HLA-B27 is also associated with inflammatory bowel disease, reactive arthritis, psoriatic arthritis and Behçet's disease.

HLA-DR4 and HLA-DRB1 are detected in patients with a variety of autoimmune diseases including systemic lupus erythematosus (SLE), rheumatoid arthritis and type 1 diabetes.

BCR-ABL is a gene formed by a translocation mutation involving chromosomes 9 and 22 (subsequently known as the Philadelphia chromosome). BCR-ABL is found in virtually all patients with chronic myeloid leukaemia (CML).

HTT codes for the protein Huntingtin. It is strongly associated with Huntington's disease.

Further reading:

https://www.nhs.uk/conditions/ankylosing-spondylitis/causes/

Question:

A 38-year-old woman presents with a 2-month history of worsening visual disturbance. To confrontation, she is found to have a bilateral temporal hemianopia.

On further questioning, it is found that she has gained a significant amount of weight over the past year. On examination, she is found to have mild hirsutism and extensive abdominal fat deposition.

Blood tests are taken to identify the underlying cause of her presentation.

Which of the following results is most likely?

A. Elevated ACTH after administration of high dose dexamethasone

B. Elevated ACTH and elevated cortisol

C. Low ACTH and elevated cortisol

D. Elevated ACTH and low cortisol

E. Low ACTH and low cortisol

Correct Answer:Elevated ACTH and elevated cortisol

Explanation:

This patient is suffering from Cushing’s syndrome. The visual field defect described makes this most likely to be the result of an ACTH-secreting pituitary adenoma (Cushing’s disease), compressing the optic chiasm. As such, blood testing would be expected to demonstrate (inappropriately) elevated ACTH, driving elevated cortisol.

Persisting elevated ACTH despite administration of high dose dexamethasone (i.e. after a high dose dexamethasone suppression test) would be seen in cases of ectopic ACTH production such as paraneoplastic syndrome. In the case of a pituitary adenoma, high dose dexamethasone would be expected to suppress ACTH production transiently.

Low ACTH and elevated cortisol would be the expected findings in ACTH-independent causes of cortisol excess. In such cases, normal homeostatic feedback mechanisms reduce pituitary ACTH production in response to increased cortisol which may be the result of iatrogenic steroid administration (common cause), adrenal cancers or other rarer causes.

Elevated ACTH and low cortisol would be seen in cases of primary adrenal insufficiency, such as Addison’s disease. The low serum cortisol drives a positive feedback loop stimulating ACTH production, in an attempt to increase adrenal cortisol production.

Inappropriately low ACTH and low cortisol are seen in cases of secondary adrenal insufficiency (i.e. cortisol deficiency due to lack of pituitary ACTH production). This can be assessed by the administration of a short Synacthen® test, in which synthetic ACTH is administered, with subsequent cortisol increase in the presence of functioning adrenal glands.

Further reading:

https://geekymedics.com/cushings-syndrome/

Question:

A 72-year-old right-handed grandmother attends the hyper acute stroke unit with right upper limb weakness only, which started 3 hours ago. She was knitting and talking to her granddaughter when she felt her right arm go weak and ‘floppy’ suddenly. This has never happened before and she has no other symptoms. She is an ex-smoker and suffers from hypertension, but has no other past medical history. On examination, you find grade 1/5 power in her right upper limb with intact sensation. You notice the monitor and she’s in atrial fibrillation (which is new) of 70 beats per minute. Her BP is 160/90. The rest of her examination is normal. The stroke consultant organises an urgent CT and CTA and asks you to fill in the request form while he discusses the case with the radiologist.

What tentative diagnosis would you fill on the request form?

A. Partial anterior circulation stroke

B. Lacunar stroke

C. Posterior circulation stroke

D. Total anterior circulation stoke

E. Transient ischaemic attack

Correct Answer:Lacunar stroke

Explanation:

The Bamford classification system is a simple bedside method of classifying acute ischaemic strokes. It uses the patients' symptoms to classify which region of the brain has been affected, and once classified it allows for the prediction of a patient's prognosis.

In this scenario, based on the Bamford classification system, the most likely provisional diagnosis would be a lacunar stroke (LACS). This is based on the presence of isolated monoparesis (pure motor stroke). Atrial fibrillation is a significant risk factor for ischaemic stroke.

See the further reading link for a detailed explanation of the Bamford classification system.

Further reading:

https://geekymedics.com/stroke-classification/

Question:

You are reviewing the blood tests of a 72-year-old man who was admitted yesterday morning with a urinary tract infection.

He is being treated with intravenous (IV) antibiotics.

Some of his blood tests from this morning are shown below, with the values from his admission blood tests in brackets.

Hb 168 g/L (152 g/L)

Platelets 256 x 109/L (223 x 109/L)

WCC 11.6 x 109/L (13.5 x 109/L)

Na+ 141 mmol/L (138 mmol/L)

K+ 3.7 mmol/L (4.2 mmol/L)

Urea 7.3 mmol/L (5.6 mmol/L)

Creatinine 98 µmol/L (60 µmol/L)

CRP 73 mg/L (86 mg/L)

Which of the following best describes the recent investigation findings?

A. Stage 1 AKI

B. Stage 3 AKI

C. No acute kidney injury (AKI)

D. Stage 2 AKI

E. Stage 4 AKI

Correct Answer:Stage 1 AKI

Explanation:

This patient has developed an AKI while in hospital, likely due to his urinary tract infection. Their creatinine has increased to more than 1.5 times the baseline (but less than 2 times) so this would be classed as stage 1 AKI. Other criteria for stage 1 AKI are an increase in creatinine by ≥26.5 µmol/L or a reduction in urine output to <0.5 mL/kg/hour for ≥ 6 hours.

It would be incorrect to say that there is no AKI, as his creatinine has risen significantly overnight.

Stage 2 AKI would be defined as an increase in creatinine by 2.0-2.9 times the baseline. The other criteria for stage 2 AKI is a reduction in urine output to <0.5 mL/kg/hour for ≥12 hours.

Stage 3 AKI is defined as an increase in creatinine by more than 3 times the baseline. The other criteria for stage 3 AKI include an increase in creatinine to ≥353.6 µmol/L or a reduction in urine output to <0.3 mL/kg/hour for ≥24 hours.

Stage 4 is not a stage of AKI that exists within the KDIGO criteria.

Further reading:

https://cks.nice.org.uk/topics/acute-kidney-injury/

Question:

A 15-year-old girl presents to the eye casualty department complaining of a 2-day history of itchy eyes. On examination, there is visible conjunctival injection in both eyes. She also mentions that her eyes feel gritty when she blinks. She also complains of watery discharge from her nose, which has been worse in the last few weeks due to the summer season starting. Her symptoms are the same inside and outside the house. She suffers from hayfever and asthma, and uses a salbutamol inhaler.

What is the most likely offending substance/organism for her symptoms?

A. Adenovirus

B. House dust mite

C. Haemophilus influenzae

D. Pollen

E. Staphylococcus aureus

Correct Answer:Pollen

Explanation:

The correct answer is pollen with the most likely diagnosis being seasonal allergic conjunctivitis. Allergic conjunctivitis is typically seasonal and is caused by allergens such as tree pollen, grasses, and fungal spores. The condition is not sight-threatening but may have an impact on the quality of life of the person. Typically patients will present with bilateral red itchy eyes and may have coryzal symptoms such as sneezing or a runny nose. This patient also has a history of atopy due to her hayfever and asthma, and so this makes seasonal allergic conjunctivitis the more probable answer.

House dust mite is the offending substance in perennial allergic conjunctivitis which is caused by non-seasonal allergens. Animal dander is also another cause. With perennial allergic conjunctivitis, symptoms may be present throughout the year, and seasonal exacerbations may be less common.

Staphylococcus aureus and Haemophilus influenzae are bacteria that may cause bacterial conjunctivitis. The presentation will differ as symptoms may be unilateral and there may be associated mucopurulent discharge from the eye/s. The eyelids may also be sticky and hard to open in the morning. Bacterial conjunctivitis can happen outside of the summer months as well.

Adenovirus is one of the most common causes of viral conjunctivitis. Viral conjunctivitis is the commonest form of acute infective conjunctivitis and is highly contagious and so other members of the family may also be affected. There may be a history of a recent upper respiratory tract infection preceding the conjunctivitis symptoms. Viral conjunctivitis can also occur outside of the summer months, and patients may complain of gritty and watering eyes with only mild itching. It may begin in one eye initially and then spread to the fellow eye, however in allergic conjunctivitis both eyes are typically affected together.

Further reading:

https://geekymedics.com/conjunctivitis/

Question:

A 55-year-old man with a background of poorly managed type 2 diabetes presents to the emergency department with a rapidly progressing painful, erythematous, and oedematous right leg. He has a fever of 39.2°C and reports feeling generally unwell over the past few days.

On examination, there is severe tenderness to palpation over the anterior surface of the lower right leg, and bullae formation is noted. His initial blood tests show elevated white blood cells and C-reactive protein (CRP).

What is the most likely diagnosis?

A. Necrotising fasciitis

B. Erysipelas

C. Deep vein thrombosis

D. Pyomyositis

E. Cellulitis

Correct Answer:Necrotising fasciitis

Explanation:

This patient's presentation suggests necrotising fasciitis, given the extreme tenderness on palpation, bullae formation, and diabetic history. Necrotising fasciitis is a severe bacterial infection which can spread rapidly throughout the body if left untreated. While the condition is rare, it may present in diabetic patients, trauma/surgical patients, or immunosuppressed individuals. The main distinguishing symptoms include extreme tenderness on palpation, rapid progression, and skin necrosis (usually a late sign). Management consists of urgent surgical debridement in addition to intravenous antibiotics.

Cellulitis is a bacterial infection of the skin and subcutaneous tissues, which presents with erythema, warmth, and tenderness. However, it usually has a more gradual onset and does not cause severe pain on light palpation.

Deep vein thrombosis may present with calf tenderness and leg swelling. However, the presence of a fever, raised white blood cells, and prominent skin changes suggest necrotising fasciitis.

Pyomyositis is a bacterial infection of skeletal muscle, which presents with localised pain and tenderness, but there is typically no erythema or skin changes.

Erysipelas is a bacterial infection of the skin, which presents with a bright erythematous and swollen rash, but there is typically no tissue necrosis or bullae formation.

Further reading:

https://patient.info/doctor/necrotising-fasciitis-pro

Question:

A 31-year-old man presents to a rheumatology clinic following a referral from his GP. He describes a 6-month history of back pain, largely located in the lumbar spine, worse in the morning and improving throughout the day. He has no other past medical history and takes no medications.

The rheumatologist confirms a diagnosis of ankylosing spondylitis.

What is the most appropriate initial management?

A. Codeine

B. Prednisolone

C. Ibuprofen

D. Etanercept

E. Paracetamol

Correct Answer:Ibuprofen

Explanation:

Where there are no contraindications, NSAIDs form the mainstay of management in ankylosing spondylitis. As this patient has no history of GI bleeding or heart failure, ibuprofen is the most appropriate initial management.

NICE state that codeine and paracetamol are suitable if NSAIDs are poorly tolerated or ineffective. Similarly, steroids have a role in management only if NSAIDs are inappropriate or ineffective. Steroid injections can help to control localised disease such as sacroiliitis or arthritis and oral steroids such as prednisolone are used for short term systemic symptom control.

TNF-alpha inhibitors such as etanercept should only be considered in severe ankylosing spondylitis, with confirmed and sustained spinal disease, with symptoms refractory to maximal treatment with two or more NSAIDs.

Further reading:

https://cks.nice.org.uk/topics/ankylosing-spondylitis/management/confirmed-ankylosing-spondylitis

Question:

A 23-year-old man is brought to A&E by his girlfriend, having been found on the floor unconscious.

She had rushed home from work as he had called her to tell her he had taken an overdose several hours ago and was not feeling well. She says he described sweating, nausea, vomiting, and a ringing in his ears, and that he sounded very breathless on the phone.

An ABG is performed on arrival to the department which shows a pH of 7.1 (7.35 - 7.45).

What is the most appropriate next step in the management of this patient?

A. N-Acetylcysteine

B. Gastric lavage

C. Haemodialysis

D. Naloxone

E. Flumazenil

Correct Answer:Haemodialysis

Explanation:

This patient is presenting with evidence of severe salicylate (aspirin) poisoning. He has a severe metabolic acidosis and is presenting in a coma. He should be discussed with a high-care area for consideration of haemodialysis. Less severe cases of salicylate overdose can be managed with activated charcoal, rehydration, and urinary alkalinization – see the link below for specific details.

Flumazenil is a GABA antagonist, used in the management of benzodiazepine overdose. It does not have a role in the management of salicylate overdose. Flumazenil is recommended for use in cases of iatrogenic benzodiazepine overdose (e.g. if too much benzodiazepine is given for procedural sedation); it is contraindicated in cases of mixed or unknown overdose.

Naloxone is an opioid receptor antagonist, used in the management of opioid overdose. It does not have a role in the management of salicylate overdose. While opioid overdose can lead to loss of consciousness, this patient’s biochemical picture and symptoms prior to their presentation are more suggestive of salicylate overdose.

N-Acetylcysteine is used in the management of paracetamol overdose, it does not have a role in salicylate overdose.

Gastric lavage can be considered if the patient presents within 1 hour, having taken > 500mg/kg salicylate. This patient’s poor clinical condition, uncertain dose, and delayed presentation make this an inappropriate option in this case.

Further reading:

https://emj.bmj.com/content/19/3/206.long

Question:

A 65-year-old man attends an outpatient neurology clinic on the advice of his GP. He has a history of benign essential tremor, which usually causes him no significant issues, but his symptoms have increased in the last six months.

His essential tremor used to cause a mild tremor in his hands when performing fine motor tasks, but now he feels like he has to, 'persuade his arms to move’. He also reports feeling less steady on his feet.

On examination, he is slow to stand, has a stooped posture and shuffling gait when asked to walk. Resistance is felt on passive flexion and extension of the elbow. His hands shake when he is asked to touch his nose but the tremor fades when his arms are at rest. There is a positive ‘pull test’.

Which of the following would be most useful in the further investigation of this patient’s symptoms?

A. FP-CIT single-photon emission computed tomography (DaTSCAN)

B. Positron emission tomography (PET scan)

C. Structural MRI

D. Magnetic resonance spectroscopy

E. Magnetic resonance volumetry

Correct Answer:FP-CIT single-photon emission computed tomography (DaTSCAN)

Explanation:

This patient is demonstrating signs and symptoms of Parkinson’s disease including postural instability, bradykinesia, and lead pipe rigidity. Whilst the patient has a diagnosis of essential tremor, is it important to remember that multiple neurological pathologies can coexist and that his symptoms should not be assumed as a progression of his pre-existing condition.

The absence of resting tremor does not preclude a diagnosis of Parkinson's disease as it is absent in up to 30% of patients at disease onset. A ‘pull test’ screens for evidence of postural instability.

FP-CIT single-photon emission computed tomography (also known as a DaTSCAN) is used to investigate the loss of dopaminergic neurons in the striatum. A radiopharmaceutical is given IV which then binds to dopamine transporters in the brain. The signal given out from the bound radiopharmaceutical is detected using single-photon emission computed tomography (SPECT) and this gives a pictorial representation of the distribution of dopamine transporters.

An abnormal DaTSCAN indicates pathology which is either:

Neurodegenerative (e.g. Parkinson’s disease or multiple systems atrophy)

Neurogenetic (e.g. spinocerebellar ataxia)

The result of cerebrovascular disease

A normal scan means the pathological process producing symptoms does not affect dopamine transports (e.g. essential tremor, drug-induced parkinsonism, or functional parkinsonism).

None of the other scans are supported by NICE in the investigation of Parkinson’s disease.

Further reading:

https://www.parkinsons.org.uk/professionals/clinical-summary-use-datscan

Question:

A 23-year-old male presents to hospital with a 10-day history jaundice. abdominal pain, diarrhoea and vomiting. He has never experienced symptoms like this previously and is usually fit and well. He denies any illicit drug use and drinks 10-15 units of alcohol a week. He has a regular sexual partner, who he has been with for 3 years. He mentions that he has recently returned from a holiday in Vietnam.

Clinical examination reveals tender hepatosplenomegaly and jaundice. Vital signs are normal. Blood tests reveal significantly elevated ALT, AST and bilirubin, with only mild elevation of ALP and GGT. HBsAg is negative, anti-HBc is negative and anti-HBs is positive. Amylase is not elevated.

Which of the following is the most likely diagnosis?

A. Ascending cholangitis

B. Alcoholic hepatitis

C. Hepatitis B

D. Pancreatitis

E. Hepatitis A

Correct Answer:Hepatitis A

Explanation:

The most likely diagnosis is hepatitis A, given the clinical presentation and history of recent travel to a high-risk area.

Hepatitis A is an RNA virus, spread via the faecal-oral route. It has an incubation period of 4 weeks. Initial symptoms include a prodrome of mild flu-like symptoms (fatigue, nausea, malaise, joint pains), followed by the development of jaundice, dark urine, pale stools, abdominal pain and pruritis. Clinical examination typically reveals tender hepatosplenomegaly and lymphadenopathy.

Investigations usually show deranged LFTs (predominantly raised ALT and bilirubin). HAV IgM will be positive in acute infection (once the patient is symptomatic) and remains positive for 3-6 months after infection.

Hepatitis B is unlikely given the results provided in the question stem suggest previous immunisation, rather than acute hepatitis B infection.

Ascending cholangitis usually presents with a triad of jaundice, fever and right upper quadrant pain. This diagnosis is less likely given the lack of fever, absence of a history of gallstones and only a mild elevation of ALP (ALP is usually significantly raised in the context of ascending cholangitis).

Alcoholic hepatitis is unlikely given the patient's reported alcohol history and age.

Pancreatitis is highly unlikely given the normal amylase result.

Further reading:

https://patient.info/doctor/hepatitis-a-pro

Question:

A 23-year-old woman, attends her GP complaining of increasing shortness of breath on exertion over the last three months. It has been particularly bad when walking outside in the cold and she often feels wheezy with associated chest tightness.

She has a past medical history of asthma. She uses a salbutamol inhaler when she becomes symptomatic and a beclomethasone inhaler every morning and night (she has used this since the age of seven).

She is having to use her salbutamol inhaler around three times a day and she feels her symptoms are getting in the way of her rugby practice. She is also struggling to sleep at night due to a dry cough.

What would be the most appropriate management option according to NICE guidelines?

A. Add leukotriene receptor antagonist

B. Switch PRN salbutamol to regular

C. Oral antibiotics

D. Switch to high dose inhaled corticosteroid

E. Add long acting beta agonist

Correct Answer:Add leukotriene receptor antagonist

Explanation:

The NICE guidelines for chronic management of asthma in over 17s who are already on a PRN short-acting bronchodilator inhaler (SABA) and a low dose ICS state that if the symptoms are uncontrolled (i.e. symptomatic more than 3 times a week) a leukotriene receptor antagonist (LRA) should be added. If an LRA does not provide symptomatic relief, then the addition of a long-acting beta agonist (LABA) should be considered.

An antibiotic would be appropriate if she had a history suggestive of bacterial lower respiratory tract infection such as productive cough, fevers or crackles on auscultation of the chest.

Regular salbutamol is not indicated in the chronic treatment of asthma, but can be given regularly as a nebulizer in the treatment of acute exacerbations.

Before increasing the dose of the inhaled corticosteroid (ICS) alternative therapies should be trialled.

Further reading:

https://www.nice.org.uk/guidance/ng80/chapter/Recommendations#principles-of-pharmacological-treatment

Question:

A 56-year-old lady presents to the acute medical unit short of breath and complaining of pleuritic chest pain. Observations demonstrate a respiratory rate of 26, oxygen saturations of 92% on room air and a heart rate of 110 beats per minute. On examination, she has a swollen, tender left calf.

Past medical history includes asthma and a hysterectomy 2 years ago. She is a non-smoker. She has recently been on holiday to Sri Lanka; her return flight landed 3 days ago.

Which of the following is the most useful investigation for making a definitive diagnosis?

A. CT pulmonary angiography (CTPA)

B. Leg ultrasound scan

C. Troponin

D. ECG

E. D-dimer

Correct Answer:CT pulmonary angiography (CTPA)

Explanation:

The most likely diagnosis for this lady is an acute pulmonary embolism (PE) secondary to a deep vein thrombosis (DVT) in her left leg, which most likely developed consequent to recent long-distance travel. CTPA is the gold standard investigation for confirming a diagnosis of PE. The key word in this question is “definitive” – all other investigations are relevant in the diagnostic work-up and management of this patient but individually they would not allow you to make a definitive diagnosis of PE.

In practice, an initial 2-Level PE Wells' score should be calculated for any patient you suspect to have a PE (so long as they are haemodynamically stable). This lady would score 7.5 (clinical features of DVT = 3, HR>100 = 1.5, an alternative diagnosis is less likely than PE = 3), which would prompt you to perform a CTPA. A score of 4 or less would prompt you to perform a d-dimer test. A positive d-dimer result would warrant a CTPA.

An ECG should be performed in all patients with chest pain and/or tachycardia to investigate differential diagnoses. ECG findings associated with PE include sinus tachycardia, T wave inversion in anterior leads V1-V4 (right ventricular strain pattern), right axis deviation and the S1 Q3 T3 pattern (which is not a specific finding).

Troponin can be elevated in PE secondary to right heart strain.

A leg USS will only support the diagnosis of a DVT.

Further reading:

https://cks.nice.org.uk/pulmonary-embolism

Question:

A 24-year-old woman who is 32 weeks pregnant presents with a history of an offensive smelling, grey vaginal discharge, with no associated pain or itch. On testing, ‘clue cells’ are seen on microscopy, and a vaginal pH is > 4.5.

Which of the following is the first-line treatment for this condition?

A. Benzylpenicillin

B. Fluconazole

C. Ceftriaxone

D. Metronidazole

E. Doxycycline

Correct Answer:Metronidazole

Explanation:

Bacterial vaginosis is most commonly associated with overgrowth of anaerobic bacteria such as Gardnerella Vaginalis, which replace the lactobacilli that are normally present and increase the vaginal pH. It is commonly asymptomatic, and in such women, no treatment may be required. However, in pregnancy, it is associated with significant complications including miscarriage, pre-term labour and chorioamnionitis. It also increases susceptibility to sexually transmitted infections such as HIV.

Metronidazole 400-500mg BD, for 5-7 days, is the first-line treatment for bacterial vaginosis.

Bacterial vaginosis has a high rate of recurrence, with up to 70% of infections returning despite treatment.

Doxycycline is the first-line treatment for chlamydia. It is contraindicated in pregnancy, as tetracycline antibiotics are associated with discolouration of the child’s teeth.

Fluconazole is an antifungal medication used for the treatment of conditions such as candidiasis (‘thrush’).

Ceftriaxone is the treatment of choice for gonorrhoea.

Benzylpenicillin is used in the treatment of syphilis.

Further reading:

https://patient.info/doctor/bacterial-vaginosis-pro

Question:

A 53-year-old female presents to her general practitioner with a 2-month history of a small, pigmented lesion on her back (shown below). She denies any itch, tenderness or bleeding and the lesion has not changed size. She is usually fit and well and takes no regular medications.

What is the most likely diagnosis?

Source: Public Domain

A. Malignant melanoma

B. Pyogenic granuloma

C. Bullous pemphigoid

D. Seborrhoeic keratosis

E. Basal cell carcinoma

Correct Answer:Seborrhoeic keratosis

Explanation:

Seborrhoeic keratosis (also known as seborrhoeic warts) are extremely common benign lesions that usually appear in middle-aged and above patients. They are most commonly found on the trunk. The features of the lesion shown are typical of a seborrhoeic keratosis. They are pigmented lesions that usually have a greasy, ‘stuck-on’ appearance and a rough surface. They are usually asymptomatic and do not commonly require any treatment.

Basal cell carcinomas more commonly occur on sun-exposed sites rather than the trunk and are not commonly pigmented. Typical features include telangiectasia, central ulceration and raised pearly edges. These are often referred to as ‘rodent ulcers’ due to their appearance.

The history and lesion in the image do not have any concerning features that would suggest malignant melanoma such as irregular borders and asymmetry. A history of ulceration, bleeding and change in size would also make malignant melanoma a more likely diagnosis.

Pyogenic granulomas usually have a fleshy, nodular appearance. They usually occur secondary to skin trauma and are most commonly found on the face, hands and feet. Neither the history nor the image fits with this as a diagnosis.

Pemphigoid is an autoimmune condition that causes tense, fluid-filled blisters that are commonly itchy. Neither the history nor the image fits with this as a diagnosis.

Further reading:

https://patient.info/doctor/black-and-brown-skin-lesions

Question:

A 26-year-old G2P0 attends her 28-week antenatal appointment. The pregnancy has been well to date, and she feels well in herself. However, she has noticed that her face and hands appear more "puffy" than usual. On examination, her blood pressure is 149/94 mmHg. Her blood pressure has been normal before this. Urine dip shows protein ++.

What is the most appropriate management option?

A. IV magnesium sulphate

B. IV labetalol

C. IV bisoprolol

D. Oral labetalol

E. Oral ramipril

Correct Answer:Oral labetalol

Explanation:

This case demonstrates pre-eclampsia, characterised by a triad of new-onset hypertension, proteinuria and oedema. The main management priorities are restoring normotension and fetal monitoring. Oral labetalol is the first-line medication in managing pre-eclampsia, to reduce maternal blood pressure.

IV labetalol would be indicated in severe hypertension (≥160/110 mmHg).

ACE-inhibitors (including ramipril) are teratogenic and should be avoided in pregnancy, unless essential.

IV magnesium sulphate is used in the management of eclampsia. Eclampsia is the development of generalised seizures in association with pre-eclampsia. It is also indicated before 34 weeks' gestation for fetal neuroprotection in established preterm labour, however, this is not the case in this scenario.

Bisoprolol is not recommended during pregnancy as it reduces the uteroplacental blood flow and can impair fetal growth.

Further reading:

https://geekymedics.com/pre-eclampsia/

Question:

You are looking after a patient on the renal ward and are asked to review their blood tests. They have been poor to attend follow-up in the end stage renal failure clinic for the past 3 years and have been admitted routinely to have a new fistula created.

The patient's blood tests show:

Creatinine 400 (eGFR 6)

Calcium 2.70

PTH 95 ng/L

Phosphate 1.72

What is the most likely diagnosis?

A. Secondary hyperparathyroidism

B. Tertiary hyperparathyroidism

C. Vitamin D deficiency

D. Primary hyperparathyroidism

E. Malabsorption syndrome

Correct Answer:Tertiary hyperparathyroidism

Explanation:

The correct answer is tertiary hyperparathyroidism.

The parathyroid glands produce PTH in response to low blood calcium or high blood phosphate levels. In chronic renal disease, vitamin D levels fall and phosphate levels rise due to poor excretion at the kidneys. For this reason, phosphate binders are often prescribed to patients with CKD stage 4 and 5. If phosphate levels are unregulated (as in this case because the patient has failed to engage in regular follow up and blood monitoring) then PTH secretion will increase (secondary hyperparathyroidism), to reduce phosphate levels in the blood. Ultimately autonomous PTH secretion from the parathyroid glands will result and the blood calcium level will also be raised (tertiary hyperparathyroidism).

In primary hyperparathyroidism, there is high calcium and low phosphate as PTH does its normal job without successful negative feedback inhibition.

Psuedohyperparathyroidism is a rare autosomal dominant condition where there is a failure of target cells to respond to PTH.

Vitamin D deficiency and malabsorption syndromes produce a secondary hyperparathyroidism resulting in low calcium and low phosphate with a raised PTH which tries to counteract the failure of the body to absorb calcium.

Further reading:

https://patient.info/doctor/hyperparathyroidism-pro

Question:

A 47-year-old man presents with intermittent fever, weight loss, lassitude and drenching night sweats over several weeks. A chest x-ray is requested which shows bulky mediastinal lymphadenopathy. This is confirmed on a CT scan, which also shows para-aortic lymphadenopathy. He undergoes a CT-guided biopsy of the enlarged thoracic lymph nodes, the histology of which shows high grade non-Hodgkin lymphoma. He is treated with combination chemotherapy. Nine days after he received his first cycle of chemotherapy he develops high fever and rigors. He is tachycardic but is normotensive and has no focal symptoms or signs of infection. Blood tests results from the same morning are as follows:

Results Reference Range

Haemoglobin (Hb) 94 g/L (130-180)

Mean cell volume (MCV) 87 fl (80-100)

White cell count (WCC) 0.4x109/L (3.6-11.0)

Neutrophils 0.07x109/L (1.8 – 7.5 x 109)

Platelets 67x109/L (140 – 400 x109)

CRP >160 mg/L >5

Na+ 141 mmol/L (133–146)

K+ 4.7 mmol/L (3.5–5.3)

Creatinine 89 micromol/L (59–104)

Urea 6.1 mmol/L (2.5 - 7.8)

A full septic screen is initiated including blood and urine cultures and a chest x-ray is requested.

What is the most appropriate next course of action?

A. Start broad spectrum antibiotics

B. Start broad spectrum antibiotics plus antifungal and antiviral therapy

C. Await the results of the chest x-ray before deciding on treatment

D. Start broad spectrum antibiotics plus antiviral therapy

E. Start broad spectrum antibiotics plus antifungal therapy

Correct Answer:Start broad spectrum antibiotics

Explanation:

The most appropriate next course of action in this scenario would be to start broad spectrum antibiotics. By definition this patient has neutropenic sepsis: he has a profound neutropenia secondary to his chemotherapy, and the clinical and examination findings show clear evidence of an infection (high fever, rigors, and a raised C-reactive protein). Early recognition and treatment of neutropenic sepsis with broad-spectrum antibiotics (e.g. Tazocin) is therefore essential to minimize the risk of severe morbidity and death. Neutropenia is particularly associated with invasive bacterial infections, but may also be complicated by invasive fungal infections. The risk of fungal infections increases with the duration of neutropenia.

Start broad spectrum antibiotics plus antifungal therapy is incorrect as antifungal therapy is not usually indicated as part of first line empiric treatment of neutropenic sepsis in the absence of any specific clinical features to suggest invasive fungal disease. However empiric antifungal treatment should be considered if the clinical response to appropriate broad spectrum antibiotics is poor.

Start broad spectrum antibiotics plus antiviral therapy is incorrect as neutropenia is not a risk factor for viral infections since granulocytes are not involved in host responses to viral infections. Instead viral infections tend to complicate conditions in which there is impaired cell mediated immunity, for example after solid organ transplant or in HIV infection.

Start broad spectrum antibiotics plus antifungal and antiviral therapy is incorrect due to explanations given above.

Await results of chest x-ray before starting treatment is incorrect as it underestimates the urgency of this situation. Febrile neutropenia is a medical emergency, and patients can deteriorate rapidly in the absence of appropriate treatment. Broad spectrum antibiotics should be administered immediately without delay. Further investigations including a chest x-ray as part of a septic screen can then proceed once antibiotics have been given.

Further reading:

https://cks.nice.org.uk/topics/neutropenic-sepsis/

Question:

A 27-year-old female is 38/40 weeks pregnant. She presents to the labour ward following rupture of membranes with increasing contractions.

On vaginal examination, she is 8cm dilated and an umbilical cord is palpable. She is attached to cardiotocography (CTG) monitoring which shows acute bradycardia on fetal heart rate monitoring.

Which of the following is a known complication of this obstetric emergency?

A. Polyhydramnios

B. Necrotising enterocolitis

C. Birth hypoxia

D. Small birth weight

E. Congenital malformations

Correct Answer:Birth hypoxia

Explanation:

Umbilical cord prolapse is defined as the umbilical cord descending below the fetal presenting part (usually head), through the cervix, in the presence of ruptured membranes. Complications of cord prolapse include birth hypoxia and psychological trauma. Cord prolapse is an obstetric emergency as the umbilical cord will develop vasospasm, and fetal hypoxia will occur if left untreated. Due to the risk of birth hypoxia, the neonatology team should be present at delivery and paired umbilical cord gases should be taken to assess fetal pH.

Polyhydramnios (excess amniotic fluid in the amniotic sac) is a risk factor for umbilical cord prolapse, not a complication.

Necrotising enterocolitis (NEC) is a common complication of prematurity but not a direct complication of umbilical cord prolapse. NEC is a serious illness in which tissues in the intestine become inflamed and start to die.

Small birth weight and congenital malformations are not known complications of cord prolapse.

Further reading:

https://geekymedics.com/cord-prolapse/

Question:

A 15-year-old boy is brought to the GP by his mother with a worsening sore throat and fever that has been ongoing for 7-days.

He feels extremely unwell today and could barely get out of bed this morning. He says he has been unable to swallow fluids for the past 24 hours.

On examination, he is febrile and appears unwell with dry mucous membranes. There is tonsillar enlargement, with the tonsils almost meeting mid-line and a 'whitewash' of exudate. His cervical lymph nodes are enlarged and tender. Capillary refill is also delayed (3 seconds). On closer examination of the abdomen, splenomegaly is noted.

What is the most appropriate initial management step?

A. Arrange hospital admission

B. Prescribe amoxicillin

C. Prescribe paracetamol

D. Prescribe aspirin

E. Prescribe ampicillin

Correct Answer:Arrange hospital admission

Explanation:

The most likely diagnosis is infectious mononucleosis, also known as 'glandular fever' and should be suspected in patients aged between 15-24 year presenting with fever, lymphadenopathy, severe sore throat and splenomegaly. NICE guidelines recommend that hospital admission should be arranged for patients if there is evidence of stridor, dehydration, difficulty swallowing fluids or a complication of glandular fever, such as splenic rupture. This patient has evidence of dehydration (dry mucous membranes, delayed capillary refill) and reports difficulty swallowing liquids over the last 24 hours. Therefore, the most appropriate next step is to arrange hospital admission for this patient.

In the context of acute glandular fever and subsequent pharyngitis, some antibiotics like ampicillin and amoxicillin should be avoided, as use may lead to the development of an extensive rash. Additionally, antibiotic treatment is not routinely indicated for the treatment of pharyngitis or glandular fever. If a secondary bacterial infection is suspected in the context of glandular fever, the antibiotic of choice is phenoxymethylpenicillin (penicillin V), as there is a lower incidence of associated rash.

Typically patients with glandular fever can be managed conservatively with analgesia such as paracetamol. However, as this patient has indications for hospital admission, this is not the most suitable answer.

Aspirin is not licensed for use in children under 16 years old; therefore, it would not be appropriate in this patient's management.

Further reading:

https://cks.nice.org.uk/topics/glandular-fever-infectious-mononucleosis/

Question:

A 13-year-old girl presented to GP with greasy skin with a mixture of comedones, papules and pustules, which started just after puberty. On physical examination, the lesions are distributed mainly on her face. However, a few are present in the chest and back too. She has also developed multiple painful cysts and nodules over the last couple of weeks. Her past medical history is significant for major depressive and body dysmorphic disorder. She is taking escitalopram and sertraline for the last 6-months.

What is the most likely diagnosis?

A. Acne rosacea

B. Perioral dermatitis

C. Milia

D. Pityrosporum folliculitis

E. Acne vulgaris

Correct Answer:Acne vulgaris

Explanation:

The most likely diagnosis is acne vulgaris usually present with greasy skin with a mixture of comedones, papules and pustules, which present just after puberty and continue for a variable number of years, usually stopping in the late teens or early 20s but uncommonly continuing well into adulthood.

Acne rosacea usually presents in middle age or later in life and it's highly unlikely to present in 13-year-old girls.

Milia are small keratin cysts that may be confused with whiteheads. They tend to be whiter than acne whiteheads and are most commonly seen around the eyes.

Pityrosporum folliculitis is a painful condition involving hair follicles. However, predominates on the trunk. Pityrosporum folliculitis tends to be itchy (acne usually is not), also pityrosporum folliculitis pustules lack comedones which are widely present in acne vulgaris.

Perioral dermatitis is an inflammatory rash involving the skin around your mouth. The rash may spread up to your nose or even your eyes. In that case, it's referred to as periorificial dermatitis. Perioral dermatitis usually appears as a scaly or red bumpy rash.

Further reading:

https://patient.info/doctor/acne-vulgaris

Question:

A 32-year-old man presents to the GP with a 6-month history of worsening fatigue. He reports that he does not feel refreshed in the morning despite going to bed earlier each night. He recently quit his job as a personal trainer as he feels exhausted after just 5 minutes of exercise.

He also describes a feeling of constant brain fog and intermittent mild headaches. The patient does not report any low mood, anhedonia or suicidal thoughts.

He has no significant past medical history and does not take any regular medication. He does not have drug allergies.

Physical examination is normal.

A comprehensive set of blood tests including FBC, ESR, CRP, TFTs, LFTs, ANA, RF and HIV antibodies do not reveal any abnormalities.

What is the most likely diagnosis?

A. Ankylosing spondylitis

B. Fibromyalgia

C. Chronic fatigue syndrome

D. Hypothyroidism

E. Infectious mononucleosis

Correct Answer:Chronic fatigue syndrome

Explanation:

The most likely diagnosis in this patient is chronic fatigue syndrome (CFS), also known as myalgic encephalomyelitis (ME). CFS/ME is characterised by persistent and disabling fatigue, post-exertional malaise (PEM), unrefreshing sleep, cognitive dysfunction and headaches. The symptoms in CFS/ME are not related to other medical or psychiatric conditions; therefore, the presence of normal physical examination and laboratory investigations supports this diagnosis.

Patients with infectious mononucleosis are typically aged between 15-24 years old and present with characteristic features of fever, malaise, tender cervical lymphadenopathy and severe sore throat. This patient is beyond the typical, expected age range and does not have any features on examination to support a diagnosis of infectious mononucleosis.

Clinically, it is challenging to distinguish between fibromyalgia and CFS/ME. However, patients with fibromyalgia typically present with widespread body pain or tenderness, in addition to fatigue, cognitive dysfunction and sleep disturbance. The absence of pain in this patient makes fibromyalgia a less likely diagnosis but does not rule it out.

Ankylosing spondylitis (AS) is a seronegative spondyloarthropathy that usually presents with inflammatory back pain (i.e. pain is worse in the morning, has an insidious onset and lasts >3 months). Patients with AS may have associated fatigue; however, they typically report an improvement of symptoms after exercise. This patient does not explicitly mention back pain but rather a general sense of fatigue, malaise, and worsening symptoms after exercise, making AS a less likely diagnosis.

This patient did not have any abnormalities detected on recent blood tests, including thyroid function tests (TFTs), making hypothyroidism a less likely diagnosis. Furthermore, patients with hypothyroidism typically report fatigue in conjunction with other symptoms, such as dry skin, cold intolerance, weight gain, weakness and constipation, which is not reported here.

Further reading:

https://cks.nice.org.uk/topics/tiredness-fatigue-in-adults/

Question:

A 75-year-old man is brought to the emergency department with memory problems, aggressive behaviour and hallucinations. A collateral history is taken. Over the last two years, he has had personality changes and reduced motivation and appetite. In the last year, he has developed faecal and urinary incontinence.

On examination, there is a non-tender granulomatous lesion on his scalp. He has small bilateral pupils which do not respond to light but still accommodate. There is bilateral lower limb weakness and diminished reflexes.

He is known to have problems with medication adherence, and the only history of note is a previous presentation with a painless genital ulcer decades ago, for which antibiotics were given.

What is the most likely diagnosis?

A. Secondary syphilis

B. Primary HIV infection

C. Alzheimer's dementia

D. Tertiary syphilis

E. Vascular dementia

Correct Answer:Tertiary syphilis

Explanation:

Tertiary syphilis is correct. This patient has presented with a widespread maculopapular rash, granulomatous skin lesions, psychiatric problems, faecal and urinary incontinence, pupillary problems, and lower limb neurological signs. The only medical history available is a painless genital ulcer from decades ago. These features all point towards a diagnosis of tertiary syphilis, which can develop decades after initial infection. Tertiary syphilis is characterised by granulomatous lesions (known as gummas) in the skin and bones, and features of neurosyphilis (e.g. memory impairment, altered mood, dementia, urinary and bowel incontinence, and pupillary problems). The sign seen with this patient's pupils is known as Argyll-Robertson pupils, which is where the pupils do not react to light but still accommodate. The fact this patient is non-adherent to medication suggests that they may not have been sufficiently treated when they first presented with the painless genital ulcer decades ago (which is often the first presentation of primary syphilis).

Secondary syphilis is incorrect. This typically develops up to 8 weeks after the primary syphilis infection. This is due to the haematogenous spread of syphilis leading to systemic symptoms (such as fever, malaise, and lymphadenopathy), a widespread maculopapular rash, and genital erosions.

Vascular dementia typically presents as a stepwise decline in cognitive function in patients with a history significant of cardiovascular disease, and Alzheimer's disease is more insidious and is not stepwise. These diagnoses would not explain the signs seen on examination.

Although neurological problems can arise in patients with HIV, and they may develop syphilis as a complication, a primary HIV infection would not explain the signs and symptoms seen. Additionally, there is no preceding genital ulceration in HIV.

Further reading:

https://geekymedics.com/sexually-transmitted-infections-stis/

Question:

A 56-year-old man presents to the emergency department with central chest pain and pressure that came on at rest. He explains that the same pain had started 6 months ago whenever he went for a jog, and has progressively worsened since. He has a background of hypertension and a ten-pack-year smoking history but takes no medication.

On examination, he does not appear distressed. On auscultation, bilateral air entry is heard, along with normal heart sounds. An ECG and serial troponins are unremarkable.

Which of the following best describes the most likely underlying pathophysiology?

A. Complete vaso-occlusion of a coronary artery

B. Intra-luminal coronary artery thrombus formation

C. Cardiovascular arrhythmias

D. Cardiovascular tissue necrosis

E. Foam cell formation in the coronary arteries

Correct Answer:Intra-luminal coronary artery thrombus formation

Explanation:

The history of chest pain at rest points towards an acute coronary syndrome on the background of chest pain on exertion, and risk factors such as hypertension and smoking. A lack of ECG changes or rise in troponin rules out ST-elevation myocardial infarction (STEMI). In a non-STEMI, a rise in troponins would be expected secondary to tissue infarction, but ECG changes may not be present. With chest pain at rest and normal investigations, the most likely diagnosis is unstable angina. Unstable angina results from intra-luminal coronary artery thrombus formation following atherosclerotic plaque rupture and leading to impaired tissue perfusion.

Foam cell formation is a key step in atherogenesis. Atherosclerotic plaque is present in the majority of stable angina cases and acute coronary syndromes, but itself does not often cause unstable angina.

Cardiovascular arrhythmias can increase myocardial oxygen demand and therefore precipitate unstable angina, but arrhythmias are not causal.

Cardiovascular tissue necrosis occurs with STEMI or a non-STEMI. Non-STEMI and unstable angina are differentiated by the presence of tissue necrosis in a non-STEMI.

Complete vaso-occulsion of a coronary artery is typically found in a STEMI, where complete blockage leads to tissue death. Instead, a partial blockage is often found in unstable angina.

Further reading:

https://bnf.nice.org.uk/treatment-summaries/acute-coronary-syndromes/

Question:

A 78-year-old man is being investigated for three months of worsening fatigue. He has also gained 6kg of weight over this period. He has a history of ischaemic heart disease, type II diabetes mellitus, hypertension, and chronic obstructive pulmonary disease (COPD). He does not report any shortness of breath, cough, haemoptysis, chest pain, palpitations, fevers, night sweats, or pain in his muscles or joints.

On examination, there is significant pitting oedema extending to the mid-shin, and he has a raised jugular venous pressure (JVP). His chest is clear on auscultation bilaterally, with normal heart sounds.

What is the most likely diagnosis?

A. Cor pulmonale

B. Small cell lung cancer

C. Squamous cell lung cancer

D. Secondary polycythaemia

E. Left heart failure

Correct Answer:Cor pulmonale

Explanation:

The patient in the vignette has features of right heart failure (fatigue, weight gain, peripheral pitting oedema and a raised JVP) with a background of COPD. Therefore the most likely diagnosis is cor pulmonale (impairment in the structure and function of the right side of the heart secondary to chronic lung disease with renal fluid retention due to hypoxia/hypercapnia).

Left heart failure is more likely to result in fluid building up in the pulmonary circulation, resulting in features associated with pulmonary congestion (cough, shortness of breath, blood-tinged sputum, and crackles on auscultation). The patient in the vignette has features more suggestive of right heart failure resulting in fluid build-up in the systemic circulation.

Secondary polycythaemia is a known complication of COPD resulting from chronic hypoxia. Although secondary polycythaemia may result in fatigue, it is not associated with peripheral oedema or a raised JVP, and there are no blood results to support this diagnosis.

Lung cancers (both small and squamous cell) are known complications of COPD. However, the patient in the vignette has features of right heart failure and secondary fluid overload, which are not associated with lung cancer. A lung cancer diagnosis should be suspected in a patient with either haemoptysis, unexplained weight loss, or suspicious changes on a chest X-ray. The patient in the vignette has weight gain (secondary to fluid overload), does not report any haemoptysis, and has no chest X-ray results to consider lung cancer as a diagnosis.

Further reading:

https://geekymedics.com/chronic-obstructive-pulmonary-disease-copd/

Question:

A 90-year-old woman presents to her GP with shortness of breath. Blood tests reveal she has a haemoglobin level of 50 g/L (115 – 165).

She is referred for admission for a blood transfusion. Four hours after the transfusion, the following observations were made:

Respiratory rate: 15/min

Blood pressure: 99/70 mmHg

Temperature: 38.2ºC

The patient is visibly short of breath. Her chest displays coarse crackles bilaterally on auscultation which are worse in the lower zones. There is no urticaria or facial swelling. A blood transfusion complication is suspected to be the cause.

What is a risk factor of the most likely diagnosis?

A. Congestive heart failure

B. History of atopy

C. Hypovolaemia before transfusion

D. Autoimmune conditions such as rheumatoid arthritis

E. Low volume of blood required for transfusion

Correct Answer:Congestive heart failure

Explanation:

Congestive heart failure is correct, because congestive heart failure (CHF) is associated with fluid overload and pulmonary oedema. The most likely complication here is transfusion-associated circulatory overload (TACO), which is where the body of the patient cannot distribute the new fluid properly, causing pulmonary oedema and respiratory distress. CHF is already associated with difficulty in maintaining a proper fluid balance, so it is a common risk factor for TACO.

Autoimmune conditions such as rheumatoid arthritis are not associated with TACO, although prior exposure to non-ABO antibodies on blood cells such as in a prior transfusion or in pregnancy are immune-mediated risk factors for developing the complication.

History of atopy is not associated with the development of TACO, which is usually more of an issue with distributing fluids around the body.

Hypovolaemia before transfusion is not a risk factor for TACO, although normo/hypervolaemia is. This is because extra fluid is being added into the total circulating volume, increasing the risk of fluid overload, which is the basic pathophysiology of TACO.

Low volume of blood required for transfusion is not a risk factor for TACO. Instead, a high volume of blood product replacement would be a risk factor, because this would constitute a greater volume of fluid, meaning the patient is at greater risk of developing fluid overload and therefore TACO.

Further reading:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6324877/

Question:

A 75-year-old male with a background of advanced COPD is admitted to the medical assessment unit with a 4-day history of increasing shortness of breath and productive cough. He describes bringing up white sputum and denies any haemoptysis. Clinical examination reveals widespread crackles and wheeze, with equal air entry throughout. Vital signs are normal other than a SpO2 of 89% on room air.

A chest x-ray reveals hyperinflation of the lungs with no evidence of consolidation. Blood tests reveal a haemoglobin of 125 g/dL, a white cell count of 8.9 and a CRP of 5. A sputum sample is sent to the lab for culture.

Which of the following is the next most appropriate management option?

A. Prednisolone 30mg orally for 7 days

B. Hydrocortisone 100mg IV for 3 days

C. Low-flow oxygen via nasal cannulae

D. Amoxicillin 500mg TDS for 5 days

E. High-flow oxygen via non-rebreather mask

Correct Answer:Prednisolone 30mg orally for 7 days

Explanation:

This patient is most likely presenting with a non-infective exacerbation of COPD, given the absence of fever, purulent sputum, focal clinical signs and consolidation on chest X-ray. The most appropriate initial management option would be to prescribe prednisolone 30mg orally for 7 days.

IV hydrocortisone can be used as an alternative to oral prednisolone in cases where the patient is unable to take tablets. However, this is not mentioned in this scenario and the patient appears stable.

High-flow oxygen via a non-rebreather mask would not be appropriate, given the patient's oxygen saturations are within a suitable range for a patient with advanced COPD. When COPD patients require high-flow oxygen, this is usually delivered via a venturi mask to reduce the risk of CO2 retention.

Low-flow oxygen via nasal cannulae is also unnecessary in this scenario, given the patient currently has a normal respiratory rate and an SpO2 that is in the acceptable range for a patient with advanced COPD (88-92%).

Amoxicillin 500mg TDS for 5 days is NOT currently indicated, given there is no clear evidence of infection (apyrexial, no consolidation, normal inflammatory markers). Should the sputum culture grow an organism, antibiotic therapy could be considered.

Further reading:

https://patient.info/doctor/acute-exacerbations-of-copd

Question:

A 54-year-old woman presents to the GP with a 3-month history of fatigue and weakness. She reports that these symptoms have come on gradually, and she has now noticed palpitations and strange tingling sensations in her hands and feet. The tiredness is now beginning to affect her ability to work, she is a garden centre assistant, and is struggling to carry plants around, as she finds she becomes short of breath quickly. She denies any problems with sleep and has no other symptoms of note. She informs the GP that her mood remains good, despite the recent COVID-19 lockdowns.

The patient has a history of Hashimoto's thyroiditis, for which she takes levothyroxine once daily; she takes no other regular medication. She reports eating a normal diet and does not smoke, although she admits to drinking 2 glasses of wine with her dinner each night. Investigations carried out reveal macrocytic anaemia, with a blood film displaying hypersegmented neutrophils and megaloblastic cells. Thyroid function tests, U&E's and LFT's are all normal.

Given the likely diagnosis, which of the following complications is most likely to arise if treatment is not initiated?

A. Prolonged prothrombin time

B. Increased risk of small bowel lymphoma

C. Issues with proprioception and vibration sense

D. Splenic atrophy

E. Aplastic anaemia

Correct Answer:Issues with proprioception and vibration sense

Explanation:

Pernicious anaemia is the most common cause of vitamin B12 deficiency; given its autoimmune nature, the condition is especially likely in this patient due to her history of autoimmune thyroid disease. The disease involves autoantibodies targeting either intrinsic factor itself, or parietal cells within the stomach that are responsible for the production of this glycoprotein. Intrinsic factor is essential for the absorption of vitamin B12 within the terminal ileum; insufficient levels in pernicious anaemia cause patients to become deficient.

If untreated, vitamin B12 deficiency can progress to cause subacute combined degeneration of the cord, with patches of demyelination arising, leading to neurological dysfunction. This most commonly affects the dorsal columns before the spinothalamic and corticospinal tracts, meaning that issues with proprioception and vibration sense (mediated by the dorsal columns) can be early signs that the condition is developing. Urgent treatment with vitamin B12 (given intramuscularly in the setting of pernicious anaemia) is necessary to prevent further neurological deficits from occurring.

Aplastic anaemia can arise due to a congenital syndrome, due to the provision of chemotherapy, or can be idiopathic in a number of cases. Vitamin B12 deficiency is not known to trigger aplastic anaemia.

Pernicious anaemia can be associated with an increased risk of gastric cancer due to the inflammation caused by the autoimmune attack of parietal cells. However, it is not associated with an increased risk of small bowel lymphoma (this can be a rare complication of coeliac disease).

A prolonged prothrombin time can arise due to vitamin K deficiency, the use of drugs such as warfarin, or liver dysfunction; it is not associated with pernicious anaemia or vitamin B12 deficiency.

Splenic atrophy and hypofunction is a rare complication of coeliac disease; this is not the cause of the patient's vitamin B12 deficiency in this case.

Further reading:

https://cks.nice.org.uk/topics/anaemia-b12-folate-deficiency/

Question:

An 8-year-old boy attends his GP accompanied by his parents with joint pain. The patient reports that his elbows and knees started to cause him discomfort around 1 week previously. He also mentions that his knees were initially more painful than his elbows, but now the opposite is true. The patient describes the affected joints as red, hot, and very painful. On further questioning, the parents report that their son suffered from a sore throat approximately 3 weeks ago, for which he had a positive throat swab and was treated appropriately.

Clinical examination reveals the following:

temperature - 38.9 oC

heart rate - 150 bpm

hot, erythematous tender elbows and knees with reduced range of movement

pericardial rub on auscultation of the heart

erythema marginatum affecting the trunk.

Which of the following are MAJOR CRITERIA used to aid in the diagnosis of the condition described?

A. Raised ESR/CRP, Prolonged PR interval, Arthralgia

B. Arthritis, Raised ESR and CRP, Prolonged PR interval

C. Subcutaneous nodules, Fever

D. Erythema marginatum, Carditis, Chorea

E. Fever, Chorea, Subcutaneous nodules

Correct Answer:Erythema marginatum, Carditis, Chorea

Explanation:

The most likely diagnosis, in this case, is rheumatic fever. The Jones Criteria is used to classify the likelihood of rheumatic fever. This criterion states that there must be evidence of recent streptococcal throat infection (e.g. positive throat swab) plus the presence of either 2 major or 1 major and 2 minor criteria.

Major criteria include:

Arthritis (usually migratory with large joints affected most commonly)

Carditis (presenting with palpitations, tachycardia, murmur, pericardial rub etc)

Chorea

Subcutaneous nodules (firm, painless nodules present on extensor surfaces)

Erythema marginatum (characteristically comprising of pale-red macules or papules)

Minor criteria include:

Fever

Raised ESR and CRP

Arthralgia

Prolonged PR interval

This condition is most commonly caused by a hypersensitivity reaction in response to a recent beta-haemolytic streptococcal throat infection.

Investigations for rheumatic fever include:

throat swabs (useful only for the initial pharyngeal infection)

anti-streptococcal antibodies

ECG (which may identify prolonged PR interval, tachycardia, sometimes pericarditis)

CXR (useful in suspected heart failure)

ECHO

Management of this condition includes:

bed rest (in order to reduce cardiac stress)

penicillin (or erythromycin or a cephalosporin in penicillin allergy)

aspirin (in the presence of arthritis)

heart failure management (e.g. ACE-inhibitor, diuretics)

Fever is not a major criterion for rheumatic fever.

A raised ESR and CRP, prolonged PR interval and the presence of arthralgia are not part of the major Jones Criteria.

Further reading:

https://patient.info/doctor/rheumatic-fever-pro

Question:

An 82-year-old gentleman is an inpatient on an elderly care ward following a fall in a care home. Whilst on the ward round the consultant notes that the patient has some abnormal facial movements. He appears to be smacking his lips and protruding his tongue in an involuntary manner. His carer who is also present reports that this has been noticed by the staff at the care home for the last month.

The patient has a past medical history of stroke, hypertension, GORD and psychosis. His medications include amlodipine, bendroflumethiazide, clopidogrel, lansoprazole and haloperidol.

On examination, the patient is displaying the abnormal orofacial movements described above but has no other obvious abnormal movements. He has left-sided hemiplegia which is long-standing from his previous stroke and no signs of parkinsonism.

What movement disorder is most likely to be present here?

A. Torticollis

B. Tardive dyskinesia

C. Chorea

D. Tics

E. Hemiballism

Correct Answer:Tardive dyskinesia

Explanation:

Antipsychotics, especially older drugs such as haloperidol, are particularly associated with tardive dyskinesia. This is a movement disorder usually characterised restlessness and by abnormal orofacial movements. It occasionally involves the distal extremities with choreiform movements. It is often seen in patients taking neuroleptic medications for a prolonged period and can be difficult to treat - switching to a newer-generation antipsychotic such as clozapine can ease symptoms.

Torticollis is dystonia affecting the sternocleidomastoid muscle causing painful neck spasms. It can be inherited and may be seen as part of generalised dystonia syndromes.

Hemiballism may occur following stroke and is characterised by uncontrollable flailing movements of one side of the body. It can also be seen acutely in cases of hyperglycaemia.

Chorea is typically associated with Huntington's Disease but can be seen in other conditions such as Parkinson's Disease, as a side effect of treatment. It is a term used to describe sudden, uncontrolled, jerky posturing movements often of the distal extremities.

Tics are repetitive stereotyped movements classically seen in Tourette's Syndrome but may occur in isolation. They may be verbal or physical and have a voluntary aspect.

Further reading:

https://patient.info/doctor/abnormal-involuntary-movements

Question:

A 65-year-old man is referred to nephrology because he has slowly progressive chronic kidney disease (CKD). His eGFR is now 15 ml/min, having been 30 ml/min three years prior. He has a past medical history of type 2 diabetes, coronary artery bypass grafting, aorto-bifemoral bypass surgery and an ischaemic stroke. There is no history of diabetic retinopathy.

Urine dipstick shows 1+ protein, no blood, no glycosuria and normal pH. Albumin creatinine ratio is returned at 5.

Ultrasound of the kidneys shows bilateral small kidneys with some loss of corticomedullary differentiation.

What is the most likely cause of this patient's CKD?

A. Polycystic kidney disease

B. Renovascular disease

C. IgA nephropathy

D. Diabetic nephropathy

E. Glomerular basement membrane disease

Correct Answer:Renovascular disease

Explanation:

This question encourages the candidate to consider the different clinical presentations of renal disorders which can be categorised into vascular, glomerular, and tubulointerstitial.

The cause of CKD in this scenario most likely to be renovascular disease. He has a strong history of arterial disease elsewhere and small kidneys on the ultrasound scan in keeping with this diagnosis. Renovascular disease does not usually does not need to be confirmed by angiographic studies. The majority of people with renovascular disease will have atheromatous renal arteries. However, a small number will have other causes of renovascular disease such as fibromuscular dysplasia.

Glomerular causes of renal disease such as IgA nephropathy and diabetic nephropathy typically present with heavy albuminuria and would be expected to show more than 1+ protein on dipstick analysis. Glomerulonephritis, in particular, would also be expected to show more haematuria, typically 3+ blood and 3+ protein on dipstick analysis. It would also often present with hypertension and ankle oedema.

Glomerular basement membrane disease is a rapidly progressive disorder which presents with acute kidney injury. It would not cause the slowly progressive loss of renal function described in the question.

Tubulointerstitial causes of kidney disease include polycystic kidney disease. They typically present with less albuminuria than glomerular disorders and in the case of polycystic kidney disease would have cysts present on ultrasound imaging, which are not apparent here.

Further reading:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2560872/

Question:

Matthew Jones, a 12-year-old boy, is brought to the A&E department with a right-sided limp. The limp came on suddenly this morning and has been causing marked pain on weight-bearing. On examination, Matthew is overweight and has a slight limp on the right side. There are no overlying skin changes of note and no overt history of trauma. Range of movement of the affected hip is reduced secondary to pain, particularly on internal rotation. Vital signs are unremarkable.

Given the likely diagnosis, which of the following would be the most appropriate way to manage this patient?

A. Joint aspiration and culture

B. Outpatient referral to dietician and physiotherapy

C. AP and lateral x-ray of the both hips and urgent review

D. Reassure and give orthopaedic outpatient appointment in 2 weeks

E. CT scan of both hips and urgent review

Correct Answer:AP and lateral x-ray of the both hips and urgent review

Explanation:

The most likely diagnosis is slipped upper femoral epiphysis (SUFE). A SUFE refers to when there is a fracture through the growth plate of the proximal femur, which results in slippage of the overlying head of the femur. It typically occurs in children aged between 10-15 years old. It can present with pain in the groin, hip, thigh, and knee. Some children may only have knee pain secondary to referred pain. Children will also typically have a limp and reduced range of movement on the affected side due to pain. A slight shortening of the leg may also be present.

Childhood limps should always be taken seriously and, given this patients age, a slipped upper femoral epiphysis should be excluded. In accordance with NICE guidelines, any child over 9 with restricted hip movements associated with pain should have an urgent AP and lateral X-ray of both hips as well as an urgent referral to orthopaedics.

Although a CT scan of the hips may be performed at some point, X-ray would be a more appropriate first-line investigation.

Joint aspiration and culture are less likely to be useful in this scenario, as the clinical history and findings are more in keeping with a diagnosis of SUFE. If the child was pyrexial, this might be a more appropriate choice.

Further reading:

https://cks.nice.org.uk/acute-childhood-limp#!scenario

Question:

A 55-year old man presents with a 2-day history of jaundice and mild abdominal distension after a heavy weekend of drinking. He denies any fevers or haematemesis. He has longstanding alcoholic liver disease. His vital signs are normal, with a temperature of 36.8oC. His MMSE is 27/30.

On examination, caput-medusae and shifting dullness are noted. Blood tests reveal albumin of 32 g/L and a leukocyte count of 8. An ascitic tap reveals albumin of 20 g/L and a white blood cell count of 50 cells/mm3.

What is the most appropriate initial treatment?

A. Antibiotics

B. Transjugular intrahepatic portosystemic shunt (TIPS)

C. Insert an abdominal drain

D. Give 100 mL 20% albumin

E. Spironolactone

Correct Answer:Spironolactone

Explanation:

This patient has ascites caused by decompensated liver cirrhosis and portal hypertension. The first-line treatment is salt restriction and diuretics (i.e. spironolactone in the first instance +/- furosemide).

Drainage is only indicated if the ascites is refractory or severe.

The patient does not have spontaneous bacterial peritonitis (diagnosis requires >250 neutrophils/mm3 in the ascitic tap), and prophylactic antibiotics are not advised routinely.

The patients’ albumin is slightly reduced, but this is probably not the main cause of the ascites. The TIPS procedure can be a treatment for refractory ascites, but would not be appropriate for this patient.

Further reading:

https://patient.info/doctor/ascites

Question:

A 66-year-old female presents to her GP with a 5-day history of worsening shortness of breath and a productive cough, with yellow-green sputum. She has a past medical history of chronic obstructive pulmonary disease (COPD) and hypertension. She recently received the pneumococcal vaccine.

Her heart rate is 74/min, respiratory rate 18/min, blood pressure 134/87 mmHg, oxygen saturation 96% and temperature 37.9oC. On examination, crackles are heard over the left lower zone. A sputum sample is collected for microscopy, culture and sensitivity.

What is the most likely causative organism?

A. Haemophilus influenza

B. Streptococcus pneumoniae

C. Staphylococcus aureus

D. Klebsiella pneumoniae

E. Legionella pneumophilia

Correct Answer:Haemophilus influenza

Explanation:

With the clinical features of a productive cough, dyspnoea and audible crackles, this patient is likely experiencing an infective exacerbation of COPD. Haemophilus influenzae is the most common causative organism.

Streptococcus pneumoniae is responsible for around 80% of cases of pneumonia. However, this patient has been recently vaccinated against the bacteria, so this is less likely to be the causative organism.

Staphylococcus aureus is the most common cause of bacterial pneumonia after an influenza virus infection and in cystic fibrosis patients.

Klebsiella pneumoniae is a common cause of bacterial pneumonia in patients with alcohol dependency.

Legionella pneumophilia is an atypical bacterial infection, commonly contracted from infected air conditioning units.

Further reading:

https://patient.info/doctor/acute-exacerbations-of-copd

Question:

A 43-year-old man presents to the GP complaining of persistent joint pain, particularly in the back and knees, and a generalised itch. The pain is worse in the morning, but he finds that swimming helps. On further questioning, he reports suffering from diarrhoea and abdominal pain for a number of years and also describes a few occasions of self-resolving painful lesions on his shins.

Blood tests are requested:

Test Result Reference range

Alkaline phosphatase (ALP) 158 U/L (30–130)

Alanine aminotransferase (ALT) 30 U/L (<41)

Bilirubin 32 μmol/L (<21)

GGT 72 U/L (<60)

Albumin 42 g/L (35–50)

Faecal calprotectin Positive Negative

Based on the probable primary diagnosis, what is the most important complication to consider?

A. Hyperlipidaemia

B. Thrombocytopenic purpura

C. Mirizzi's syndrome

D. Cholangiocarcinoma

E. Subacute sclerosing panencephalitis

Correct Answer:Cholangiocarcinoma

Explanation:

The history of arthralgia, in combination with vague abdominal symptoms and erythema nodosum (the likely explanation for the patient's shin lesions), should lead to a consideration of inflammatory bowel disease (IBD) as a possible diagnosis. Enteropathic arthritis and erythema nodosum are relatively common extra-articular manifestations of both Crohn's and ulcerative colitis, and whilst irritable bowel syndrome could account for the patient's symptoms, this is a diagnosis of exclusion, and the history given suggests that the patient has not sought medical advice for his medical symptoms previously.

The LFT results show a cholestatic picture, with a raised ALP and GGT. Considering the patient's history of likely ulcerative colitis, and reports of increasing itch, the most likely explanation for these results is primary sclerosing cholangitis (PSC); this condition is almost exclusively seen in those with the condition. The disease involves chronic inflammation of intra- and extrahepatic bile ducts, which results in issues with the passage of bile, and explains the abnormalities on LFTs. MRCP is often used to confirm the diagnosis; the characteristic finding is of dilation and beading of the bile ducts.

The most important complication in the setting of PSC is the development of cholangiocarcinoma; this can affect up to 15% of those with the condition. This patient will also have a small increased risk of hepatocellular carcinoma, as well as of bowel malignancy, due to the underlying ulcerative colitis.

Mirizzi's syndrome refers to the presence of a large gallstone within the neck of the gallbladder that causes obstruction of the common hepatic duct and thus cholestasis. It is not associated with PSC.

Hyperlipidaemia is a known complication of primary biliary cholangitis, rather than of primary sclerosing cholangitis; patients with the condition may present with xanthelasma on examination.

Subacute sclerosing panencephalitis is a rare complication of measles infection that can arise many years after the initial illness. The presentation is will progressive neurological dysfunction; there is currently no known treatment for the condition.

There is no known association between primary sclerosing cholangitis and thrombotic thrombocytopenic purpura.

Further reading:

https://patient.info/doctor/primary-sclerosing-cholangitis-pro

Question:

You are examining a 35-year-old man who complains of progressive bilateral leg weakness and numbness. He is unable to walk unassisted and his legs appear stiff, extended at the hip knee and ankle.

Motor examination reveals bilateral leg weakness, predominantly affecting the hip flexors, quadriceps and ankle dorsiflexors. There is also mild weakness of the small muscles of both hands with associated wasting. Ankle and knee jerks are brisk and there is a crossed adductor reflex. The biceps and supinator reflexes are normal but you find it hard to elicit the triceps reflex. Sensory examination reveals a sensory level at the upper chest and loss of sensation to the ulnar aspect of both hands and forearms.

Where is the lesion most likely located?

A. Lumbosacral plexus

B. Lower thoracic spinal cord

C. Ulnar nerve

D. Lower cervical spinal cord

E. Cauda equina

Correct Answer:Lower cervical spinal cord

Explanation:

A lower cervical cord lesion would explain the findings listed above. There are upper motor neuron findings BELOW the level of the lesion evidenced by the pyramidal distribution of weakness and brisk/pathological reflexes in the lower limbs. There are lower motor neuron findings AT the level of the lesion evidenced by weakness of the small muscles of both hands (C8/T1) with associated wasting. There is a sensory level that incorporates C8 dermatome on the ulnar aspect of hands and forearm.

A lower thoracic cord lesion would cause similar findings in the legs but not abnormalities in the hands. A cauda equina lesion tends to cause lower motor neuron findings in the legs with sphincter dysfunction. Lumbosacral plexus lesions tend to cause pain and lower motor neurone weakness in the legs. Finally, an ulnar nerve lesion could explain some of the upper limb findings but would not explain lower limb abnormalities.

Further reading:

https://geekymedics.com/spinal-cord-summary/

Question:

A 44-year-old manual worker presents to the GP worried about a skin lesion that has developed on his shoulder. He states that it has been growing over the past 2 months and has almost doubled in size. The lesion is pigmented and is now beginning to itch.

An excision biopsy is carried out, which reveals abnormal melanocytic proliferation in the epidermis.

What factor is used in the prognostication of this patient's diagnosis?

A. Depth of invasion of the skin lesion

B. Diameter of the skin lesion

C. Whether colour irregularity is present within the skin lesion

D. Whether or not skin lesion is symptomatic

E. Rate of growth of the skin lesion

Correct Answer:Depth of invasion of the skin lesion

Explanation:

This case demonstrates malignant melanoma, which can present with a rapidly changing symptomatic, pigmented lesion on sun-exposed areas. Cytology findings of abnormal melanocytic proliferation in the epidermis are typical for malignant melanoma. The correct answer, in this case, is the depth of invasion of the tumour. This is usually determined by the pathologist using the sample from the excision biopsy; tumours that have invaded to a greater depth, particularly if they have entered distant structures such as the subcutaneous fat, are far more likely to represent advanced disease and carry a poorer prognosis.

The depth of invasion may be classified using different systems - Clark's scale and Breslow's thickness are two commonly used classification systems. The results of these systems often feed into the 'T' of the TNM system used to stage the tumour, along with the results of the sentinel lymph node biopsy and whether signs of metastasis are present.

Rate of growth, diameter, symptomatic nature and colour irregularity are all included within the Glasgow Checklist of malignant melanoma features that warrant a 2-week-wait referral, they simply indicate that a lesion is likely to be malignant; on their own, they are not used to estimate the prognosis of a particular tumour.

Further reading:

https://patient.info/doctor/malignant-melanoma-of-skin

Question:

A 35-year-old woman attends her GP concerned that her periods have been absent for the last 6 months. When asked, she says they have generally been regular since starting her period aged 13, and does not often experience severe symptoms associated with her cycle. She also describes recently noticing a small volume of milky white discharge from both nipples. She has a BMI of 23 and is not currently nor has she ever been pregnant.

A hormone abnormality is suspected, and she is asked about her past medical history and her current medications.

Which of the following would be most likely to cause this hormone abnormality and the resulting symptoms?

A. Propranolol

B. Risperidone

C. Progesterone-only contraceptive pill

D. Sertraline

E. Lamotrigine

Correct Answer:Risperidone

Explanation:

The most likely hormone abnormality contributing to these symptoms is hyperprolactinaemia. Prolactin is secreted from the anterior pituitary and is responsible for stimulating milk production from the mammary glands (galactorrhoea). It can also inhibit follicle-stimulating hormone (FSH) and therefore prevent ovulation, often presenting with amenorrhoea.

There are several physiological causes of hyperprolactinaemia, such as pregnancy. Abnormalities of the pituitary gland are also commonly associated, in particular prolactin-secreting pituitary adenomas. Various medications also interfere with prolactin production, including dopamine receptor blockers, those affecting the thyroid, as well as those mentioned above.

Antipsychotics such as risperidone are a known cause of hyperprolactinaemia. Dopamine acts on the pituitary to inhibit prolactin secretion. Risperidone is a typical antipsychotic that blocks D2 receptors on the pituitary, allowing prolactin levels to rise.

Several types of antidepressant, including selective serotonin reuptake inhibitors (SSRIs) such as sertraline, have been linked with hyperprolactinaemia, but not as strongly associated as antipsychotics.

Lamotrigine is a sodium channel blocker used to treat epilepsy and is not associated with hyperprolactinaemia. However, epileptic seizures can be a cause.

The progesterone-only contraceptive pill is an unlikely option here. Progesterone inhibits the stimulatory effect of prolactin on lactation, which would not explain the galactorrhoea.

Beta blockers such as propranolol are not associated with hyperprolactinaemia.

Further reading:

https://patient.info/doctor/hyperprolactinaemia-and-prolactinoma

Question:

You are a junior doctor working in the urology department. You are conducting a quality improvement project regarding prostate-specific antigen (PSA) and its role as a tumour marker in prostate cancer.

Which of the following situations would be least likely to result in a raised PSA level?

A. Recent digital rectal examination

B. Ejaculation within the last 48 hours

C. Prostate biopsy

D. Stage 1 chronic kidney disease

E. Urinary tract infection

Correct Answer:Stage 1 chronic kidney disease

Explanation:

Prostate-specific antigen (PSA) can be elevated for a number of reasons, both cancerous and benign, and these should be considered and enquired about when carrying out a PSA level. Stage 1 chronic kidney disease would not, in isolation, cause a raised PSA level.

Raised levels can occur due to:

Urinary tract infection

Prostate biopsy or other prostate stimulation

Digital rectal examination

Urinary catheterisation

Ejaculation within the last 48 hours

Anal sexual intercourse

Vigorous exercise

Practically, it is recommended to take blood samples prior to undertaking a digital rectal examination if consideration is being made for prostate cancer to limit the likelihood of false elevation.

Further reading:

https://www.nice.org.uk/guidance/ng131

Question:

A 42-year-old female is reviewed in general practice. She reports a 3-month history of weight loss yet describes feeling hungry most of the time. In addition, she has noticed a fine shaking in her hands and a sensation of a rapid heartbeat. This has particularly worsened over the last 2 weeks.

On examination she is noticeably warm to the touch and is found to be in atrial fibrillation.

Urgent blood tests are performed which subsequently show low haemoglobin with normal mean cell volume (MCV), normal inflammatory markers, low thyroid-stimulating hormone (TSH) and raised free thyroxine (T4).

What is the most likely diagnosis?

A. Hyperparathyroidism

B. Hypothyroidism

C. Hyperthyroidism

D. Anaemia of chronic disease

E. Addison's disease

Correct Answer:Hyperthyroidism

Explanation:

The most likely diagnosis is hyperthyroidism. Symptoms are variable but may include:

diarrhoea

weight loss

tremor

sweating

heat intolerance

palpitations

mood disturbance

oligomenorrhea and infertility.

This patient has a low thyroid-stimulating hormone (TSH) level and raised free thyroxine (T4) in the context of signs and symptoms of hyperthyroidism. This suggests TSH is being suppressed due to negative feedback and primary hyperthyroidism is likely. Patients with hyperthyroidism may have a normocytic anaemia, raised ESR, abnormal LFTs and raised calcium. Atrial fibrillation and rhythm disturbances are also relatively common and should prompt investigation of thyroid function when present.

In hypothyroidism, the TSH level is raised and common symptoms include tiredness, weight gain and intolerance to cold. Anaemia of chronic disease would not explain all of the patient's presenting features and should be a diagnosis of exclusion. Hyperparathyroidism may be asymptomatic or may present with symptoms of hypercalcaemia. Addison's disease, or primary adrenal insufficiency, can cause weight loss but would not usually cause atrial fibrillation and a disturbance in thyroid function tests.

Further reading:

https://patient.info/doctor/hyperthyroidism

Question:

An 88-year-old woman is seen by her GP for a routine review of her type 2 diabetes. She has a past medical history of mild heart failure. Her diabetes is currently being treated with metformin 1g twice daily, which she tolerates well. She remains active, attends regular exercise classes and strictly follows dietary advice. On review at her GP appointment, she is found to have a HbA1C of 65.

What is the most appropriate next step in her diabetes treatment?

A. Add pioglitazone

B. Increase metformin

C. Stop metformin and start gliclazide

D. Add sitagliptin

E. Add gliclazide

Correct Answer:Add sitagliptin

Explanation:

This woman continues to have an elevated HbA1c despite lifestyle advice and maximal metformin therapy. The best thing to do would be to add sitagliptin. Sitagliptin is a DPP-4 inhibitor and is commonly used as a first intensification step. Adding pioglitazone or a sulfonylurea are other options, however, she has heart failure and is elderly making them bad choices respectively. Stopping metformin would be inappropriate, further therapy should be added unless metformin becomes contra-indicated or is not tolerated. Increasing metformin is not appropriate as she is already on the maximum dose.

Further reading:

https://www.nice.org.uk/guidance/ng28

Question:

A 30-year-old male, recovering from a recent laparoscopic appendectomy, reports feeling sweaty and complains of a headache. Intravenous fluids have been stopped as he has started to eat and drink, but over the past day, he has not felt like eating anything and is not keen on the hospital food.

On examination his observations are stable and he is apyrexial. He has a slight tremor visible is his hands bilaterally and appears agitated. He is alert and able to respond to questions. Otherwise, apart from some tenderness over his laparoscopy incisions, his examination is unremarkable.

What would be the most appropriate initial investigation in this patient?

A. HbA1c

B. Capillary blood glucose

C. Fasting serum glucose

D. Blood ketones

E. Urinary ketones

Correct Answer:Capillary blood glucose

Explanation:

The most appropriate initial investigation in this patient would be capillary blood glucose. This is a straightforward and useful bedside test that can be performed to inform further management. It appears that this is post-operative hypoglycaemia with no indications of any underlying pathology (such as diabetes) at this stage. Although local guidelines vary, <4mmol/L is typically defined as hypoglycaemia.

Fasting serum glucose can be a useful blood test in the diagnosis of diabetes, but results are not available as quickly as capillary blood glucose.

Blood ketones may be indicated if the patient has suspected diabetic ketoacidosis, but this diagnosis is not suggested in this clinical scenario and capillary blood glucose would be most useful for determining ongoing management of hypoglycaemia.

Urinary ketones would not be useful in this scenario.

HbA1c is typically used for monitoring long-term management of blood glucose levels in diabetics and is not the most appropriate initial investigation.

Further reading:

https://patient.info/doctor/hypoglycaemia

Question:

A 58-year-old man presents with a variceal bleed. He is known to have cirrhosis of the liver. The consultant hepatologist decides to insert a transjugular intrahepatic portosystemic shunt

(TIPSS). The next day, the patient appears somnolent, disorientated and confused. On examination, there is evidence of asterixis.

What is the most likely cause of his symptoms?

A. Dehydration

B. Hepatic encephalopathy

C. Further variceal bleeding

D. Delirium

E. Alcohol excess

Correct Answer:Hepatic encephalopathy

Explanation:

A TIPSS is used when bleeding from varices cannot be controlled by band ligation. A common side effect of the procedure is the development of hepatic encephalopathy. This occurs because the TIPSS procedure creates a shunt between the portal vein and hepatic vein, thus causing blood to bypass the liver. Nitrogenous compounds such as ammonia can, therefore, remain in the blood and cross the blood-brain barrier, resulting in development of hepatic encephalopathy. This is, therefore, the most likely answer in this scenario.

Hepatic encephalopathy reflects a spectrum of neuropsychiatric abnormalities and is graded according to severity. Patients may present with confusion, mood disturbances, and in severe cases, somnolence or coma. In intermediate stages, asterixis may be observed (flapping tremor when the patient’s hands are outstretched), whilst clonus may be seen in advanced stages. Other signs of liver disease may be evident in these patients. Common triggers of hepatic encephalopathy include infection, constipation, drugs and electrolyte abnormalities.

Further reading:

https://patient.info/doctor/hepatic-encephalopathy

Question:

A 65-year-old male is brought into the emergency department (ED) by ambulance. His wife called 999 after he collapsed at home and stopped breathing. On arrival, CPR is being performed by a paramedic, with a bag valve mask and oropharyngeal airway in use. A defibrillator is attached, which shows pulseless electrical activity.

The paramedics could not gain IV access at the scene, and two further attempts in the ED have failed.

What is the most appropriate next step in gaining vascular access?

A. Reattempt intravenous access

B. Central venous catheter

C. Continue without access

D. Intraosseous access

E. Arterial line

Correct Answer:Intraosseous access

Explanation:

This patient is in cardiac arrest and requires urgent vascular access to receive adrenaline and fluid. As several attempts to gain intravenous (IV) access have failed in this emergency scenario, intraosseous (IO) access should be attempted. This involves inserting a needle into the medullary space of the bone using a specialised drill or by hand. The common sites of insertion in adults are the proximal tibia and proximal humerus. IO can be used to deliver all IV medications and fluids, including inotropes.

An arterial line is a small catheter placed directly into the artery - commonly the radial or brachial and sometimes femoral artery. They are generally used for invasive blood pressure monitoring and for obtaining repeat arterial blood gas samples. They should not be used to administer medication, as many medications (like adrenaline) can cause considerable tissue damage.

A central venous catheter involves inserting a catheter into a large vein, commonly the internal jugular or subclavian vein. It is a relatively complex procedure and NICE advocate the use of ultrasound guidance. Urgent access is needed in this situation.

Continuing without access would not be appropriate as this patient requires urgent medication and fluid.

Reattempting peripheral intravenous access would likely be futile and further delay the administration of potentially life-saving treatment. There have been three failed attempts and so IO access should be attempted.

Further reading:

https://litfl.com/intraosseous-access/

Question:

A 42-year-old patient is rushed into hospital by paramedics after being rescued from the wreckage of a road traffic accident. He remains conscious and is able to hold a conversation with the admitting doctors, albeit he appears slightly confused. He has suffered a number of wounds to his upper chest and limbs; the paramedics estimate that he lost approximately 500mls of blood at the site. The patient is complaining of severe shortness of breath, and some dull central chest pain.

Assessment of the patient reveals significant tachycardia and tachypnoea, with a prolonged capillary refill time, and cold, clammy extremities. The patient's JVP is notably elevated at 6cm above the sternal angle. His blood pressure is noted to be 80/52; back-to-back fluid boluses help to raise this slightly. Auscultation of the lungs reveals no added sounds, but the heart sounds are unable to be commented on, as they appear to be unusually quiet.

The admitting doctor attaches ECG leads and is considering the need for further imaging - he is extremely concerned about the patient's presentation.

What is the most likely diagnosis in this case?

A. Cardiac tamponade

B. Life-threatening haemorrhagic shock

C. Fat embolism

D. Boerhaave's syndrome

E. Traumatic aortic rupture

Correct Answer:Cardiac tamponade

Explanation:

This patient has presented with likely cardiac tamponade secondary to the sustained chest trauma. This can result in non-specific symptoms of shock, as the accumulation of fluid within the pericardial space can obstruct diastolic ventricular filling and reduce cardiac output. This patient also has a number of examination features that point towards this as the likely diagnosis - the combination of muffled heart sounds, elevated JVP and hypotension is referred to as 'Beck's triad' and is classically associated with this condition.

This patient will likely require echocardiography to confirm the diagnosis should he remain stable, with treatment being via pericardiocentesis; a needle is passed under the rib-cage into the pericardial space to allow for the drainage of the fluid and the relief of the pressure on the heart. It is essential that this occurs as swiftly as possible, as there is a significant risk of cardiac arrest (most frequently in the form of pulseless electrical activity) and subsequent morbidity and mortality.

This patient has suffered a degree of haemorrhage, which is likely to be contributing to his haemodynamic instability; however, an estimated 500ml blood loss is very unlikely to be life-threatening; the body can usually compensate well for losses of less than 15% of the total volume (approximately 750ml). Haemorrhage alone would also not explain the quiet heart sounds or elevated JVP, meaning life-threatening haemorrhagic shock is unlikely to be the cause of this patient's symptoms.

Traumatic aortic rupture can arise as a result of road traffic collisions but is less likely to be the cause of this patient's symptoms. The mortality rate of this injury is exceptionally high, and even greater haemodynamic instability would be expected, with the patient unlikely to be conscious. It would not explain the examination features such as a raised JVP present in this scenario.

Boerhaave's syndrome is a form of oesophageal rupture that occurs due to excessive vomiting - whilst it may present with chest pain, it does not fit with the rest of the clinical scenario.

Fat embolism can occur due to the fracture of long bones in the setting of trauma and could present with shortness of breath, as complained of by this patient. However, no fractures were described in this scenario, and this condition would not explain the muffled heart sounds nor the raised JVP.

Further reading:

https://patient.info/doctor/cardiac-tamponade

Question:

A 4-year-old girl presents to her GP with an itchy rash. Her mother reports that she first noticed the rash two days ago and states that her daughter has constantly been scratching and cannot sleep due to the itch. She is otherwise well in herself, has a good appetite and is passing urine and opening her bowels as usual. She has no significant past medical history.

On examination, there are raised red lumps on the sides and in the webbing of the fingers. Vital signs are normal.

What is the next most appropriate management step for this patient?

A. Oral antihistamine

B. Topical steroid cream

C. Topical emollient

D. Oral steroids

E. Topical permethrin cream

Correct Answer:Topical permethrin cream

Explanation:

The most appropriate management step would be prescribing topical permethrin cream.

Scabies is a highly contagious skin infestation caused by a parasitic mite, Sarcoptes scabiei var. hominis. It is transmitted through direct skin-to-skin contact, or less commonly indirectly via fomites. Scabies can be difficult to eradicate as it is highly contagious and has a long incubation period. Good hygiene is important. Washing all bed linen, clothes, toys, and other items is recommended to eradicate scabies from the household. Close contacts of a person with scabies will need to be examined and treated concurrently.

Permethrin 5% cream is the treatment of choice for scabies, applied to the entire body (excluding the face) and left on for 8 hours, with treatment repeated in 7 days. Some guidelines do not recommend permethrin for use in children younger than 2 months of age, so it is important to check local guidelines.

Topical and oral steroid treatment is the first-line treatment option for a number of dermatological conditions including eczema flares, however, both oral and topical steroids will not eradicate a scabies mite infection.

Likewise, a topical emollient cream can be used for a variety of skin conditions but would be ineffective in the management of scabies.

Oral antihistamines are commonly prescribed in adjunction to an insecticide, however, they are for symptomatic alleviation only, and do not treat the underlying infection.

Further reading:

https://cks.nice.org.uk/scabies#!diagnosissub:1

Question:

A new drug, X, is developed with the intention of reducing the incidence of a common condition. The drug is now being tested in a randomised control trial.

132 patients are treated with drug X. 75 patients in this group go on to develop the condition.

Of the 100 patients treated with a placebo drug, 92 patients go on to develop the condition.

What is the number needed to treat (NNT) for drug X?

A. 1.4

B. 8.2

C. 4.1

D. 2.8

E. 0.4

Correct Answer:2.8

Explanation:

Number needed to treat (NNT) is a useful means of describing the effectiveness of an intervention in reducing the incidence of an adverse event. A number needed to treat of 5 means that for every 5 patients who are given the intervention, 1 adverse event will be prevented. NNT can be applied to any health intervention (e.g a drug, therapy or validated exercise programme).

To calculate number needed to treat, you need to determine the absolute risk reduction of a group of patients receiving the intervention compared to a group of patients receiving a control intervention.

In the experimental group, the absolute risk of developing the condition is 75 / 132 = 0.568 (to 3 significant figures).

In the control group, the absolute risk of developing the condition is 92 / 100 = 0.920.

The absolute risk reduction is therefore 0.920 - 0.568 = 0.352 (a 35.2% reduction in absolute risk of developing the condition).

We can now calculate the number needed to treat, which is the reciprocal of the absolute risk reduction:

NNT = 1 / 0.352 = 2.84 (2.8 to 2 significant figures) - for every 2.8 patients treated with drug X, 1 incidence of the condition will be prevented.

Further reading:

https://geekymedics.com/statistics-for-medical-students/

Question:

A 22-year-old nulligravida woman presents to the emergency department with a one-day history of bright red vaginal bleeding and deep pelvic pain. Her last menstrual period was seven weeks ago. Her menstrual cycle is usually regular, every 28 days. Two years ago, she received treatment for a Chlamydia trachomatis infection.

What is the most appropriate initial investigation for this patient?

A. Speculum examination

B. Laparoscopy

C. Urine hCG

D. Transvaginal ultrasound

E. Serum hCG

Correct Answer:Urine hCG

Explanation:

This case demonstrates an ectopic pregnancy, which typically presents with pelvic pain and vaginal bleeding 6-8 weeks after the last menstrual period. Transvaginal ultrasound is the diagnostic investigation of choice, to determine an ectopic pregnancy or lack of intrauterine pregnancy once pregnancy is initially confirmed via urine hCG.

Serum hCG is essential to determine if the patient is pregnant. However, it has no role in diagnosing an ectopic pregnancy.

Speculum examination may show evidence of vaginal bleeding or an adnexal mass, raising the suspicion of an ectopic pregnancy, but it is not diagnostic. It is often unremarkable in cases of unruptured ectopic pregnancy. The key initial investigation of choice is a urinary hCG, and once pregnancy is confirmed high-resolution TVUS examination is used to determine the location of the pregnancy.

Laparoscopic intervention is one of the available management options for a tubal ectopic pregnancy. However, transvaginal ultrasound is required first to determine the presence of a tubal ectopic.

Further reading:

https://geekymedics.com/ectopic-pregnancy/

Question:

A 57-year-old Greek man presents to hospital with fever and headache after returning from a holiday in Venezuela. He has been feeling unwell for almost a week, and the fever appears to come and go; he was permitted to fly home despite his fever, as he received a negative test result for COVID-19. He has previously been well and has no past medical history of note.

Testing done in A&E included a rapid diagnostic test for Plasmodium falciparum malaria, which returned positive. Full blood count, urea and electrolytes and liver function tests are all normal. As a result, he is commenced on artemisinin and mefloquine; due to his travel destination, it was considered likely that chloroquine would be ineffective due to resistance. The patient was also given primaquine to reduce potential malaria transmission.

4 days later, the patient reports fatigue and shortness of breath. He has noticed that his urine is notably dark. A repeat full blood count reveals normocytic anaemia, and LFT’s reveal a raised bilirubin, ALT and ALP. The patient reports that he has had similar, less severe episodes of these symptoms in the past, but has never had dark urine alongside this.

Considering the patient’s history, which of the following is most likely to explain the patient’s symptoms?

A. Hereditary spherocytosis

B. Haemolytic uraemic syndrome

C. Thrombotic thrombocytopenic purpura

D. Undiagnosed G6PD deficiency

E. Paroxysmal nocturnal haemoglobinuria

Correct Answer:Undiagnosed G6PD deficiency

Explanation:

This patient has presented with likely haemolytic anaemia given the normocytic anaemia and elevated bilirubin. The dark urine is likely to be haemoglobinuria due to excessive haemolysis of red blood cells. There are a number of possible causes of haemolytic anaemia - malaria infection, which was the presenting complaint of the patient being one such consideration. However, blood tests were normal on admission, and signs of haemolysis only developed after treatment was initiated, making malaria less likely to be the cause.

Given the patient's nationality (the condition is more common in Mediterranean populations) and the prescription of primaquine, the most likely consideration is undiagnosed glucose-6-phosphate dehydrogenase (G6PD) deficiency. This X-linked recessive condition results in an inability of red blood cells to resist oxidative stress, meaning that certain triggers can induce haemolytic crises. Medications are common culprits in those with the condition, with primaquine being one such drug that has been documented to cause oxidative stress and haemolysis. The medication should be discontinued and supportive management initiated.

Paroxysmal nocturnal haemoglobinuria is a rare condition caused by the destruction of red blood cells by the complement system. This can cause haemolytic anaemia and classically presents with red discolouration of the urine. However, patients also frequently suffer from thrombocytopenia and paradoxical thrombosis, neither of which are present. Given the history of medication that can induce a crisis in patients with G6PD deficiency, this is not the most likely diagnosis.

Hereditary spherocytosis is an autosomal dominant condition that can result in haemolysis due to excessive breakdown of abnormally shaped erythrocytes. However, this usually presents in childhood; the patient is unlikely to have progressed through to the age of 57 without the diagnosis being made; it is unlikely to give discrete episodes of symptoms as described in the history.

Haemolytic uraemic syndrome is a condition most commonly arising due to infection with VTEC Ecoli 0157; the Shiga toxin produced by this bacteria can induce a form of microangiopathic haemolytic anaemia. The classic triad of symptoms described is haemolytic anaemia, thrombocytopenia and renal impairment. Given the lack of gastrointestinal features and normal platelet count, this is not the most likely diagnosis.

Thrombotic thrombocytopenic purpura is another rare form of microangiopathic haemolytic anaemia occurring due to ADAMTS13 dysfunction. This enzyme usually cleaves von Willebrands factor; without its activity, excessive coagulation can occur. Patients are usually extremely unwell, with renal impairment and neurological involvement, this is not the case in this patient.

Further reading:

https://patient.info/doctor/glucose-6-phosphate-dehydrogenase-deficiency

Question:

A 20-year-old man presents with pain and swelling in his left testes. It has been worsening on the last few days but is worse when he has been standing up in work for long periods or after the gym. He is worried about testicular cancer.

An ultrasound scan reveals that he has a left-sided varicocele.

On reading, the man discovers that varicoceles are due to dilated veins of the pampiniform plexus in the spermatic cord. This is more common in the left testes than the right due to the differences in the venous drainage of the different testes.

Which vessel does the left testicular vein drain into?

A. Left external iliac vein

B. Left internal iliac vein

C. Left common iliac vein

D. Left renal vein

E. Inferior vena cava

Correct Answer:Left renal vein

Explanation:

The left testicular vein drains into the left renal vein. This differs from the right testes that drains into the inferior vena cava. Due to this, the left testicular vein is longer and has a sharper angle of insertion compared to the right. As a result, varicoceles commonly present on the left side.

Varicocele can rarely be the first presenting sign of a patient with renal cell carcinoma affecting the left kidney.

Further reading:

https://patient.info/doctor/varicocele-pro

Question:

Charlotte Morgan, a 26-year-old female of Afro-Caribbean descent, presents to her GP with fatigue and joint pain involving her fingers, wrists and ankles. She also reports that she can no longer sunbathe, as her skin becomes painful and itchy in the sun. Other than recently being diagnosed with depression she has no relevant medical history.

On examination, Charlotte has a butterfly-shaped rash on her face along with swelling and stiffness in her fingers, wrist and ankles. Her blood tests show:

• Haemoglobin: 110 g/L

• White cell count: 2.0 x 109/L

• Platelets: 120 x 109/L

• Antinuclear antibody: Positive

All other routine blood tests are normal.

Given Charlotte’s symptoms, testing for which of the following antibodies would be most likely to confirm the diagnosis?

A. Anti-scl-70 (anti-topoisomerase 1)

B. Anti-dsDNA

C. Anti-Sm

D. Anti-centromere

E. Anti-Ro

Correct Answer:Anti-dsDNA

Explanation:

This collection of clinical features and blood results can be attributed to systemic lupus erythematosus (SLE), an autoimmune disease most often found in Afro-Caribbean women. Antinuclear antibodies (ANA) are nearly always positive in SLE, but are also present in a number of other autoimmune diseases. If the results are ANA positive, more detailed tests are warranted. Out of these, the correct answer is anti-dsDNA. Both anti-dsDNA and anti-Sm (or anti-Smith) are highly specific for SLE, but anti-dsDNA antibodies have a sensitivity of 70% compared to 30% for anti-Sm, making it the most likely to confirm the diagnosis.

The mnemonic “SOAP BRAIN MD” can be used to remember the more common features of SLE:

• Serositis – pleurisy, pericarditis

• Oral ulcers

• Arthritis

• Photosensitivity

• Blood disorders (all are low – anaemia, leukopenia, thrombocytopenia)

• Renal involvement

• Antinuclear antibodies (ANA)

• Immunologic phenomena (anti-dsDNA, anti-sm)

• Neurologic features (psychiatric, seizures)

• Malar rash (Or “butterfly” rash)

• Discoid rash

Anti-centromere antibodies and anti-scl70 antibodies are associated with scleroderma (systemic sclerosis), an autoimmune condition where the skin becomes hardened and sclerotic, with varied organ involvement depending on the subtype.

Anti-Ro antibodies are found in 20-30% of patients with SLE, but are more associated with Sjögren's syndrome, an autoimmune condition that causes dry mucosal surfaces, including the eyes, mouth and vagina.

Further reading:

https://patient.info/doctor/systemic-lupus-erythematosus-pro

Question:

A 65-year-old man presents via ambulance to A&E with a 3-hour history of sudden onset abdominal pain and feeling unwell. He has vomited twice. He looks pale and shocked on arrival and is confused. His blood pressure is 90/45 mmHg, and his HR is 115 bpm. He has a respiratory rate of 28 and is saturating at 95% on room air. He has had 10mg of IV morphine in the ambulance but is still clearly in pain.

You do a blood gas and find a metabolic acidosis with a lactate of 7. On examination, he has a large umbilical hernia, which is soft, and a guarded abdomen While examining him he passes a large volume of dark loose stool.

He has a past medical history of myocardial infarction, stroke and peripheral vascular disease. An OGD performed for reflux 2 years ago showed normal gastric and duodenal mucosa. He smokes 15 cigarettes a day.

Which of the following is the most likely diagnosis?

A. Strangulated hernia

B. Diverticular abscess

C. Small bowel obstruction

D. Viral gastroenteritis

E. Acute superior mesenteric artery thrombosis

Correct Answer:Acute superior mesenteric artery thrombosis

Explanation:

With his past medical history, history of presenting complaint, and lactate level, necrosis or infarction is a likely diagnosis, hence the correct answer is superior mesentery artery (SMA) thrombosis.

SMA thrombosis results in impaired blood supply to the intestine, resulting in bowel ischaemia and eventual perforation. Patients typically present with progressively worsening general abdominal pain that is out of proportion to the clinical findings. In the later stages, patients have features of peritonism, absent bowel sounds and rectal bleeding.

The next most likely diagnosis would be diverticular abscess, although we would not expect such a high lactate at this stage from a local perforation, nor such a stark systemic response.

A strangulated hernia could cause this picture, but with him having a soft and large umbilical hernia, it is very unlikely this is the cause of this acute deterioration.

Small bowel obstruction would likely have a more gradual onset and would present with absolute constipation.

Viral gastroenteritis would be very unlikely to give such a change to his biochemistry and physical status after such a short time.

Further reading:

https://patient.info/doctor/bowel-ischaemia

Question:

A 28-year-old woman comes to the GP to collect the results from her recent cervical screening. The results from the screening show a negative HPV test. She underwent cervical screening 12 months previously and was previously positive for HPV and had a negative cytology report then.

What is the best advice to give the patient following this result?

A. Repeat smear in 6 months

B. Refer for urgent colposcopy

C. Repeat smear in 3 months

D. Return to normal screening programme

E. Repeat smear within 2 weeks

Correct Answer:Return to normal screening programme

Explanation:

Cervical cancer screening is offered to all women in the UK. Women are first invited for screening at age 25 and then screening continues every 3 years between ages 25-49 and then 5-yearly until aged 65.

As part of cervical screening, HPV status is tested in the first step, as this helps better stratify a woman's risk of developing cervical cancer. In this scenario, cervical screening has identified an HPV-negative on a background of a previously HPV-positive cervical screening test 12-month earlier. The absence of HPV infection means that the patient is highly unlikely to develop cervical cancer and therefore can be returned to normal cervical screening recall, with no need for colposcopy.

However, if the patient remained high-risk HPV-positive and cytology negative at this repeat test, there would be a repeat HPV test in a further 12 months. If instead at the 12-months test the cytology was positive then she would be referred for colposcopy straight away.

Further reading:

https://patient.info/doctor/cervical-screening-cervical-smear-test-pro

Question:

A 52-year-old woman of Asian origin presents to the emergency department with a two-day history of constant pain in her right lower abdomen and diarrhoea. She denies any blood in the stool, weight loss, change in appetite or vomiting. Her last period was 13 months ago.

Her observations are

Oxygen saturations: 98% on room air

Respiratory rate: 18 breaths per minute

Heart rate: 91 beats per minute

Blood pressure: 122/84 mmHg

Temperature: 38.4 °C

What is the most likely diagnosis?

A. Appendicitis

B. Ulcerative colitis

C. Colorectal cancer

D. Diverticulitis

E. Ectopic pregnancy

Correct Answer:Diverticulitis

Explanation:

This patient is presenting with constant right lower quadrant pain, diarrhoea and a fever, which all point towards a diagnosis of diverticulitis. Diverticulitis may occasionally affect the right side of the colon, which is more frequently seen in younger patients of Asian origin.

Appendicitis is an important differential in a patient presenting with right lower quadrant pain, however, it is less common in people aged over 30, is not typically associated with diarrhoea, and often presents within hours rather than days.

An ectopic pregnancy must be ruled out in any woman of childbearing age presenting with an acute abdomen, however, this patient’s last period was over one year ago, meaning she is now post-menopausal. Therefore, an ectopic pregnancy is very unlikely.

Colorectal cancer is an important diagnosis to consider in someone presenting with a change in bowel habit, however, the acute presentation with abdominal pain, diarrhoea and fever are more characteristic of diverticulitis. Furthermore, the patient does not report weight loss, which is commonly seen in colorectal cancer.

Ulcerative colitis typically causes bloody diarrhoea, presents in young adults, and may be associated with weight loss. The absence of these features makes ulcerative colitis less likely.

Further reading:

https://teachmesurgery.com/general/large-bowel/diverticular-disease

Question:

A 42-year-old female presents to her general practitioner complaining of dry, gritty eyes and some intermittent double vision. On examination, she is found to have diffuse smooth swelling in her anterior neck most noticeable on neck extension. She has exophthalmos and slight difficulty with upward gaze.

Which test is most likely to be helpful in establishing an underlying diagnosis?

A. Full blood count

B. Liver function tests

C. Random cortisol level

D. Thyroid function tests

E. Capillary blood glucose testing

Correct Answer:Thyroid function tests

Explanation:

This patient likely has thyroid eye disease and the next appropriate step is to check their thyroid function. Thyroid eye disease is a clinical diagnosis and can be the first presentation of Graves’ disease, seen in 25-50% of cases. However, it should be noted that the biochemical picture in thyroid eye disease may be hypothyroid, euthyroid or hyperthyroid. Smoking is a major risk factor. Symptoms range from dry eyes to photophobia, diplopia and symptoms of optic nerve compression. Signs may include:

exophthalmos

proptosis

ophthalmoplegia due to extraocular muscle swelling and fibrosis

loss of colour vision

relative afferent pupillary defect

papilloedema

conjunctival oedema

corneal ulceration

A full blood count may show evidence of anaemia in thyroid disease. Liver function testing would not be helpful here and neither would cortisol testing for adrenal disturbance or blood glucose testing.

Further reading:

https://patient.info/doctor/thyroid-eye-disease-pro

Question:

A 41-year-old male presents to the general practitioner with complaints of burning on urination for the last three days. He states that he has had to urinate more frequently and that his urine has been ‘cloudy’. He is also complaining of pain in the perineal region. He is able to provide a urine sample in the clinic with moderate burning throughout micturition. The patient has no pertinent past medical history and is in a monogamous relationship with his wife. He has no past surgical history. He takes no medications and has no known drug allergies.

His observations are shown below:

Temperature: 37.1 degrees Celsius

Blood pressure: 120/75 mmHg

Heart rate: 81 beats/minute

Respiratory rate: 15 breaths/minute

SpO2: 97% on room air

Physical examination reveals a boggy, warm and extremely tender prostate on digital rectal examination. Urine dipstick is positive for a moderate amount of leucocytes and blood.

The drug that this patient should be prescribed as first-line treatment belongs to which class of medications?

A. Macrolides

B. Non-steroidal anti-inflammatories

C. Fluoroquinolones

D. Cephalosporins

E. Aminoglycosides

Correct Answer:Fluoroquinolones

Explanation:

The patient in the above scenario has presented with dysuria, urinary frequency, perineal pain, cloudy urine and a soft, tender prostate on examination. Urine dipstick has confirmed the presence of an underlying infectious process. This is consistent with a diagnosis of acute bacterial prostatitis. This question focuses on the management of acute bacterial prostatitis in a patient who is in a haemodynamically stable condition in the general practice setting. Oral ciprofloxacin, which belongs to the class of antibiotics called the fluoroquinolones, is indicated as first-line treatment as it provides coverage for the gram-negative bacteria that are most often implicated in these cases. Fluoroquinolones (ciprofloxacin, levofloxacin, moxifloxacin etc.) are commonly used antibiotics for conditions such as infectious diarrhoea, pyelonephritis, otitis externa, pseudomonal infections and many other medical problems. Notable side effects include gastric distress, QT interval prolongation, tendonitis and tendon rupture. They are contraindicated in pregnant women.

Non-steroidal anti-inflammatory agents such as ibuprofen can be used as adjunctive therapy in cases of acute bacterial prostatitis in order to reduce inflammation and pain, however, they would not be suitable as monotherapy.

Intravenous aminoglycosides like gentamicin can be used in conjunction with intravenous ciprofloxacin in patients who are critically ill (hypotension, tachycardia, spiking fevers etc). The patient in the above question stem is in stable condition and outpatient treatment with an oral agent would be more appropriate. Notable side effects of aminoglycosides include ototoxicity and nephrotoxicity.

Cephalosporins are available in five different generations. Third-generation cephalosporins like ceftriaxone can be used in patients with acute bacterial prostatitis who also have a background of high-risk sexual behaviours. The inclusion of ceftriaxone in the antibiotic regimen provides coverage for sexually transmitted infections like Neisseria gonorrhoeae.

Macrolides are used in the treatment of atypical pneumonia caused by organisms such as Mycoplasma pneumoniae and Legionella pneumophila and sexually transmitted infections caused by Chlamydia trachomatis. Macrolides would not be helpful in a patient with acute bacterial prostatitis that is most likely secondary to a gram-negative organism such as Escherichia coli.

Further reading:

https://patient.info/doctor/prostatitis

Question:

Sputum smear microscopy is a commonly used diagnostic test for pulmonary tuberculosis (TB). In the UK, it has a sensitivity of 55%, specificity of 99%, positive predictive value of 100% and negative predictive value of 93%.

When used in a country with a higher prevalence of pulmonary tuberculosis, what change in parameter would most likely be observed?

A. The positive predictive value will be lower

B. The sensitivity will be lower

C. The specificity will be lower

D. The negative predictive value will be lower

E. Sensitivity, specificity and positive and negative predictive values are not affected by changes in prevalence

Correct Answer:The negative predictive value will be lower

Explanation:

It is important to remember that the positive and negative predictive values change when the prevalence of the condition being tested changes, whereas sensitivity and specificity remain constant. When the prevalence of the condition is higher, the negative predictive value will be lower and the positive predictive value will be higher.

Further reading:

https://geekymedics.com/sensitivity-specificity-ppv-and-npv/

Question:

Dominic Adams, a 63-year-old male, presents to his GP with a long history of shortness of breath when walking. He has had these symptoms for several months, however, he has recently started coughing up what he describes as pink, frothy sputum. He is using two pillows to prop himself up at night. On questioning, he recalls having rheumatic fever as a child.

On examination, Dominic appears flushed in his face and has an irregularly irregular pulse. On auscultation of his heart, there is a clear opening snap, followed by a mid-diastolic murmur that is best heard at the apex with Dominic laid on his left side.

Given the clinical picture, what is the most likely diagnosis?

A. Aortic stenosis

B. Aortic regurgitation

C. Tricuspid stenosis

D. Mitral stenosis

E. Mitral regurgitation

Correct Answer:Mitral stenosis

Explanation:

The most likely diagnosis is mitral stenosis, given the worsening heart failure and examination findings. Mitral stenosis is classically associated with rheumatic fever, although rarer causes include age-related calcification and carcinoid tumours.

In early cases of mitral stenosis, there will usually be no symptoms. But as the mitral valve orifice decreases left atrial pressure increases to attempt to maintain cardiac output. This eventually results in left atrial hypertrophy and pulmonary hypertension, which cause the majority of symptoms. The larger left atrium predisposes to atrial fibrillation, a common complication of mitral stenosis, leading to an irregularly irregular pulse. The opening snap on auscultation is a result of the mitral valve suddenly opening forcefully, and is followed by a mid-diastolic murmur best heard in the apex area with the patient laid on their left side.

Out of the other possible answers:

Tricuspid stenosis would also lead to a diastolic murmur, but this is usually best heard at the lower left sternal edge.

Mitral regurgitation would present with similar symptoms, but the murmur would be pan-systolic with radiation towards the axilla.

Aortic stenosis would have different symptomology, in the later stages, it has a classic triad of exercise-induced syncope, angina and dyspnoea. This will produce an ejection systolic, crescendo-decrescendo murmur best heard at the upper right sternal border and radiating to the carotid areas.

Aortic regurgitation would present differently, with angina and dyspnoea, and can feature a number of other examination findings (e.g. collapsing pulse, Quincke’s sign). On auscultation, an early diastolic murmur would be present and best heard at the lower left sternal edge with the patient sat forward and their breath held in expiration.

Heart murmurs can be difficult to remember at first, but in order to make an educated guess, it is helpful to recall which murmurs are systolic or diastolic and the areas where the relevant valves are heard clearest.

A mnemonic to remember most of the systolic murmurs is “MR V TRAPS”:

Mitral Regurgitation

Ventricular septal defect

Tricuspid Regurgitation

Aortic

Pulmonary Stenosis

The mnemonic “All Patients Trust Me” can be used to remember the valve areas. However, it is worth noting that aortic regurgitation is best heard close to the tricuspid area, not the aortic area.

Further reading:

https://patient.info/doctor/mitral-stenosis-pro

Question:

A 25-year-old male returns from an agriculture trip in India two weeks ago, where he inspected various farms. He has now presented to his GP feeling generally unwell, fatigued, with reduced appetite. He is also complaining of having dark urine and pale stools. On examination he is noted to be jaundiced.

What is the most likely cause of his symptoms?

A. Hepatitis C

B. Hepatitis E

C. Hepatitis B

D. Hepatitis D

E. Ischaemic hepatitis

Correct Answer:Hepatitis E

Explanation:

Hepatitis E, caused by the hepatitis E virus, is found in the faeces of infected individuals and is most commonly transmitted through infected water sources. Hepatitis E occurs more in the developing world due to unclean water sources. This patient visited a developing country, and in particular a farm. It is likely he has Hepatitis E.

Ischaemic hepatitis is highly unlikely given the patient's age and no significant past medical history. Ischaemic hepatitis most commonly occurs secondary to embolic disease or hypoperfusion of the liver due to other causes (e.g. severe sepsis).

Hepatitis B is caused by the hepatitis B virus (HBV). HBV is found in the blood or bodily fluids of infected individuals and is spread through unprotected sexual intercourse, transfusions of infected blood, unsterilized medical equipment, unsterilized tattoo equipment, or sharing needles for the use of intravenous drugs.

Hepatitis C is caused by the hepatitis C virus (HCV). HCV is found in the blood of infected individuals. It is most commonly spread through sharing needles for drug use, poorly sterilized medical or tattoo equipment, and transfusions of infected blood.

Hepatitis D, caused by the hepatitis D virus (HDV), is only found in individuals already infected with Hepatitis B and therefore has the same methods of transmission as hepatitis B.

Further reading:

https://patient.info/doctor/viral-hepatitis-particularly-d-and-e#nav-10

Question:

An 82-year-old is found collapsed at home by her relatives and brought into hospital. They are unsure how long she was on the floor, but became worried when they had not heard from the patient for 3 days and went round to check on her. They report that she was previously independent, and was able to organise her own shopping and cooking - however, the family were beginning to have concerns surrounding her mobility. The patient is unable to provide any form of history; whilst she is conscious, she appears very confused and increasingly lethargic.

On examination, the patient has bruising on her arms, but no signs of focal tenderness or fracture. A brief neurological examination reveals no abnormalities in tone or reflexes. The patient is not shivering, and a tympanic thermometer gives a reading of 36 degrees. Notably, the patient has a pulse rate of 38, and her blood pressure is recorded at 80/48. The admitting doctor is extremely concerned about the patient's presentation and orders further investigations.

Given the patient's history and examination findings, which of the following diagnoses is the most important to exclude?

A. AV nodal block

B. Severe hypothermia

C. Neck of femur fracture

D. Stroke

E. Sick sinus syndrome

Correct Answer:Severe hypothermia

Explanation:

This patient has presented with a history of a long lie; there is no way of determining exactly how long she was on the ground, but there is a chance that she may have been immobile for as long as 3 days. In any patient who has been immobile for such a time, it is crucial to consider the potential for severe hypothermia, especially in elderly individuals, whose ability to regulate their body temperature may be impaired. Bradycardia, hypotension, confusion and lethargy are all possible symptoms of this condition.

In this case, both the lack of shivering and low-grade temperature drop detected on the thermometer may be falsely reassuring. Regular tympanic thermometers can often fail to register extremely low temperatures; therefore, in any patient who records a temperature below 36.5 degrees, it is essential to use a rectal, low-reading thermometer to ascertain the exact temperature. At very low temperatures, the shivering mechanism will often fail; thus, the lack of shivering in combination with a recorded temperature of 36 degrees should be worrying rather than reassuring.

Stroke is an important cause of falls in the elderly to consider; however, the normal neurological examination makes this less likely, and given the lack of clarity about the history, the patient is certainly not a candidate for thrombolysis. Therefore, excluding severe hypothermia is far more pressing in this scenario.

Whilst AV nodal block and sick sinus syndrome are possible alternative explanations for the patient's bradycardia, these are unlikely to be immediately life-threatening.

Neck of femur fractures can often complicate falls in the elderly, due to the prevalence of osteoporosis making a fracture far more likely. Whilst ordering an X-ray to rule out orthopaedic pathology may be warranted, it is far more pressing to rule out hypothermia.

Further reading:

https://patient.info/doctor/hypothermia-pro

Question:

A 48-year-old woman presents to the GP with a worsening headache. She reports the headache has been there almost constantly for the last two weeks. She describes the headache as dull and non-throbbing in character but always worse in the morning. She also experienced one episode of vomiting this morning. She has not had any recent head trauma.

She is currently undergoing treatment with tamoxifen 20mg for HER2 positive breast cancer. She is allergic to NSAIDs, resulting in a skin rash.

What is the most likely diagnosis?

A. Encephalitis

B. Tension headache

C. Chronic subdural haematoma

D. Cerebral metastases

E. Meningitis

Correct Answer:Cerebral metastases

Explanation:

The most likely diagnosis is brain metastases (cerebral metastases). Any cancer can spread to the brain, but the most likely to cause brain metastases via haematogenous spread are lung, breast, colon, kidney and melanoma. This patient has a significant medical history of breast cancer. There are also red flags for raised intracranial pressure in the history, including worsening of symptoms, morning headaches and new-onset vomiting.

Typically subdural haematoma presents with headache, nausea ± vomiting, confusion and drowsiness. The absence of previous head trauma makes the diagnosis less likely but does not rule it out. The ongoing treatment for breast cancer makes a diagnosis of brain metastasis more likely.

Patients with encephalitis typically present with altered mental state, fever and focal neurological deficits. There may also be a history of a recent febrile illness.

Tension headaches typically present as a dull, non-throbbing headache that feels like a 'tight band' around the head. The ongoing treatment for breast cancer and features of raised intracranial pressure (morning headache, vomiting) should make this a diagnosis of exclusion.

Meningitis should be considered in patients presenting with headache, neck stiffness, fever and an altered level of consciousness. This patient does not demonstrate any features of meningism.

Further reading:

https://www.nice.org.uk/guidance/ng99

Question:

An obese 42-year-old patient presents to the GP with persistent abdominal pain after eating. He describes a burning sensation under his ribs, with this sometimes travelling up towards his throat; this is particularly severe with large meals. Recently, he has suffered from recurrent bouts of hiccups; these can last a number of minutes and be distressing. The patient reports that he has sought advice for his symptoms previously, with a previous doctor informing him that reflux is the most likely explanation. However, treatment with omeprazole and over-the-counter Gaviscon recommended has not resulted in any improvement.

The patient reports a 3 stone weight loss over the past 6 months, although he has been attending a weight loss class during this time, with the aim of becoming a more healthy weight. He denies changes in appetite, changes in bowel habit or passing blood in his stools. Abdominal examination reveals no tenderness or masses on palpation. There is no lymphadenopathy elicited.

Given the patient's non-response to PPI therapy, the GP makes a hospital referral. The consultant informs the patient that he may require an upper GI endoscopy; however, before this is carried out, he is booked in for a chest X-ray. This is reported as showing a significant degree of retrocardiac air; this allows for a diagnosis to be made without a need for more invasive investigations.

What is the most likely cause of this patient's symptoms?

A. Dieulafoy lesion

B. Heyde's syndrome

C. Hiatus hernia

D. Ruptured gastric ulcer

E. Gastric adenocarcinoma

Correct Answer:Hiatus hernia

Explanation:

The most likely diagnosis, in this case, is a hiatus hernia; a displacement of a portion of the stomach above the diaphragm. This most commonly involves the gastro-oesophageal junction (a sliding hiatus hernia), with the fundus of the stomach implicated in some cases (a rolling hiatus hernia). The condition may remain asymptomatic or can present with persistent reflux symptoms, as the proximal location of the stomach results in an increased chance of acid coming into contact with the oesophagus. Hiccups are another feature that points towards a hiatus hernia as a likely diagnosis; these can arise due to diaphragmatic irritation. The condition is far more common in obese patients, as the increased BMI causes an increase in abdominal pressure.

A chest X-ray is a useful first-line investigation for suspected hiatus hernia given its rapid availability. This can demonstrate a retrocardiac gastric bubble in larger hernias (this patient is likely to have a larger defect, given his extensive symptoms). Management of hiatus hernia can be simply via the provision of proton pump inhibitors, but as that the patient has not fully responded to these; a surgical approach is likely to be offered. Nissen's fundoplication is the usual procedure used in the setting of a hiatus hernia - this involves reducing the defect and then wrapping a section of the gastric fundus around the gastroesophageal junction to reinforce it; thus preventing further herniation.

Heyde's syndrome is an exceptionally rare condition characterised by a classic triad of aortic stenosis, acquired von Willebrand deficiency and gastrointestinal bleeding due to angiodysplasia. The features are not in keeping with the presentation of this patient.

A ruptured gastric ulcer could cause similar symptoms to those of this patient, however, the presentation would likely be more acute, with sudden onset pain and peritonism. Pneumoperitoneum would be expected on a chest X-ray rather than a retrocardiac air bubble.

Gastric adenocarcinoma must always be considered in patients with non-specific upper GI symptoms; especially given the patient's weight loss history. However, given that the weight loss was intentional and the chest X-ray findings, it is not the most likely diagnosis in this case.

A Dieulafoy lesion is a large, tortuous arteriole, often found in the stomach, that can cause occult gastrointestinal bleeding. This patient has not presented with melaena, nor signs of anaemia, and the condition would not explain the patient's other symptoms.

Further reading:

https://patient.info/doctor/hiatus-hernia-pro

Question:

A 31-year-old man presents to the emergency department with a 1-hour history of sudden onset chest pain, whilst watching TV. He describes it as sharp, in the middle of his chest and radiating to his left shoulder. His grandfather died of a heart attack aged 71, but he has no other family history. He takes no regular medications.

On examination, he is leaning forward in the chair. Examination is unremarkable, apart from a temperature of 37.7°C.

His ECG shows PR depression in leads V2 and V3 as well as concave ST elevation in V5 and V6.

What is the most likely diagnosis?

A. Pulmonary embolism

B. Pericarditis

C. Pneumothorax

D. Musculoskeletal chest pain

E. Acute myocardial infarction

Correct Answer:Pericarditis

Explanation:

Pericarditis classically causes sudden-onset pleuritic chest pain which radiates to the trapezius ridge. Viral pericarditis is relatively more common in younger males and typical ECG findings include PR depression in any lead except aVR, concave ST elevation in any leads except aVR and V1 (but most commonly V5 and V6) and reciprocal ST depression in aVR and V1. It is often managed with aspirin and/or colchicine as tolerated.

Pulmonary embolism is a possibility but ECG changes are typically sinus tachycardia, ‘S1Q3T3’ or signs of right heart strain. The patient would also usually present with hypoxia.

Acute myocardial infarction would be unusual in a younger patient but may present similarly – the pain is usually crushing however and not positional.

Musculoskeletal chest pain would not cause ECG changes, and neither would pneumothorax (which would also likely feature focal chest findings).

Further reading:

https://www.rcemlearning.co.uk/references/pericarditis/

Question:

Miss Grey is a 20-year-old female who is reviewed in her GP practice following some blood tests. She previously presented to the nurse practitioner feeling anergic and lethargic. She has no past medical history of note although volunteers that her periods are usually very heavy and always have been. She has no known allergies. She works in a local supermarket as a team leader and enjoys regular exercise. Her examination is unremarkable.

Routine blood tests show the following:

Haemoglobin (Hb): 82 g/L

Mean cell volume (MCV): 78 fL

White cell count (WCC): 6 × 109/ L

Neutrophils: 4 × 109/ L

Serum ferritin: 2 ng/mL

Thyroid function tests and HbA1c were within the normal range.

What is the most appropriate initial treatment option?

A. Outpatient appointment for intravenous iron replacement

B. Vitamin B12 injections

C. Folic acid

D. No treatment required, repeat full blood count in 2 weeks

E. Ferrous sulfate

Correct Answer:Ferrous sulfate

Explanation:

This patient has a microcytic anaemia and low ferritin confirming iron deficiency anaemia. The most likely cause given the history provided would be blood loss secondary to possible menorrhagia.

Oral ferrous sulfate 200mg three times daily is recommended by NICE as the first-line treatment for iron deficiency anaemia. Ferrous fumarate or ferrous gluconate are second-line if ferrous sulfate is not tolerated. The patient will need a repeat FBC at 2-4 weeks once treatment has started and likely 3 months of treatment.

Not treating and repeating FBC in 2 weeks is not appropriate in this instance as the patient is symptomatic and given the probable underlying cause it is unlikely the anaemia will have improved.

Vitamin B12 and folic acid do not treat iron deficiency anaemia.

Intravenous iron replacement, often provided by Ambulatory Care services, is reserved for those who have failed oral iron replacement.

This patient will need a formal gynaecological history taken with regards to her heavy periods to establish if she has menorrhagia. Iron supplementation will not treat the underlying cause if this is the case and if her menorrhagia is untreated the anaemia may persist.

Further reading:

https://cks.nice.org.uk/anaemia-iron-deficiency

Question:

A 75-year-old retired farmer presents to his GP with a hyperpigmented skin lesion on his ear. He states that this has been present for approximately 1-month and has increased in size over this time. He reports the lesion is sore to the touch and has bled on occasion.

On examination, there is a 6 mm x 5 mm raised lesion on the posterior aspect of his left pinna. The lesion is keratotic, with a small area of central ulceration centrally and poorly defined margins. On palpation, the lesion is tender and indurated (firm to the touch). There is no local lymphadenopathy.

What is the most likely diagnosis?

A. Basal cell carcinoma

B. Bowen's disease

C. Squamous cell carcinoma

D. Actinic keratosis

E. Malignant melanoma

Correct Answer:Squamous cell carcinoma

Explanation:

The most likely diagnosis is squamous cell carcinoma (SCC). These are typically located in sun-exposed sites such as the face, ears, arms, forearms and lower legs. SCC lesions can be tender, ill-defined, keratotic, ulcerated and can bleed. They can grow over weeks to months.

This gentleman's lesion would justify an urgent referral to dermatology for assessment and treatment. This can take the form of surgical excision with a 5 mm margin.

Nodular basal cell carcinoma (the most common form of BCC) presents classically with a pearly rolled edge and telangiectasia. It may also ulcerate and bleed much like an SCC. By contrast, BCC is very slow-growing.

Malignant melanoma presents with the ABCDE features:

Asymmetry

Irregular border

Irregular colour

Diameter >6 mm

Evolution of lesion over time (e.g. size, shape, colour)

Actinic keratosis is a common lesion caused by sun exposure. The lesions are usually <1 cm and a rough, red patch. These are commonly found in older individuals - NICE suggest that >23% of people aged >60 in the UK have actinic keratoses.

Bowen's disease is a form of carcinoma-in-situ which has a small risk of progression to SCC. It presents with slowly growing, well-defined red plaques/patches.

Further reading:

https://cdn.bad.org.uk/uploads/2021/12/29200247/Derm\_Handbook\_3rd-Edition-\_Nov\_2020-FINAL.pdf

Question:

A 69-year-old man is incidentally found to have a 3.9cm abdominal aortic aneurysm during an admission to hospital with diverticulitis. He has a past medical history of hypertension and smokes 20 cigarettes a day.

Which of the following is the most appropriate management plan?

A. CT abdomen every 5 years

B. Annual ultrasound monitoring

C. 2 week referral to vascular surgery

D. Annual CT abdomen

E. Three-monthly ultrasound monitoring

Correct Answer:Annual ultrasound monitoring

Explanation:

Uncomplicated abdominal aortic aneurysms (AAAs) less than 5.5cm are generally monitored whereas larger aneurysms (>5.5cm) may require surgical intervention. Patients with a new AAA between 3.0-5.4cm should be referred to a regional vascular service to be seen within 12 weeks, and those with an new AAA >5.5cm should be seen within 2 weeks.

Ultrasound is the investigation of choice for monitoring AAAs, with the frequency dictated by the diameter of the aneurysm:

3.0-4.4 cm - annual ultrasound

4.5-5.4 cm - three-monthly ultrasound

5.5 cm or bigger - consider surgical intervention

CT monitoring is not used due to the unnecessary radiation exposure.

In addition to monitoring, patients should be made aware of red flag symptoms (i.e. abdominal pain etc) that warrant urgent review.

Patients should also be advised to reduce their risks factors where possible:

Smoking cessation

Tight blood pressure control

Further reading:

https://patient.info/doctor/abdominal-aortic-aneurysms

Question:

You are called to see a 32-year-old woman, two hours post vaginal delivery. She had a normal delivery with a second-degree vaginal tear that was sutured, with an estimated blood loss of 200ml. Since then the patient has had persistent vaginal bleeding, with associated blood clots and 10 changes of her sanitary pad. The patient is now complaining of dizziness and shortness of breath at rest.

Vital signs are as follows:

BP 84/60 mmHg

HR 120 bpm

RR 20

SpO2 98% (on air) Speculum examination reveals an open cervical os with increased PV blood and clots visible in the vaginal cavity.

Inspection of the perineum reveals a sutured wound with no active bleeding.

Which of the following would be the most appropriate management step to perform next?

A. Abdominal ultrasound

B. Administer warmed IV crystalloid STAT

C. IV co-amoxiclav STAT

D. Uterine massage

E. Insertion of a foley catheter

Correct Answer:Administer warmed IV crystalloid STAT

Explanation:

The most likely diagnosis is post-partum haemorrhage (PPH) with secondary haemodynamic instability, suggestive of significant blood loss. Visual estimation of blood loss is inaccurate and should not be relied upon to guide management. The absence of bleeding from the vaginal tear suggests the uterus is the source of bleeding (i.e. uterine atony or retained products of conception). Management of PPH requires a structured ABCDE approach as shown below.

Airway:

Ensure the patient's airway is patent

Breathing:

Check respiratory rate, SpO2 and auscultate the chest (administer oxygen if required)

Circulation:

Check pulse and blood pressure every 15 minutes

Position the patient flat

Gain IV access (in this scenario, two large-bore IV cannulas should be inserted)

Urgent venepuncture (group and save, full blood count, coagulation screen)

Commence a warmed IV crystalloid infusion (transfuse up to 3.5L whilst awaiting blood transfusion)

Transfuse blood, platelets and FFP once available

Consider IV syntocinon if uterine atony is suspected as the cause of PPH

Insert a foley catheter to monitor urine output

Disability:

Check capillary blood glucose

Assess consciousness level (AVPU)

Exposure:

Inspect for evidence of bleeding sources

Perform uterine massage and consider further surgical intervention

An abdominal ultrasound may be performed at some point, to assess for retained products of conception, however, the administration of warmed IV crystalloids takes priority given the patient's haemodynamic instability.

IV co-amoxiclav is not immediately required in this scenario, as there is no clear evidence of infection.

Further reading:

https://obgyn.onlinelibrary.wiley.com/doi/full/10.1111/1471-0528.14178

Question:

A 50-year old woman is in recovery following laparoscopic surgery to perform a Roux-en-Y gastric bypass. Her observations are stable, she is afebrile and she is regaining consciousness following the reversal of her anaesthetic. It is noted by the scrub team that a clip is missing from the surgical instrument set and it cannot be located.

An abdominal X-ray is promptly conducted when the patient has regained consciousness 30 minutes later. The clip cannot be located on the film and it is consequently found on the floor of the theatre. However, the consultant uses the abdominal X-ray in his next teaching session, and explains it is an excellent demonstration of ‘Rigler’s sign’.

What abdominal X-ray finding does Rigler’s sign describe?

A. Presence of gas under the diaphragm

B. Increased prominence of the inner bowel wall

C. Prominent appearance of the inner and outer bowel walls

D. The appearance of two bowel loops being in contact with one another

E. Thickening of the bowel wall due to inflammation from recent suturing

Correct Answer:Prominent appearance of the inner and outer bowel walls

Explanation:

During laparoscopic abdominal surgery, such as gastric bypass surgery, in this case, the abdominal cavity is filled with air to improve visualisation. The presence of free gas in the abdominal cavity is known as ‘pneumoperitoneum’, which can also occur in intestinal perforation. A key sign of pneumoperitoneum is ‘Rigler’s sign’. This is when the free air within the abdomen acts as an additional contrast agent on abdominal X-ray resulting in both the inner and outer bowel wall becoming visible (normally only the inner wall should be visible). Therefore the correct answer, in this case, is the prominent appearance of the inner and outer bowel walls and this is demonstrated in the abdominal X-ray below.

Pneumoperitoneum can also result in the presence of gas under the diaphragm when an erect chest X-ray is performed, as the free air rises to sit below the diaphragmatic edge. However, Rigler’s sign describes a different sign of pneumoperitoneum - the prominent appearance of inner and outer bowel walls.

Rigler’s sign occurs due to the increased prominence of the outer bowel wall from the presence of free intraabdominal air. Normally the inner bowel wall is visible on abdominal X-ray, but the outer bowel wall is not. Therefore the answer of increased prominence of the inner bowel wall is not the correct answer in this case.

Although the bowel wall may become inflamed following a recent surgery, it is unlikely to be obvious on abdominal X-ray unless the inflammation is chronic such as in cases of inflammatory bowel disease. Rigler's sign is not used to describe an inflammatory process, it occurs due to the presence of gas in the abdominal cavity. Therefore the answer of thickening of the bowel wall due to inflammation from recent suturing is incorrect.

The nature of Roux-en-Y gastric bypass surgery does involve repositioning of bowel loops but the appearance of two bowel loops being in contact with one another is not termed Rigler’s sign.

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Further reading:

https://geekymedics.com/abdominal-x-ray-interpretation/

Question:

A 6-year-old boy presents to the GP with a neck lump. On examination, there is a mobile lump in the anterior triangle of the neck. On palpation, it is smooth, fluctuant and does not move on swallowing. It does not transilluminate.

What is the most likely diagnosis?

A. Thyroglossal cyst

B. Cystic hygroma

C. Hashimoto’s thyroiditis

D. Grave’s disease

E. Branchial cyst

Correct Answer:Branchial cyst

Explanation:

A branchial cyst is a benign, developmental defect of the branchial arches. They typically present in late childhood or early adulthood and present as asymptomatic neck lateral neck lumps and are usually located anterior to the sternocleidomastoid muscle. They are typically unilateral, smooth, fluctuant, and non-tender. They do not move on swallowing nor transilluminate. They can be treated conservatively or surgically excised.

Grave’s and Hashimoto’s are unlikely considering his age and the fact he is asymptomatic. In addition, goitres are usually central.

Cystic hygromas usually present before the age of 2-years-old and are classically found in the left posterior triangle of the neck.

Thyroglossal cysts typically occur in the midline of the neck and are mobile and fluctant. They characteristically move on movement of the tongue.

Further reading:

https://patient.info/doctor/neck-lumps-and-bumps

Question:

A 61-year-old woman presents to her GP with stomach pain, early satiety, and weight loss of 4kg in the last month. She is referred for an upper GI endoscopy under the 2-week wait pathway, which reveals several small erosions and nodules. Biopsy of these lesions gives a diagnosis of low-grade gastric MALT lymphoma and shows she is H. pylori positive.

What is the most appropriate definitive treatment?

A. ABVD (adriamycin, bleomycin, vinblastine, dacarbazine)

B. Gastrectomy

C. R-CHOP (rituximab, cyclophosphamide, hydroxydaunorubicin, oncovin, prednisolone)

D. Endoscopic mucosal resection

E. H. pylori eradication

Correct Answer:H. pylori eradication

Explanation:

The definitive treatment for H. pylori-positive gastric MALT lymphoma is H. pylori eradication with triple therapy, comprising a proton pump inhibitor, clarithromycin and amoxicillin (or metronidazole).

Endoscopic mucosal resection removes pre-cancerous or early-stage cancers from the gastrointestinal tract. However, it is not the first-line treatment for gastric MALT lymphoma.

Gastrectomy, with or without neoadjuvant and adjuvant chemotherapy, is the definitive treatment for gastric cancers. However, it is not used to treat gastric MALT lymphomas.

ABVD (adriamycin, bleomycin, vinblastine, dacarbazine) is a chemotherapy regimen used to treat Hodgkin’s lymphoma.

R-CHOP (rituximab, cyclophosphamide, hydroxydaunorubicin, oncovin, prednisolone) is a chemotherapy regimen used to treat non-Hodgkin lymphoma. However, it is not used to treat gastric MALT lymphoma.

Further reading:

https://www.nice.org.uk/guidance/NG52/chapter/Recommendations#management-of-malt-lymphoma

Question:

A 16-year-old male presents to the general practitioner (GP) accompanied by his father. The patient reports pain at the front of both knees upon walking and jumping. There is no pain at rest.

He has a normal body mass index. Physical examination reveals tenderness at the tibial tuberosity bilaterally.

What is the most likely diagnosis?

A. Legg-Calve-Perthes disease

B. Osteoid osteoma

C. Ewing’s sarcoma

D. Slipped capital femoral epiphysis

E. Osgood-Schlatter disease

Correct Answer:Osgood-Schlatter disease

Explanation:

This adolescent has presented to the primary care clinic with typical features of Osgood-Schlatter disease – a common condition that causes painful enlargement of the tibial tuberosity. Male adolescents are most commonly affected. This is a benign, self-limiting condition that resolves once growth halts. Most patients can be managed with activity modification, rest, physiotherapy and non-steroidal anti-inflammatories.

Legg-Calve-Perthes disease refers to avascular necrosis of the femoral head that typically presents in children aged between four and eight. Clinical features include an antalgic gait and reduced internal rotation of the affected hip.

Ewing’s sarcoma is an extremely aggressive malignant tumour that typically affects boys less than 15 years old. Clinical manifestations include fever, weight loss, erythema and swelling.

Osteoid osteoma is a bone-forming tumour arising from osteoblasts which typically affects the proximal femur and presents with nocturnal pain. The patient in the question stem has symptoms in both legs, making a tumour very unlikely.

Slipped capital femoral epiphysis is the most common adolescent hip disorder and typically affects overweight male adolescents. The patient in the above question has a normal body mass index and his clinical findings make Osgood-Schlatter disease a more likely diagnosis.

Further reading:

https://patient.info/doctor/osgood-schlatter-disease-pro

Question:

A patient wishes to know more about the efficacy of statins. Their doctor finds a research paper which states that statins have a number needed to treat (NNT) of 60 for heart attacks.

What is the most accurate interpretation of this number needed to treat?

A. Statins reduce the risk of heart attack by a factor of 60

B. For every 60 patients treated with a statin, 1 will have a heart attack

C. Statins reduce the risk of heart attack by 60%

D. 60% of heart attacks could be prevented with a statin

E. For every 60 patients treated with a statin, 1 heart attack will be prevented

Correct Answer:For every 60 patients treated with a statin, 1 heart attack will be prevented

Explanation:

The number needed to treat (NNT) is the number of patients that would have to be treated to prevent one adverse event. Therefore, the correct answer is for every 60 patients treated with a statin, 1 heart attack will be prevented.

Further reading:

https://geekymedics.com/statistics-for-medical-students/

Question:

A 23-year-old medical student presents with a 9-month history of abdominal cramps and bloating. She also complains of diarrhoea and constipation, which is made worse after eating any food with no obvious trigger found. She describes her stools as being pellet-like and relief of cramps on opening her bowels. She denies any fevers, weight loss, changes in the colour of her stool or the presence of blood/mucous in her stools.

What is the most likely diagnosis?

A. Malabsorption

B. Gastroenteritis

C. Inflammatory bowel disease (IBD)

D. Coeliac disease

E. Irritable bowel syndrome (IBS)

Correct Answer:Irritable bowel syndrome (IBS)

Explanation:

The most likely diagnosis is irritable bowel syndrome (IBS) given the presence of abdominal cramps that are relieved by opening her bowels, bloating and frequent alternation between constipation and diarrhoea. The cause of IBS is likely multifactorial, involving a mixture of abnormal smooth muscle activity, visceral hypersensitivity and abnormal central processing of painful stimuli. The absence of systemic symptoms, change in stool colour or blood in the stool makes the other diagnoses less likely.

Inflammatory bowel disease (i.e. Crohn's or ulcerative colitis) is a much less likely diagnosis given the absence of weight loss or blood/mucous in the stools.

Coeliac disease seems less likely given the symptoms appear to occur regardless of food type. You would expect the patient to associated worsening of symptoms with foods known to contain high levels of gluten (i.e. bread).

Malabsorption seems unlikely given the absence of weight loss or other system features. In addition, she denies any change to the colour of her stools and doesn't report difficulty flushing them (i.e. steatorrhoea).

Gastroenteritis is highly unlikely given the duration of symptoms and absence of other systemic features such as fever or vomiting. Gastroenteritis typically causes acute episodes of diarrhoea and vomiting, often with associated fever and malaise.

Further reading:

https://patient.info/doctor/irritable-bowel-syndrome-pro

Question:

A 31-year-old female attends the emergency department with a headache. She works in a nearby shop and was advised to attend the department by her colleagues because of worsening headache. It came on around 4 hours ago, having initially been 2/10 severity and worsening to 6/10. She describes a dull, tight, aching sensation that forms a band around her head crossing her temples, brow and vertex of the scalp. She had some relief earlier from massaging her temples. She has no other complaints, is not photophobic and has no neck stiffness. She tells you she does not normally suffer from headaches and has not yet tried any analgesia. She states that she has been “stressed” today due to a work deadline but is usually well with no past medical history.

On examination, the patient is a slim female who is comfortable at rest and has no focal neurological deficit. She is afebrile.

What is the most likely diagnosis?

A. Cluster headache

B. Idiopathic intracranial hypertension

C. Tension-type headache

D. Trigeminal neuralgia

E. Migraine

Correct Answer:Tension-type headache

Explanation:

This headache contains the features of a tension-type headache. The patient has a bilateral, pressing/tightening (non-pulsating) headache of mild to moderate severity which has lasted for more than 30 minutes.

Migraine is more typically unilateral and is often more severe. It may be associated with other phenomena such as visual aura, nausea or vomiting and photophobia.

Cluster headache is uncommon but severe and is particularly associated with unilateral autonomic features: lacrimation, rhinorrhoea, partial Horner's syndrome with ptosis and miosis and sweating abnormalities. The attacks occur in bouts and can be extremely severe.

Trigeminal neuralgia often manifests as severe shooting pains in a distribution of the trigeminal nerve (V1, V2 or V3) on one side of the face. These may be triggered or worsened by activities such as touching the face.

Idiopathic intracranial hypertension may cause a generalised headache with features of raised intracranial pressure, such as worsening on coughing or Valsalva manoeuvre and with posture. Visual blurring and loss of vision is a major concern here.

Further reading:

https://patient.info/doctor/tension-type-headache-pro

Question:

A 55-year-old woman presents with a 3 month history of decreased appetite, fatigue, abdominal bloating, urinary frequency and weight loss. She has no significant past medical history and takes no regular medication.

Clinical examination reveals cachexia, pallor and ascites. There is no hepatosplenomegaly or other abnormalities present. Vital signs are normal and urine dipstick is negative.

Which of the following investigations is likely to be most useful in reaching a diagnosis?

A. CA 125

B. LFTs

C. CA 19.9

D. CA 15.3

E. Alpha-fetoprotein

Correct Answer:CA 125

Explanation:

This patient most likely has a diagnosis of ovarian cancer, given the insidious onset of abdominal bloating, fatigue, weight loss, anorexia and urinary frequency. The presence of ascites, cachexia and pallor further supports the likely diagnosis.

In the context of suspected ovarian cancer, CA 125 would be the most useful investigation to help confirm the diagnosis. Further investigations would then be required, including abdominal ultrasound and CT abdomen.

CA 15.3 is a biomarker associated with breast cancer.

CA 19.9 is associated with pancreatic cancer and cholangiocarcinoma, neither of which is likely in this scenario given the absence of jaundice.

Alpha-fetoprotein (AFP) is associated with hepatocellular carcinoma and yolk-sac tumours.

LFTs may be deranged in the presence of ovarian cancer metastases, but this test would be less useful in establishing a diagnosis of ovarian cancer compared to CA 125.

Further reading:

https://patient.info/doctor/ovarian-cancer-pro

Question:

A 25-year-old man arrives at the emergency department with periumbilical pain. The pain came on gradually two days ago and is getting progressively worse. He also complains of anorexia, nausea, and general malaise. He has no urinary symptoms, no change in bowel habits, and no testicular tenderness on palpation. During the examination, no masses are felt, the abdomen is not distended but there is general rigidity on abdominal palpation, rebound tenderness and severe pain in the right lower quadrant, and a positive Rovsing’s sign.

What likely complication has this patient developed?

A. Paralytic ileus

B. Perforation

C. Bowel obstruction

D. Abscess

E. Appendix mass

Correct Answer:Perforation

Explanation:

It is likely that this patient has now developed peritonitis secondary to a perforation of the appendix. While all of these options are complications of appendicitis, a perforated appendix is the most likely cause of his severe pain, generalised rigidity and tenderness as well as rebound tenderness. Signs of peritonitis.

An appendix mass is a common complication that usually presents with fevers and a mass in the right iliac fossa. However, it is unlikely to cause generalised rigidity or rebound tenderness. If left untreated, this can lead to an abscess which would also cause a mass, fever, and potentially sepsis. This would increase the risk of perforation in the future.

Bowel obstruction is another complication of appendicitis. Depending on where exactly the obstruction is will determine the symptoms; however, they usually include nausea, faeculent vomiting and distended abdomen in small bowel obstructions or constipation, absence of flatus and a distended abdomen in large bowel obstructions.

Paralytic ileus can occur in appendicitis but it is quite rare and would present with a distended abdomen, absent bowel sounds, and absolute constipation.

Further reading:

https://cks.nice.org.uk/topics/appendicitis/background-information/complications/

Question:

A 26-year-old G2P0 attends her 28-week antenatal appointment. The pregnancy has been well to date, with no issues. On examination, her blood pressure is 156/98mmHg. Her blood pressure has been normal before this.

What is the most appropriate next step?

A. Start labetalol

B. Start ramipril

C. Urine dipstick

D. Urine MC&S

E. Discharge and check blood pressure at 31 weeks

Correct Answer:Urine dipstick

Explanation:

This case demonstrates new-onset hypertension (blood pressure >140/90 mmHg) ≥20 weeks' gestation. A blood pressure reading and urine dip for proteinuria should be carried out at every antenatal appointment. In this case, a urine dip is of even greater importance to differentiate between gestational hypertension and pre-eclampsia.

Before starting labetalol to manage this patient's hypertension, it is essential to exclude pre-eclampsia as the patient may require admission for further investigation and treatment.

A urine MC&S is carried out at every antenatal appointment to exclude asymptomatic bacteriuria, which requires antibiotic therapy during pregnancy. However, a urine dip to determine proteinuria is the most important next step.

Discharging and checking blood pressure at 31 weeks is highly inappropriate in a pregnant woman with new-onset hypertension.

Ramipril is teratogenic and so should not be prescribed during pregnancy.

Further reading:

https://cks.nice.org.uk/topics/hypertension-in-pregnancy/

Question:

A 60-year-old woman presents to her general practitioner with symptoms of pelvic pain and weight loss.

She has been postmenopausal for 5 years. She used hormone replacement therapy (HRT) for 6 years and the combined oral contraceptive pill (COCP) for 12 years. Her past cervical screening has revealed no abnormalities. She has no obstetric history.

Her past medical history is significant for hypertension and angina, for which she is prescribed amlodipine and GTN spray respectively. She has no known drug allergies. She currently works as a solicitor and smokes 10 cigarettes per day.

On examination, observations are normal and her BMI is 35.3 kg/m2. Bimanual examination reveals a left adnexal mass.

She is urgently referred to the gynaecology clinic, where, following investigation, she is subsequently diagnosed with ovarian cancer

Which aspect of this patient's history is protective against ovarian cancer?

A. COCP use

B. HRT use

C. Smoking

D. Obesity

E. Nulliparity

Correct Answer:COCP use

Explanation:

Simply put, it is thought that the higher the number of ovulations cycles in a woman's lifetime, the higher the risk of ovarian cancer.

Therefore, factors which reduce the number of ovulations are protective:

COCP use

Multiparity

Breastfeeding

HRT use for >5 years can increase the risk of ovarian cancer, as can nulliparity (increased number of ovulations).

Obesity, smoking and diabetes also increase the risk of ovarian cancer. Increasing age and BRCA mutations (which may clinically manifest as a family history of breast or ovarian cancer) also increase the risk.

It is important to understand the purpose of the risk of malignancy index (RMI). The RMI is used in the assessment of an ovarian mass and calculates the likelihood of that mass being cancerous. A score is allocated for each of the following factors, which are then multiplied:

Ultrasound appearance

Menopausal status

Serum CA-125

The RMI does not estimate a patient's future risk of developing ovarian cancer in the future (like, for example, the QRISK score does for a cardiovascular event); it is instead used more as a diagnostic tool.

Further reading:

https://geekymedics.com/ovarian-cancer/

Question:

An 8-year-old boy presents to his GP with painful bilateral swelling near the jaw and cheeks. He finds it increasingly difficult to swallow. This swelling was preceded by a 3-day history of a headache, fever and general malaise. He received all of his childhood vaccines.

For how long should he be excluded from school?

A. 5 days

B. 10 days

C. Until symptoms resolve

D. 14 days

E. No exclusion

Correct Answer:5 days

Explanation:

This case demonstrates mumps, which is caused by the highly infectious paramyxovirus and is a notifiable disease. It is spread by respiratory droplets and saliva and is commonly seen in children and young adults. Despite having both MMR vaccines, there is still a risk of contracting mumps. Management involves supportive care with analgesia, rest and maintaining fluid intake. Children should be excluded from school for 5 days following the development of parotitis.

Further reading:

https://geekymedics.com/mumps/

Question:

A 58-year-old male presents to the emergency department with sudden onset, tearing, central chest pain which radiates to the back. He also reports that, since the onset of the chest pain, his legs have become progressively numb and weak.

On examination, he is tachycardic, hypertensive, tachypnoeic, and afebrile. There is an early diastolic murmur heard loudest over the aortic valve. On examination of the lower limbs, there is paraplegia and complete sensory loss below the level of T12. His ECG shows sinus tachycardia. His past medical history is significant for poorly controlled hypertension.

Which of the following is the most likely diagnosis?

A. Cardiac tamponade

B. STEMI

C. Aortic dissection

D. Infective endocarditis

E. Ruptured abdominal aortic aneurysm

Correct Answer:Aortic dissection

Explanation:

Aortic dissection typically presents with central tearing chest pain that can radiate to through to the back. The most important risk factor is uncontrolled hypertension. Aortic regurgitation can also occur due to dilation of the aortic root. Occasionally, aortic dissection can present with neurological symptoms, in this case, due to involvement of the spinal arteries resulting in spinal cord ischaemia. Other neurological presentations including ischaemic stroke, ischaemic neuropathy, nerve compression, syncope, and seizures.

STEMI typically presents with chest pain, shortness of breath and diaphoresis. The absence of ST-elevation on the ECG and the presence of neurological symptoms do not fit with this diagnosis.

Cardiac tamponade typically presents with tachycardia, hypotension, and muffled heart sounds. It is often associated with chest pain as pericarditis is a common precipitant. This diagnosis would not account for the early diastolic murmur or the sudden onset of lower limb neurological symptoms.

Infective endocarditis can cause aortic regurgitation and embolic disease might result in the occlusion of distal lower limb circulation, but the absence of fever and the presence of acute onset chest pain does not fit with this diagnosis.

A ruptured abdominal aortic aneurysm typically presents with sudden onset abdominal pain (rather than chest pain) and would not cause an early diastolic murmur.

Further reading:

https://pubmed.ncbi.nlm.nih.gov/17194878

Question:

A post-partum 30-year old is currently an inpatient on the maternity ward. She sustained a third-degree tear following an instrumental delivery and lost 1.5L of blood. This is her second delivery. She has no significant past medical or surgical history, is not taking any other regular medications and does not have any allergies. She is currently breastfeeding.

A full blood count was obtained following delivery, which revealed her haemoglobin levels were 50g/L. She also reported feeling light-headed and dizzy, and on examination appeared pale. A 2 unit transfusion of A-positive packed red cells is crossmatched and commenced. She has never previously had a blood transfusion.

Two hours later the patient's temperature is noted to be 38.5⁰C and she reports feeling very cold. Her midwife reports that she has been experiencing rigors. Her blood pressure is currently 125/90mmHg and her pulse is 110bpm. Her JVP is not raised and her ankles are not swollen. Her respiratory rate is 15bpm.

What is the most likely cause of her symptoms?

A. Febrile non-haemolytic blood transfusion reaction

B. Iron overload reaction

C. Haemolytic blood transfusion reaction

D. Transfusion-associated circulatory overload (TACO)

E. Allergic transfusion reaction

Correct Answer:Febrile non-haemolytic blood transfusion reaction

Explanation:

The most likely cause of her symptoms is a febrile non-haemolytic blood transfusion reaction, which typically manifests within 4 hours of transfusion cessation. As described in this cas, a febrile non-haemolytic reaction presents with a mild fever, chills and rigors. There are no signs of haemolysis, such as jaundice and dark-coloured urine, which would typically occur in a haemolytic blood transfusion reaction. There are no allergic phenomena such as a rash or signs of anaphylaxis (her blood pressure is normal), which would occur in an allergic transfusion reaction.

Iron overload reaction is incorrect. Not only would this tend to present as a delayed blood transfusion reaction (i.e. over 24 hours after the blood transfusion begins), this would be unlikely to occur following one transfusion – it typically occurs in patients receiving multiple blood transfusions over a prolonged period, for example in sickle cell disease patients. The question would also be likely to cite classic signs of iron overload, such as skin colour changes (bronze or grey), nausea and vomiting, and deranged liver function.

An allergic transfusion reaction is unlikely. Her normal respiratory rate and blood pressure make an acute anaphylactic reaction highly unlikely and there is no mention of any skin rashes that could be suggestive of a milder allergic reaction.

A haemolytic blood transfusion reaction may be acute (<24hr following transfusion) or delayed (>24hr following transfusion). A key feature of both would be signs of haemolysis being apparent in the patient due to the breakdown of red blood cells, such as jaundice and dark urine.

Transfusion-associated circulatory overload (TACO) will typically present with breathlessness and signs of fluid overload, in a patient who has received multiple transfusions. This patient has a normal JVP and no obvious swelling, making fluid overload less likely. Patients with TACO can usually be treated with diuretics to manage fluid overload.

Further reading:

https://patient.info/doctor/blood-transfusion-reactions

Question:

A 31-year-old primigravida recently gave birth via vaginal delivery 5 days ago. She complains of feeling unwell with offensive lochia, but denies any abdominal pain. Clinical examination reveals a palpable uterine fundus above the level of the umbilicus. During bimanual vaginal examination, the cervix admits a finger and there is offensive lochia present. Vital signs are all normal.

What is the most appropriate next step?

A. Admit for IV fluids

B. Admit for observation

C. Admit for IV fluids and antibiotics

D. Admit for ultrasound scan

E. Admit for evacuation under anaesthetic

Correct Answer:Admit for ultrasound scan

Explanation:

Offensive lochia and no involution signifies retained products of conception. An ultrasound scan of the uterus would be the next most appropriate step to confirm the diagnosis, prior to surgical evacuation under anaesthetic.

Although observations must be checked frequently on this patient, admission is indicated primarily for investigation and management, not observations alone.

IV fluids would be the most appropriate next step in a similar case, where the patient was haemodynamically unstable which is not the case here.

Similarly, broad-spectrum antibiotics would only have been given as the next step if the patient was septic. There’s no evidence to support the use of prophylactic antibiotics prior to surgical evacuation.

Further reading:

https://www.obgyn.net/obgyn-ultrasound/retained-products-conception-rpoc

Question:

A 29-year-old lady presents with a 2-day history of post-coital bleeding. She describes the bleeding as a few spots of fresh blood and denies any dyspareunia, fever, vaginal discharge or change of her sexual partner. She is currently on Microgynon (combined contraceptive pill), which she started 7 months back, with no issues. She had received the HPV vaccine at the age of 11 years and her last cervical smear was performed 3 months back and was normal. You perform a pelvic examination that reveals an anteverted uterus with no tenderness or masses in the adnexa. The speculum examination reveals the picture below.

What is the most likely diagnosis?

Source: Gynpath.ru [CC BY-SA 4.0]

A. Cervical cancer

B. Cervical polyp

C. Cervical ectropion

D. Cervical intraepithelial lesion

E. Cervicitis

Correct Answer:Cervical ectropion

Explanation:

Cervical ectropion involves the columnar cells that normally line the endocervix extending beyond the os. These cells are more fragile than the usual epithelial cells and therefore can result in post-coital bleeding.

It is a physiological condition secondary to oestrogen and very common in women of childbearing age. Cervical ectropion is more common in pregnancy and in women taking the combined oral contraceptive pill. No management is usually required.

Cervical cancer usually presents as abnormal vaginal bleeding, most commonly postcoital. It can also present as inter-menstrual bleeding. With the introduction of the cervical screening program, the majority of cervical cancer cases are identified prior to the development of any symptoms. This patient is highly unlikely to have cervical cancer given she had the HPV vaccine and had a recent normal smear.

A cervical polyp would usually be visible on speculum examination, while with cervicitis a history of abnormal vaginal discharge, itching, fever or dyspareunia is typical.

Cervical intraepithelial lesions are a histological diagnosis and commonly asymptomatic. They are diagnosed through the cervical screening program. As previously stated, the fact the patient had the HPV vaccine and a recent normal smear make this diagnosis highly unlikely.

Further reading:

https://patient.info/doctor/uterine-cervix-and-common-cervical-abnormalities

Question:

A 37-year-old man is referred to eye casualty by his GP for worsening blurred vision. He initially presented a week ago to his GP with a red itchy watering left eye, for which he was advised self-care measures including saline eyewash and cool compresses, though this has not helped. Since then he has developed a fever and the blurring has worsened. He has no past medical history of note and is otherwise fit and well. Examination reveals erythema of the left upper eyelid with pustules along the margin. When everting the upper eyelid, you accidentally brush the cornea with your cotton bud, but this does not trouble the patient and he does not blink. You carry out a slit-lamp examination with fluorescein staining which shows the following.

What would be the most appropriate long-term management of this condition to prevent recurrence?

Imrankabirhossain / CC BY-SA

A. Aciclovir 3% eye ointment PDS and Prednisolone 0.5% OD

B. Aciclovir 3% eye ointment PDS

C. Aciclovir 400mg BD

D. Keratoplasty

E. Advise patient to no longer use contact lenses

Correct Answer:Aciclovir 400mg BD

Explanation:

The patient has presented with classical signs and symptoms of herpes simplex keratitis. This is an infection caused by HSV-1 (and rarely HSV-2) that can affect the surrounding ocular structures, but typically the cornea. It can involve one or more of the three layers which include:

Epithelial: most superficial layer inflammation resulting in a dendritic ulcer (most common presentation)

Stromal: middle layer inflammation that can be non-necrotising (stromal thickening) or necrotising (more severe that can lead to corneal perforation)

Metaherpetic: permanent defects in the basement membrane of the epithelium

Long term prophylaxis is generally considered for those with recurrent epithelial or stromal keratitis using Aciclovir 400mg BD PO, which has shown to reduce the rate of recurrence by around 50%.

Aciclovir 3% eye ointment PDS would be the first-line acute treatment for suspected herpes simplex keratitis.

If non-necrotising keratitis was suspected the initial treatment would be with Aciclovir 3% eye ointment PDS and Prednisolone 0.5% OD. Due to the risk of viral proliferation, steroids are used cautiously in necrotising keratitis once the epithelial defect is healed to prevent further progression.

The Herpetic Eye Disease Study (HEDS) found no association between long term contact lens use and herpes simplex keratitis recurrence, therefore advising the patient to no longer use contact lenses would not be appropriate. However, patients should be advised not to use contact lens until 24 hours after all symptoms have resolved.

Keratoplasty is reserved for those severe cases of stromal keratitis where a sight-threatening scar remains following infection. However, recurrence with HSV can occur and therefore oral aciclovir prophylaxis is advised.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK545278/#\_article-23858\_s7\_

Question:

A 75-year-old man with worsening exertional dyspnoea and chest pain is referred to the cardiology clinic by his GP.

On examination, he has an ejection systolic murmur and a diminished, single S2. His examination is otherwise normal.

An ECG is conducted which demonstrates left ventricular hypertrophy. An echocardiogram is subsequently conducted which demonstrates a calcified aortic valve, reduced aortic valve area and elevated aortic pressure gradient. A diagnosis of aortic stenosis is made, and he is deemed fit for valve replacement surgery on anaesthetics review.

What is the most appropriate management option for the patient?

A. Bioprosthetic valve with anti-coagulation

B. Metallic valve with anti-coagulation

C. Valve replacement contraindicated

D. Metallic valve without anti-coagulation

E. Bioprosthetic valve without anti-coagulation

Correct Answer:Bioprosthetic valve without anti-coagulation

Explanation:

The most appropriate management option for this patient would be a bioprosthetic valve without anti-coagulation. This patient has been deemed fit for surgery and two forms of prosthetic aortic valves can be used in valve replacement surgery – mechanical and bioprosthetic. Although metallic valves are longer-lasting, in patients over 70 bioprosthetic valves tend to be favoured as anticoagulation is not required following insertion and the relative benefits of valve longevity are not as important as in a younger patient.

Metallic valve with anticoagulation is incorrect as the burden of daily systemic anticoagulation is unlikely to be outweighed by the benefits of metallic valve longevity.

Metallic valve without anticoagulation is incorrect as when a metallic valve is inserted it requires anticoagulation medication to be initiated.

Valve replacement contraindicated is incorrect as there are no features in the clinical case study that would be absolute contraindications to valve replacement.

Bioprosthetic valve with anti-coagulation is incorrect as anti-coagulation is not routinely commenced when a bioprosthetic valve is inserted.

Further reading:

https://patient.info/doctor/aortic-stenosis-pro

Question:

A 72-year-old male is admitted to the acute medical unit with a 1-day history of shortness of breath and right-sided pleuritic chest pain. He has a past medical history of previous deep vein thrombosis 2-years previously. He is not currently taking any regular medication.

Clinical examination is unremarkable, other than a tender swollen right lower calf region.

Vital signs are as follows:

HR 110 bpm

BP 123/80 mmHg

RR 24

SpO2 91% on air

Apyrexial

Which of the following would be the most useful investigation to confirm the diagnosis?

A. ECG

B. D-dimer

C. CT pulmonary angiography (CTPA)

D. VQ scan

E. Chest X-ray

Correct Answer:CT pulmonary angiography (CTPA)

Explanation:

The most likely diagnosis in this scenario is a pulmonary embolism (PE) and a deep vein thrombosis. The patient's Well's score is 9 points, supporting the likely diagnosis of a PE.

A CT pulmonary angiography (CTPA) would be the most appropriate investigation to perform next, to confirm the likely diagnosis of PE. NICE recommends immediate CTPA for patients with a Well's score of more than 4 points. If there will be a delay in the person receiving a CTPA, they should be given immediate interim low molecular weight heparin.

D-dimer would not be necessary to perform in this scenario, as this test is more useful for ruling out PE (rather than ruling it in). NICE recommends using D-dimer for patients with a Well's score of 4 points or less. If the D-dimer is positive in these patients, the next step would be to perform a CTPA.

A chest x-ray would be a useful investigation to rule out other lung pathology (i.e. pneumonia, pneumothorax). However, given the clinical presentation, absence of chest signs and past medical history, a CTPA is more likely to provide a definitive diagnosis.

VQ scan can be used to diagnose PE (often in patients with contraindications to CTPA), however, this patient has no contraindications and CTPA is the gold standard.

An ECG would be useful to perform, but it would provide less valuable information than a CTPA would. In the context of PE, an ECG most often shows sinus tachycardia and can occasionally show the "textbook" pattern of an S wave in lead 1, and a Q wave and inverted T wave in lead 3.

Further reading:

https://cks.nice.org.uk/pulmonary-embolism#!scenario

Question:

A 25-year-old woman presents to the GP concerned about a change in her vaginal discharge. She has vulval itching and unoffensive thick, white discharge. She has had no new sexual partners and is otherwise asymptomatic. She is currently 9 weeks pregnant.

What is the most appropriate management option?

A. Clindamycin pessary

B. Oral fluconazole

C. Topical emollient

D. Oral metronidazole

E. Topical clotrimazole

Correct Answer:Topical clotrimazole

Explanation:

The most likely diagnosis, in this case, is vulvovaginal candidiasis, otherwise known as thrush. This is more likely to occur in pregnancy. The most common causative organism is Candida albicans.

The treatment for this condition is oral fluconazole and/or topical clotrimazole. Clotrimazole pessaries can also be used. In pregnancy, however, oral fluconazole is not recommended therefore the correct answer, in this case, is the topical antifungal cream. General use of emollients, avoidance of irritants and using soap substitutes can be of help for some patients.

Oral metronidazole is used as a therapy for Trichomonas vaginalis infections, and for bacterial vaginosis. This should also generally be avoided in pregnancy.

Clindamycin pessary is used for bacterial vaginosis if oral metronidazole is not suitable.

Further reading:

https://patient.info/doctor/vaginal-and-vulval-candidiasis

Question:

A 65-year-old lady presents to the GP with a 3-day history of diarrhoea, abdominal pain and nausea. She feels nauseous but has not vomited. She is passing loose stool around 5 times a day and she notes that it is particularly foul-smelling.

One week ago she was admitted to hospital with pneumonia and received a course of IV co-amoxiclav to treat the infection which has been continued orally on discharge. Following discharge, she has had no further shortness of breath and her productive cough has resolved.

On examination, she has generalised abdominal tenderness but she has no signs of peritonitis and bowel sounds are present. She has dry mucous membranes and a capillary refill time of 1 second. She has a blood pressure of 125/75mmHg, a heart rate of 75bpm and a temperature of 37.5⁰C. A stool sample and blood samples are obtained for further testing.

The stool sample is positive for Clostridium difficile toxin. Her white cell count is 12x109/L and CRP is 25mg/L.

She has a past medical history of type 2 diabetes mellitus, for which she takes metformin. She works as a receptionist in her local primary school.

What would be the most appropriate management of this patient?

A. Stop co-amoxiclav, start oral metronidazole and instruct not return to work until no diarrhoea or vomiting for 24 hours

B. Stop co-amoxiclav, start oral vancomycin and instruct not to return to work until no diarrhoea or vomiting for 48 hours

C. Admit to the hospital for oral antibiotics and fluids

D. Prescribe loperamide, encourage oral intake and advise infection usually resolves by itself in 1-2 weeks

E. Admit to the hospital for IV antibiotics and further investigation

Correct Answer:Stop co-amoxiclav, start oral vancomycin and instruct not to return to work until no diarrhoea or vomiting for 48 hours

Explanation:

The most appropriate management would be to stop co-amoxiclav, start oral vancomycin and instruct not to return to work until no diarrhoea or vomiting for 48 hours. This is a case of C. difficile colitis, which often occurs following administration of broad-spectrum antibiotics (as in this case, in which the patient has been treated with co-amoxiclav for her previous pneumonia infection). Therefore it would be appropriate to stop the co-amoxiclav, especially given that she has not had any further symptoms and she has received an appropriate length of IV and oral treatment. C. difficile colitis is typically categorised based on severity.

In the UK, the National Institute for Health and Care Excellence recommends vancomycin for an initial episode, regardless of disease severity. Fidaxomicin is considered a second-line agent. Metronidazole is now only recommended in settings where access to first-line agents is limited.

Moderate C. difficile colitis is diagnosed if patients have a WCC that is only mildly elevated (<15x109/L), 3-5 episodes of loose stool per day, and no features of severe infection such as a temperature over 38.5⁰C, raised serum creatinine indicating compromised renal function, signs of ileus or toxic megacolon, or hypotension. Moderate C. difficile colitis can be treated with oral vancomycin. Diarrhoea should typically resolve within 1-2 weeks, and the patient should be advised that whilst they are ill and have symptoms they remain infectious. They should be instructed to complete the course of antibiotics fully and remain off work until 48 hours after the diarrhoea and/or vomiting have resolved.

It would be inappropriate in this case to admit to the hospital for IV antibiotics and further investigation, as this would be classified as a moderate rather than severe infection given her symptoms, observations and biochemistry results. She can, therefore, be managed with oral antibiotics at this stage, and if symptoms do not resolve within 1-2 weeks (or if symptoms worsen) she should be instructed to return for further assessment as to whether further management is required.

It is incorrect to stop co-amoxiclav, start oral metronidazole and instruct not return to work until no diarrhoea or vomiting for 24 hours. Although it would be a good idea to stop the co-amoxiclav as explained above, metronidazole is typically a tertiary line agent if vancomycin or fidaxomicin is not available. Also, patients should be instructed to remain off work until 48 hours after symptoms have resolved (not 24 hours).

It is also incorrect to prescribe loperamide, encourage oral intake and advise infection usually resolves by itself in 1-2 weeks. Loperamide is an anti-motility medication that is indicated for recurrent loose stools in some patients (for example in certain inflammatory bowel disease patients) but should not be used in infective colitis. Although encouraging oral intake is a useful management step, oral antibiotics will need to be given to treat the infection and it should not be left to self-resolve. With treatment, symptoms should resolve within 1-2 weeks.

Although secondary care is indicated in severe C. difficile colitis, this infection carries features of moderate rather than severe C. difficile colitis and can, therefore, be treated with oral antibiotics in the community rather than to admit to the hospital for oral antibiotics and fluids.

Further reading:

https://cks.nice.org.uk/topics/diarrhoea-antibiotic-associated/management/diarrhoea-antibiotic-associated/

Question:

A 15-year-old male presents to his general practitioner (GP) accompanied by his father. He reports pain at the front of both knees upon walking and jumping. There is no pain at rest.

Physical examination reveals tenderness at the tibial tuberosity bilaterally and pain at the anterior knee upon resisted knee extension bilaterally.

What is the next best step in management?

A. Ultrasound of both knees

B. Plain radiograph of both knees

C. Supportive care

D. Anti-nuclear antibody test

E. Magnetic resonance imaging (MRI) of both knees

Correct Answer:Supportive care

Explanation:

This young patient with bilateral anterior knee pain and tenderness at the tibial tuberosity has Osgood-Schlatter disease (OSD) of both knees. OSD is a benign, self-limiting disease that resolves spontaneously as growth halts and the growth plates ossify. Male adolescents are most commonly affected. The usual duration is 6 – 18 months, during which symptoms wax and wane. This is a common condition seen in the primary care setting that does not require further investigation and patients should be managed with supportive care (rest, physiotherapy and non-steroidal anti-inflammatories for pain relief).

Anti-nuclear antibody (ANA) test can be considered if the patient’s symptoms are thought to be of autoimmune in origin. The patient’s clinical presentation of tibial tuberosity enlargement and pain on knee extension bilaterally is more consistent with OSD.

Plain radiograph of the knees would be an appropriate investigation if bony abnormalities such as a fracture or a bony tumour were being considered in the differential.

MRI is an appropriate investigation to confirm ligament ruptures. The patient does have a history of trauma or knee joint swelling.

Ultrasound of both knees is not required in the diagnosis of OSD. Although point of care ultrasound has gained some attention in recent times, OSD still remains a clinical diagnosis without the need for further investigations.

Further reading:

https://patient.info/doctor/osgood-schlatter-disease-pro

Question:

A 40-year-old woman presents to her GP with sleeping difficulties. Her sleeping problems began 5 weeks ago and coincided with her discharge from intensive care after sustaining life-threatening injuries in a road traffic accident. She reports several flashbacks to the accident and is now scared to get back into a car. The patient reports that she sleeps an average of 2 hours per night and consequently feels chronically tired. On further questioning, she mentions that she also feels ‘on edge’ most of the time, is very irritable and has become socially isolated. She now has difficulty concentrating and feels emotionally numb. She has a past medical history of depression and takes 20 mg of Fluoxetine once daily.

What is the most appropriate management for this patient’s condition?

A. Increase her dose of Fluoxetine to 40mg once daily

B. Cognitive behavioural therapy (CBT)

C. Debriefing

D. Watch and wait approach

E. Quetiapine

Correct Answer:Cognitive behavioural therapy (CBT)

Explanation:

The most likely diagnosis, in this case, is post-traumatic stress disorder (PTSD) precipitated by a road traffic accident and/or intensive care management. PTSD was first noted in soldiers who fought in the first world war. This condition is often precipitated by a life-threatening (or perceived life-threatening) event (e.g. serious accidents, hostage situations, assaults, terrorist attacks, domestic violence). Research suggests that the autonomic nervous system, hypothalamic-pituitary-adrenal axis and noradrenaline are key components in the pathophysiology underlying this condition.

PTSD symptoms fall into 3 categories:

re-experiencing (characterised by flashbacks, nightmares, distress provoked by reminders of the event)

avoidance or rumination (characterised by avoidance of reminders of the event in daily life and suppression of thoughts relating to the event)

hyperarousal (characterised by hyper-vigilance for threat, concentrating difficulties, emotional blunting, exaggerated startle responses, social isolation and irritability)

Management of this condition can involve CBT (for major features) or adopting a watch and wait approach (for mild features) within the first month after the triggering event. Alternatives to CBT include eye movement desensitisation and reprocessing (EMDR) or stress management.

De-briefing (a.k.a. single-session interventions) immediately after an event has been widely deemed as ineffective, even sometimes harmful, in the treatment of PTSD.

A watch and wait approach is appropriate in cases of PTSD presenting with mild features less than 1 month after the triggering event. This option would be less appropriate in this case as the patient’s quality of life has been markedly affected by her condition (e.g. social isolation, insomnia).

This patient is not suffering from psychosis and, therefore, quetiapine is not indicated.

Increasing the patient’s dose of fluoxetine would not be first-line management in this case. PTSD often precipitates pre-existing depression and, therefore, patients benefit from receiving treatment for PTSD in the first instance.

Further reading:

https://patient.info/doctor/post-traumatic-stress-disorder-pro

Question:

A 12-year-old boy is brought to the emergency department with his mother and father with fevers and a headache over the last two days. During this period, he has been drowsy, fatigued, and sensitive to loud noises and bright lights.

On examination, he appears unwell, with a temperature of 38ºC, a heart rate of 120 bpm, a blood pressure of 94/54 mmHg, and a respiratory rate of 45 /min. A petechial rash is noted on his torso. He is admitted and given IV antibiotics and fluids.

What is the most appropriate management option for his parents?

A. Single dose of oral ciprofloxacin

B. Single dose of IM benzylpenicillin

C. Single dose of oral phenoxymethylpenicillin

D. Safety-netting advice only

E. Single dose of IM ceftriaxone

Correct Answer:Single dose of oral ciprofloxacin

Explanation:

A single dose of oral ciprofloxacin is correct. This patient has signs and symptoms of meningococcal septicaemia characterised by headaches, fever, photophobia, phonophobia, tachycardia, hypotension and fatigue. The presence of a petechial rash on his torso is also strongly suggestive of this. Therefore, all people with close contact during the 7 days before the onset of illness should be offered a single dose of oral ciprofloxacin. Rifampicin may also be considered.

A single dose of IM benzylpenicillin, IM ceftriaxone, and oral phenoxymethylpenicillin are all incorrect. IM benzylpenicillin is typically indicated in primary care for suspected meningitis, before referral to the emergency department. Ceftriaxone is used in the management of bacterial meningitis itself, however, it is not licensed for prophylactic use. Phenoxymethylpenicillin has no role in either the management of meningitis or in prophylaxis.

Safety-netting advice alone is incorrect. All people with close contact during 7 days before the onset of illness should be offered antibiotic prophylaxis. However, safety-netting advice should still be given, and patients should be instructed to seek urgent medical attention should signs and symptoms of meningitis arise.

Further reading:

https://geekymedics.com/meningitis/

Question:

A 62-year-old patient presents to hospital with sudden onset abdominal pain, nausea and vomiting, which began around an hour ago and has increased in intensity. The pain now appears to be coming in waves, and he scores it a 9 out of 10. He reports that the pain is especially bad over the right-hand side of the abdomen and that he had noticed a bulge in this region a few days previously, but thought nothing of it.

On examination, the patient has a visibly distended abdomen and is clearly in some discomfort. He denies opening his bowels or passing flatus since the symptoms began. A large mass is clearly visible in the lower right quadrant of the abdomen, this is irreducible and exquisitely tender to palpation. Bowel sounds are absent. The patient does not have a fever, and routine observations are within the normal ranges.

The patient has no relevant past medical history; he takes no regular medication and has never had any form of abdominal surgery. He has not had similar episodes in the past. The admitting doctor books an abdominal X-ray which reveals loops of small bowel with a diameter of 5cm, without any dilation of the large bowel.

Which of the following is the most appropriate next management step in this scenario?

A. Initiate the Sepsis 6 protocol

B. Prescribe a stimulant laxative

C. Insertion of flatus tube

D. Insertion of wide-bore nasogastric tube

E. Encourage the patient to continue drinking fluids wherever possible

Correct Answer:Insertion of wide-bore nasogastric tube

Explanation:

This patient has presented in acute bowel obstruction, as indicated by the abdominal distension, lack of the passage of flatus, colicky abdominal pain and absent bowel sounds. Dilated loops of small bowel on ultrasound confirm this diagnosis; the measured diameter of 5cm is greater than the 3cm expected for this section of the gastrointestinal tract on imaging. The sudden onset of symptoms, in combination with a non-reducible mass, makes the most likely underlying diagnosis a strangulated hernia. This refers to a weakness in the abdominal wall that allows for the passage of intraabdominal contents through the defect. Whilst in most cases, structures such as loops of the small bowel can move through the defect freely, in some circumstances, a section of the bowel can become trapped (strangulated), causing an obstruction.

Patients presenting in bowel obstruction are usually managed via a 'drip and suck' approach; IV fluids are given to replace losses caused by the third spacing that arises due to the obstruction, and bowel decompression is achieved via the insertion of a wide-bore nasogastric tube, with the aim of reducing the chance of aspiration of bowel contents due to the increase in pressure. Surgery is then required for definitive management, the strangulated hernia will be reduced, with the defect in the abdominal wall often being reinforced with mesh.

Insertion of a flatus tube can be used in bowel obstruction, more specifically in the setting of sigmoid volvulus. This form of volvulus causes large bowel obstruction, which is not present in this case, as the colon was reported to have a normal diameter on abdominal X-ray.

The observations for this patient are in the normal ranges, and he lacks a fever. Therefore, there is no immediate suspicion of infection or a need to initiate the Sepsis 6 protocol in this case. It is important to continue to monitor the patient's observations and clinical state, however, bowel obstruction carries with it a risk of perforation and peritonitis, at which point, antibiotics would be required urgently.

Patients with bowel obstruction will likely require surgery, and should therefore be kept nil-by-mouth. It would therefore be inappropriate for the patient to be encouraged to continue drinking fluids wherever possible, given the potential need to anaesthetise him in an emergency.

The patient has acute bowel obstruction; prescribing a stimulant laxative such as Senna would cause increased contraction of the bowel against the obstruction, increasing the patient's abdominal pain. It may also increase the risk of perforation, and would not be appropriate in this scenario.

Further reading:

https://patient.info/doctor/intestinal-obstruction-and-ileus

Question:

A study is conducted investigating the efficacy of chest X-rays in detecting lung cancer. The study concludes that chest X-rays have a sensitivity of 80% in detecting lung cancer.

What is the most accurate interpretation of this sensitivity value?

A. 80% of those with lung cancer will have a positive chest X-ray

B. 80% of those with a positive chest X-ray have lung cancer

C. 80% of those having a chest X-ray will have a positive result

D. 80% of those without lung cancer will have a negative chest X-ray

E. 80% of those with a negative chest X-ray do not have lung cancer

Correct Answer:80% of those with lung cancer will have a positive chest X-ray

Explanation:

The sensitivity of a test is the proportion of individuals with the condition who will test positive, for example, an 80% sensitivity means that 80% of individuals with the condition will test positive. Therefore, the correct answer is 80% of those with lung cancer will have a positive chest X-ray.

Further reading:

https://geekymedics.com/statistics-for-medical-students/

Question:

A 46-year-old woman presents to the GP with weight gain, hot flushes, mood changes, breast tenderness, thinning hair and a 14-month history of amenorrhea. She is not currently taking any hormonal contraception.

What is the most likely diagnosis?

A. Menopause

B. Depression

C. Hyperprolactinemia

D. Hyperthyroidism

E. Anorexia

Correct Answer:Menopause

Explanation:

Menopause can cause a variety of symptoms, such as weight gain, mood changes, thinning hair/hair loss, hot flushes, insomnia, vaginal dryness, reduced libido and amenorrhea. Menopause can be diagnosed in women over the age of 45 if they are not on hormonal contraception and are experiencing amenorrhea lasting 12 months or longer.

Hyperthyroidism is when the thyroid gland produces too much thyroid hormones. This may present with mood changes, hair thinning/hair loss and menstrual irregularities such as amenorrhea, but it would typically cause weight loss, not weight gain. Hyperthyroidism also will not cause breast tenderness.

Depression is persistent low mood for greater than 2 weeks, with associated symptoms such as sleep disturbances, appetite/weight changes, anhedonia, low concentration and fatigue. It is unlikely to cause 14 months of amenorrhea and breast tenderness.

Anorexia is an eating disorder characterised by a fear of gaining weight and restricting food intake. Since food intake is restricted, it is unlikely to cause weight gain or breast tenderness but it may cause mood changes, thinning hair and amenorrhea.

Hyperprolactinemia is when there is high levels of prolactin in the blood. This can cause symptoms such as amenorrhea, mood changes and weight gain. It can lead to thinning hair/hair loss, however, hyperprolactinemia is quite rare (>1% of population affected) and is likely to present with additional symptoms such as milky nipple discharge, headaches and visual disturbances.

Further reading:

https://cks.nice.org.uk/topics/menopause/diagnosis/diagnosis-of-menopause-perimenopause/

Question:

A 67-year-old woman presents to the GP, concerned about a non-healing ulcer that has been present for the last 3 weeks. She was diagnosed with type 2 diabetes 10 years ago and was informed by her consultant that she was at an increased risk of ulceration, and is therefore concerned about her recent symptoms. She has a past medical history of recurrent deep vein thromboses due to an underlying diagnosis of antiphospholipid syndrome, as well as hypertension and hyperlipidemia. She consumes a gluten-free diet due to a relatively recent diagnosis of coeliac disease. The patient reports taking daily ramipril, metformin and atorvastatin, as well as warfarin as prophylaxis against further venous thromboembolism.

Examination reveals an ulcer with poorly demarcated edges, located around 1cm below the medial malleolus. There is notable pitting oedema of both lower limbs, and the surrounding skin appears dry and hardened, with brown discolouration. Diabetic foot examination reveals no sensory abnormalities, and there are no ulcers detectable on the soles of the feet.

Given the likely diagnosis, which of the following features is also likely to be present?

A. Absent hair and smooth shiny skin on the lower limbs

B. Raised pruritic violaceous plaques around the ulcer

C. Atrophic plaques around the site of disease

D. Prolonged capillary refill time

E. Reduced dorsalis pedis pulse

Correct Answer:Atrophic plaques around the site of disease

Explanation:

The examination findings in this patient most likely point towards a diagnosis of venous ulceration; the 'gaiter area' near the medial malleolus is a classic site of disease, and dry, hardened skin and brown discolouration are likely describing venous stasis eczema and haemosiderin deposition respectively. Both are classically associated with venous ulceration. Other dermatological features of the condition may include 'atrophie blanche'; the development of atrophic plaques around the site of disease due to absent capillaries within the fibrotic tissue, and lipodermatosclerosis.

This patient is likely to be suffering from chronic venous insufficiency, as evidenced by the history of recurrent DVT, which can lead to valvular incompetence. Pitting oedema in the extremities is in keeping with the diagnosis. This and the subsequent ulceration will likely be diagnosed using Doppler ultrasound to confirm venous insufficiency, with management involving layered compression bandaging to encourage venous return.

A prolonged capillary refill time, reduced dorsalis pedis pulse and absent hair and smooth shiny skin on the lower limbs would both be more indicative of a diagnosis of arterial ulceration. This patient does have risk factors for arterial disease and subsequent ulceration (hypertension, type 2 diabetes and hyperlipidemia), but the description does not point towards this as the likely diagnosis. Arterial ulcers are classically 'punched out' in appearance, and are usually accompanied by severe pain due to arterial insufficiency and ischaemia.

Raised pruritic violaceous plaques is a classic description of lichen planus; a condition most commonly affecting the wrists and trunk. It is not associated with venous ulceration.

Further reading:

https://cks.nice.org.uk/topics/leg-ulcer-venous/

Question:

A 64-year-old man presents to the ophthalmology department after referral by his optometrist.

He is found to have elevated intraocular pressures bilaterally: 25mmHg in the left eye and 26mmHg in the right eye.

On dilated examination, the cup-to-disc ratio is 0.5 in his left eye and 0.6 in his right eye. Gonioscopy is normal.

He reports that he has not experienced any changes in his vision; however, some peripheral visual field loss is present on automated testing.

He has a history of type 2 diabetes and hypertension managed with metformin 500mg and ramipril 2.5mg.

What is the most appropriate initial management step?

A. Pan-retinal photocoagulation

B. Topical latanoprost

C. Topical tropicamide

D. No treatment required

E. Topical pilocarpine

Correct Answer:Topical latanoprost

Explanation:

The most likely diagnosis is primary open-angle glaucoma (POAG) - a form of glaucoma that develops slowly over time and has a normal drainage angle (iridocorneal angle). Typically patients are asymptomatic until the disease is very advanced. The presence of an increased cup-to-disc ratio, raised intraocular pressure and changes to visual fields are all indications to initiate treatment in this patient. The first-line recommendation for POAG according to NICE guidelines is a topical prostaglandin analogue such as latanoprost. NICE also recommends topical beta-blockers as an alternative first-line treatment.

In this patient, no treatment would not be suitable as there are signs of glaucoma. The presence of visual field changes especially necessitates the use of topical preparations to reduce intraocular pressure and further damage.

Patients with proliferative diabetic retinopathy should be managed with pan-retinal photocoagulation as this helps to reverse the consequences of hypoxia such as neovascularization. Whilst this is an important consideration for this patient with his history of diabetes, the stem does not describe diabetic retinopathy, therefore it is the less suitable answer.

Topical cholinergic agents such as pilocarpine are not used for POAG.

Topical tropicamide is not indicated for the management of POAG at any stage. It is a mydriatic medication often used for dilated fundoscopy.

Further reading:

https://cks.nice.org.uk/topics/glaucoma/management/primary-open-angle-glaucoma-intraocular-hypertension/

Question:

A 2-year-old boy is brought to see the GP by his mother after complaining of ear pain for the last 2 days. He has been generally irritable; his mother took his temperature this morning and noted that he had a low-grade fever. The trigger for presenting to the doctor was the boy reporting a recent episode of severe pain; his mother noticed some green discharge from the affected ear.

The patient is resistant to otoscopy initially and cries when the GP attempts to inspect his ears. However, with some encouragement from his mother, he allows the examination to take place. The tympanic membrane is notably red and inflamed; the cone of light is absent. A small perforation is visible in the central portion of the membrane.

The GP informs the patient's mother of the likely diagnosis and the treatment options; she is concerned and wishes to know what has caused her child's symptoms.

Considering the likely diagnosis, which of the following is most likely to have been responsible for the child's presentation?

A. Paramyxovirus

B. Moraxella catarrhalis

C. Parvovirus B19

D. Clostridium perfringens

E. Pseudomonas aeruginosa

Correct Answer:Moraxella catarrhalis

Explanation:

The most likely diagnosis, in this scenario, is acute otitis media, given the classic history of ear pain with tympanic membrane rupture and otorrhoea. Otitis externa is an important differential; this would be less likely to cause a perforation, and the erythema would be expected to be localised to the external auditory meatus, rather than the tympanic membrane. Acute otitis media classically affects younger children and those with underlying risk factors such as craniofacial abnormalities, exposure to cigarette smoke, and allergies.

Whilst viruses are a common cause of acute otitis media, bacteria are usually implicated in more severe disease resulting in perforation; the three most common are the classic respiratory pathogens - Streptococcus pneumoniae, Haemophilus influenzae and Moraxella catarrhalis.

Clostridium perfringens is a bacteria that is implicated in the development of gas gangrene; it is not a pathogen associated with the development of ENT pathologies.

Pseudomonas aeruginosa is implicated in otitis externa rather than otitis media; it is one of the most common causative organisms for this condition, alongside Staphylococcus aureus. The infection can also cause severe pneumonia in patients with cystic fibrosis; the bacteria are often resistant to a number of antibiotics, so careful consideration needs to be given to the treatment approach.

Parvovirus B19 is implicated in the disease erythema infectiosum (often referred to as 'slapped cheek' disease); it is not a frequent cause of otitis media.

Paramyxoviruses are a family of viruses including those causing measles and mumps - these do not frequently cause otological involvement

Further reading:

https://cks.nice.org.uk/topics/otitis-media-acute/

Question:

An 80-year-old woman admitted to the care of the elderly ward complains of worsening pain buttock pain. She is currently being treated for a community-acquired pneumonia and has a history of vascular dementia.

On examination, there is a 2x2 inch, stage 3 pressure ulcer with a foul-smelling discharge. A recent groin swab is positive for MRSA, and a wound swab is taken.

What is the most appropriate initial antibiotic of choice?

A. Glycopeptide plus fusidic acid

B. Linezolid

C. Fusidic acid

D. Rifampicin

E. Tetracycline

Correct Answer:Tetracycline

Explanation:

Staphylococcus aureus is a gram-positive organism that colonises the skin. Risk factors for methicillin-resistant Staphylococcus aureus (MRSA) include:

Hospital admission

Elderly population

Pre-existing wounds (surgical wounds, ulcers, catheter lines etc)

Recent antibiotic use

Management of MRSA is multifaceted and depends on the site and severity of the infection. Treatment often includes hygiene measures (e.g. hand-washing, aprons, isolation) and targeted antibiotic therapy based on bacterial culture results.

Skin and soft tissue MRSA infections may only require incision and drainage without antibiotic use. However, the following antibiotic regime may be implemented when clinically appropriate:

A tetracycline alone or combination of fusidic acid and rifampicin as first-line treatment of uncomplicated infection. Clindamycin alone may be used as an alternative.

Severe skin and soft tissue MRSA infections can be treated with a glycopeptide (vancomycin or teicoplanin). Linezolid can be used as an alternative under expert advice if a glycopeptide is not suitable.

The use of fusidic acid alone to treat MRSA is not advised due to the risk of rapid resistance development.

The use of rifampicin alone to treat MRSA is not advised for the same reason.

Combination therapy (e.g. a glycopeptide and fusidic acid) is only indicated to treat an MRSA soft tissue and skin infection when a single antimicrobial agent has failed.

Linezolid is not appropriate in this case. This would be indicated in the presence of severe infection if a glycopeptide was not suitable (under the advice of microbiology).

Further reading:

https://bnf.nice.org.uk/treatment-summary/mrsa.html

Question:

A 30-year-old man presents to the emergency department with a 3-week history of diarrhoea and abdominal pain. He has recently returned from a 3-month work trip to Mexico, where he lived in rural communities. He describes having watery diarrhoea without mucous or blood and has lost 5kg in weight.

On examination, he is diaphoretic, has a temperature of 38.2ºC, and has tenderness in the right hypochondrium with a palpable liver edge.

Blood results demonstrate:

Blood test Result Reference ranges

Hb 150 130 – 180 g/L

WCC 16.0 3.6 – 11.0 x 109/L

Platelet count 350 140 – 400 x109/L

ALP 120 30–130 U/L

ALT 83 <41 U/L

AST 121 1 - 45 U/l

Bilirubin 15 <21 μmol/L

Based on these findings, what is the most likely causative organism?

A. Vibrio cholera

B. Taenia solium

C. Entamoeba histolytica

D. Giardia lamblia

E. Escherichia coli

Correct Answer:Entamoeba histolytica

Explanation:

In addition to having chronic diarrhoea, the patient in the vignette has features consistent with a liver abscess (pain in the right upper quadrant, fever, and hepatitis). The blood results show a high white cell count consistent with infection and raised ALT and AST levels, consistent with amoebic hepatitis. Amebic liver abscess is the most common extra-intestinal manifestation of the protozoan Entamoeba histolytica. The patient is at an increased risk of infection as he has recently travelled to an endemic region (Mexico) in the previous 12 months.

Escherichia coli is the most common cause of traveller's diarrhoea, resulting in watery diarrhoea, abdominal cramping, and nausea. The infection can also result in a fever. However, Escherichia coli usually resolves in 5-7 days and is not associated with weight loss or liver abscess formation. Therefore this option is incorrect.

Giardia lamblia is typically associated with a prolonged history of non-bloody diarrhoea, abdominal bloating and frequent belching. The infection is spread through contaminated sources (recreational fresh water, untreated-tap water, unwashed vegetables). Although Giardia lamblia results in chronic diarrhoea, it is not known to cause liver abscesses.

Taenia solium (also known as pork tapeworm) may cause abdominal pain and diarrhoea. It is spread through the faecal-oral route using humans as definitive hosts and pigs as secondary hosts. There is a delay in the onset of symptoms as the tapeworm takes 6-8 weeks to fully develop in the human intestine. Although this patient has chronic diarrhoea, tapeworms usually result in mild disease and do not cause liver abscesses.

Vibrio cholera causes acute diarrhoea in returning travellers and causes classic 'rice water' stool. Cholera is primarily spread through contaminated water sources and undercooked seafood in endemic countries. Cholera can also result in weight loss. However, cholera is not known to cause liver abscesses.

Further reading:

https://almostadoctor.co.uk/encyclopedia/amoebiasis

Question:

A 3-year-old boy presents to the paediatric clinic following concerns about his development. His parents have noticed that he is developing much slower than his sister. In particular, his motor function appears delayed; whilst he walked at 14 months, he still appears unsteady when taking steps, and rising to stand from a seated position takes a long time. There are no concerns about the patient's speech and language or social milestones. There is no past medical history of note, and both the pregnancy and the birth were uncomplicated.

Examination of the boy's musculature reveals no significant wasting. Slightly reduced muscle tone is noted, but reflexes appear normal. Further investigations reveal a raised creatine kinase level, and genetic testing reveals the presence of an in-frame deletion mutation.

What is the most likely diagnosis?

A. Becker muscular dystrophy

B. Cerebral palsy

C. Fragile X syndrome

D. Duchenne muscular dystrophy

E. Noonan syndrome

Correct Answer:Becker muscular dystrophy

Explanation:

In any patient with delayed gross motor milestones, it is essential to rule out muscular dystrophy by ordering a creatine kinase measurement; this would be raised in the setting of muscular involvement. Whilst this patient has presented without the classic symptoms of Duchenne's muscular dystrophy (the most well-known of this group of diseases), there are a number of subtypes of muscular dystrophy, with different types having different severities. Making an early diagnosis of these conditions is crucial, as they are often life-limiting, and require a multidisciplinary approach to management.

Given the results of the investigations; the most likely diagnosis, in this case, is Becker muscular dystrophy. This is a similar condition to the more well-known Duchenne muscular dystrophy, with both being inherited in an X-linked recessive manner; however, the mutation involved is different. In Duchenne, a frameshift mutation is present; this results in a complete absence of any dystrophin (a key structural protein within the muscle) within the body. In Becker muscular dystrophy, however, the mutation is 'in frame', meaning that dystrophin can still be made, albeit with a reduced amount present. The description of an in-frame deletion and a reduced level of functional dystrophin, rather than a complete absence make Becker muscular dystrophy the most likely cause of this patient's symptoms.

Cerebral palsy can also cause an isolated gross motor delay; however, this is less likely to be the underlying diagnosis in this scenario, as there are no features in the pregnancy or birth history that would indicate the possibility of this condition. Additionally, the condition will often present with hypertonia and hyperreflexia on examination due to the upper motor neuron lesion that is present.

Fragile X syndrome is a congenital disorder that arises due to CGG trinucleotide repeat expansions; this usually presents with intellectual disability and classical dysmorphic features such as a long face and large testicles. It does not fit with the history of this particular patient.

Noonan syndrome is a genetic disease that can frequently present with cardiac involvement in the form of pulmonary stenosis. Individuals with the condition often have a similar phenotype to those with Turner's; with a webbed neck, short stature and widely-spaced nipples often being observed.

Further reading:

https://www.parentprojectmd.org/about-duchenne/what-is-duchenne/types-of-mutations/

Question:

A 76-year-old man visits his GP for an annual health check. He has a history of hypertension and takes amlodipine and atorvastatin. He reports no new symptoms over the last year.

A pansystolic murmur is audible on examination, which is loudest at the apex. The murmur radiates to the axilla.

What is the most likely diagnosis?

A. Mitral stenosis

B. Aortic stenosis

C. Mitral regurgitation

D. Aortic regurgitation

E. Pulmonary stenosis

Correct Answer:Mitral regurgitation

Explanation:

This case demonstrates a new asymptomatic murmur, found incidentally on examination. A pansystolic murmur loudest at the apex, radiating to the axilla is characteristic of mitral regurgitation.

A mid-diastolic murmur heard loudest at the apex is characteristic of mitral stenosis.

An ejection-systolic murmur heard loudest at the aortic region, radiating to the carotids is characteristic of aortic stenosis.

A blowing early diastolic murmur heard loudest at the aortic and left sternal edge is characteristic of aortic regurgitation.

An ejection systolic murmur radiating to the left shoulder with an ejection click, loudest on inspiration, is characteristic of pulmonary stenosis.

Further reading:

https://geekymedics.com/heart-murmurs/

Question:

A 45-year-old gentleman presents to his GP for the first time with a headache and tunnel vision. He has also noticed his skin has become more oily and his wedding ring no longer fits.

What is the most appropriate initial investigation for the likely diagnosis?

A. Random IGF-1 level

B. Insulin tolerance test

C. MRI Pituitary

D. Random growth hormone level

E. Oral glucose tolerance test

Correct Answer:Random IGF-1 level

Explanation:

The most likely diagnosis is acromegaly. Acromegaly is a rare disorder caused by the excessive secretion of growth hormone (GH), or rarely ectopic production of GH or GH-releasing hormone (GHRH). Acromegaly causes an overgrowth of all organ systems, bones, joints and soft tissues. As a result, patients develop enlarged hands, prominent facial features (e.g. nose, lips, enlarged tongue, widely spaced teeth), thick and coarse skin, headache and sometimes bitemporal hemianopia (due to compression of the optic chiasm by a pituitary adenoma).

The most appropriate initial investigation is a random IGF-1 level. IGF-1 is a primary mediator of the effects of growth hormone and correlates well with GH levels in addition to having a long half-life making measurement much easier than direct GH measurement. An elevated level IGF-1 level would therefore be suggestive of a diagnosis of acromegaly.

An oral glucose tolerance test is typically performed after a raised IGF-1 is found, to confirm the likely diagnosis. GH is normally inhibited by glucose. If the glucose load fails to suppress the GH level below 1.0 mcg/L this confirms the diagnosis of acromegaly.

Growth hormone is released in a pulsatile manner and has a short half-life. As a result, serum growth hormone levels are not a practical test to perform.

MRI pituitary would be performed, once IGF-1 and the oral glucose tolerance tests had confirmed the likely diagnosis of acromegaly. The aim would be to identify the source of excessive GH production, which is typically from a pituitary adenoma.

Further reading:

https://patient.info/doctor/acromegaly-pro

Question:

A 58-year-old man with poorly controlled hypertension presents to his GP for a routine check-up. His clinic blood pressure reading is 154/97 mmHg, and home blood pressure monitoring averages 150/95 mmHg. He is currently on ramipril, amlodipine, indapamide and spironolactone at optimum doses and with no adverse effects. Recent investigations show no signs of end-organ damage.

What is the most appropriate next step?

A. Stop spironolactone

B. Referral for specialist assessment

C. Add bisoprolol

D. Repeat investigations for end-organ damage

E. Adrenal vein sampling

Correct Answer:Referral for specialist assessment

Explanation:

This patient has resistant hypertension and is already on four antihypertensives. According to NICE guidelines, this warrants a referral for specialist assessment.

Repeating investigations for end-organ damage is not necessary, as his last set of investigations was done recently. The more urgent action needed is to refer him for specialist assessment.

Although this patient may ultimately need the addition of a fifth antihypertensive, a referral for specialist assessment should be made first. Therefore, the most appropriate next step is not to add bisoprolol.

Adrenal vein sampling is used in Conn’s syndrome to determine whether autonomous aldosterone production is unilateral or bilateral. Although this patient has resistant hypertension, there are no investigations that suggest he has Conn’s syndrome at this stage, therefore, this answer is incorrect.

This patient is on optimum doses of all four antihypertensives and is not experiencing any adverse effects. Therefore, it is not necessary to stop spironolactone.

Further reading:

https://www.nice.org.uk/guidance/qs28/chapter/Quality-statement-6-Referral-to-a-specialist-for-people-with-resistant-hypertension

Question:

A 27-year-old woman attends the emergency department complaining of breathlessness. She explains that it developed quickly around one hour ago without any clear trigger and has been persistent since. The patient denies any dizziness, nausea or haemoptysis, but describes her heart as racing in her chest. She adds that using a salbutamol inhaler has only slightly improved her symptoms.

Her past medical history is significant for asthma, and she has no known allergies.

Vital signs show the following:

Respiratory rate: 24 breaths per minute

Heart rate: 105 beats per minute

Blood pressure: 115/76mmHg

Oxygen saturation: 94%

AVPU: Alert

On examination, a wheeze can be heard from the end of the bed. Her trachea is central, but the doctor notes reduced air entry bilaterally on auscultation. There is no evidence of oedema or urticaria, and her calves are non-tender and equal in size.

A D-dimer result is normal.

What is the most appropriate investigation to perform at this stage?

A. Peak expiratory flow rate (PEFR)

B. Chest X-ray

C. Spirometry

D. Mast cell tryptase

E. CT pulmonary angiogram (CTPA)

Correct Answer:Peak expiratory flow rate (PEFR)

Explanation:

The presence of rapid onset dyspnoea, wheezing and hypoxia in a patient with a background of asthma is suggestive of an acute asthma exacerbation. Management of such patients is guided by the severity of their episode, and therefore their peak expiratory flow rate (PEFR) should be promptly recorded in addition to their vital signs. In life-threatening asthma: PEF <33% of best or predicted.

Spirometry is a pulmonary function test that is used in the diagnosis and monitoring of patients with asthma. While it does provide a peak expiratory flow value, this test is not available in the emergency department and therefore arranging it might delay treatment. It would therefore be inappropriate to perform spirometry at this stage.

A chest X-ray may be considered for the exclusion of other pathologies as a cause of the patient’s dyspnea. However, in this case, assessing the patient’s PEFR is a higher priority because the PEFR is both useful for supporting the diagnosis of acute asthma as well as guiding its management.

A mast cell tryptase can be useful for supporting a diagnosis of anaphylaxis, a condition which may be considered as a differential in patients presenting with rapid onset shortness of breath. In this patient’s case, the absence of any identifiable trigger or allergies along with no oedema or urticaria on examination suggests anaphylaxis is less likely. It is therefore a higher priority to perform a PEFR as this is used to classify and guide the management of an acute asthma exacerbation.

A CT pulmonary angiogram (CTPA) is the gold standard investigation for a pulmonary embolism (PE), which can present with sudden onset dyspnea. However, the presence of a normal d-dimer is strongly indicative of an alternative diagnosis, and therefore it would not be appropriate to perform a CTPA at this stage.

Further reading:

https://geekymedics.com/acute-management-of-asthma/

Question:

A 22-year-old man presents with a 2-week history of a painful, hot, swollen right knee. The pain was sudden in onset and during these 2 weeks, he has had associated dysuria and watery eyes. 4 weeks ago, he received treatment for an infection characterised by penile discharge and dysuria, however, the discharge has stopped. He admits to having unprotected sexual intercourse with a new partner 6 weeks ago.

His heart rate is 85 bpm, his blood pressure is 124/82 mmHg, his temperature is 37.2ºC, and his oxygen saturations are 97% on room air. A synovial fluid sample is taken from his right knee.

What is the most likely finding on analysis of the synovial fluid?

A. Positively birefringent crystals

B. Staphylococcus aureus

C. Negatively birefringent crystals

D. Chlamydia trachomatis

E. Sterile synovial fluid

Correct Answer:Sterile synovial fluid

Explanation:

Sterile synovial fluid is correct. This patient has signs and symptoms of reactive arthritis, characterised by the presence of oligoarthritis in the lower limb, dysuria, and conjunctivitis following a urogenital infection 4 weeks ago. A helpful way of remembering the features of reactive arthritis is 'can't see (eye redness), pee (dysuria), or climb a tree (joint swelling and pain)'. In reactive arthritis, the pathology is aseptic and is thought to either be due to cross-reactivity of bacterial antigens with joint tissues, or deposition of bacterial antigens in the joints. Therefore, the synovial fluid extracted is sterile.

Chlamydia trachomatis is incorrect. Although this organism can cause reactive arthritis and it is likely that this patient suffered from a chlamydia infection prior to the onset of this presentation, reactive arthritis is aseptic in nature. This is more likely to be present in septic arthritis, which this patient does not have as they are afebrile. As well as this, most patients with septic arthritis of weight-bearing joints (such as the knee) will not be able to walk and examining the joint is extremely difficult due to severe pain.

Staphylococcus aureus is incorrect. This is more likely to be present in septic arthritis, which this patient does not have as they are afebrile. As well as this, most patients with septic arthritis of weight-bearing joints (such as the knee) will not be able to walk and examining the joint is extremely difficult due to severe pain.

Positively birefringent crystals is incorrect. This finding is suggestive of pseudogout, which presents as an acute onset of severe joint pain, swelling, tenderness, and erythema. It is unlikely that this patient will have endured the pain felt in pseudogout before seeking help. Many patients describe the pain as the worst pain they have ever felt.

Negatively birefringent crystals is incorrect. This finding is suggestive of gout, which presents as an acute onset of severe joint pain, swelling, tenderness, and erythema. It also typically affects joints in the feet, especially the first metatarsophalangeal joint. It is unlikely that this patient will have endured the pain felt in gout before seeking help. Many patients describe the pain as the worst pain they have ever felt.

Further reading:

https://patient.info/doctor/reactive-arthritis-pro

Question:

A 23-year-old student presents to the GP with a worsening sore throat that has been present for the last 4 days. This has progressed to a level that he is now beginning to affect his ability to eat without discomfort, which has triggered him to seek medical advice. The patient reports that they feel relatively well systemically, although they have had a minor headache for the last week. He has no other medical conditions and takes no regular medication.

Examination reveals observations within the normal range, the patient's temperature is normal. Tender lymphadenopathy is present in the anterior cervical chain, and notable erythema is present over the palatine tonsils, with evidence of significant white exudate.

The GP ascertains that the patient meets all four of the Centor criteria, and therefore a streptococcal infection is determined to be likely. He prescribes the patient phenoxymethylpenicillin and discharges him with safety-netting in place.

Which of the following is included within the criteria used by the GP to determine the patient's management plan?

A. Absence of fever

B. Painless lymphadenopathy

C. Previous episodes of streptococcal pharyngitis

D. Odynophagia

E. Absence of cough

Correct Answer:Absence of cough

Explanation:

The Centor criteria are a checklist frequently used by GP's to determine the likelihood of pharyngitis being due to infection with Streptococcus (as opposed to viral infection). The presence of 3 or more of the features within the list is estimated to carry up to a 56% likelihood of this infection, with this score considered significant enough to warrant antibiotic therapy. Phenoxymethylpenicillin is the usual drug of choice for suspected streptococcal sore throat; amoxicillin is avoided, as there is a risk of causing the development of a rash if the pharyngitis is in fact due to Epstein-Barr virus infection.

The Centor criteria consist of:

Tonsillar exudate

Tender anterior cervical lymphadenopathy or lymphadenitis

History of fever (over 38°C)

Absence of cough

The absence of fever and painless lymphadenopathy are obviously not part of the Centor criteria; these are the opposite of two of the key features included in this list.

Whilst odynophagia (a classic symptom of streptococcal sore throat) and previous episodes of streptococcal pharyngitis may make the diagnosis more likely, they are not included within the Centor criteria.

Further reading:

https://www.nice.org.uk/guidance/ng84/chapter/terms-used-in-the-guideline

Question:

A 68-year-old man presents with sudden onset pleuritic chest pain and shortness of breath. He has had 2 episodes of haemoptysis He has a past medical history of deep vein thrombosis following a knee replacement six years ago, but is otherwise well and doesn’t take any regular medication. He is apyrexial, his heart rate is 96 beats per minute, blood pressure 142/85 mmHg, respiratory rate is 24 breaths per minute and his pulse oximetry is 94% in room air. Clinical examination is unremarkable. His chest X-ray is normal and his electrocardiogram shows a normal sinus rhythm.

What feature in his history makes him most at risk of having a pulmonary embolism?

A. Respiratory rate of 24 breaths per minute

B. Age 68-years-old

C. Heart rate of 96 beats per minute

D. Past medical history of deep vein thrombosis

E. Two episodes of haemoptysis

Correct Answer:Past medical history of deep vein thrombosis

Explanation:

The most likely diagnosis is pulmonary embolism. The Wells score is used to assess the risk of pulmonary embolism. His Wells score is 4.5, making a pulmonary embolism likely and he should proceed to imaging with a computed tomography pulmonary angiography without measuring his D-dimer level.

He scores 1.5 points for his past medical history of deep vein thrombosis, 1 point for his haemoptysis and 3 points for a pulmonary embolism being the most likely diagnosis. He scores no points for a heart rate of 96 beats per minute, a heart rate above 100 beats per minute scores 1.5 points. His age and respiratory rate aren’t included in the Wells score.

The other components of the Wells score are:

Clinical signs and symptoms of DVT – 3 points.

Immobilisation for more than 3 days or surgery in the previous 4 weeks – 1.5 points.

Malignancy – 1 point

Further reading:

https://www.nice.org.uk/guidance/ng158

Question:

An 8-year-old boy is brought into the emergency department with a painful and swollen red eye. The right eyelid and surrounding skin are grossly swollen, and the right eye appears to bulge outwards. Apart from a recent upper respiratory tract infection, he usually is well.

On examination of the right eye, eye movements are painful in all directions and visual acuity is reduced to hand movements. Both pupils appear to dilate when a light is rapidly shone from the left to the right eye. He has a temperature of 38.3oC.

What is the diagnostic investigation, for the likely diagnosis?

A. Conjunctival swab for MC&S

B. Goldmann applanation tonometry

C. Blood cultures

D. CT sinus and orbit

E. Gonioscopy

Correct Answer:CT sinus and orbit

Explanation:

This case demonstrates orbital cellulitis, which is defined as an infection posterior to the deep orbital septum. It is more common in children and can spread from a recent sinus/upper respiratory tract infection. It is an ophthalmological emergency and an important differential of periorbital cellulitis. CT sinus and orbit is the diagnostic investigation and will demonstrate inflammation of orbital tissues located deep to the septum.

Conjunctival swab for MC&S and blood cultures may aid in identifying the causative pathogen and in prescribing narrow-spectrum antibiotics once sensitivities are known; however, they cannot diagnose orbital cellulitis.

Goldmann applanation tonometry is typically used to measure the intraocular pressure in glaucoma.

Gonioscopy involves measuring the iridocorneal angle. It is commonly used to differentiate between angle-closure and open-angle glaucoma.

Further reading:

https://geekymedics.com/orbital-and-periorbital-cellulitis/

Question:

A 44-year-old man is referred to hospital with suspected acromegaly after developing hyperhidrosis, organomegaly and type 2 diabetes mellitus, alongside features of raised intracranial pressure; namely a morning headache. IGF-1 levels are notably raised, which confirms the diagnosis, and an MRI is ordered to determine the location of the tumour.

Imaging reveals a large pituitary mass as suspected; however, its location within the gland makes a transsphenoidal approach to resecting the tumour more challenging than expected. The consultant neurosurgeon discusses the risks with the patient, and it is decided that surgery would be too dangerous in this scenario. A decision is therefore made to start the patient on medication to attempt to induce remission of the tumour, and improve the patient's symptoms.

What is the mechanism of action of the likely drug being prescribed in this patient?

A. Somatostatin analogue

B. Inhibition of thyroid peroxidase

C. GLP-1 inhibitor

D. Dopamine antagonist

E. DPP-4 inhibitor

Correct Answer:Somatostatin analogue

Explanation:

Octreotide is a somatostatin analogue that may be given to patients with acromegaly if transsphenoidal surgery fails, or is not appropriate. It functions by binding to somatostatin receptors within the brain which function to inhibit growth hormone secretion. This is beneficial for reducing IGF-1 levels and thus improving the symptoms experienced by patients, and in some cases can cause the disease to enter remission. Due to the inhibitory effects of somatostatin on the functions of the gastrointestinal tract, side effects such as constipation, diarrhoea, and abdominal pain are all frequently encountered with the drug.

GLP-1 analogues and DPP-4 inhibitors are prescribed in patients with type 2 diabetes, as they help to increase the bodies insulin response when glucose is consumed. Whilst this patient does have type 2 diabetes, the drugs will not target the acromegaly itself, and are unlikely to be that described in this scenario.

Drugs such as carbimazole and propylthiouracil act by inhibiting thyroid peroxidase; this acts to reduce the rate of synthesis of thyroid hormone in the setting of thyrotoxicosis. This effect is unlikely to be of benefit in this patient.

Dopamine antagonists are most commonly used in the setting of psychotic diseases such as schizophrenia; haloperidol and risperidone (first and second-generation medications respectively) are classic examples. They are not given in the setting of acromegaly, rather, drugs that agonise dopamine such as cabergoline may be added alongside somatostatin analogues to help to reduce IGF-1 levels.

Further reading:

https://patient.info/doctor/acromegaly-pro

Question:

A 24-year-old woman who is 30 weeks pregnant presents to the GP after receiving a positive result for trichomoniasis using a self-test kit. She would like to know about any factors that could have increased her risk of contracting trichomoniasis.

Which of the following is a risk factor for trichomoniasis?

A. Early menarche

B. Multiple sexual partners

C. Using condoms

D. Nulliparity

E. Antibiotic therapy

Correct Answer:Multiple sexual partners

Explanation:

There are many factors which can increase the risk of contracting trichomoniasis. One of these factors is multiple sexual partners. This is because trichomoniasis resides in the lower genital tract and can be spread via sexual intercourse. Other risk factors include engaging in sexual intercourse without a condom and previous infection with trichomoniasis or other STIs.

Nulliparity is a term used to describe a woman who has not given birth before. Nulliparity is not a risk factor for trichomoniasis.

Early menarche refers to the first menstrual cycle, with 'early' suggesting a young age. This is not a risk factor for trichomoniasis.

Using condoms protects against STIs such as trichomoniasis. Therefore it is a protective factor, not a risk factor.

Antibiotic therapy does not increase the risk of contracting trichomoniasis. However, antibiotic therapy (metronidazole) may be given as a treatment for trichomoniasis infection.

Further reading:

https://cks.nice.org.uk/topics/trichomoniasis/

Question:

A 33-year-old woman is bought into the Emergency Department by ambulance accompanied by her friend. Her friend reports that they had been drinking alcohol all afternoon before the patient began vomiting. After vomiting 4-5 times she subsequently vomited a large amount of fresh red blood. This happened around 1 hour ago and aside from a couple of small flecks of blood, there has been no further significant bleeding. Her friend is unsure if she has any other significant medical problems or if she takes any medications, and reports that she works for an IT company and only drinks alcohol on social occasions.

On examination, the patient is heavily intoxicated but alert to voice. She is unable to give any further history but does not appear in significant pain. She is maintaining her own airway and all of her observations are within the normal range. Her abdomen is soft with some very mild epigastric tenderness.

Routine blood tests show:

Hb 142 g/L, WCC 7.1 x 109/L, platelets 294 × 109/L

Na+ 145 mmol/L, K+ 3.7 mmol/L, Urea 8.1 mmol/L, Cr 74 μmol/L (60–110).

What is the most likely diagnosis?

A. Peptic ulcer disease

B. Variceal bleeding

C. Oesophageal rupture

D. Gastric carcinoma

E. Mallory-Weiss syndrome

Correct Answer:Mallory-Weiss syndrome

Explanation:

Mallory-Weiss Syndrome refers to a tear in the gastric mucosa, often at the oesophageal-gastric junction, resulting in upper gastrointestinal bleeding. It can be secondary to a variety of precipitants but is classically seen after prolonged or violent vomiting, as is the case here. It may result in severe bleeding or may present as an isolated episode of haematemesis if the tear is small. Tears often heal spontaneously but may require endoscopic intervention.

Oesophageal rupture is a serious differential diagnosis for upper GI bleeding related to vomiting. Patients are typically unwell with intractable vomiting, severe upper abdominal or chest pain, dyspnoea and shock. Subcutaneous emphysema may also be seen. This is less likely in this patient given the normal observations and absence of significant pain.

Variceal bleeding usually occurs in patients with a significant history of liver disease and is seen as large volumes of blood in repeated vomits. Again, patients are often unwell with variceal bleeding and urgent intervention is needed.

Gastric carcinoma is unlikely in a younger patient with no significant risk factors and is not the most likely diagnosis given the presence of precipitating factors here. Peptic ulcer disease is common but again would not be the top differential given the classical history.

Regardless of the cause of upper GI bleeding, a Blatchford score should be calculated and the patient should be risk-stratified to guide investigation and management. For significant upper GI bleeding, endoscopy is the investigation of choice to visualise and possibly treat the source of bleeding. A Rockall score can be calculated to guide further management.

Further reading:

https://patient.info/doctor/mallory-weiss-syndrome-pro

Question:

A 55-year-old man presents with acute right loin pain radiating to his right groin. The pain is severe and constant, and he has associated haematuria.

His temperature is 38.3ºC, his heart rate is 115 bpm, his respiratory rate is 15 /min, his blood pressure is 124/75 mmHg, and his oxygen saturations are 94% on room air.

A urine dipstick is performed:

Factor Result

Blood ++

Nitrites Positive

Leukocytes ++

Protein ++

Urine cultures demonstrate the presence of Proteus mirabilis. An x-ray is performed, which demonstrates a stag-horn calculus in the right renal pelvis.

What is the most likely composition of the renal stone?

A. Calcium phosphate

B. Xanthine

C. Urate

D. Calcium oxalate

E. Struvite

Correct Answer:Struvite

Explanation:

Struvite is correct. This patient has features of a renal stone, characterised by acute and severe loin-to-groin pain and associated haematuria. The presence of fever is suggestive of infection and potential hydronephrosis, meaning urgent treatment is necessary. The urine dipstick demonstrates evidence of renal calculi (haematuria, leukocytes, and protein), and the presence of nitrites suggests an infective cause. Stag-horn calculi are larger renal stones that can extend from the renal pelvis into the calyces and quickly lead to obstruction. These are made from struvite, also known as ammonium magnesium phosphate). Infection from Proteus species can predispose to struvite stone formation and hence, the formation of a stag-horn calculus as they metabolise urea into ammonia.

Calcium oxalate is incorrect. Although this is the most common type of renal stone, they are not associated with the presence of a stag-horn calculus and infection.

Urate is incorrect. Urate stones are radiolucent, meaning they are not visible on a plain radiograph. They are also not associated with staghorn calculi or infection but are associated with hyperuricaemia and obesity.

Calcium phosphate is incorrect. Although infection from Proteus species can predispose to the formation of calcium phosphate, calcium phosphate is not associated with the formation of staghorn calculi.

Xanthine is incorrect. Xanthine stones are radiolucent, meaning they are not visible on a plain radiograph. They are also not associated with staghorn calculi or infection.

Further reading:

https://patient.info/doctor/urinary-tract-stones-urolithiasis

Question:

As the F1 on call in A&E, you are asked to see an 80-year-old gentleman who has been admitted with worsening shortness of breath over the last 10 days. His breathlessness is associated with productive cough with white phlegm. He reports no fevers, chest pain or palpitations. His past medical history includes type 2 diabetes and hypertension. He also suffered an ST-elevation myocardial infarction 5 years ago and subsequently underwent a coronary artery bypass.

His vital signs are normal except for a respiratory rate of 28 and oxygen saturations of 93% on 8 litres of oxygen. On examination, he is using accessory muscles of respiration and speaking in half sentences. On auscultation, there are crepitations bilaterally to the mid zones with peripheral pitting oedema to the knees.

You perform an arterial blood gas on current oxygen levels which shows reveals: pH 7.37, pO2 7.8, pCO2 4.5, HCO3 26, Lactate 1.8.

Which of the following is the next most appropriate investigation to reach the likely diagnosis?

A. D-dimer

B. CT pulmonary angiogram

C. Chest x-ray

D. High-resolution CT chest

E. Sputum culture

Correct Answer:Chest x-ray

Explanation:

This patient has presented with signs of decompensated heart failure suggested by worsening shortness of breath over several days with signs of pulmonary oedema such as white phlegm, bilateral crepitations on auscultation and peripheral oedema.

An arterial blood gas shows type 1 respiratory failure which is indicative of impaired gas exchange at the alveolar membrane. A chest x-ray would provide you with the clues you need to confirm your diagnosis of decompensated heart failure (alveolar oedema, bilateral pleural effusions, upper lobe diversion, cardiomegaly).

D-dimer should only be performed in patients where the likelihood of pulmonary embolism (PE) is low, as a way of ruling the diagnosis out. Given the patient's presenting symptoms and past medical history, a diagnosis of heart failure with secondary pulmonary oedema is much more likely than a PE. As a result, this investigation would be unlikely to confirm the definitive diagnosis (but it might be useful in ruling out PE).

A sputum culture would be a useful investigation to send to the lab, as it might provide valuable information in the next few days if the patient does have pneumonia. However, given the patient's presenting symptoms, pneumonia is not the most likely diagnosis (clear sputum, no fever, bilateral chest signs) and therefore it would not be the most useful investigation to help reach a definitive diagnosis.

A CT pulmonary angiogram (CTPA) the gold standard investigation for confirming the diagnosis of pulmonary embolism. However, given the low likelihood of PE in this scenario, CTPA would not be the next best investigation to help confirm the diagnosis of heart failure.

A high-resolution CT chest is most often used in the investigation of interstitial lung disease, helping to confirm the diagnosis. It would not be the next most appropriate investigation to confirm the likely diagnosis of heart failure and pulmonary oedema.

Further reading:

https://patient.info/doctor/heart-failure-diagnosis-and-investigation

Question:

A 27-year-old woman presents to the GP with rectal bleeding lasting one week. She explains that she has noticed bright red blood on the tissue and in the toilet bowl after a bowel movement. She has not experienced any abdominal pain or pain on defecation. She is otherwise well, with no fever or changes in bowel habits.

She has no significant past medical history and no known allergies. She mentions her grandfather died of colon cancer aged 82.

On examination, the patient appears well, and all vitals are recorded as normal. Rectal examination reveals no abnormalities; the only finding is bright red blood on examining your gloved finger. The rectal tone is normal, and the examination does not elicit pain.

What is the most likely diagnosis in this patient?

A. Anal fissure

B. Anorectal varices

C. Colorectal cancer

D. Haemorrhoids

E. Ulcerative colitis

Correct Answer:Haemorrhoids

Explanation:

The most likely diagnosis in this patient is haemorrhoids (also known as piles), abnormally swollen vascular mucosal cushions within the anal canal. Haemorrhoids are classified as internal or external, depending on their relation to the dentate line. Internal haemorrhoids arise above the dentate line; they have no pain fibres and are therefore not sensitive to touch, temperature or pain unless they become strangulated. Bright red, painless rectal bleeding is the most common symptom and typically only occurs with defecation. An important feature to note is the location of the blood; in haemorrhoids, blood is seen as streaks on the toilet paper or in the toilet bowl but is not mixed in with the stool. This patient, therefore, most likely has internal haemorrhoids.

Anorectal varices typically present in patients with a past medical history of liver cirrhosis, as they occur secondary to portal hypertension. Patients with anorectal varices may present with painless rectal bleeding and other signs of portal hypertension (e.g. upper gastrointestinal bleeding); on examination, there are often enlarged blue vessels visible.

Patients with anal fissures classically present with painful rectal bleeding on defecation; examination often reveals skin tags, mucosal fissures and significant tenderness, making digital rectal examination too painful to perform. This patient does not report any pain either with defecation or during the rectal examination; therefore, this is a less likely diagnosis.

Patients with ulcerative colitis present with bloody diarrhoea, lower abdominal pain, faecal urgency and extra-intestinal manifestations (e.g. uveitis). This patient does not report any abdominal pain or changes to bowel habits (e.g. consistency, frequency); therefore, this is a less likely diagnosis.

Patients with colorectal cancer may present with rectal bleeding; however, this is typically associated with altered bowel habits, abdominal pain and weight loss. This patient does not report any abdominal pain or changes to bowel habits (e.g. consistency, frequency). Furthermore, whilst there is a family history of bowel cancer, the relative was older, suggesting an inherited cancer syndrome is not likely.

Further reading:

https://cks.nice.org.uk/topics/haemorrhoids/

Question:

A 50-year-old woman presents to the GP with 18 months of fungal toenail infection. Despite using miconazole cream for the past 12 months, her condition has not improved. She has a past medical history of type II diabetes mellitus and obesity. On examination, there is significant subungual hyperkeratosis in the toenails of both feet.

Nail clippings sent for microbiological testing confirm the presence of dermatophytes.

The patient is started on treatment with oral terbinafine and counselled appropriately.

What is the main complication of this treatment that needs to be monitored for?

A. Agranulocytosis

B. Hepatic impairment

C. Renal impairment

D. Thyroid dysfunction

E. Peripheral neuropathy

Correct Answer:Hepatic impairment

Explanation:

Patients started on oral terbinafine should have periodic liver function testing to monitor for potential hepatic impairment. The manufacturers recommend that patients with active or chronic liver disease not be started on terbinafine. Furthermore, terbinafine should be stopped if there is evidence of hepatic impairment. Terbinafine has been linked to rare instances of severe and fatal liver injury.

The BNF advises using oral terbinafine with caution in those with renal impairment. However, oral terbinafine is not known to cause renal impairment or kidney injury,

Although agranulocytosis is listed as a rare side effect according to the BNF, the association between agranulocytosis and oral terbinafine use is unclear. Reports of terbinafine-induced blood disorders are very rare and, as a result, are not routinely monitored for.

Thyroid dysfunction is not associated with the use of oral terbinafine.

Peripheral neuropathy is not associated with the use of oral terbinafine.

Further reading:

https://bnf.nice.org.uk/drugs/terbinafine/

Question:

A 35-year-old man is being managed on a gastrointestinal ward due to a flare of his Crohn's disease. He is well known to the team as he has several serious flares each year. His disease is largely confined to the ileum.

A routine panel of blood tests are ordered and he is found to have secondary hyperparathyroidism.

Which of the following options is most likely to be the results of his blood tests?

A. PTH high, calcium high, phosphate low

B. PTH high, calcium low, phosphate low

C. PTH low, calcium low, phosphate high

D. PTH high, calcium high, phosphate high

E. PTH high, calcium low, phosphate high

Correct Answer:PTH high, calcium low, phosphate low

Explanation:

Secondary hyperparathyroidism (SHPT) occurs when the parathyroid glands become hyperplastic in response to chronic hypocalcaemia. This most commonly occurs in chronic kidney disease (CKD) secondary to reduced calcitriol production. This leads to reduced uptake of dietary calcium from the intestines.

This patient's SHPT is due to chronic vitamin D deficiency, therefore, the expected blood results would be raised PTH, low calcium, and low phosphate. Vitamin D deficiency leads to low serum calcium, which stimulates the production of PTH. Phosphate is low as PTH stimulates the reabsorption of calcium and excretion of phosphate in the renal tubules.

In patients with SHPT due to CKD, we would expect raised PTH, low calcium, and high phosphate due to the impaired renal phosphate excretion.

The two options with raised calcium are incorrect as secondary hyperparathyroidism only occurs in the setting of chronically low calcium.

The option with low PTH is incorrect as hyperparathyroidism never occurs in the context of low PTH.

Further reading:

https://patient.info/doctor/hyperparathyroidism-pro

Question:

A 60-year-old man presents to his general practitioner complaining of chest pain. This pain has been present intermittently for the past 4-months, - occurring while gardening and walking his dog. He describes the pain as heavy. There is no radiation, nausea, vomiting, shortness of breath, or sweating. The pain is relieved by a few minutes of sitting.

He has a past medical history of hypertension. His only regular medication is ramipril, with no known drug allergies.

On examination, his BP is 132/88 mmHg. Cardiovascular, respiratory, and abdominal examinations are all normal. His BMI is 24.8 kg/m2.

He is prescribed a GTN spray to be used as required.

What additional medication should be prescribed to improve his symptoms?

A. Bisoprolol 5 mg once daily

B. Atorvastatin 20 mg once nightly

C. Aspirin 75 mg once daily

D. Isosorbide mononitrate 20 mg twice daily

E. Clopidogrel 75 mg once daily

Correct Answer:Bisoprolol 5 mg once daily

Explanation:

This gentleman is presenting with typical features of stable angina and has therefore been prescribed prescribed GTN spray to use in the treatment of acute attacks. He should be counselled to call an ambulance if two doses, five minutes apart fail to relieve his symptoms.

Isosorbide mononitrate is a long-acting nitrate which can be used to reduce the severity and frequency of anginal attacks, however, it is not the first-line choice.

Bisoprolol is the correct answer. NICE recommend offering patients newly diagnosed with angina either a beta-blocker or a calcium channel blocker. SIGN recommends that beta-blocker should be offered before calcium channel blockers unless contraindicated. If one of these agents alone is ineffective then they can be used in combination.

Aspirin and atorvastatin are often used in stable angina as secondary prevention. Crucially, the question is asking for a prescription to reduce his symptoms - while these drugs are often used they would not reduce his symptoms.

Clopidogrel is not the first line antiplatelet in stable angina. It can be used if the patient is already taking clopidogrel for peripheral arterial disease or stroke.

Further reading:

https://cks.nice.org.uk/topics/angina/management/new-diagnosis/

Question:

A 52-year-old male presents to his GP with a 3-month history of unexpected weight loss. He feels non-specifically unwell, with no focal symptoms. There is no significant past medical history. On examination, he looks visibly fatigued, and there is marked pallor of his conjunctiva.

His blood count reveals the following:

Result Reference range

Hb 91 g/L (130-180)

MCV 70 fl (80-100)

MCH 26 pg (27-32)

WCC 6 x 109/L (3.6-11.0)

Platelets 181 x 109/L (140-400)

What is the next most appropriate investigation?

A. Serum B12

B. Serum iron

C. Serum folate

D. Haemoglobin electrophoresis

E. Serum ferritin

Correct Answer:Serum ferritin

Explanation:

The next most appropriate investigation in this scenario is to request serum ferritin. This man has microcytic hypochromic anaemia, and the differential, therefore, includes iron deficiency and disorders of globin synthesis (the thalassaemias). Iron deficiency is best diagnosed with a full complement of iron studies, including ferritin, serum iron and transferrin saturation; however, of the options given, serum ferritin is the most appropriate choice. Serum iron is generally a poor reflection of iron stores, since it fluctuates diurnally and in response to inflammation, infection and dietary intake, but is important to test in conjunction with the rest of the iron studies. While an acute phase response may increase serum ferritin and thus mask iron deficiency, low ferritin is an excellent indication that iron stores are depleted. Importantly, while low ferritin confirms iron deficiency, since ferritin is an acute phase reactant (like CRP), a normal ferritin level cannot exclude iron deficiency. Serum transferrin levels can also be a sensitive measure for iron deficiency, with levels usually high/in the upper part of the normal range. Once iron deficiency has been established, finding the underlying cause is essential. In this scenario, a faecal occult blood screen is indicated and may pick up microscopic blood loss in the stool that is otherwise not evident clinically. However, since colorectal cancer is a key diagnosis to exclude in this patient (and any older patient with weight loss and an unexplained iron deficiency anaemia), an urgent colonoscopy +/- biopsy of any abnormal tissue visualised would be useful.

Haemoglobin electrophoresis is essential for the diagnosis of thalassemias which is a key differential for patients with microcytic anaemia, however, given the lack of any significant past medical history, we can assume the anaemia is a new finding, making a hereditary globin disorder less likely.

Classically, B12 and folate deficiency both cause macrocytic anaemia; therefore, serum B12 and folate are unlikely explanations as to the underlying cause, given the MCV indicates the anaemia is microcytic.

Serum iron is generally considered a poor marker of iron status as it is subject to significant diurnal fluctuations but is still worth testing in conjunction with other iron studies.

Further reading:

https://gut.bmj.com/content/70/11/2030

Question:

A 65-year-old male presents to the emergency department with a 4-hour history of painless vision loss in the right eye. This came on rapidly without any precipitating symptoms. The patient denies fever, nausea, vomiting, eye pain, discharge or recent weight loss.

His past medical history is significant for two diabetes mellitus, poorly controlled hypertension and hyperlipidaemia. He also has a 35-pack-year history of smoking.

Physical examination confirms the loss of vision of the right eye.

What is the most likely diagnosis?

A. Closed-angle glaucoma

B. Corneal abrasion

C. Temporal arteritis

D. Retinal detachment

E. Retinal artery occlusion

Correct Answer:Retinal artery occlusion

Explanation:

The clinical presentation of acute, monocular, painless vision loss in a patient with atherosclerotic risk factors is concerning for retinal artery occlusion (RAO). Atherosclerotic disease of the ipsilateral carotid artery is the most common cause of RAO. These patients require follow-up ultrasound scanning of the carotid arteries to assess for atherosclerotic lesions, which may require carotid endarterectomy depending on the extent of stenosis. Cardiogenic embolism is the second most common cause, which is typically seen in younger patients secondary to atrial fibrillation. Fundoscopic examination typically demonstrates retinal whitening suggestive of retinal ischemia. RAO is an emergency that requires urgent ophthalmic referral.

Temporal or giant cell arteritis can lead to vision loss but is more likely to have associated symptoms like jaw claudication, scalp tenderness and constitutional symptoms. Elderly females (> 70 years old) are most commonly affected.

Retinal detachment also presents with vision loss, however, patients typically complain of floaters in one eye. Causes of retinal detachment include trauma and recent eye surgery which this patient does not have a history of.

Corneal abrasion should be suspected in a patient who has a history of local eye trauma, eye pain, conjunctival injection and excessive tearing.

Patients with closed-angle glaucoma present with a red, painful eye and an acute onset of vision loss. The involved pupil is classically mid-dilated and non-reactive. Nausea and vomiting can also be seen. This is also an emergency that requires urgent ophthalmic referral.

Further reading:

https://patient.info/doctor/retinal-artery-occlusions

Question:

A clinical trial is undertaken to find out whether a newly developed medication reduces mortality in patients with hepatocellular carcinoma (HCC). The research group randomly selects 700 patients with HCC and manually assigns them to either the treatment arm or the placebo arm, ensuring the treatment arm consists only of individuals who are known to be compliant with their medications. Although the experimenters are aware of which patients are taking the new medication and which are taking a placebo, the patients are not.

What type of study is described?

A. Randomised controlled trial

B. Observational study

C. Case-control

D. Single-blind trial

E. Double-blind trial

Correct Answer:Single-blind trial

Explanation:

This is a single-blind trial. A blind trial is one in which the patient is not aware of which treatment they are receiving. If the researcher is also unaware, the trial is a double-blind trial.

A randomised controlled trial involves randomly assigning individuals to a treatment arm or a control arm of the experiment and following them up over time to study any differences in outcome. As the research group has assigned patients manually to ensure that only patients who are known to be compliant with their medications are in the treatment arm, this is not a randomised controlled trial.

Studies can be divided into observational and interventional studies. An observational study is one in which no intervention is offered. Here, the patients are given either the new drug or a placebo, therefore, this study is an interventional study.

Case-control studies are typically used to study the cause of a condition rather than to investigate the efficacy of treatments for a condition. They involve comparing a group of cases with a group of controls and seeing if there are different rates of risk factor exposure between the two groups.

Further reading:

https://guides.himmelfarb.gwu.edu/prevention\_and\_community\_health/types-of-studies

Question:

A 14-year-old boy presents to the emergency department with sudden onset, unilateral scrotal pain. This started 30 minutes ago whilst playing football. He feels nauseated and has vomited twice. He has no significant past medical history and takes no medications.

On examination, the left testicle appears swollen and is lying horizontally. It is exquisitely painful to touch, and the pain is not relieved by elevation of the scrotum.

What is the most likely diagnosis?

A. Epididymo-orchitis

B. Varicocele

C. Epididymal cysts

D. Hydrocele

E. Testicular torsion

Correct Answer:Testicular torsion

Explanation:

This case demonstrates testicular torsion, in a young boy whilst playing sport. Testicular torsion is characterised by sudden onset, unilateral scrotal pain associated with nausea and vomiting. The testicle may appear inflamed with a horizontal lie and the pain is not relieved on elevating the testes. The cremasteric reflex may also be absent, whereby stroking the inner thigh fails to cause an upward movement of the testes.

Sudden onset scrotal pain is testicular torsion until proven otherwise

A hydrocele is typically a soft, painless swelling which transilluminates. It is caused by a collection of fluid within the tunica vaginalis.

A varicocele is where the veins in the pampiniform plexus become swollen and enlarged. It may present with a dull/throbbing or dragging sensation, which is worse on standing. Clinically, the scrotal mass feels like a 'bag of worms', which disappears when lying down.

Epididymo-orchitis is an infection of the epididymis and testicle, most commonly caused by a urinary tract or sexually transmitted infection. It results in gradual onset testicular and epididymal pain. Elevation of the testes relieves the pain.

Epididymal cysts are typically painless, soft lumps found in the epididymis. They are very common in adults.

Further reading:

https://geekymedics.com/testicular-torsion/

Question:

A 62-year-old type 2 diabetic visits her GP complaining of repetitive hypoglycaemic episodes. During these episodes, she experiences anxiety, a tremor, cold sweats and confusion. Her capillary blood glucose was 2.4mmol/L during the left episode.

Which medication is the most likely cause?

A. Sitagliptin

B. Gliclazide

C. Metformin

D. Dapagliflozin

E. Pioglitozone

Correct Answer:Gliclazide

Explanation:

Sulfonylureas (gliclazide) and insulin are the two anti-diabetic medications most well known to cause hypoglycaemia.

Biguanides (metformin), thiazolidinediones (pioglitazone), DDP4 inhibitors (sitagliptin), and SGLT-2 inhibitors (dapagliflozin) are less known to cause hypoglycaemia.

Further reading:

https://cks.nice.org.uk/topics/diabetes-type-2/

Question:

A 61-year-old male with a suspected exacerbation of COPD is being treated in the emergency department. He has become lethargic over the past two hours and has been given oxygen and bronchodilator therapy.

Vital signs are as follows:

Temperature 37.4°C

Pulse 96 bpm

BP 134/96 mmHg

Respiratory rate 26

O2 saturation 86% on 10 L oxygen

An ABG shows:

PaO2: 7.6 kPa

pH: 7.26

PaCO2: 8.4 kPa

HCO3–: 26

Base excess: +1

What is the most appropriate immediate treatment for this patient?

A. Broad-spectrum antibiotics

B. IV fluids

C. Nebulised salbutamol

D. Non-invasive ventilation

E. Titrated oxygen therapy

Correct Answer:Non-invasive ventilation

Explanation:

Non-invasive ventilation is the most appropriate treatment for this patient. This patient is in type 2 respiratory failure (i.e. a PaO2 of <8kPa and a PaCO2 of > 6kPa). An exacerbation of COPD that is not responding to bronchodilator and oxygen therapy with a persistent or worsening acidosis requires ventilator support. The pH range in which NIV is most efficacious in this context is between 7.25-7.35.

IV fluids are not appropriate as the patient is haemodynamically stable.

Broad-spectrum antibiotics may be necessary but are not as urgent as the need to address the patient's hypoxia, hypercapnia and acidosis.

Oxygen therapy and bronchodilators have already been used and so continuing them with no changes would not be beneficial for this patient.

See the BTS guidelines below for further information.

Further reading:

https://thorax.bmj.com/content/71/Suppl\_2/ii1

Question:

A 61-year-old woman is referred to the gynaecology clinic with a 6-week history of post-menopausal bleeding. She went through the menopause 8 years ago and has not previously had issues with vaginal bleeding. She has no significant past medical history and takes no regular medication. She has a 30 pack-year smoking history.

A transvaginal ultrasound scan reveals an endometrial thickness of 5mm.

Which is the most appropriate next step?

A. Endometrial pipelle sampling

B. Radical hysterectomy

C. CT abdomen/pelvis

D. MRI abdomen/pelvis

E. Hysteroscopy

Correct Answer:Endometrial pipelle sampling

Explanation:

This patient has a concerning history that is suggestive of underlying endometrial hyperplasia or malignancy.

The most appropriate next step would be to attempt outpatient endometrial pipelle sampling (endometrial biopsy). Outpatient endometrial biopsy is convenient and has high overall accuracy for diagnosing endometrial cancer.

Hysteroscopy with additional endometrial assessment may be necessary if abnormal bleeding persists or if intrauterine structural abnormalities such as polyps are suspected on transvaginal ultrasound or endometrial biopsy.

CT or MRI abdomen/pelvis are not commonly used in the diagnosis of endometrial hyperplasia or malignancy. They may be performed after a diagnosis endometrial cancer has been confirmed, to assess for metastatic spread to both local and distal structures.

A radical hysterectomy involves the excision of the uterus, parametrium (i.e. round, broad, cardinal, and uterosacral ligaments), pelvic lymph nodes and the upper one-third to one-half of the vagina. This approach is sometimes used in the surgical management of endometrial cancer, but it would not be an appropriate next step.

Further reading:

https://patient.info/doctor/endometrial-cancer

Question:

A 27-year-old woman presents with nausea, right upper quadrant pain, and fever. She returned from a holiday in China a month ago, occasionally injects drugs, and has been sexually active with three casual partners in the past six months. Serology results show that she is positive for hepatitis B.

What is the mode of transmission of hepatitis B?

A. Airborne transmission

B. Fomites

C. Contact with body fluids

D. Vector-borne

E. Faeco-oral spread

Correct Answer:Contact with body fluids

Explanation:

Hepatitis B is spread through contact with body fluids, such as blood or semen. This may occur through sexual contact, sharing needles, or through vertical transmission from mother to child during pregnancy or parturition.

Further reading:

https://www.cdc.gov/hepatitis/hbv/index.htm

Question:

A 46-year-old man is investigated for nausea and right upper quadrant pain. Apart from a low-grade fever, his observations are within the normal range, and he is alert and oriented. An abdominal exam shows mild tenderness in the right upper quadrant and nothing else of note.

Relevant blood tests are shown below:

Parameter Value Reference range

Alkaline phosphatase (ALP) 139 U/L 30 – 130 U/L

Alanine transaminase (ALT) 1050 U/L < 41 U/L

Aspartate transaminase (AST) 905 U/L 1 - 45 U/L

Bilirubin 120 μmol/L <21 μmol/L

Gamma-glutamyl transferase (GGT) 80 U/L < 60 U/L

Albumin 38 g/L 35 – 50 g/L

Prothrombin time (PT) 12 seconds 10-14 seconds

His hepatitis serology results reveals the following:

HBsAg: +

Anti-HBs: -

Anti-HBc IgM: +

Anti-HBc IgG: -

HBeAg: +

Anti-HBe: -

Hepatitis B virus DNA: +

Hepatitis C virus RNA: not detected

What is the most appropriate treatment?

A. Broad-spectrum antibiotics

B. Hemihepatectomy

C. Analgesia and anti-emetics

D. Liver transplant

E. Antiretroviral therapy

Correct Answer:Analgesia and anti-emetics

Explanation:

This patient has acute hepatitis B infection, shown by the presence of HBsAg and anti-HBc IgM, and the absence of anti-HBc IgG, on their serology results. Acute hepatitis B usually self-resolves and is managed conservatively, therefore, analgesia and anti-emetics are the most appropriate treatment.

Antiretroviral therapy is used to treat chronic or severe acute hepatitis B. As this patient’s serology shows acute hepatitis B infection and they have no concerning signs of liver failure, such as a raised prothrombin time, encephalitis, or ascites, they can be managed conservatively.

A liver transplant would only be considered if this patient had fulminant liver failure resulting from hepatitis B infection, therefore, it is not indicated at this stage.

A hemihepatectomy involves removing half of the liver and is typically used to treat tumours of the liver or biliary tree. It is not used in the treatment of hepatitis.

Broad-spectrum antibiotics are not indicated, as hepatitis B is a viral infection.

Further reading:

https://geekymedics.com/hepatitis-b-serology-interpretation/

Question:

Sonia, a 30-year-old female, presents to A&E with a 7-day history of loose stools, opening her bowels up to 10 times per day. The diarrhoea contains blood and mucus. In addition, she complains of abdominal pain and fevers. Sonia takes no regular medication.

On examination, she has a heart rate of 110 bpm and a BP of 110/80 mmHg. Her abdomen is diffusely tender with no evidence of peritonism and no palpable masses. An abdominal x-ray is unremarkable. She had a colonoscopy 5 months ago that confirmed a diagnosis of ulcerative colitis.

What is the next most appropriate step in management?

A. Oral aminosalicylate

B. Intravenous corticosteroids

C. Surgery

D. Intravenous ciclosporin

E. Oral prednisolone

Correct Answer:Intravenous corticosteroids

Explanation:

Ulcerative colitis is the most common type of inflammatory bowel disease. It usually affects the rectum and a variable amount of the colon proximal to the rectum. Typically, it has a relapsing-remitting pattern. This patient has an acute severe exacerbation of her ulcerative colitis as per the Truelove and Witts’ severity index. The first-line management after fluid resuscitation is to administer IV hydrocortisone.

For milder exacerbations, NICE recommends topical or oral aminosalicylate as first-line and oral prednisolone as second-line there is intolerance to aminosalicylates.

Intravenous ciclosporin is recommended as a second-line treatment for severe exacerbations of ulcerative colitis if IV hydrocortisone is contraindicated or if there is an inadequate response to IV steroids alone.

Surgery should be considered for patients who do not respond to drug treatments with acute severe exacerbations and who have evidence of colonic dilatation on abdominal x-ray. It is worth involving surgeons early in anyone with a severe exacerbation of ulcerative colitis and performing abdominal x-rays to rule out toxic megacolon, which is a surgical emergency.

Further reading:

https://www.nice.org.uk/guidance/ng130

Question:

A 35-year-old man presents to A&E with a 4-day history of lethargy, fever, intermittent palpitations and pain in his fingertips when handling objects.

He drinks around 8-10 units of alcohol a week and has previously used intravenous drugs.

On examination, he has a temperature of 38.2 degrees and a heart rate of 105bpm. On examination, small tender nodes are palpable on his fingertips and a systolic murmur is audible on auscultation of the chest. Fundoscopy demonstrates pale retinal lesions that are surrounded by areas of haemorrhage.

ECG demonstrates sinus tachycardia and blood tests demonstrate normocytic anaemia, normal troponin and raised CRP. His chest X-ray is normal. Echocardiography demonstrates mitral valve vegetations and regurgitation.

What is the most likely diagnosis in this patient?

A. Pericarditis

B. Infective endocarditis

C. Myocardial infarction

D. Aortic stenosis

E. Atrial myxoma

Correct Answer:Infective endocarditis

Explanation:

The most likely diagnosis in this patient is infective endocarditis. Infective endocarditis can present with non-specific symptoms such as lethargy and arthralgia, fever and cardiac symptoms such as palpitations, dyspnoea and chest pain. Classic peripheral signs include Janeway lesions (painless dark plaques on the palms and soles), Osler nodes (painful nodules in the fingertips), splinter haemorrhages in the nails, petechiae on the palate and Roth spots (pale retinal lesions surrounded by haemorrhage, seen on fundoscopy). Examination may reveal a new murmur. Previous intravenous drug users, prosthetic valves and a past medical history of congenital heart disease all increase the risk of infective endocarditis. Echocardiography may demonstrate vegetations or dysfunction of the affected valve.

Atrial myxoma will typically reveal an atrial mass on echocardiography and chest X-ray may show cardiomegaly and calcification of the myxoma.

Pericarditis typically presents with sudden onset sharp, severe pain that radiates to the back and is pleuritic. On examination, the characteristic finding of pericarditis is a pericardial friction rub and on ECG there is often diffuse ST elevation.

Myocardial infarction would typically demonstrate dynamic ECG changes suggestive of acute coronary syndrome and a raised troponin.

Aortic stenosis is associated with an ejection systolic murmur, but the fever, peripheral stigmata and fundoscopic findings do not fit with this diagnosis.

Further reading:

https://patient.info/doctor/infective-endocarditis-pro

Question:

A 42-year-old man presents to his GP with progressive shortness of breath. He was recently diagnosed with asthma and has been prescribed beclometasone dipropionate two puffs twice daily and inhaled salbutamol when required.

Despite the correct inhaler technique and good medication compliance, the patient reports that he is still experiencing shortness of breath most days, especially when exercising. He also sometimes wakes up in the night with a tight chest and breathing difficulties. He did not previously tolerate montelukast due to the side effects of nightmares.

On examination, chest sounds wheezy bilaterally and his PEFR is 480 L/min (best recorded 600 L/min).

His observations are as follows:

O2 98% on air

HR 78 bpm

RR 22

BP 131/70 mmHg

Temp 37 oC

What is the next most appropriate step in the management for this patient's condition?

A. Refer patient to an asthma specialist

B. Add a leukotriene receptor antagonist (LTRA)

C. Add a long-acting beta-2 agonist (LABA)

D. Advise the patient to take inhaled salbutamol daily

E. Increase the inhaled corticosteroid dose

Correct Answer:Add a long-acting beta-2 agonist (LABA)

Explanation:

Take care with this question - there is a difference between NICE and BTS guidelines for the management of asthma escalation. However, this vignette actually gives you a logical answer that would be appropriate for both NICE and BTS guidelines in terms of escalation.

The patient is still experiencing symptoms despite inhaled corticosteroid (ICS) and ‘when required’ short-acting beta-2 agonist (SABA) therapy. The NICE guidelines recommend that at this stage it is advisable to add a leukotriene receptor antagonist (LTRA) into the therapeutic management to alleviate symptoms. However, this patient is intolerant of the LTRA montelukast (due to nightmares) and would thus not be appropriate at this stage. Thus adding a long-acting beta-2 agonist (LABA) would be appropriate.

Under the BTS guidelines, at this stage you would trial adding a long-acting beta-2 agonist (LABA) with the SABA and ICS, before trialling LTRA. Given that the patient has already trialled LTRA, LABA would be the next step.

Increasing the salbutamol frequency is not an advisable option because reliance on short-acting beta-2 agonist more than 3 times a week indicates a need for an increase in alternative asthma therapy.

Increasing the inhaled corticosteroid dose is something that could be considered at a later stage in the management process if the patient failed to respond to a maintenance and reliever (MART) regimen (which includes a low dose ICS + LABA).

Whilst an asthma specialist may be required if the patient continues to feel symptomatic despite adequate therapy, currently, his care is within the scope of a primary care service.

Further reading:

https://cks.nice.org.uk/topics/asthma/management/newly-diagnosed-asthma/

Question:

A 4-year-old boy presents with a 24-hour history of hip pain and limp. He has recently been unwell with a viral infection. He has otherwise been eating and drinking well, has not been woken by the pain and has not experienced night sweats. There are no bruises, cuts or marks on a head-to-toe inspection and he is a healthy weight and size for a boy his age.

On examination, the child is happy and comfortable at rest, apyrexial with no erythema or warmth around the hip joint. There is pain elicited at the extreme ranges of movement, but otherwise normal range of joint motion. He is able to weight bear without any issues. Neurovascular examination of the lower limbs is unremarkable. Vital signs are otherwise unremarkable and blood tests reveal a normal FBC, CRP and ESR. An X-ray of the hip does not reveal any abnormalities.

What is the most appropriate action to take?

A. Refer to orthopaedics

B. Alert your senior to concerns regarding non-accidental injury

C. Refer to paediatric rheumatology

D. Admit for intravenous antibiotics

E. Reassure the parent and advise regular NSAIDs

Correct Answer:Reassure the parent and advise regular NSAIDs

Explanation:

The most likely diagnosis in this scenario is transient synovitis of the hip joint, a self-limiting condition that typically follows a viral infection. Transient synovitis of the hip joint most often affects children between the ages of 2-10. Typical presenting features include mild hip pain that is absent with rest and exacerbated at the extremes of passive movement. Management involves reassurance and NSAIDs.

In the early stages, transient synovitis and septic arthritis can present similarly and therefore it is important to consider the possibility of septic arthritis in all children presenting with joint pain. The child in this scenario is otherwise well, with normal vital signs and normal inflammatory markers, making a diagnosis of septic arthritis much less likely than transient synovitis. Children with septic arthritis usually present with fever, joint pain, irritability and an inability to weight bear. Clinical examination may reveal a hip that is held flexed and abducted. If septic arthritis was suspected, the child would need urgent review by the orthopaedic team to consider drainage of the joint in addition to IV antibiotics.

Referral to rheumatology is unlikely to be required in this scenario, given the history is much more in keeping with transient synovitis. Rheumatological causes should be considered in all children presenting with joint pain and/or a limp. The absence of pain at rest, short duration and normal inflammatory markers make a rheumatological diagnosis much less likely than transient synovitis.

There is no suggestion that this presentation may relate to non-accidental injury provided in the clinical vignette, however this should always be considered. The presence of signs of trauma (i.e. bruising/fracture) which is not adequately explained by the history would be a red flag of possible non-accidental injury.

Further reading:

https://patient.info/doctor/painful-hips-in-children

Question:

A 12-month-old girl presents with her parents to the GP for a check-up. Four weeks ago, you treated her for her fifth documented episode of acute otitis media (AOM).

On physical examination, she is alert and playful with normal vital signs. Otoscopy reveals opaque tympanic membranes with decreased mobility bilaterally. They are non-erythematous and non-bulging. The child can say mama, dada, and cat and can follow one-step commands.

What is the next best step in the management of this patient?

A. Treatment with high-dose amoxicillin/clavulanate

B. Refer to a ear nose throat (ENT) specialist

C. Treatment with ceftriaxone

D. Referral to speech and language therapy (SALT)

E. Treatment with high-dose amoxicillin

Correct Answer:Refer to a ear nose throat (ENT) specialist

Explanation:

Referral to ENT for tympanostomy tube placement should be considered in children who:

have 3 separate, well-documented episodes of acute otitis media (AOM) within 6 months

have ≥4 episodes within 1 year

have effusion that persists > 3 months

Children aged less than 2 years benefit most from tympanostomy tube placement because adequate hearing is critical for language development.

Treatment with high-dose amoxicillin/clavulanate, ceftriaxone or high-dose amoxicillin would not be appropriate. The patient has an effusion which is pretty common following an episode of AOM. However, she has no signs of a current episode of AOM (such as erythema, bulging of the tympanic membranes or otalgia) and therefore she does not require antibiotic therapy.

Recurrent episodes of AOM may decrease the acuity of the child’s hearing and put the child at risk for delayed language acquisition. However, the child, in this case, is currently meeting language milestones for her age and so does not require referral to SALT.

Further reading:

https://patient.info/doctor/otitis-media-with-effusion

Question:

You are working in an Accident and Emergency department in South America. A 4-year-old male is brought in by his parents with breathing difficulties. His parents inform you that their son suffered from cold-like symptoms around 1 week previously then began to develop other symptoms over the last 24 hours including a swollen neck, thick nasal discharge, sore throat, fever and breathing difficulties. The parents also report that a few other children at their son’s nursery group have been ill with similar symptoms.

On examination, you note the following:

pyrexia of 39 oC

"bull’s neck" appearance

nasal crusting

membranous pharyngitis

anterior cervical lymphadenopathy

numerous ‘punched-out’ lesions on the lower limbs

high-pitched inspiratory sound

Which of the following is the MOST LIKELY causative organism of the condition described?

A. Candida albicans

B. Parainfluenza virus

C. Corynebacterium diphtheriae

D. Epstein-Barr virus

E. Haemophilus influenzae type B

Correct Answer:Corynebacterium diphtheriae

Explanation:

The most likely diagnosis is diphtheria caused by corynebacterium diphtheriae. Corynebacterium diphtheriae is a gram-positive, aerobic, rod-shaped bacterium. This condition usually occurs in epidemics and is transferred mainly by droplet spread.

Risk factors of diphtheria include areas of low socioeconomic status, poor sanitation and certain geographical locations (South America, Southeast Asia, Africa, India).

Clinical features of this condition include:

preceding coryzal symptoms

thick, mucopurulent nasal discharge with nasal crusting

pyrexia

anterior cervical lymphadenopathy

‘bulls neck’ appearance due to oedema of the soft tissues in the neck

membranous pharyngitis (which may lead to stridor)

cutaneous features (vesicles or pustules that rupture to form ‘punched-out’ lesions) typically on the lower limbs, feet or hands

features related to exotoxin release (e.g. cardiac failure, paralysis)

Diagnosis is usually achieved by direct culture of the organism (either of respiratory secretions or cutaneous lesions).

Epstein-Barr virus commonly causes infectious mononucleosis. This condition would more likely present with pyrexia, fatigue, sore throat with tonsillar enlargement (typically exudative), fine macular rash, lymphadenopathy and splenomegaly.

Haemophilus influenzae type B may cause epiglottitis. This condition would more likely present with sore throat, odynophagia, drooling, ‘hot potato voice’ and pyrexia.

Parainfluenza virus commonly causes croup. This condition presents similarly to epiglottitis with fever, respiratory distress and a barking cough.

Candida albicans may cause oral candidiasis. This condition usually presents with white plaques in the mouth that are easily rubbed off and painless, as well as an associated unpleasant taste.

Further reading:

https://patient.info/doctor/diphtheria-and-diphtheria-vaccination

Question:

A 31-year-old man attends his GP after experiencing multiple episodes of palpitations and dizziness. He describes feeling like his heart is racing and pounding in his chest, and often feels short of breath. He hasn't experienced any chest pain and is otherwise healthy.

He undergoes an ECG and some abnormalities are identified. He is later diagnosed with Wolff-Parkinson-White (WPW) syndrome.

Which of the following features on ECG is most characteristic of Wolff-Parkinson-White syndrome?

A. Sawtooth baseline

B. Tall tented T waves

C. Broad QRS complex

D. Variable PR interval

E. Slurred upstroke of the QRS complex

Correct Answer:Slurred upstroke of the QRS complex

Explanation:

The correct answer is a slurred upstroke of the QRS complex, also known as a delta wave. These alone are not diagnostic of WPW syndrome; a tachyarrhythmia must also be present.

WPW syndrome is a congenital condition caused by an additional accessory pathway between the atria and ventricles, predisposing to supraventricular tachycardia. It becomes symptomatic in around 60% of individuals with this pathway and can present with tachycardia, palpitations, shortness of breath, and/or syncope. It may be managed by antiarrhythmics such as amiodarone but definitive treatment is ablation of the pathway.

Source

A short PR interval <120ms is seen in WPW syndrome, rather than a variable PR interval. The PR interval may be variable in conditions such as second-degree heart block Mobitz type 1.

A broad QRS complex is seen in WPW syndrome but is not characteristic and may be seen in many other conditions, such as left or right bundle branch block, hyperkalaemia, or ventricular pacing.

A sawtooth baseline is not present in WPW syndrome but is characteristic of atrial flutter.

Tall tented T waves are not present in WPW syndrome but are strongly suggestive of hyperkalaemia.

Further reading:

https://patient.info/doctor/wolff-parkinson-white-syndrome-pro

Question:

A 75-year-old lady is referred to a respiratory clinic with shortness of breath. She has had progressive shortness of breath over the last year. She has no significant past medical history and does not smoke.

Her spirometry reveals the following:

FEV1: 3.2L (~4)

FVC: 3.8L (~5)

FEV1/FVC: 84%

What is the most likely diagnosis?

A. Asthma

B. Pneumonia

C. Primary pulmonary hypertension

D. Interstitial lung disease

E. Chronic obstructive pulmonary disease (COPD)

Correct Answer:Interstitial lung disease

Explanation:

This lady’s spirometry points to a diagnosis of interstitial lung disease. She has a restrictive pattern with reduced FEV1 and FVC but a preserved ratio. If she had COPD, you would expect her spirometry to be obstructive. Her history does not fit with a diagnosis of asthma, and the spirometry in asthma outside of an acute exacerbation is usually normal. Her history is too long for pneumonia. In primary pulmonary hypertension, you would expect her spirometry to be normal.

Further reading:

https://geekymedics.com/spirometry-interpretation/

Question:

A 32-year-old woman is followed up in general practice after an admission to the emergency department for a prolonged tonic-clonic seizure. The seizure occured while she was at work one week ago, lasting more than 20 minutes, and was terminated by a dose of buccal midazolam given by paramedics. The patient recalls the smell of burning toast and losing consciousness.

The patient has a past medical history of epilepsy which was diagnosed at age 14. This is her first seizure in two years. Her regular medication consists of sodium valproate 2g once daily (no recent adjustments) and the combined oral contraceptive pill. She works as a nurse and drives a car to work.

Which of the following statements is true regarding the patient's driving?

A. The patient will have their driving license revoked permanently

B. The patient will not be able to drive for at least 6 months

C. The patient can continue to drive provided they take their anti-epileptic medication

D. The patient will not be able to drive for at least 1 year

E. The patient can continue to drive provided they see an epilepsy specialist

Correct Answer:The patient will not be able to drive for at least 1 year

Explanation:

Seizures impair a patient's ability to drive which may result in serious harm to themselves and others. In the UK, patients have a legal obligation to inform the Driving and Vehicle Licensing Agency (DVLA) if they have epilepsy and/or recurrent seizures. The specific rules depend on whether the patient holds a license for a car, motorbike or larger vehicle such as a coach.

In this case, the patient should inform the DVLA immediately and stop driving. Her group 1 driving license (motorcycles and cars) can be reinstated if she has been seizure-free for at least 1 year.

If there is evidence that a seizure was provoked by an iatrogenic adjustment to anti-epileptic medication, the patient can drive after 6 months without a seizure at their original dose. This patient has not had any recent medication adjustments.

Further reading:

https://www.gov.uk/epilepsy-and-driving

Question:

An 18-year-old girl attends A+E with pain in her left leg. She has a background of sickle cell anaemia. The pain is located in her left leg just above the knee. The pain is so great that she is unable to move the limb. She feels hot but is cold and clammy. There is no history of trauma.

On examination, she has an erythematous, hot, swollen area just above her left knee. Her temperature is 38.4˚C.

An MRI of the leg is performed and confirms a diagnosis of osteomyelitis.

What is the most likely causative organism?

A. Haemophilus influenzae

B. Staphylococcus aureus

C. Streptococcus spp

D. Salmonella

E. Escherichia coli

Correct Answer:Salmonella

Explanation:

In patients with sickle cell anaemia (SCA), salmonella is the most common causative organism of osteomyelitis.

Staphylococcus aureus is the most common cause of osteomyelitis in other adult patients.

Streptococcus and E. coli are other common causative organisms.

Haemophilus influenzae is a common cause of osteomyelitis in paediatric patients (especially those aged between 4 months to 4 years old).

Further reading:

https://patient.info/doctor/osteomyelitis-pro

Question:

A 38-year-old G3 P2+1 woman presents to the emergency department at 30 weeks gestation. She has been complaining of bright red vaginal bleeding for the past 4 hours. The bleeding has been increasing in severity. She has no associated pain or cramping. Her pregnancy has been relatively uncomplicated to date. The baby was conceived using IVF. At her most recent visit to the GP, it was noted that the baby was in a breech presentation.

Which of the following investigations would be most appropriate to perform first?

A. Kleihauer test

B. Transvaginal ultrasound

C. CT scan

D. MRI

E. Abdominal ultrasound

Correct Answer:Transvaginal ultrasound

Explanation:

This woman is having an antepartum haemorrhage (APH). Vaginal bleeding that is painless in a woman over 24 weeks gestation is characteristic of placenta praevia. Placenta praevia exists when the placenta is inserted entirely or partly into the uterus's lower segment. Placenta praevia is graded by ultrasound findings as:

major, if the placenta covers the internal os of the cervix.

minor or partial, if the leading edge is in the lower segment but not covering the os.

Risk factors for placenta praevia include scarred uterus (e.g. previous caesarean section), previous placenta praevia, assisted reproduction, maternal smoking, increasing parity and advancing maternal age.

The most appropriate investigation to perform first is a transvaginal ultrasound. This will locate the placental edge and confirm placenta praevia. Placenta praevia can also be graded using this imaging modality. Ultrasound imaging is a very safe method of scanning and does not use radiation.

MRI should only be ordered if placenta accreta spectrum or abruption cannot be reliably excluded on ultrasound as the initial investigation.

Abdominal ultrasound is a less accurate method of diagnosing placenta praevia. Abdominal ultrasound can over-diagnose up to 1/4 of cases.

Kleihauer test is a test to quantify fetal-maternal haemorrhage in rhesus negative women. This is an important test to perform when there has been a sensitising event (e.g. APH). However, it does not need to be performed immediately and cannot be used to diagnose placenta praevia.

CT has a limited role in evaluating the location of the implanted placenta.

Further reading:

https://patient.info/doctor/placenta-praevia

Question:

A 54-year-old woman presents to the emergency department with severe pain in the throat, difficulty breathing, and drooling. This has developed over the last 24 hours. She has type 2 diabetes and hypertension, for which she takes metformin and ramipril.

On examination, she is sitting on the edge of the chair, leaning forward. Inspiratory stridor is audible from a distance, with apparent drooling from the mouth. Heart rate is 115 bpm regular, BP 142/87 mmHg, RR 31/min, SpO2 94% on room air, and temperature 38.5°C.

What is the most appropriate immediate management option?

A. Intravenous ketorolac

B. Intravenous morphine

C. Intravenous dexamethasone

D. Nebulised adrenaline

E. Intramsuclar adrenaline

Correct Answer:Nebulised adrenaline

Explanation:

The patient has acute epiglottitis. Although intravenous steroids and antibiotics are required, the patient should be started on an adrenaline nebuliser. This may help to reduce swelling and improve airway patency.

There should be no attempt to examine the patient's throat, and the patient should be left in a position in which they are comfortable. Do not attempt to lay the patient back or flat.

Anaesthetics and ENT assistance should be requested urgently as the patient may require urgent intubation, or if not possible, emergency front-of-neck access, to secure the airway. A fine nasal endoscopy may be performed by ENT to examine the airway prior to intubation.

A lateral neck X-ray may show the 'thumb sign' due to the enlarged epiglottis.

Further reading:

https://geekymedics.com/stridor/

Question:

A 60-year-old man with a 40-pack-year history of smoking was diagnosed with chronic obstructive pulmonary disease (COPD) 3 years ago, and his condition has remained stable since diagnosis. He attends annual clinic appointments with the nurse at his GP surgery and was started on a short-acting beta-agonist (SABA) salbutamol inhaler last year, which he uses when he becomes short of breath. He receives annual flu vaccinations and gave up smoking 2 years ago.

Recently his salbutamol inhaler has not been effective at controlling his breathlessness, and he feels that he requires further treatment. On examination at rest, his chest is clear, his respiratory rate is 20bpm, and his oxygen saturations are 94%. His peak flow reading demonstrates an FEV1 of 60%. He is not cyanotic.

He is wheelchair-bound due to a left foot amputation for vascular disease performed 5 years ago. He also has hypertension and type 2 diabetes mellitus, for which he takes ramipril and metformin, respectively. He has no known allergies.

What would be the next most appropriate management step for this patient?

A. Prescribe a long-acting Beta-agonist (LABA) inhaler + long-acting muscarinic antagonist (LAMA) inhaler

B. Prescribe oral theophylline

C. Prescribe oral corticosteroids

D. Prescribe an inhaled corticosteroid (ICS) inhaler

E. Offer oxygen therapy and pulmonary rehabilitation

Correct Answer:Prescribe a long-acting Beta-agonist (LABA) inhaler + long-acting muscarinic antagonist (LAMA) inhaler

Explanation:

The most appropriate management of this patient would be to prescribe a LABA inhaler + LAMA inhaler. In a patient who is using a short-acting bronchodilator such as salbutamol, a long-acting beta-2 agonist (LABA) inhaler should be offered. In addition to a LABA inhaler, a long-acting muscarinic antagonist (LAMA) inhaler should be offered if there are no asthmatic features. These inhalers are ‘preventers’ as opposed to ‘relievers’ like salbutamol and are used daily. If LABA + LAMA inhalers fail to improve breathlessness, patients can be offered a trial of using an inhaled corticosteroid inhaler, usually for 3 months, to see if this helps with symptoms.

It would be inappropriate to just prescribe an ICS inhaler. If the patient had asthmatic features it would be appropriate to offer a LABA + ICS, but there is no history of asthma in this man.

Oxygen therapy and pulmonary rehabilitation are treatments that are offered for certain COPD patients but would not be appropriate as the next treatment step in this patient. Pulmonary rehabilitation aims to improve a patient’s physical condition through various facets including exercise training and education on nutrition and behaviours that may be beneficial. However NICE recommends not to refer patients who are unable to walk, and although this patient may benefit from the educational aspects of pulmonary rehabilitation, altering medical therapy would be the next most appropriate management step. Oxygen therapy can help to improve survival, but would not be indicated in this patient. Although he is breathless, his examination does not demonstrate hypoxaemia. Oxygen therapy is considered in patients demonstrating signs of hypoxaemia such as oxygen saturations <92% and cyanosis. It is not initiated without specialist assessment. It should also be noted that oxygen therapy cannot be initiated if a patient smokes.

Oral corticosteroids are not typically prescribed for long-term treatment of COPD patients, although they can be used in acute exacerbations. If they are being considered as a long-term treatment respiratory specialist input in secondary care is required and osteoporosis prophylaxis needs to be prescribed.

Oral theophylline would only be considered if short and long-acting bronchodilators did not provide relief, and again would only started in secondary care with the input of a respiratory specialist. It requires monitoring of plasma theophylline levels and dose titration as appropriate.

Further reading:

https://cks.nice.org.uk/topics/chronic-obstructive-pulmonary-disease/management/stable-copd/#basis-for-recommendation-d40

Question:

A 50-year-old woman presents to A&E with abdominal pain, distension, and vomiting that has progressed over the last 24 hours. Her past medical history is significant for an abdominal hysterectomy 10 years ago. An abdominal x-ray reveals multiple dilated loops of small bowel that contain air-fluid levels.

What is the next step in the treatment of this patient?

A. Laparotomy for lysis of lesions

B. Nasogastric tube suction decompression

C. Laparoscopic lysis of adhesions

D. Intestinal angiogram

E. Air enema

Correct Answer:Nasogastric tube suction decompression

Explanation:

Adhesions are fibrous bands that form between tissues as a result of the scarring process and are the number one cause of small bowel obstruction. Any abdominal surgery, such as a hysterectomy, is a risk factor for the development of adhesions. They can result in bowel obstruction at any time following the initial surgery.

Patients with small bowel obstruction commonly present with abdominal pain, abdominal distension and vomiting. Patients can develop severe dehydration and contraction metabolic alkalosis as a result of excessive vomiting.

Other causes of bowel obstruction include hernias, malignancy, intussusception, volvulus and foreign bodies.

The initial treatment of small bowel obstruction thought to be secondary to abdominal adhesions is nasogastric tube suction decompression. Patients should be kept nil by mouth (NBM) until their abdominal distension has resolved and they are able to tolerate a clear liquid diet. The majority of obstructions will resolve on their own with non-surgical management.

Further reading:

https://patient.info/doctor/intestinal-obstruction-and-ileus

Question:

A 38-year-old man comes to the emergency department with a 24-hour history of worsening sharp chest pain. The pain worsens when he is supine and improves when he sits upright. He has never had pain like this before and he denies shortness of breath, diaphoresis or nausea. He is a non-smoker. He has no past medical or family history. He has recently had an upper respiratory tract infection that resolved approximately three days ago.

His temperature is 37.6 ºC, blood pressure is 119/88 mmHg, pulse rate is 92/minute and respiration rate is 16/minute. Physical examination is normal. A chest x-ray is normal, and an electrocardiogram (ECG) shows diffuse ST-segment elevation.

Which of the following is the most appropriate first-line treatment for this condition?

A. Pericardiocentesis

B. Ceftriaxone

C. Vancomycin

D. Glucocorticoids

E. Non-steroidal anti-inflammatory drugs (NSAIDs)

Correct Answer:Non-steroidal anti-inflammatory drugs (NSAIDs)

Explanation:

The patient above has a clinical presentation (position-dependent sharp chest pain, recent viral infection) and ECG findings (diffuse ST-segment elevation) that are consistent with acute pericarditis. Acute pericarditis is inflammation of the pericardium that is typically viral in aetiology. Additionally, given the patient’s young age and lack of atherosclerotic risk factors, acute coronary syndrome is highly unlikely. First-line treatment for pericarditis involves NSAIDs. Second-line agents such as colchicine or glucocorticoids can be considered in patients who have contraindications to NSAIDs or in refractory cases.

Pericardiocentesis would be indicated if the patient was suffering from cardiac tamponade. Cardiac tamponade typically presents with Beck’s triad (hypotension, distended neck veins and muffled heart sounds).

Glucocorticoids are used for treating acute pericarditis in patients who have contraindications to NSAIDs such as severe peptic ulcer disease or upper gastrointestinal bleeding. The relatively young patient in the question stem should be prescribed NSAIDs as a first-line agent.

Vancomycin is useful in severe infections where methicillin-resistant Staphylococcus aureus is thought to be the cause. Although pericarditis can be bacterial in origin, these patients typically present with signs of systemic infection like fevers, chills and tachycardia.

Ceftriaxone is a third-generation cephalosporin that can be used for the management of bacterial pericarditis, however, is not indicated in patients suffering from acute viral pericarditis.

Further reading:

https://patient.info/heart-health/pericarditis-leaflet#nav-4

Question:

A 5-year-old child presents with a 2-day history of fever and irritability, and a new rash. He also complains of pain when looking at bright lights. He is up to date with his immunisations and has just started school. He has no past medical history and no known allergies.

On examination, he is lethargic but responsive to voice. His hands and feet feel cool to the touch, with a non-blanching, purple petechial rash visible on both shins. Heart rate is 120bpm, temperature 38.5°C, and capillary refill time is 3 seconds.

A lumbar puncture demonstrates high opening pressures, a raised neutrophil and protein count, and low glucose concentration in the CSF.

What is the most likely diagnosis?

A. Bacterial meningitis

B. Viral meningitis

C. Tuberculosis meningitis

D. Subarachnoid haemorrhage

E. Fungal meningitis

Correct Answer:Bacterial meningitis

Explanation:

The most likely diagnosis is bacterial meningitis. Bacterial meningitis is most commonly caused by Neisseria meningitidis and Streptococcus pneumoniae in children of this age; infection with Haemophilus influenzae type B (Hib) is now uncommon due to the high uptake of childhood immunisation. Neisseria meningitidis can enter the bloodstream resulting in a classic petechial non-blanching rash, although the absence of a rash does not rule out meningococcal disease. Although vaccinations provide protection against certain meningococcal subgroups (A, B, C, W), they do not protect against all strains so meningitis may still present in vaccinated children. In bacterial meningitis, the CSF is typically cloudy and turbid, and the opening pressure when the CSF sample is obtained may be raised due to the increased intracranial pressure from meningeal inflammation. As the primary responder to bacterial infections, neutrophils will be raised, and a Gram stain and culture can be performed to demonstrate the presence of bacteria in the CSF. Glucose will be low due to increased metabolism by bacteria and immune cells responding to the infection, and protein raised.

Viral meningitis is more common than bacterial meningitis, accounting for over half of meningitis cases, but will not present with a meningococcal rash and can be distinguished by CSF analysis. CSF is usually clear rather than cloudy. Although white blood cells are also likely to be raised, a white cell differential will reveal that the white cells are mostly lymphocytes rather than neutrophils. The protein level is usually elevated, but glucose levels will usually be normal (although beware that in HSV infection they may be slightly lowered). CSF PCR can be used to identify viruses present in the CSF.

A patient with tuberculosis (TB) meningitis will be more likely to have a history of TB exposure or risk factors such as living in a developing country. Again, a meningococcal rash would not be present. CSF is typically opaque (and if it is left to settle it classically forms a ‘fibrin web’).

Fungal meningitis is much less common than viral or bacterial meningitis and classically presents in immunocompromised patients more prone to infections with fungi such as Cryptococcus and Candida. A meningococcal rash would not be present, and fever (as well as neck stiffness) are less common in these patients. CSF analysis can appear very similar to bacterial meningitis – with a cloudy appearance, elevated opening pressure and raised white blood cells; as well as low glucose and raised protein. Bacterial culture is useful to distinguish the two.

Subarachnoid haemorrhage does cause an elevated opening pressure when obtaining a lumbar puncture but presents with a very different clinical picture – classically a sudden onset ‘thunderclap headache’. CSF analysis typically reveals initial blood-stained CSF, followed by xanthochromia (in which the CSF appears yellow) >12 hours later. Glucose level is usually normal, and a meningococcal rash would not be present. It usually occurs on a background of trauma or vascular malformation but may be spontaneous.

Further reading:

https://cks.nice.org.uk/meningitis-bacterial-meningitis-and-meningococcal-disease

Question:

A 15-year-old boy is brought into General Practice by his mother with a rash. This began with several small purple-red spots on his legs but this morning the lesions have become more confluent and raised. On further questioning, the boy has a 5-day history of generalised abdominal pain and nausea. He feels generally unwell with diffuse joint pains and his mother reports that she believes he has had a fever at times.

The patient is usually fit and well and reports a short-lived viral illness 3 weeks previously. He takes no regular medications and has no known allergies. In addition, he has no significant family history and both of his parents are well.

On examination, there is a raised, palpable, purpuric rash on the boy's upper legs and buttocks. His abdomen is soft and generally mildly tender. His observations are all within normal limits.

What investigation is most useful to screen for serious complications of the likely underlying diagnosis?

A. Urinalysis

B. Joint x-rays

C. CT head

D. Serum IgA levels

E. Echocardiography

Correct Answer:Urinalysis

Explanation:

The most likely diagnosis is Henoch-Schönlein Purpura (HSP). This is a vasculitis most commonly seen in childhood and is IgA-mediated and autoimmune in origin, often in response to a recent viral infection. The classically associated skin changes are a palpable purpuric rash affecting the back of the legs, buttocks and ulnar aspect of arms. In addition, patients often have abdominal pain, may have bloody diarrhoea and are at an increased risk of intussusception and scrotal involvement.

The most serious complication of HSP is renal involvement (nephritis) and may manifest as haematuria, proteinuria, nephrotic syndrome or renal failure. Urinalysis must, therefore, be carried out in every patient with suspected or confirmed HSP and is a useful investigation for vasculitides in general. Older children and adults who are affected by HSP are at higher risk of long-term renal disease.

Although IgA levels are often raised in the serum, they are non-diagnostic and not helpful in assessing for complications of the disease. Non-specific neurological complaints such as headaches may occur in HSP but there is no routine role for the use of CT head scanning. Joints may become swollen and tender but permanent joint deformity does not occur and joint x-rays are of limited use unless there is the concern of another underlying pathology. Echocardiography is recommended in children with Kawasaki disease to screen for aneurysms but has no routine use in HSP.

Further reading:

https://patient.info/doctor/henoch-schonlein-purpura-pro#nav-5

Question:

A 41-year-old primip attends her 36-week growth scan for suspected intrauterine growth restriction. She was last reviewed 4 days ago by her community midwife when her blood pressure was 150/98 mmHg. She was referred in to the hospital for assessment and commenced on labetalol 200mg BD. At the time, her urine dip test showed no proteinuria. Her symphysis-fundal height was measuring small for gestation and so she was booked for a growth scan and discharged home with follow up in a week. Over the last few days, she has started to feel unwell with worsening frontal headaches, nausea and blurred vision. She has been feeling increasingly short of breath. She is usually fit and well with a BMI of 39. Whilst in the waiting room, the patient collapses and has a generalised tonic-clonic seizure.

What is the most likely diagnosis?

A. Eclampsia

B. Epilepsy

C. Migraine

D. Intracranial space-occupying lesion

E. Pre-eclampsia

Correct Answer:Eclampsia

Explanation:

The most likely diagnosis is eclampsia. The patient initially presented with pregnancy-induced hypertension (BP >140/90 mmHg, no proteinuria). This rapidly progressed to pre-eclampsia and was then complicated by eclampsia.

In pregnancy, normal BP is <140/90 mmHg. BP is expected to drop by 30/15mmHg in the second trimester then rise to pre-pregnancy levels by term. Pre-eclampsia is diagnosed when the BP is over 140/90 mmHg and significant proteinuria is present. It is important to note that hypertension usually precedes proteinuria. Any type of hypertensive disease in pregnancy can progress to pre-eclampsia, antihypertensives do not alter the progression of the condition.

Eclampsia is a complication of pre-eclampsia causing generalised tonic-clonic seizures. Over a third of eclamptic fits occur before proteinuria and hypertension have been documented. Eclamptic seizures occur when there is increased vascular permeability causing cerebral oedema. Note that the patient had increasing shortness of breath suggesting she had also developed pulmonary oedema.

This patient had several risk factors for pre-eclampsia; maternal age >40, primiparity and raised BMI. Additionally, she developed hypertensive disease in pregnancy which progressed to pre-eclampsia (although undiagnosed). This was evidenced by her symptoms of headache and visual disturbance. There were also fetal signs of pre-eclampsia; impaired uteroplacental circulation leading to fetal growth restriction. However, this is not the correct answer as at the time of collapse she had developed eclampsia.

Intracranial space-occupying lesions (SOLs) rarely present in pregnancy. SOLs are a cause of headaches and seizures however given the context of raised BP and SOB in pregnancy it is not the most likely diagnosis

This patient had no history of seizures, a new diagnosis of epilepsy in pregnancy is therefore unlikely given the context.

Seizures are not a feature of migraine.

Further reading:

https://emj.bmj.com/content/17/1/7

Question:

A 40-year-old sexually active, multiparous woman presents with complaints of irregular menstrual bleeding and foul-smelling vaginal discharge, postcoital spotting and pelvic pain for 5-months. She has not attended any pap smear appointments for the past 10 years. She has a past medical history of pelvic inflammatory disease. Per vaginal examination reveals an exophytic growth with indurations in the cervix.

What is the most appropriate investigation?

A. Pap smear with high risk HPV testing

B. Trans-vaginal ultrasound

C. Coloposcopy with a biopsy

D. Pelvic ultrasound

E. Pelvic MRI

Correct Answer:Coloposcopy with a biopsy

Explanation:

The next best step is performing a colposcopy with a biopsy. Based on the findings of history and examination it is likely to be a malignant cervical growth. Colposcopy is a procedure using a colposcope to examine the vagina, cervix and anus for precancerous lesions or abnormalities, It allows magnified visualization of the epithelium to guide biopsy sampling for histologic diagnosis. It is indicated if there is a gross abnormality noted on pelvic examination.

Similarly, a cervical biopsy is usually done when abnormalities are found during a pelvic exam, pap smear, and/or HPV test. It is often performed along with colposcopy, these are a few types of cervical biopsy (i.e. punch biopsy, cone biopsy and endocervical curettage).

A Pap smear with high-risk HPV testing is performed as part of screening for cervical cancer in this case it is not the investigation of choice as findings of the pelvic scan are indicative of advanced disease.

Pelvic MRI is not routinely performed in the diagnosis of cervical cancer.

Transvaginal and pelvic ultrasound are great modalities for the detection of pelvic pathologies but are not the best investigation in this case.

Further reading:

https://www.nice.org.uk/guidance/conditions-and-diseases/cancer/cervical-cancer

Question:

A 16-month-old boy is brought to the emergency department by his parents after witnessing a 'fit' at home. His parents describe a single episode where the boy became unresponsive, went stiff and then began jerking his limbs. This episode lasted approximately 3 minutes. Afterwards, the boy appeared sleepy but was responsive to his parents.

His parents report an ongoing febrile illness with coryzal symptoms lasting two days. They have treated him with regular oral paracetamol at home. After the fit, they administered another dose of paracetamol as he felt 'very hot'.

On examination, the child is alert and playing with toys. His temperature is 38.8°C, respiratory rate 24/min, blood pressure 92/55 mmHg and SpO2 99% on room air. Neurological examination is normal with no neck stiffness noted.

What is the most likely diagnosis?

A. Epilepsy

B. Acute encephalopathy

C. Infantile spasms

D. Febrile seizure

E. Breath-holding spell

Correct Answer:Febrile seizure

Explanation:

The most likely diagnosis in this patient is a febrile seizure - a seizure occurring in infants in the context of febrile illness, without central nervous system involvement, and fever (any temperature higher than 38°C). Febrile seizures are further classified as simple or complex, depending on the duration, movements and recurrence. This patient likely experienced a simple febrile seizure, as the history suggests an isolated, tonic-clonic episode lasting for 5 minutes only with rapid recovery. Despite recent paracetamol, this child is still pyrexial, suggesting a previous spike in temperature provoked this seizure episode.

Infantile spasms (IS) are a specific seizure type presenting in the first year of life, most commonly between 3 and 9 months. The spams in IS cause flexion of the trunk with stiffness and extension of the limbs. The history in this patient is not suggestive of IS, and the presence of fever makes this a less likely diagnosis.

A diagnosis of epilepsy should only be made when at least two unprovoked seizures occur more than 24 hours apart. This patient has a history of systemic illness and fever, suggesting this seizure is 'provoked' in nature, and only one episode of seizure has occurred, making epilepsy an unlikely diagnosis at this time.

A breath-holding spell is a diagnosis that should be suspected in an afebrile infant with an apparent apnoeic attack. Other suggestive features in the history include cyanosis and transient loss of consciousness. The history in this child is not suggestive of a breath-holding spell.

A serious differential to consider in paediatric patients presenting with seizure is acute encephalopathy. Patients with acute encephalopathy typically present following a viral prodrome or exposure to toxins such as aspirin, vomiting and profound impairment of consciousness with multiple seizures. The history and examination in this child are not suggestive of acute encephalopathy; therefore, this is a less likely diagnosis.

Further reading:

https://cks.nice.org.uk/topics/febrile-seizure/background-information/definition/

Question:

A 72-year-old patient with known chronic obstructive pulmonary disease (COPD) presents to her GP with worsening dyspnoea. She is currently prescribed a combination LABA+LAMA+ICS inhaler, alongside a SABA inhaler PRN. She reports good concordance, and her inhaler technique is good. The GP considers if long-term oxygen therapy (LTOT) would be suitable for this patient.

Which of the following features should prompt a referral for long-term oxygen therapy?

A. Forced expiratory volume in 1 second (FEV1) 55% of predicated

B. Peripheral oedema

C. Anaemia

D. Breathlessness impacting quality of life

E. Oxygen saturations of 94% of less breathing air

Correct Answer:Peripheral oedema

Explanation:

Chronic obstructive pulmonary disease (COPD) is characterised by persistent respiratory symptoms and airflow obstruction, usually progressive and not fully reversible. Spirometry is the diagnostic investigation in COPD and will demonstrate a reduced forced expiratory volume in 1 second (FEV1), a normal or reduced forced vital capacity (FVC), and a reduced FEV1/FVC ratio. NICE states that patients with COPD should be referred for consideration for long-term oxygen therapy (LTOT) if they have:

Oxygen saturations of 92% or less breathing air

Very severe (forced expiratory volume in 1 second [FEV1] less than 30% predicted) or severe (FEV1 30–49% predicted) airflow obstruction

Cyanosis

Polycythaemia

Peripheral oedema

Raised jugular venous pressure

LTOT must be used for at least 15 hours a day to provide any benefit. Assessment involves two arterial blood gas readings at least 3 weeks apart, in patients with stable COPD with optimal medical management and non-smokers. LTOT should be offered to these patients with a pO2 <7.3kpa, or pO2 <8.0kpa if any of the following are present:

Pulmonary hypertension

Secondary polycythaemia

Nocturnal hypoxaemia

Peripheral oedema

Further reading:

https://cks.nice.org.uk/topics/chronic-obstructive-pulmonary-disease/

Question:

A 38-year-old woman has a two-unit transfusion of group A RhD negative blood following a complicated open appendicectomy. One week later, she notes that her sclera are slightly jaundiced. Her GP requests a blood count, which shows that her haemoglobin has fallen by approximately 20g/L. Two years ago, she received her first blood transfusion following an emergency caesarean section.

What complication of transfusion is she most likely to have suffered?

A. Intravascular haemolysis

B. Autoimmune haemolysis

C. Transfusion-associated infection

D. Immune sensitisation to RhD

E. Delayed haemolytic transfusion reaction

Correct Answer:Delayed haemolytic transfusion reaction

Explanation:

The most likely complication of transfusion, in this case, would be a delayed haemolytic transfusion reaction. This occurs typically in patients who have received transfusions in the past; often, these patients may have very low antibody titres that appear undetectable on pretransfusion testing so that seemingly compatible units of red blood cells are transfused. Exposure to antigen-positive red blood cells then provokes an anamnestic response and increased production of corresponding antibodies. Several days after transfusion, the antibody titre becomes high enough to haemolyse transfused red blood cells, manifesting in clinical symptoms. In this patient, the combination of jaundice and a drop in the haemoglobin to the pre-transfusion level suggests a haemolytic complication, and the one-week interval between transfusion and the presenting symptoms is typical of a delayed transfusion reaction.

Intravascular haemolysis as a result of mismatched transfusion is usually caused by ABO incompatibility; this occurs immediately due to the presence of preformed IgM ABO antibodies. Patients typically manifest acute circulatory compromise and are likely to need intensive support.

RhD sensitisation would not occur in this scenario as the patient has been transfused with RhD-negative blood.

Transfusion-associated infection is exceedingly rare in clinical practice. Transfusion of bacterially contaminated blood would be expected to induce an immediate and severe clinical picture of fever and circulatory compromise; virally infected blood (e.g. hepatitis B/C) would not be expected to produce a clinical picture of anaemia and jaundice one week following transfusion, and current practice ensures transfused blood is meticulously screened for viral infection prior to its entry to the blood bank.

Autoimmune haemolysis is theoretically possible and compatible with the presenting symptom of scleral jaundice, but the balance of probabilities in a recently transfused patient makes a delayed transfusion reaction much more likely.

Further reading:

https://geekymedics.com/blood-transfusion-osce-guide/

Question:

A 42-year-old man presents to A&E with chest pain. He developed sudden onset chest pain 30 minutes ago and it has not improved. He has a past medical history of type 1 diabetes and hypertension.

Vital signs are as follows:

Heart rate: 120 bpm

Blood pressure: 72/31 mmHg

Oxygen saturations on room air: 72%

On examination, he looks unwell and is peripherally cool. Auscultation of the chest reveals bilateral crepitations, wheeze and normal heart sounds.

What is the most probable type of shock?

A. Distributive shock

B. Neurogenic shock

C. Cardiogenic shock

D. Obstructive shock

E. Septic shock

Correct Answer:Cardiogenic shock

Explanation:

This gentleman is in cardiogenic shock following an acute myocardial infarction. He has acute heart failure with hypotension and pulmonary oedema. He needs urgent critical care involvement to facilitate primary percutaneous coronary intervention (PCI).

Distributive shock is hypoperfusion caused by vasodilation.

Septic shock is a subtype of distributive shock characterised by hypotension resistant to fluids in a patient with an infection.

Neurogenic shock is also a subtype of distributive shock caused by disruption of the autonomic pathways within the spinal cord (e.g. after spinal cord trauma).

Obstructive shock is hypoperfusion due to physical obstruction to the great vessels into or out of the heart.

Further reading:

https://lifeinthefastlane.com/ccc/shock-ddx/

Question:

A 53-year-old woman presents to her general practitioner (GP) with a 3-month history of painful pins and needles affecting her feet. This is present most of the time but seems to be worse at night. She has also been finding it increasingly difficult to keep her balance, and often finds herself unsteady on her feet.

The patient has a history of alcoholic liver disease and continues to drink 1 litre of vodka per day. She has no other medical problems. She is prescribed thiamine but admits to not taking this regularly and takes no other medications.

What is the most likely cause of her symptoms?

A. Diabetic neuropathy

B. Lead poisoning

C. Hypothyroidism

D. Vitamin B12/folate deficiency

E. Alcoholic neuropathy

Correct Answer:Alcoholic neuropathy

Explanation:

This patient has symptoms suggestive of painful peripheral sensory neuropathy. Given her history, alcoholic neuropathy is the most likely diagnosis. This may accompany thiamine deficiency and other nutritional disturbances. Other symptoms may include loss of sensation and the patient should have a full neurological examination performed to elicit signs of peripheral neuropathy, including sensory loss in a ‘glove and stocking’ distribution, loss of vibration sense and impaired proprioception.

All of the other options listed are causes of peripheral neuropathy. Vitamin B12/folate deficiency may be secondary to diseases such as pernicious anaemia, and there is no reason to suggest that this is more likely in this patient than alcoholic neuropathy. Likewise, she has no history of diabetes mellitus or hypothyroidism and no other symptoms suggestive of either of these. Lead poisoning is uncommon and usually presents with primarily motor neuropathy rather than sensory.

In practice, it would be appropriate to test thyroid function and B12/folate levels as well as testing for diabetes, although alcoholic neuropathy is the most likely working diagnosis.

Further reading:

https://patient.info/doctor/polyneuropathies

Question:

A 7-day-old baby boy is referred to the hospital by the GP due to an absence of bowel movements, abdominal distension and vomiting. The child passed meconium late in the third day of life and has not produced dirty nappies since. He is still passing good volumes of urine, but his feeding is reduced and he is vomiting regularly. There is no significant family history and there were no issues during the pregnancy or vaginal delivery.

Clinical examination reveals a distended abdomen which is tympanic on percussion. Vital signs are normal.

What would be the most appropriate investigation to confirm the likely diagnosis?

A. Abdominal x-ray

B. Serum lactate

C. CT abdomen

D. Rectal suction biopsy

E. Stool culture

Correct Answer:Rectal suction biopsy

Explanation:

This neonate likely has a diagnosis of Hirschsprung’s disease, caused by an absence of parasympathetic ganglion cells in the myenteric and submucosal plexus of the rectum, possibly extending to the colon. This results in functional bowel obstruction. The condition tends to present within the first two years of life, with more severe cases presenting earlier with obstruction and milder cases presenting later with constipation. The most appropriate investigation to confirm the diagnosis is a rectal suction biopsy. The histology from this investigation can provide a definitive diagnosis of Hirsprung's disease.

Typical presenting features of Hirsprung's disease in the neonatal period include abdominal distension, vomiting and failure to pass meconium within the first 48 hours of life. Older children and infants may present with chronic constipation that is resistant to the usual treatments. Some children will develop enterocolitis secondary to Hirsprung's disease, which presents with abdominal pain, fever, bloody diarrhoea and vomiting. Clinical examination will usually reveal abdominal distension which is tympanic to percussion.

An abdominal X-ray may reveal dilated loops of bowel suggestive of bowel obstruction, but it would not provide a definitive diagnosis.

Serum lactate may be raised in the context of bowel obstruction and enterocolitis, however this would not provide a definitive diagnosis as it is a non-specific marker of poor end-organ perfusion.

A CT abdomen may be used to further assess bowel obstruction, but it would not provide a definitive diagnosis.

Stool culture would be unlikely to provide any useful information in this scenario, given the child does not have diarrhoea or fever.

Further reading:

https://patient.info/doctor/hirschsprungs-disease-pro

Question:

A 68-year-old man presents following a number of falls in his home. His wife has noticed that he’s been walking more slowly for the past couple of months, and he has tripped on a rug at home a number of times.

Thankfully, he has never been badly hurt and has never lost consciousness during these falls. He doesn’t feel dizzy before the falls but has noticed dizziness if he stands up from his chair too quickly. He says he feels more unsteady on his feet and very off balance. He is embarrassed to admit that he has wet himself without warning number of times. He only realised once his trousers were wet. He has struggled to go out in public for fear of it happening in a public place. Furthermore, when asked directly, he admits to being unable to get an erection, something he has only noticed over the last couple of months.

On examination, you notice a hunched posture, with slowing of movements. He is unsteady on his feet, walking slowly and with his legs far apart. You notice horizontal nystagmus but no other problems with gaze. Babinski sign is positive.

What is the most likely diagnosis?

A. Drug-induced parkinsonism

B. Progressive bulbar palsy

C. Multiple system atrophy

D. Progressive supranuclear palsy

E. Parkinson’s disease

Correct Answer:Multiple system atrophy

Explanation:

This patient seems to be presenting with multiple system atrophy (MSA). This is a rare neurodegenerative condition and is considered one of the Parkinson’s plus syndromes. Patients often present with Parkinsonian symptoms alongside autonomic disturbance – most commonly urogenital problems. Cerebellar ataxia and postural hypotension are also common, as seen in this patient. A positive Babinski sign is part of the diagnostic criteria.

Parkinson’s disease, whilst much more common, is the less likely diagnosis here. The patient lacks the classic pill-rolling tremor, and whilst postural hypotension is common in patients with Parkinson’s disease, urinary incontinence is not usually seen. Patients with Parkinson’s may have some problems with balance and falling, but the examination findings suggest cerebellar ataxia which is more in keeping with MSA.

Drug-induced parkinsonism is an important diagnosis to consider, although this would present slightly differently. Again, the urinary and ataxic symptoms would be unlikely, and the patient is not taking any medications known to induce parkinsonism. Medications such as metoclopramide and haloperidol could induce these symptoms.

Progressive supranuclear palsy is another Parkinson’s plus syndrome, and this is characterised by walking difficulties and frequent falls. However, some of the more distinctive features are missing in this patient; you would normally expect difficulty with upward gaze and keeping the eyelids open, as well as speech and swallowing problems.

Progressive bulbar palsy is a type of motor neuron disease and is characterised by difficulties with chewing, speaking and swallowing. It has the worst prognosis of the motor neuron diseases, with a life expectancy of 6 months – 3 years.

Further reading:

https://patient.info/doctor/multiple-system-atrophy

Question:

A 41-year-old female is brought to the emergency department via ambulance after being involved in a major car accident. Ambulance staff report the patient has suffered significant chest trauma.

Physical examination demonstrates a patent airway and spontaneous breathing. She has significant bruising on her anterior thorax. Her capillary refill time is delayed and her extremities are cool to touch. Auscultation reveals muffled heart sounds and her jugular venous pressure is elevated on observation.

Pertinent vital signs are shown below:

Blood pressure: 92/60 mmHg

Heart rate: 132 beats/minute

Respiratory rate: 21 breaths/minute

SpO2: 98% on room air

After establishing intravenous access an electrocardiogram (ECG) is performed. The ECG shows sinus tachycardia, low QRS voltages and large variations in R wave amplitude.

What is the most likely diagnosis?

A. Costochondritis

B. Myocardial infarction

C. Pulmonary embolus

D. Tension pneumothorax

E. Cardiac tamponade

Correct Answer:Cardiac tamponade

Explanation:

This patient’s hypotension, jugular venous distention, muffled heart sounds (collectively known as Beck’s triad) and ECG findings with a recent history of chest trauma are highly concerning for cardiac tamponade. Cardiac tamponade occurs when there is increasing pressure in the pericardial space leading to poor diastolic filling of the right heart and consequently low cardiac output and hypotension. ECG findings include sinus tachycardia, low QRS voltages and electrical alternans (beat to beat variations in the R wave amplitudes). Causes of cardiac tamponade include trauma, malignancy, proximal aortic artery dissection and uraemia. The patient in the above scenario is likely to have suffered from massive chest trauma leading to bleeding into the pericardial space.

Tension pneumothorax can present with signs of shock, however, a deviated trachea to the contralateral side of the pneumothorax is likely to be seen in these patients. Additionally, the ECG findings presented in the question stem are not characteristic of a tension pneumothorax.

Although pulmonary emboli can lead to haemodynamic instability, patients typically present with pleuritic chest pain, hypoxia and acute dyspnoea. Additionally, the ECG findings presented are not characteristic of a pulmonary embolus. The most common ECG finding in patients who have pulmonary embolism is sinus tachycardia.

Although myocardial infarction can lead to haemodynamic compromise, ST-segment changes are likely to be seen on ECG. The ECG findings and the clinical context of significant chest trauma are of more indicative of cardiac tamponade.

Costochondritis is a common cause of non-cardiac chest pain. It is unlikely to cause an acute change in vital signs or ECG changes. Treatment of costochondritis involves non-steroidal anti-inflammatory drugs (NSAIDs).

Further reading:

https://patient.info/doctor/cardiac-tamponade

Question:

A new blood test is developed for detecting Coeliac disease. 30 individuals are recruited to evaluate the test and the results are shown below.

Coeliac disease No Coeliac disease

Test positive 8 2

Test negative 2 18

What is the likelihood ratio for a positive result on this new test?

A. 2

B. 18

C. 8

D. 9

E. 4

Correct Answer:8

Explanation:

The positive likelihood ratio (LR+) is the probability that a positive result is a true positive versus a false positive. For example, a positive likelihood ratio of 8 means that a patient with a positive result has 8 times higher odds of truly having the disease than not.

The positive likelihood ratio can be calculated by dividing the proportion of patients with the disease who test positive (8/(8+2) = 0.8) by the proportion of patients without the disease who test positive (2/(2+18) = 0.1, which gives a positive likelihood ratio of 8. Note that the positive likelihood ratio can also be calculated from the sensitivity and specificity using the formula below:

Further reading:

https://geekymedics.com/statistics-for-medical-students/

Question:

A 44-year-old man presents to his GP with a history of diarrhoea which began approximately 3 months previously. After undergoing investigations he is diagnosed with giardiasis.

Which of the following medications is most likely to be curative for this condition?

A. Azithromycin

B. Loperamide

C. Metronidazole

D. Ciprofloxacin

E. Pancreatin (Creon)

Correct Answer:Metronidazole

Explanation:

Metronidazole is the treatment of choice for giardiasis. Giardiasis is a disease characterised by diarrhoea, often following travel to endemic areas. It is caused by the giardia parasite and classically causes chronic watery, foul-smelling, greasy stools.

Loperamide can be used symptomatically for diarrhoea to help prevent dehydration but is not a curative treatment. Pancreatin (Creon) is used in cases of pancreatic insufficiency to replace pancreatic enzymes and aid digestion.

Ciprofloxacin and azithromycin are sometimes used for traveller's diarrhoea, but would not be helpful for giardiasis as this is caused by a protozoan.

Further reading:

https://patient.info/doctor/giardiasis

Question:

A 75-year-old female is referred to your outpatient clinic because of renal impairment. Her past medical history includes shingles 6 weeks ago and depression. She takes no regular medications. The patient tells you that she feels fatigued and has been suffering from recent headaches and back pain.

On clinical examination, there are widespread bruises to both upper and lower limbs. Blood pressure is 168/92 mmHg.

Blood tests reveal the following:

Creatinine 389 umol

Na 142 mmol

K 5.4

Ur 7.6

Hb 9.2 g/dl

WBC 3.1

Pl 123

Albumin 39 g/L

Prothrombin time 14 sec

Total protein 87 g/L

Adjusted calcium 2.9 mmol

HbA1c 40 mmol

Urine protein creatinine ratio of 390 mg/mmol

What is the most likely cause of renal impairment?

A. Renal sarcoidosis

B. Lupus nephritis

C. Diabetic nephropathy

D. Chronic dehydration

E. Myeloma kidney

Correct Answer:Myeloma kidney

Explanation:

This patient’s presentation is concerning for a possible diagnosis of myeloma. A myeloma diagnosis would account for the anaemia, apparent immunoparesis causing shingles, bruising caused by thrombocytopenia, hypercalcaemia and headaches caused by plasma hyperviscosity. Hyperviscosity is typically observed when plasma viscosity reaches 4-5 centipoises as a result of excessive serum globulin levels. Further diagnostic tests would usually confirm a serum paraprotein and bone marrow biopsy would reveal raised numbers of plasma cells.

Lupus nephritis is amongst the differential diagnosis and could account for the bone marrow suppression, headaches, back pain and nephrotic range proteinuria. However, it would not typically present with a raised total protein (which in this case is due to circulating globulins) or hypercalcaemia.

Whilst sarcoid is known to affect the kidneys and cause hypercalcaemia, it would not account for the patient's nephrotic range proteinuria, as it is a tubulointerstitial rather than a glomerular disorder.

Chronic dehydration would not account for the extrarenal manifestations of disease present in the clinical vignette.

Diabetic nephropathy is usually a slowly progressive disease and would not exhibit the extra-renal symptoms described here.

Further reading:

https://patient.info/doctor/myeloma-pro

Question:

A 45-year-old male presents to the emergency department complaining of upper abdominal pain that is radiating to his back. It is relieved by leaning forward. He is unable to eat and has had 3 episodes of vomiting since the onset of pain last night.

He has a past medical history of alcohol misuse and depression, with an alcohol intake of 20 units a week. He denies recreational drug use. He is currently living alone and has no recent travel history.

He has a temperature of 38.2, heart rate of 105bpm, respiratory rate of 22bpm and blood pressure of 100/80mmHg. On abdominal palpation, there is marked tenderness of the epigastric region. His mucus membranes are dry. Assessment of the chest reveals reduced breath sounds and a dull percussion note in the right lung base.

Blood tests demonstrate an amylase of 400U/L, white cell count of 17.5x109/L and a CRP of 240U/L. Serum urea is 15mmol/L and serum blood glucose is 8mmol/L. An ABG is performed, demonstrating a PaO2 of 9kPa on room air.

Glasgow criteria are applied to predict the severity of his clinical condition.

Which of the following would be indicative of severe disease in this clinical case according to the Glasgow criteria?

A. Serum urea

B. PaO2

C. Blood glucose

D. Age

E. White blood cell count

Correct Answer:White blood cell count

Explanation:

The parameter that would be indicative of severe acute pancreatitis is the white blood cell count of 17.4x109/L. The Glasgow criteria predict prognosis in acute pancreatitis, with 1 point assigned for each of the following laboratory criteria collected during the first 48 hours following admission:

Age over 55

Serum albumin <32g/L

PaO2 on room air <8kPa

Serum calcium <2mmol/L

Blood glucose >10mmol/L

Serum LDH >600U/L

Serum urea >16.1mmol/L

White blood cell count >15x109/L

The Glasgow criteria can be used for pancreatitis caused by gallstone pathology or alcohol and a score of >2 predicts severe pancreatitis.

Age is incorrect as age >55 is an indicator of severe disease and this man is 45.

PaO2 is incorrect as a PaO2 of <8kPa on room air is an indicator of severe disease, but in this case PaO2 is 9kPa.

Blood glucose is incorrect as a blood glucose >10mmol is an indicator of severe disease, but in this case blood glucose is 8mmol/L.

Serum urea is incorrect as a serum urea >16.1mmol/L is an indicator of severe disease, but in this case serum urea is 15mmol/L.

Further reading:

https://patient.info/doctor/acute-pancreatitis-pro

Question:

A newborn baby girl is undergoing a newborn infant physical examination (NIPE).

The mother explains that she only had the 12-week (dating) scan and refused further investigations because she wanted to "trust her body". The mother is 35 years old, with no significant past medical history. She reports both pregnancy and delivery were normal.

On general inspection, the baby girl is noted to have a flattened nasal bridge, protruding tongue and upward slanted eyes with prominent epicanthic folds. On auscultation of the chest, a pan systolic murmur is noted.

What is the most likely diagnosis in this patient?

A. Patau syndrome

B. Edwards syndrome

C. Zellweger syndrome

D. Down syndrome

E. Turner syndrome

Correct Answer:Down syndrome

Explanation:

The most likely diagnosis in this patient is Down syndrome (DS), also known as trisomy 21, the most common chromosomal abnormality affecting liveborn infants. The risk of trisomy 21 increases significantly with maternal age (by age 35, the risk increases to ~1/350). Clinically, DS is characterised by dysmorphic facial features (e.g. upslanting palpebral fissures, epicanthic folds, flat nasal bridge), congenital organ defects (e.g. congenital heart defect) and endocrine disorders (e.g. hypothyroidism). Whilst DS is typically detected during routine antenatal scans and subsequent investigations, this patient's mother did not attend her recommended scans; therefore, appropriate testing was not performed. Examination revealed some dysmorphic features, and a pan-systolic murmur, suggesting the presence of a ventricular septal defect (VSD) - a congenital heart malformation commonly associated with DS.

Patients with Turner syndrome may present with features such as a webbed neck, high-arched palate and widely spaced nipples; however, this condition is classically only identified in teenagers, who present with primary amenorrhoea and delayed puberty.

Zellweger syndrome, also known as cerbrohepatorenal syndrome, is an autosomal recessive condition that results in impaired peroxisome synthesis. Typical clinical features include neonatal seizures, hypotonia, hepatomegaly and prolonged jaundice. Whilst DS can also cause muscle hypotonia, this child has no clinical features to suggest Zellweger syndrome is the most likely diagnosis.

Trisomy 13, also known as Patau syndrome, is a chromosomal condition caused by three copies of chromosome 13. Clinical features include microcephaly, cleft lip ± palate and polydactyly. Patau syndrome can also result in congenital heart defects, such as VSD; however, the dysmorphic features noted in this patient are not in keeping with Patau syndrome.

Trisomy 18, also known as Edwards syndrome, is a chromosomal condition caused by three copies of chromosome 18. Clinical features include micrognathia, microcephaly, and rocker-bottom feet. Edwards syndrome can also result in congenital heart defects, such as VSD; however, the dysmorphic features noted in this patient are not in keeping with Edwards syndrome.

Further reading:

https://patient.info/doctor/downs-syndrome-trisomy-21

Question:

You are called to see a 30-year-old female post-laparoscopic investigation for endometriosis. She is complaining of severe central chest pain that started gradually 2 hours after her laparoscopy. She states that the pain is sharp in nature and sometimes radiates to her upper abdomen. She states that the pain is worsened by deep breathing, coughing and lying flat. The only thing that seems to improve the pain is leaning forward. She has taken paracetamol and 5mg of oramorph neither of which has helped to alleviate the pain. She has no other associated symptoms and otherwise feels well in herself. She has never had any issues like this previously.

She has no significant past medical history or drug allergies. She takes the combined oral contraceptive pill but no other regular medications. She has no significant family history and does not smoke. Vital signs are unremarkable.

Clinical examination reveals a mildly distended abdomen in keeping with her recent procedure, but no other abnormal findings in any major body system. Her BMI is within the normal range. Urinalysis is normal. An ECG shows concave ST-segment elevation in leads V1-V6.

Which of the following is the most appropriate immediate management option?

A. Low-molecular weight heparin (LMWH)

B. Watch and wait

C. Naproxen 250mg

D. Thrombolysis

E. Aspirin 300mg

Correct Answer:Naproxen 250mg

Explanation:

Naproxen is the most appropriate first-line management option for suspected pericarditis. It is an NSAID that can help to reduce inflammation of the pericardium and thus alleviate pain. NICE recommends a dose of 250mg every 6-8 hours.

Aspirin 300mg is typically used in the management of myocardial infarction, which is unlikely in this scenario given the patient's age and absence of cardiovascular risk factors.

LMWH is typically used in the management of deep vein thrombosis (DVT) and pulmonary embolism (PE). The clinical findings in this scenario do not fit well with a diagnosis of PE (normal vital signs, normal clinical examination).

Thrombolysis is indicated for massive PE (i.e. with haemodynamic instability) or acute stroke. The patient does not fit any criteria for the use of thrombolysis.

Further reading:

https://patient.info/doctor/acute-pericarditis

Question:

Mrs J, a 62-year-old woman, presents to her GP with a history of excruciating pain in her left cheek for the past week. She describes it as someone putting a hot poker across her face and it keeps coming and going. It can be triggered by touch or going outside. She has never had anything like this in the past and has no other medical problems.

What is the most appropriate treatment for this patient?

A. Carbamazepine

B. Gabapentin

C. Codeine phosphate

D. Amitriptyline

E. Duloxetine

Correct Answer:Carbamazepine

Explanation:

Mrs J is describing a classic case of trigeminal neuralgia. The pain is “lancinating” and unilateral, in the maxillary (V2) distribution of the trigeminal nerve. It is triggered by touch which is very common.

Trigeminal neuralgia is a neuropathic cause of pain and is best treated with neuropathic agents. All of the above except for codeine phosphate are neuropathic agents but NICE recommends carbamazepine as the first-line agent in trigeminal neuralgia.

Further reading:

https://cks.nice.org.uk/trigeminal-neuralgia#!scenario

Question:

A 62-year-old male presents to the emergency department with a distended abdomen. He has presented to the same hospital in the past due to alcohol intoxication, variceal bleeding and ascites. He has known liver cirrhosis secondary to chronic alcohol abuse.

His vital signs are as follows:

Temperature: 37.0 Celsius

Blood pressure: 122/90 mmHg

Respiratory rate: 18 breaths/minute

Heart rate: 81 beats/minute

SpO2 = 98% (room air)

Physical examination is significant for hepatomegaly and shifting dullness on percussion. There is no hepatic flap.

Diagnostic paracentesis is performed and analysis of the ascitic fluid confirms the presence of neutrophils >250/mm3 suggestive of spontaneous bacterial peritonitis (SBP).

Which of the following medications would be most appropriate to prevent future cases of SBP in this patient?

A. Vancomycin

B. Ciprofloxacin

C. Ceftriaxone

D. Lactulose

E. Propranolol

Correct Answer:Ciprofloxacin

Explanation:

Ths patient has ascitic tap findings and a clinical picture consistent with spontaneous bacterial peritonitis (SBP). Whilst he will also be needed to be treated for his current episode of SBP with a third-generation cephalosporin such as ceftriaxone, the question focuses on the prophylactic management for SBP. As SBP is most commonly caused by gut bacteria such as Escherichia coli and Klebsiella, prophylactic regimens include trimethoprim-sulfamethoxazole or fluoroquinolone therapy (ciprofloxacin or norfloxacin). Prophylactic antibiotics for SBP are recommended in patients with previous episodes of SBP or those with low serum albumin, elevated prothrombin time or low ascitic fluid.

Vancomycin is useful in severe infections where methicillin-resistant Staphylococcus aureus is thought to be the cause. SBP is more likely to be caused by enteric bacteria.

Ceftriaxone is a third-generation cephalosporin that is used in the management of SBP but is not used as a prophylactic agent for this condition.

Propranolol is a non-specific beta-blocker that is used in prophylaxis of variceal bleeding but does not have a role in the prophylaxis of SBP

Lactulose is a synthetic disaccharide used in the treatment of constipation and hepatic encephalopathy (HE). The patient above does have not have any signs of HE (asterixis, slurred speech, vomiting or blurred vision).

Further reading:

https://patient.info/doctor/intra-abdominal-sepsis-and-abscesses

Question:

A 55-year-old woman attends her GP practice for a review of her rheumatoid arthritis. She reports a flare in her symptoms over the past 4 weeks with increasing pain in her MCP and PIP joints bilaterally. This has been associated with significant stiffness worst early in the morning and lasting for approximately one hour. As a result, she feels her hands have become weaker and she is struggling to grip things. Her current medications include paracetamol, ibuprofen, methotrexate and folic acid.

On examination she is apyrexial. There is obvious swelling and redness over the MCP joints and the MCP squeeze test is positive. The GP decides to order an X-ray of her hands and wrist to check for any underlying damage.

What is the most likely X-ray finding for rheumatoid arthritis?

A. Subchondral sclerosis

B. Joint erosions

C. Osteophyte formation

D. MCP joint subluxation

E. Bone cysts

Correct Answer:Joint erosions

Explanation:

The most common x-ray finding associated with rheumatoid arthritis is joint erosions, which arise as the overlying pannus and ongoing inflammation result in bone destruction.

Subchondral sclerosis is unlikely and is more consistent with osteoarthritis, along with osteophyte formation, reduced joint space and bone cyst formation.

Bone cysts can arise late in rheumatoid arthritis and are not a typical feature.

MCP joint subluxation can occur in severe rheumatoid arthritis, however, it is seen less commonly nowadays with earlier and more effective therapies for the disease.

Further reading:

https://radiopaedia.org/articles/rheumatoid-arthritis-musculoskeletal-manifestations-2

Question:

A 26-year-old patient is brought to the emergency department by ambulance with shortness of breath. He has a background of asthma which is normally well controlled with inhaled salbutamol and clenil modulite.

On examination, he is working hard to complete sentences, although he is alert and oriented. Chest auscultation reveals air entry bilaterally and widespread wheeze. His PEFR is 360 L/min (normally 600 L/min when well).

The ambulance crew have administered 2 litres of oxygen via nasal cannula and they have delivered 2 boluses of inhaled salbutamol en route. Despite this therapy, he continues to be symptomatic.

Observations are as follows:

O2 96% on 2 litres

RR 24/min

HR 100 bpm

BP 130/70 mmHg

Temp 36.7 oC

What is the next most appropriate management step for this patient?

A. Referral to critical care

B. Repeated doses of nebulised salbutamol

C. IV magnesium sulphate

D. Oral theophylline

E. Increased titration of oxygen to 4 litres

Correct Answer:Repeated doses of nebulised salbutamol

Explanation:

The most appropriate next management step involves repeating the dose of nebulised salbutamol.

This patient has presented with a moderate acute exacerbation of asthma which has not fully responded to inhaled bronchodilators. The British Thoracic Society/SIGN have generated guidelines to aid clinicians in calculating the severity of an asthma exacerbation. Parameters used in this classification include respiratory rate, heart rate, peripheral and arterial oxygen levels, peak flow (PEFR), and clinical signs. The classification can be found via the further reading link.

This patient demonstrates features of a moderate asthma exacerbation with tachypnoea, tachycardia, and a PEFR of 60% following initial treatment. The most appropriate next management step would, therefore, be to deliver nebulised Salbutamol in repeated doses (also referred to as ‘back to back nebs’) as per BTS guidelines.

The benefit of nebulisers is that they allow superior drug delivery and concurrent administration of oxygen.

The patient in this scenario is stable, and there is a good chance that he will respond to the nebulised bronchodilators adequately. Therefore a referral to the critical care team at this stage is not required although if nebulised bronchodilators are ineffective, then senior help should be sought.

Oral theophylline and IV magnesium are recommended treatments for severe/life-threatening asthma exacerbations, and would not currently be indicated for this patient.

This patient is maintaining saturations between 94-98% in this scenario, and therefore increased supplemental oxygen is not indicated.

Further reading:

https://www.brit-thoracic.org.uk/quality-improvement/guidelines/asthma/

Question:

A 48-year-old lady presents to A&E with sharp central chest pain that is worse on inspiration and mild shortness of breath. She has no significant past medical history and her only prescribed medication is the combined oral contraceptive pill (COCP). The patient mentions that she has recently returned from a holiday to New Zealand. Vital signs reveal a heart rate of 107bpm, oxygen saturations of 94% on air, respiratory rate of 19, blood pressure of 105/78mmHg and a temperature of 36.5oC. Clinical examination reveals tachypnoea, but no other abnormalities. A chest X-ray is unremarkable.

Which of the following is the most appropriate investigation to perform next?

A. Ultrasound of the legs

B. CTPA

C. D-dimer

D. V/Q scan

E. Peak expiratory flow rate measurement

Correct Answer:CTPA

Explanation:

This patient has presented with typical clinical features of pulmonary embolism (PE) and has several risk factors for the development of PE including recent long-haul travel and the COCP. This patient's Wells score is >4 (i.e. PE likely) and therefore a CTPA should be performed to confirm (or rule out) PE.

D-dimer is a less appropriate investigation in this scenario as the patient has a high pre-test probability of having a PE (Wells score >4). D-dimer should be used to rule out PE in patients with a low pre-test probability of PE (i.e. Wells score <4).

An ultrasound of the legs would be appropriate if there were symptoms or clinical signs of deep vein thrombosis (e.g. unilateral limb swelling, tenderness, distended superficial veins). However, in this scenario, there are no clinical features of deep vein thrombosis present.

V/Q scans can be used to diagnose PE, but they have now been largely superseded by CTPA due to increased sensitivity and specificity.

Peak expiratory flow rate (PEFR) measurement is not appropriate in this scenario. PEFR is typically used in the context of asthma to assess disease severity and response to treatment. This patient has no history of asthma and there are no specific clinical features of asthma mentioned (e.g. no wheeze noted on auscultation).

Further reading:

https://cks.nice.org.uk/pulmonary-embolism#!diagnosissub

Question:

A 65-year-old woman presents to A&E with a painful lump in her groin. The patient describes experiencing pain in the region of her left groin this morning and then noticing a lump. She denies ever having previously noticed the lump. She has not opened her bowels today and has not vomited, but does feel nauseated. She has no significant past medical history.

Clinical examination reveals a mass below and lateral to the pubic tubercle, which is tender and not reducible. Vital signs reveal tachycardia but otherwise normal observations.

What is the most likely diagnosis?

A. Hiatus hernia

B. Obstructed femoral hernia

C. Indirect inguinal hernia

D. Direct inguinal hernia

E. Non-obstructed femoral hernia

Correct Answer:Obstructed femoral hernia

Explanation:

The most likely diagnosis in this scenario is a femoral hernia given the hernia's location (inferior and lateral to the pubic tubercle). It femoral hernia is obstructed as it is irreducible, tender and associated with absent bowel motions and nausea.

Passing beneath the inguinal ligament are some important structures travelling to the upper leg. Most notably this includes the femoral artery, the femoral vein and the femoral nerve. The order in which these structures lie is easily remembered by the ‘NAVY VAN’ mnemonic. With the ‘Y’ signifying the creases of the groin, it illustrates how from lateral to medial the structures lie nerve, artery and then the vein.

The femoral artery and vein are enclosed within a sheath (see diagram below). Lying medial to the femoral vein is a space known as the femoral canal. The function of this space is to allow expansion of the femoral vein in order to increase venous return. In health, the femoral canal contains just a small amount of fatty tissue and a lymph node (known as the lymph node of Cloquet).

This space, particularly in elderly women, can be a defect through which abdominal contents can protrude. It is important to note that this space is quite tight, and it is bordered medially by the sharp edge of the lacunar ligament. Therefore, femoral hernias are at high risk of strangulation and obstruction, as is the case in this scenario.

A hiatus hernia involves herniation of a part of the abdominal viscera through the oesophageal aperture of the diaphragm. This would not present as a lump in the groin.

A direct inguinal hernia is caused by a weakness in the posterior wall of the inguinal canal. The abdominal contents (usually just fatty tissues, sometimes with bowel) are forced through this defect and enter the inguinal canal. This means that the contents emerge in the canal medial to the deep ring.

An indirect inguinal hernia, however, does not pierce the posterior wall. The abdominal contents pass through the deep inguinal ring, passing through the inguinal canal and can exit via the superficial ring.

An appreciation of the anatomical differences can help to distinguish between the two with a clinical exam. The principle of this is that if you can place your finger over the deep inguinal ring (just above the mid-point of the inguinal ligament), then you can control an indirect inguinal hernia which has been reduced. If when you press the deep ring, the hernia still protrudes, then the hernia is emerging via a defect in the posterior wall medial to this point and is, therefore, a direct hernia. It is useful to understand this clinical test as it helps remember the difference between the two, its clinical application, however, is limited as it is not very reliable and doesn’t change management.

Source: Geeky Medics

Further reading:

https://patient.info/doctor/femoral-hernias

Question:

A 45-year-old female is admitted to the acute medical unit following blood tests performed by her GP. She reports several months of general lethargy, fatigue, loss of appetite and intermittent generalised abdominal discomfort.

She has no significant past medical history but reports undergoing concurrent outpatient investigation for rheumatoid arthritis.

The patient denies drinking alcohol. She cooks all the meals in her household and never eats pork. She is sexually active with her partner of 22 years, has never used any illicit substances, has no tattoos and has no significant travel history.

Her initial liver function tests show the following:

ALT: 1989 IU/L

AST: 2043 IU/L

What is the most likely diagnosis?

A. HIV infection

B. Diverticulitis

C. Cholecystitis

D. Viral hepatitis

E. Autoimmune hepatitis

Correct Answer:Autoimmune hepatitis

Explanation:

The most likely diagnosis is autoimmune hepatitis. The patient is female and between the ages of 20 and 50 years old with no identified risk factors for viral hepatitis. Her liver function tests show a hepatitic picture (ALT and AST >1000) and she is under investigation for another autoimmune condition. Viral hepatitis may present very similarly to autoimmune hepatitis and it is important to enquire about risk factors - none are present in this history. Cholecystitis typically causes right upper quadrant pain and is not usually associated with hepatitic LFT derangement. Diverticulitis usually presents with lower GI symptoms of lift iliac fossa pain, bloody stool and urgency to open the bowels. HIV infection is less likely in this patient with no identified risk factors.

Further reading:

https://patient.info/doctor/autoimmune-hepatitis-pro

Question:

A 36-year-old woman presents with a tender lump on the back of her neck. She reports that this lump has been present for several years, slowly increasing in size and occasionally discharging some foul-smelling "cheese-like" discharge. Normally it is painless, however, it sometimes gets infected, becoming red and painful. She has required 4 previous courses of antibiotics for infections of the lump over the last few years. On this occasion, she believes the lump is infected again.

On examination, there is a 3x3cm lump on the posterior aspect of the neck. The lump is firm, tender and erythematous. There is an overlying punctum and the lesion appears slightly fluctuant. There is no associated lymphadenopathy and examination is otherwise unremarkable. Vital signs are normal.

Which of the following is the most appropriate management option?

A. Administer local anaesthetic and express the contents of the lesion

B. Admit to hospital for IV flucloxacillin and plastic surgery review

C. Send an urgent referral for surgical excision

D. Prescribe flucloxacillin and send a non-urgent referral for surgical excision

E. Reassure the patient

Correct Answer:Prescribe flucloxacillin and send a non-urgent referral for surgical excision

Explanation:

The most likely diagnosis is a sebaceous cyst, given the classical history and examination findings. The most appropriate course of action is to prescribe some oral flucloxacillin to treat the acute infection and refer non-urgently for surgical excision of the lesion. The lesion has become infected on several occasions and therefore surgical excision is warranted. Excision is best performed when the sebaceous cyst is not acutely inflamed, and therefore a non-urgent referral, to allow time for the inflammation to settle would be most appropriate.

Sebaceous cysts are often treated conservatively, with simple reassurance and a "watch and wait" approach. However, cysts that become recurrently infected or are cosmetically problematic, can be surgically excised. If the entire cyst capsule is removed, the risk of recurrence is very low.

Hospital admission for IV antibiotics is unnecessary given the patient is systemically well.

It would not be appropriate to express the contents of the cyst, as the cyst capsule will remain in situ, meaning a high likelihood of recurrence.

Further reading:

https://cks.nice.org.uk/neck-lump#!scenario

Question:

An 83-year-old retired farmer presents to his GP concerned about a lump he has noticed on the left side of his face, that has been slowly growing for over a year. On examination, the GP notices a well-defined pearly nodule, with associated telangiectasia and a necrotic centre.

What is the most appropriate initial management for this lesion?

A. Imiquimod cream

B. Punch biopsy

C. Reassurance

D. Surgical excision

E. Radiotherapy

Correct Answer:Surgical excision

Explanation:

This patient has a basal cell carcinoma (BCC), a slow-growing, locally invasive malignant epidermal skin tumour. Although metastasis is rare, the tumours cause local destruction of tissues and therefore need to be excised. The most significant risk factor is excessive UV exposure (not uncommon in the farmers). Lesions usually affect sun-exposed areas (most commonly the head and neck). Early BCCs present as small, translucent/pearly lesions with rolled edges and telangiectasia. More advanced BCCs may develop an ulcerated centre. Management involves local excision, ensuring to remove the entire tumour, to prevent further local destruction by the lesion.

Radiotherapy is not used as a first-line option for the treatment of BCCs in most cases. Indications for radiotherapy include incomplete excision, recurrent BCC, nodular BCC or BCCs invading into bone or cartilage.

Imiquimod cream (topical treatment) is effective at treating small, superficial, low-risk BCCs. It triggers an immune response against the lesion. Given the description of the lesion in this scenario, imiquimod would not be a typical first-line choice.

Reassurance or a punch biopsy are not appropriate management options in this scenario.

Further reading:

https://patient.info/doctor/basal-cell-carcinoma

Question:

A 9-year-old boy is reviewed in paediatric A+E with a very concerned mother. He has pain in his right lower abdomen which has been present for 36 hours. The pain came on suddenly and does not radiate, he describes it as “achey”. His mother thinks it is something to do with a viral infection he had the previous week. His bowel habit is normal and he has not vomited.

Up until last week, he has been eating and drinking well with normal weight gain. There had been no trouble with school and his vaccinations are up to date.

On examination, there is some mild lower abdominal tenderness towards the right iliac fossa, with no associated guarding. There are no palpable abdominal masses. There is cervical and submandibular lymphadenopathy present as well as mildly inflamed tonsils with no exudate. Vital signs are unremarkable and white cells/CRP are only mildly elevated. An ultrasound of the abdomen did not reveal any abnormalities.

What is the most likely diagnosis?

A. Appendicitis

B. Mesenteric lymphadenitis

C. Abdominal migraine

D. Crohn’s disease

E. Intussusception

Correct Answer:Mesenteric lymphadenitis

Explanation:

The most likely diagnosis is mesenteric lymphadenitis.

Mesenteric lymphadenitis is due to non-specific inflammation of the mesenteric lymph nodes which provokes a mild peritoneal reaction and stimulates painful peristalsis in the terminal ileum.

The history of a recent viral illness, non-specific findings on clinical examination, normal vital signs, normal bowel habit and normal ultrasound findings make appendicitis less likely (although differentiating appendicitis from mesenteric adenitis is notoriously difficult, particularly in young children). Although mild elevation of WCC and CRP is typical of mesenteric lymphadenitis, it is not helpful for differentiating between answers as a similar picture could be present in most of the other diagnoses.

Crohn's disease is unlikely in this scenario, given the brief history of symptoms, absence of weight loss and normal bowel habit.

Intussusception is also less common than mesenteric adenitis (it typically affects children aged 2 months - 2 years old) and there is no history of a change in bowel habit (i.e. red currant jelly stools).

Abdominal migraine is much less common than mesenteric adenitis and is a diagnosis of exclusion. Given this is the first episode of abdominal pain, this diagnosis is unlikely (it is more commonly associated with recurrent abdominal pain).

Further reading:

https://patient.info/doctor/right-iliac-fossa-pain

Question:

A 10-year-old boy presents to A&E with his mother, who explains that he has been unwell following a recent throat infection. Despite his sore throat slowly improving, he has become progressively lethargic over the last few days, with associated fever, headache, rash and joint pains. Yesterday his knee joints were quite swollen and tender, however today his wrists are also affected.

Clinical assessment reveals:

Vital signs: HR 109 bpm, BP 100/84 mmHg, RR 19, SpO2 98% on air, Temperature 38.9 oC

An erythematous, ring-like rash affecting the proximal arms and trunk

Swollen tender knee joints and wrist joints, with reduced range of motion.

Otherwise normal cardiovascular, respiratory, gastrointestinal and neurological examination

What is the most likely diagnosis?

A. Meningococcal septicaemia

B. Infectious mononucleosis

C. Rheumatoid arthritis

D. Rheumatic fever

E. Psoriatic arthritis

Correct Answer:Rheumatic fever

Explanation:

The most likely diagnosis is rheumatic fever, given the history of recent throat infection (most likely group A streptococcal) and the subsequent development of migratory arthritis, erythema marginatum (ring-like rash) and ongoing high fever. Rheumatic fever is now a rare disease in developed countries, but the description in this scenario is convincing of the diagnosis.

Symptoms typically appear one to five weeks after a sore throat. The Jones criteria are used to identify patients that have a high likelihood of having rheumatic fever.

Typically the following are required to confirm a diagnosis:

Evidence of recent streptococcal infection (i.e. positive throat swab or increasing antistreptolysin O titre)

Two major criteria (shown below)

One major criterion and two minor criteria

Major criteria

Migratory arthritis affecting the large joints (i.e. knees, ankles, wrists, elbows)

Carditis

Chorea

Subcutaneous nodules

Erythema marginatum

Minor criteria:

Fever

Raised ESR and CRP

Prolonged PR interval

Arthralgia

Further reading:

https://patient.info/doctor/rheumatic-fever-pro

Question:

A 67-year-old male presents to the A&E department with a 1-day history of a painful right wrist. He also reports feeling 'feverish' over the past 24 hours. There is no history of trauma.

On examination, the joint is red, swollen and very tender to touch. There is limited range of movement in the joint due to pain.

He has a past medical history of osteoarthritis, type 2 diabetes and hypertension. His regular medications include ibuprofen 5% gel TDS, metformin 1g BD and ramipril 5mg OD.

Vital signs: HR 115, BP 90/78, SpO2 96% on air, RR 16, temperature 37.9 oC.

What is the single most appropriate investigation to confirm the suspected diagnosis?

A. Joint fluid aspiration for M, C & S

B. Blood cultures

C. X-ray of his right wrist

D. MRI of his right wrist

E. Serum urate

Correct Answer:Joint fluid aspiration for M, C & S

Explanation:

Given the patient’s presentation with a single painful, swollen joint associated with fever, tachycardia and hypotension, the most likely diagnosis is septic arthritis. As a result, the most appropriate investigation to confirm the diagnosis is joint fluid aspiration for M, C & S (in addition to Gram stain).

Septic arthritis should always be considered and ruled out in the context of an acutely swollen joint and system features.

The results of synovial fluid culture can help confirm the diagnosis and guide antibiotic therapy (although patients should initially be commenced on broad-spectrum antibiotics as soon as possible).

Blood cultures would be an appropriate investigation to perform, however, it is not the most useful for confirming a diagnosis of septic arthritis, as it would not identify the source of bacteraemia.

An X-ray of the wrist may be useful to rule out acute fracture and identify signs of osteomyelitis, however, it would not be able to confirm a diagnosis of septic arthritis.

MRI is not routinely used to assess acute wrist joint pathology and it would be unlikely to convey clinical value in this situation.

Serum urate is generally measured 4-6 weeks after a suspected attack of gout to confirm hyperuricaemia, rather than as a first-line diagnostic test for gout. More importantly, a diagnosis of gout would not explain this patient’s systemic clinical features.

Further reading:

https://patient.info/doctor/septic-arthritis-pro

Question:

A 28-year-old woman presents to the GP with a 4-week history of episodic headaches. She explains that the headache feels like a 'tight band' on both sides of her head.

She explains she is very stressed with work at the moment, which makes the headache worse. She reports the headaches typically start at the end of the working day.

She does not report any nausea, vomiting, photophobia or neck stiffness.

On examination, there is tenderness of the scalp and trapezius muscles. Neurological examination is otherwise normal.

What is the most likely diagnosis?

A. Tension-type headache

B. Cluster headache

C. Meningitis

D. Giant cell arteritis

E. Migraine

Correct Answer:Tension-type headache

Explanation:

The most likely diagnosis is tension-type headache (TTH). TTH is a common primary headache disorder causing a generalised headache, typically described as 'pressure' or 'tightness' around the head. Patients also report pericranial tenderness, which is elicited by palpation of the muscles. Both the intensity and duration of TTH are variable; however, it is classically described as a mild to moderate intensity headache, lasting anywhere from minutes to days. There are typically no other associated symptoms, and the headache is not exacerbated by physical activity. Psychological stress is a common trigger and an important part of the presenting complaint.

A migraine classically presents with an intermittent unilateral, throbbing headache. Patients with migraine also express worsening of the headache with activity and associated symptoms such as visual disturbance, nausea ± vomiting, and photophobia ± phonophobia.

Giant cell arteritis (GCA) typically presents in patients aged 50 years or older. GCA classically presents with a temporal or occipital headache, jaw claudication and co-existing polymyalgia rheumatica.

Meningitis should be considered in patients presenting with headache, neck stiffness, fever and an altered level of consciousness. This patient does not demonstrate any features of meningism.

Patients with cluster headaches typically present with a unilateral headache lasting 15-180 minutes and autonomic symptoms such as red-eye, lacrimation, rhinorrhoea, eyelid swelling and aural fullness. This patient does not have any features consistent with cluster headaches.

Further reading:

https://cks.nice.org.uk/topics/headache-tension-type/

Question:

A 35-year-old woman attends A&E with a cough. She states that the cough started 3 days ago and is associated with grey sputum and fevers. She was given some antibiotics by the GP 3 days ago, however, they don't seem to have made much difference. On further questioning, she admits that her symptoms have gradually improved over the last few days, but she feels this illness has "been going on too long" and she is requesting "stronger antibiotics". She denies any chest pain or significant shortness of breath. The patient has no significant past medical history and takes no regular medication. She does not smoke and denies any recent weight loss.

Clinical examination reveals some transmitted upper airway sounds an a few scattered crackles across the chest. There is no wheeze or other focal chest signs. Vital signs are unremarkable. A chest X-ray reveals clear lung fields.

Which of the following is the most likely diagnosis?

A. Legionnaires' disease

B. Asthma

C. Mycoplasma pneumonia

D. Tuberculosis

E. Acute bronchitis

Correct Answer:Acute bronchitis

Explanation:

The most likely diagnosis is acute bronchitis, given the history of a cough with associated fever.

Acute bronchitis is usually caused by a viral infection. The disease involves inflammation of the bronchi and typically presents with cough, fevers, headache, coryzal symptoms and general aches. The symptoms usually peak after 2-3 days and then gradually resolve. Acute bronchitis can take 2-3 weeks to fully resolve, which can be particularly frustrating for patients. The cough is usually the last symptom to settle.

Management of acute bronchitis includes hydration, regular paracetamol for fevers and ibuprofen to help with the aches and pains. If patients smoke, they should be advised to stop as this will often prolong the episode and make them vulnerable to further infections.

NICE advises that otherwise healthy people who have acute bronchitis should not be prescribed antibiotics. However, for patients who are at higher risk of developing chest infections, an antibiotic prescription (immediate or delayed) would be appropriate (i.e. over 80-years-old, cystic fibrosis, immunosuppression, diabetes, heart failure).

Legionnaires' disease (LD) is a rare severe, potentially life-threatening acute bacterial pneumonia acquired by droplet inhalation of water contaminated by bacteria of the genus Legionella. Patient's can present with similar symptoms to acute bronchitis including headache, myalgia, fever and cough (initially dry and then productive). Other symptoms commonly present in LD include shortness of breath, pleuritic chest pain and haemoptysis. Given the patient is clinically improving, has no focal signs on clinical examination and has normal vital signs and chest imaging results, acute bronchitis is a much more likely diagnosis.

Tuberculosis is unlikely given the absence of any risk factors in the clinical scenario, ongoing clinical improvement and a normal chest X-ray. Typical chest x-ray findings in primary tuberculosis include apical consolidation.

Asthma is unlikely given the lack of any past medical history of the condition and the absence of wheeze or shortness of breath.

Mycoplasma pneumonia is a form of atypical pneumonia caused by the bacterial organism mycoplasma pneumoniae. It typically presents with the insidious onset of fever, headache, sore throat, myalgia, pleuritic chest pain, tracheal pain and dry cough. Given the short duration of the patient's symptoms (which are now improving), the presence of a productive cough and the absence of any abnormalities on chest X-ray, mycoplasma pneumonia is less likely. Chest X-ray findings in mycoplasma pneumonia can include peribronchial/perivascular interstitial infiltrates and airspace consolidation.

Further reading:

https://patient.info/chest-lungs/chest-infection/acute-bronchitis

Question:

A 65-year-old man presents to the emergency department with severe pain in his right knee for the last 24 hours. He denies any history of trauma. His past medical history is significant for severe peptic ulcer disease, chronic kidney disease (GFR<10) and poorly controlled type two diabetes mellitus. He admits to drinking six cans of lager per day for the last ten years and smokes heavily. He has no family medical history.

His vital signs are stable. Aspiration of the right knee joint is performed, which confirms the diagnosis of gout.

What is the most appropriate management option?

A. Allopurinol

B. Intra-articular corticosteroid injection

C. Oral prednisolone

D. Indomethacin

E. Colchicine

Correct Answer:Intra-articular corticosteroid injection

Explanation:

This question focuses on the management of an acute gout attack in a patient who has several chronic diseases. Although first-line agents for acute gout flares include high dose non-steroidal anti-inflammatories (NSAIDs), this medication should be avoided in this patient given his history of peptic ulcer disease (PUD) and chronic renal failure. Colchicine is another option for treatment, however, this medication should be avoided in patients with renal dysfunction (only if GFR <10). Steroids are another option in patients who have contraindications to first and second-line treatment. Given the mono-articular nature of this patient’s presentation, an intra-articular steroid injection would be most appropriate. It is imperative to rule out a septic joint with a joint aspiration prior to the administration of intra-articular steroids.

Allopurinol is a xanthine oxidase inhibitor which is used in the chronic management of gout and should be avoided in patients with acute gout flares as it can worsen symptoms.

Colchicine should be avoided in patients with renal insufficiency. Notable side effects of colchicine include significant nausea, vomiting and severe diarrhoea. Compliance is often low.

Indomethacin is considered as a first-line agent for acute gout attacks, however, should be avoided in this patient given his history of PUD and chronic renal disease.

Oral steroids such as prednisolone can be used in patients with acute gout flares that involve multiple joints if there are contraindications present to both NSAID and colchicine use. However, this patient has a history of poorly controlled type two diabetes mellitus, therefore systemic steroid administration should be avoided as it could result in profound hyperglycaemia.

Further reading:

https://patient.info/doctor/gout-pro

Question:

A 72-year-old woman presents to the emergency department with a 6-hour history of sudden-onset severe central abdominal pain. She feels nauseous, has vomited once and has had one episode of diarrhoea.

On examination, his pulse is irregularly irregular, her abdomen is non-distended, and there is mild generalised abdominal tenderness without guarding.

What is the most likely cause of her presentation?

A. Non-occlusive disease

B. Mesenteric vein thrombosis

C. Superior mesenteric artery embolism

D. Superior mesenteric artery thrombosis

E. Reduced blood flow to the splenic flexure

Correct Answer:Superior mesenteric artery embolism

Explanation:

This woman is presenting with severe abdominal pain out of proportion with the examination findings. Combined with the symptoms of nausea, vomiting and diarrhoea, these all point towards a diagnosis of acute mesenteric ischaemia. The commonest cause of acute mesenteric ischaemia is superior mesenteric artery embolism caused by atrial fibrillation, which is made even more likely in this patient by the finding of an irregularly irregular pulse on examination.

Superior mesenteric artery thrombosis is usually caused by atherosclerotic plaque rupture and is less common than superior mesenteric artery embolism.

Mesenteric vein thrombosis is a rare cause of acute mesenteric ischaemia.

Non-occlusive disease is seen in low-flow states such as hypovolaemia or sepsis and is less common than superior mesenteric artery embolism.

Reduced blood flow to the splenic flexure is a cause of ischaemic colitis, which typically presents with abdominal pain and bloody diarrhoea. The absence of blood in this patient’s stool makes ischaemic colitis less likely.

Further reading:

https://teachmesurgery.com/vascular/peripheral/mesenteric-ischaemia/

Question:

An 18-year-old female presents to her GP with a new vaginal discharge. She reports a foul-smelling, green discharge for the past 3 days. She has also experienced pain whilst urinating. The patient reports having unprotected sex with two new sexual partners in the last month.

A vulvovaginal swab is taken. Microscopy reveals gram-negative intracellular diplococci.

What is the most likely diagnosis?

A. Gardnerella vaginalis

B. Chlamydia trachomatis

C. Treponema pallidum

D. Trichomonas vaginalis

E. Neisseria gonorrhoeae

Correct Answer:Neisseria gonorrhoeae

Explanation:

This patient's vulvovaginal swab has identified gonorrhoea. Gonorrhoea is caused by the Neisseria gonorrhoeae bacteria, which are gram-negative intracellular diplococci.

Chlamydia trachomatis is the causative organism in chlamydia. It is a pleomorphic, gram-negative bacterium, typically coccoid or rod-shaped.

Treponema pallidum is the causative organism in syhpilis. It is a spirochete gram-negative bacterium.

Trichomonas vaginalis is the caustive organism in trichomoniasis. It is a flagellated protozoan parasite.

Gardnerella vaginalis is one of the main causative organisms in bacterial vaginosis. It is a gram-negative coccobacilli.

Further reading:

https://geekymedics.com/sexually-transmitted-infections-stis/

Question:

A 58-year-old woman is referred to the neurology clinic with a 1-year history of lethargy and fatigue. Over the past 6 months, she has also experienced discrete episodes of arm and leg weakness, which generally last 1 week before resolving spontaneously. In the last fortnight, she has noticed that her vision has become blurred and she has started to struggle with distinguishing traffic light colours when driving.

On examination of the cranial nerves she finds eye movements painful, her visual acuity is 6/12 and she is unable to distinguish colours on Ishihara plate testing. A swinging light test is performed, which the neurologist describes as being positive for a left relative afferent pupillary defect. Fundoscopy reveals a pale optic disc. Upper and lower limb neurological examinations are both normal.

Based on history and clinical examination, she is referred for MRI imaging and a CSF sample is obtained by lumbar puncture. Oligoclonal bands of IgG are observed on CSF electrophoresis, and MRI reveals multiple demyelinating lesions.

Which of the following examination findings is consistent with a left relative afferent pupillary defect (RAPD)?

A. Reduced right pupil constriction when the light is moved from the left to the right eye

B. No left or right pupil constriction when light is shone in the left eye

C. Reduced left and right pupil constriction when light is shone in the left eye

D. Increased left pupil constriction when the light is moved from the right to the left eye

E. No left pupil constriction in response to light being shone in the left or right eye

Correct Answer:Reduced left and right pupil constriction when light is shone in the left eye

Explanation:

A left relative afferent pupillary defect (RAPD) would result in reduced left and right pupil constriction when light is shone in the left eye. This clinical scenario describes a classic case of multiple sclerosis (MS), in which demyelination of neurones results in a variety of neurological symptoms that frequently include episodes of weakness and visual changes but can be variable depending on lesion distribution. Multiple sclerosis can cause RAPD if there is a lesion of the optic nerve between the retina and optic chiasm. RAPD is detected using the ‘swinging flashlight test’ and is indicated by a reduced pupillary response to light in the affected eye. In the swinging flashlight test, light is shone into both eyes. If there is no lesion, both pupils will constrict equally when light is shone in either eye because both can detect the light. If there is a lesion in one of the optic nerves, when light is shone in the affected eye there will be reduced constriction in both eyes because the optic nerve is essential for both the direct and consensual constriction reflexes.

Although pupil constriction is reduced in both eyes when there is a lesion of the optic nerve in MS, there is still some pupil constriction because the lesion very rarely severs the nerve completely. Hence, the option of no left or right pupil constriction when light is shone in the left eye is incorrect.

It is incorrect that there would be increased left pupil constriction when the light is moved from the right to the left eye. There is reduced left pupil constriction in this scenario because the right eye can detect the light and constrict the left and right pupils in normal response using direct and consensual reflex pathways. However, when the light is moved to the left eye there is less light detected so the left and right eyes will appear to dilate slightly.

There would not be reduced right pupil constriction when the light is moved from the left to the right eye. Instead, there would be increased right pupil constriction, because the right eye can fully detect the light and stimulate normal direct and consensual reflex constriction whereas the left eye is unable to do so. As a result, there will be increased right pupil constriction when the light is moved from the left to the right eye.

Although left pupil constriction is reduced when light is shone in the left eye it is not absent altogether, and when light is shone in the right eye there is normal left pupil constriction via the consensual constriction reflex. Hence it is incorrect that there would be no left pupil constriction in response to light being shone in the left or right eye.

Further reading:

https://stanfordmedicine25.stanford.edu/the25/pupillary.html

Question:

A 32-year-old male is admitted to hospital with a 1-week history of fevers, productive cough with green sputum and shortness of breath. He is otherwise fit and well. He is treated for chest sepsis with IV amoxicillin and clarithromycin and switched to oral antibiotics after 48 hours.

5 days later he deteriorates, feeling feverish with an extremely painful rash. On examination, he has multiple erythematous macules, some of which have the appearance of target lesions. His lips are covered with blisters.

What is the MOST likely diagnosis?

A. Drug reaction with eosinophilia and systemic symptoms

B. Mycoplasma pneumoniae

C. Steven Johnson Syndrome

D. Anaphylaxis

E. Staphylococcal scalded skin syndrome

Correct Answer:Steven Johnson Syndrome

Explanation:

Stevens-Johnson syndrome (SJS) is a rare but potentially life-threatening adverse cutaneous drug reaction. SJS and toxic epidermal necrolysis (TEN) are both variants of the same condition. Both SJS and TEN are most commonly associated with systemic medications, including sulfonamides, penicillins, anti-convulsants and allopurinol. SJS is characterised by erythematous/purpuric macules +/- targetoid lesions and blisters which merge to form sheets of skin detachment. Mucosal involvement is prominent in both SJS and TEN; this includes the eyes, lips, mouth, pharynx, gastrointestinal tract and genitals. SJS and TEN are differentiated by the extent of skin detachment: SJS <10% body surface area, TEN >10%. SJS/TEN usually develops within the first week of antibiotic therapy.

Staphylococcal scalded skin syndrome is also characterised by erythema and blistering but it is secondary to staphylococcus aureus epidermolytic toxins; furthermore it is most common in children.

This gentleman presents with severe pneumonia and is treated empirically with penicillin. The subsequent painful rash, associated with oral mucosal involvement and fever, is characteristic of SJS. The mechanism of SJS is not fully understood but it is not a type 1 hypersensitivity reaction like anaphylaxis.

Although anaphylaxis is a more common drug reaction than SJS, this presentation is not in-keeping. Patients with SJS can have targetoid lesions, which also typically occur in erythema multiforme. Erythema multiforme is a hypersensitivity reaction, usually triggered by infections; most commonly herpes simplex virus, followed by mycoplasma pneumoniae. Erythema multiforme is self-limiting and resolves without complications opposed to SJS/TEN.

Drug reaction with eosinophilia and systemic symptoms (DRESS) is another adverse drug reaction, characterised by fever, cutaneous features overlapping SJS/TEN, eosinophilia and organ involvement. This patient does not meet the criteria.

Further reading:

https://www.dermnetnz.org/topics/stevens-johnson-syndrome-toxic-epidermal-necrolysis/

Question:

A 1-week-old female of Asian origin is brought into the GP by her parents regarding a mark on her lower back. Her parents report that the mark has been present since birth, has not changed in appearance and describe it as blue in colour. On examination, the mark is present directly over the baby’s lumbar vertebrae, it is flush with the skin, blue-grey in colour, has the same texture compared to surrounding skin, is 4 cm in diameter, does not blanch on direct compression and has an irregular margin. Additionally, the child is grossly neurologically intact.

What is the MOST LIKELY diagnosis?

A. Infantile haemangioma

B. Non-accidental injury (NAI)

C. Spina bifida

D. Port wine stain

E. Mongolian blue spot

Correct Answer:Mongolian blue spot

Explanation:

The most likely diagnosis, in this case, is a Mongolian blue spot. Mongolian blue spots (a.k.a. congenital dermal melanocytosis or slate grey naevi) are a form of pigmented birthmark that appears around the time of birth and persists until adolescence. Risk factors for this condition include Asian ethnicity and dark skin tones. These lesions are typically non-raised compared to the surrounding skin, have a similar texture to surrounding skin, usually measure 2-8cm in diameter, are irregular in shape and usually are located on the lower back or buttocks. Mongolian blue spots present no danger to health, however, they should always be examined by a Paediatrician to ensure the correct diagnosis (they are often identified and documented as part of the newborn infant screen). These lesions do not require any management.

Port-wine stains are more commonly located on the face and neck. Also, they tend to be pink-red in colour rather than blue-grey like Mongolian blue spots.

Although non-accidental injury should always be considered in cases of unexplained bruise-like lesions appearing on a child, abuse is not likely in this case. Bruises tend to fade and change in colour over time (unlike Mongolian blue spots which do not change in appearance).

Infantile haemangioma is less likely in this case as these lesions tend to blanch in colour when compressed.

Spina bifida is not likely in this case. It would more likely present with the following features: meningocele, neurological dysfunction, hydrocephalus or a naevus, dimple or subcutaneous mass located on the lower back.

Further reading:

https://www.nhs.uk/conditions/birthmarks/

Question:

A 30-year-old man presents to his general practitioner with a firm testicular lump. The lump has developed over the course of several months as the patient has noticed that his scrotum has felt 'heavy'. On examination, there is a unilateral, firm testicular lump.

The patient has a history of HIV for which he is taking antiviral therapy. However, his compliance with his treatment is poor. The general practitioner writes an urgent referral letter to the urology team for a suspected cancer.

Given this history, what is the most likely cause of this urgent suspected cancer diagnosis?

A. Testicular teratoma

B. Testicular seminona

C. Sertoli cell tumour

D. Spermatocytic tumor

E. Testicular yolk sac tumour

Correct Answer:Testicular seminona

Explanation:

The correct answer is a testicular seminoma. Poorly managed HIV is associated with testicular atrophy and has been linked with an increased incidence of germ cell tumours, particularly testicular seminoma. (Goedert et al. 2007)

Pure testicular teratomas make up a much smaller proportion of testicular tumour diagnoses. They are predominantly found in children under the age of 2-years-old, although mixed germ cell tumours containing teratomas may occur in the 20-30s age group.

Sertoli cell tumours are an extremely rare form of testicular tumour, representing only 0.4%-1.5% of all cases. (Coleman et al. 2014).

Testicular yolk sac tumours are a common cause of testicular tumours in the under 2-year-old age group. Therefore it is unlikely to be present in a 30-year-old patient.

Spermatocytic tumours are another rare cause of testicular cancer, which mainly occurs in the 50-60s age group and is rarer still in the under 30s.

Further reading:

https://aacrjournals.org/cebp/article/16/6/1266/260314/Risk-of-Germ-Cell-Tumors-among-Men-with-HIV

Question:

A 70-year-old woman presents to the emergency department with a 12 hour history of severe crampy abdominal pain and vomiting.

On examination, she has a slim build with a body mass index (BMI) of 18.5. Her abdomen is generally distended with no focal tenderness or peritonism. There is a small, tender irreducible swelling in the right groin, which is located below and lateral to the pubic tubercle.

What is the most likely diagnosis?

A. Obturator hernia

B. Spigelian hernia

C. Richter's hernia

D. Inguinal hernia

E. Femoral hernia

Correct Answer:Femoral hernia

Explanation:

This patient has presented with cardinal features of small bowel obstruction and an irreducible groin swelling. The most likely diagnosis in this case is an obstructed femoral hernia. Femoral hernias pass through the femoral canal into the upper medial thigh. They pass behind the inguinal ligament and are typically located below and lateral to the pubic tubercle. They are at very high risk of obstruction or strangulation, as the femoral canal is a narrow space bordered medially by the sharp edge of the lacunar ligament. Femoral hernias are much more common in older women. A low BMI is an important risk factor as it results in decreased amounts of fatty tissue within the femoral canal, creating an empty space which increases the likelihood of herniation.

Inguinal hernias pass through the inguinal canal into the groin. They run along the upper edge of the inguinal ligament and are typically located above and medial to the pubic tubercle. They have a relatively low risk of obstruction or strangulation as the tissues around the neck of the hernia are softer. They are the commonest type of groin hernia but are much more likely to affect men.

Obturator hernias are very rare. They pass through the obturator foramen of the bony pelvis into the upper medial thigh. They typically present with small bowel obstruction but are often impalpable on clinical examination due to their small size and deep location within the tissues.

Spigelian hernias are a type of anterior abdominal wall (or ventral) hernia. They pass through the Spigelian fascia lateral to the rectus sheath. They are usually very small and present with localised pain or a lump immediately lateral to the rectus abdominis muscle. They have a fairly high risk of obstruction or strangulation due to the tight fascial layers around the hernia neck.

A Richter’s hernia involves the partial herniation of one edge of the bowel wall as opposed to its whole circumference. This phenomenon can affect any type of hernia and can result in serious complications, as the herniated portion of the bowel wall can rapidly become strangulated and ischaemic. However, Richter’s hernias do not cause obstruction as the lumen of the bowel remains patent.

Further reading:

https://geekymedics.com/hernias/

Question:

A 62-year-old patient presents to hospital with sudden onset abdominal pain, nausea and vomiting, which began around an hour ago and has increased in intensity. The pain now appears to be coming in waves, and he scores it a 9 out of 10. He reports that the pain is especially bad over the right-hand side of the abdomen and that he had noticed a bulge in this region a few days previously, but thought nothing of it.

On examination, the patient has a visibly distended abdomen and is clearly in some discomfort. He denies opening his bowels or passing flatus since the symptoms began. A large mass is clearly visible in the lower right quadrant of the abdomen, this is irreducible and exquisitely tender to palpation. Bowel sounds are absent.

The patient has no relevant past medical history; he takes no regular medication and has never had any form of abdominal surgery. He has never had similar episodes in the past. The admitting doctor obtains IV access and books an ultrasound scan of the abdomen which reveals loops of small bowel with a diameter of 5cm. A follow-up CT is reported as showing a strangulated Spigelian hernia causing small bowel obstruction. The doctor explains to the patient that some of his intestines have pushed through a weakness in his abdomen, and have now become stuck, preventing faeces from moving through the bowel.

In which location has the obstruction occurred in this patient?

A. Between the linea semilunaris and the arcuate line

B. Through the obturator canal

C. Through the sciatic foramen

D. Inferior and lateral to the pubic tubercle

E. Superior and medial to the pubic tubercle

Correct Answer:Between the linea semilunaris and the arcuate line

Explanation:

This patient has presented in acute bowel obstruction, as indicated by the abdominal distension, lack of the passage of flatus, colicky abdominal pain and absent bowel sounds. Dilated loops of small bowel on ultrasound confirm this diagnosis; the measured diameter of 5cm is greater than the 3cm expected for this section of the gastrointestinal tract on imaging. The sudden onset of symptoms, in combination with a non-reducible mass, makes the most likely underlying diagnosis a strangulated hernia. A Spigelian hernia, as reported by the CT scan, is the protrusion of intraabdominal contents through the junction between the linea semilunaris and the arcuate line. These frequently strangulate and can lead to an acute bowel obstruction, as in this scenario.

Femoral hernias arise inferior and lateral to the pubic tubercle; these are more common in women, and like a Spigelian hernia, will usually require surgical intervention, as they carry a high risk of strangulation.

Inguinal hernias are the most common hernia subtype; these emerge superior and medial to the pubic tubercle. They are more common in males, due to the weakness left by the descent of the testes, and do not strangulate as frequently as Spigelian hernias; they can often be managed conservatively.

Hernias arising through the obturator canal and through the sciatic foramen refer to the self-explanatory obturator hernia and sciatic hernia respectively. These are exceptionally rare, and due to their location, they will not present with an abdominal mass as in this scenario.

Further reading:

https://patient.info/doctor/abdominal-wall-hernias

Question:

A 21-year-old male presents to his GP with body aches and a sore throat lasting 10-days.

He has no significant past medical history and has no known allergies. He is sexually active with one male partner; he reports they both recently had a full-sexual health screen, which was negative.

On examination, he looks pale and is febrile at 38.3°C. He has marked tender posterior cervical lymphadenopathy and enlarged erythematous and exudative tonsils. You note mild splenomegaly on examination of the abdomen.

Which of the following investigations is most appropriate to perform first in this patient?

A. Serum HIV enzyme-linked immunosorbent assay (ELISA)

B. Nucleic acid testing for cytomegalovirus

C. HSV polymerase chain reaction (PCR)

D. Anti-toxoplasma IgM (serum)

E. Monospot test (heterophile antibodies)

Correct Answer:Monospot test (heterophile antibodies)

Explanation:

The most likely diagnosis is infectious mononucleosis, also known as 'glandular fever'. According to NICE guidelines, infectious mononucleosis should be suspected in patients aged between 15-24 years presenting with fever, lymphadenopathy, severe sore throat and splenomegaly. The most common causative organism in ~90% of cases is Epstein-Barr Virus (EBV). NICE guidelines recommend performing a monospot test (heterophile antibodies) in the second week of illness to confirm the suspected diagnosis; this is often supplemented with further investigations such as FBC and LFTs.

The clinical features associated with a primary HIV infection include fever, sore throat, lymphadenopathy and constitutional symptoms; therefore, there is a substantial overlap to the clinical presentation of glandular fever. NICE guidelines suggest testing for HIV in patients presenting with a 'glandular fever-like illness' and two subsequently negative monospot tests, especially if patients have known risk factors for HIV infection. However, given this patient's recent negative sexual health screen, characteristic posterior cervical lymphadenopathy and exudative pharyngitis, glandular fever is the most likely diagnosis, and this should be excluded first.

In addition to HIV, NICE guidelines recommend excluding other differentials such as cytomegalovirus (CMV) and toxoplasmosis in patients with a 'glandular fever-like illness' and two negative monospot tests. Therefore, testing for CMV and toxoplasmosis are not considered first-line investigations and should only be performed once appropriate testing for glandular fever has been carried out. Furthermore, testing for CMV and toxoplasmosis infections are only typically recommended in patients who are immunocompromised.

Patients with herpes simplex virus-1 (HSV-1) typically present with acute onset symptoms, including high fever, myalgia, arthralgia and cough. HSV-1 is also characteristically associated with an eruption of lesions at the site of infection. This patient does not have any features to suggest HSV-1 infection is likely; therefore, an HSV polymerase chain reaction would not be an appropriate investigation to perform in the work-up of this patient.

Further reading:

https://cks.nice.org.uk/topics/glandular-fever-infectious-mononucleosis/

Question:

A 27-year-old woman presents to her GP practice with a 1-day history of severe left-sided headache. This came on over one hour and beforehand she noticed some “funny spots” in her vision. She describes a history of similar headaches over several years.

Which of the following medications is contraindicated in this condition?

A. Propranolol

B. Combined oral contraceptive pill

C. Nimodipine

D. Aspirin

E. Sumatriptan

Correct Answer:Combined oral contraceptive pill

Explanation:

The underlying condition is most likely migraine, and the “funny spots” in the patient’s vision suggest an aura phenomenon. The combined oral contraceptive pill is completely contraindicated in patients who experience migraine with aura due to an increased risk of ischaemic stroke. Of the remaining options, aspirin and sumatriptan are useful in the acute management of migraine. Propranolol and nimodipine are examples of beta-blockers and calcium channel blockers respectively, two classes of medication used in the prophylaxis of migraine.

Further reading:

https://patient.info/doctor/migraine-management

Question:

A 73-year-old woman is referred to her local ophthalmology department by her community optometrist following an eye exam.

The patient describes blurring of her vision and lines appearing wavy, making it difficult to read; however, if she holds a book above or below eye level, it is easier to make out the letters. The patient explains this is a long-standing problem of approximately five years; however, it has gradually worsened.

She has a past medical history of hypertension and diabetes, managed with amlodipine, losartan and metformin. She has no known allergies.

Intraocular pressure is normal at 16mmHg in the left eye and 17mmHg in the right eye. Dilated fundoscopy examination reveals confluent drusen in the macular region of both eyes and geographic atrophy.

What is the most likely diagnosis in this patient?

A. Open-angle glaucoma

B. Wet age-related macular degeneration

C. Dry age-related macular degeneration

D. Retina detachement

E. Pre-proliferative diabetic retinopathy

Correct Answer:Dry age-related macular degeneration

Explanation:

The most likely diagnosis in this patient is dry age-related macular degeneration (AMD) - a degenerative disease of the retina and characterised by the formation of drusen (yellow coloured accumulations of extracellular material) in Bruch's membrane, macular pigment changes and geographic atrophy. Key clinical features of dry AMD include insidious onset of unilateral or bilateral painless central visual impairment associated with both metamorphopsia and scotoma. This patient has evidence of central visual loss as she notices an improvement in sight when holding a book above or below her eyes and also reports metamorphopsia as lines appear wavy.

In contrast to dry AMD, wet age-related macular degeneration is typically characterised by acute onset painless visual impairment (over weeks to months) that usually manifests unilaterally. A key feature of wet AMD is choroidal neovascularisation; the vessels that form are weak and leaky. Wet AMD leads to a more rapidly progressive loss of vision, driven by the formation of exudate or subsequent haemorrhage from the new vessels. This patient reported a slowly progressive visual impairment and did not have any evidence of neovascularisation on examination; therefore, wet AMD is not the most likely diagnosis.

Patients with retinal detachment typically present with unilateral, acute onset, painless visual loss, often likened to "a falling curtain"; retinal detachments are often preceded by flashes and floaters. In retinal detachment, fundoscopy will reveal a detached retina. Therefore, in this patient, both the history and examination are not suggestive of retinal detachment.

This patient has a past medical history of type 2 diabetes mellitus; however, there are no signs of diabetic eye disease; pre-proliferative diabetic retinopathy is characterised by multiple microaneurysms ± haemorrhages and hard exudates. Furthermore, it is unlikely for pre-proliferative diabetic retinopathy to present with these symptoms.

Chronic glaucoma, also known as open-angle glaucoma, is initially asymptomatic, however over time, there is progressive visual loss (from peripheral to central). Open-angle glaucoma is characterised by increased intraocular pressure (>21 mmHg) and optic nerve cupping (increased cup to disc ratio). This patient had normal intraocular pressures and no evidence of cupping on fundoscopy; therefore, this is a less likely diagnosis.

Further reading:

https://geekymedics.com/age-related-macular-degeneration-armd/

Question:

You are a junior doctor working in the outpatient oncology clinic. You are reviewing a 47-year-old lady with a diagnosis of breast cancer who has completed a further course of chemotherapy. You note a tumour marker has been used to assess her response to treatment.

Which tumour marker is most likely to have been measured?

A. CA 19-9

B. CA 15-3

C. BRCA1

D. CA 125

E. Carcinoembryonic antigen (CEA)

Correct Answer:CA 15-3

Explanation:

CA 15-3 may be used to assess response to treatment in breast cancer. CA 19-9 is a pancreatic cancer tumour marker. CA 125 is an ovarian cancer tumour marker. Carcinoembryonic antigen (CEA) is a tumour marker most commonly associated with colorectal cancer. BRCA1 is a gene which normally codes for a tumour suppressor protein; mutations in this may be associated with breast, ovarian and prostate cancer.

Of additional note, CA 27.29 is a tumour marker which also has a role in breast cancer. It is often used to detect recurrence or metastasis of breast cancer.

Further reading:

https://patient.info/doctor/tumour-markers

Question:

A 5-year-old girl presents to A+E with loss of consciousness following persistent vomiting.

Her Dad says she has recently been unwell with chickenpox but has been responding well to aspirin until this morning.

On examination, there is a rash on her palms and feet, marked hepatomegaly but no jaundice can be seen. Her temperature is 36.8oC.

What is the most likely cause of her illness?

A. Encephalitis

B. Bowel obstruction

C. Hypoglycaemia

D. Reye’s syndrome

E. Meningitis

Correct Answer:Reye’s syndrome

Explanation:

The most likely cause of this child's presentation is Reye’s syndrome. Reye’s syndrome is a rapidly progressive encephalopathy and hepatitis that typically causes hepatomegaly without jaundice.

It is associated with viral illnesses, NSAIDs and aspirin use in children (i.e. breastfed babies in which the mother takes aspirin or giving NSAIDs to children with chickenpox).

Children with Reye’s syndrome can present with vomiting, confusion, loss of consciousness and also a rash on their hands or feet.

Coxsackievirus can also cause a rash on a child’s hands and feet but you would not expect a history of loss of consciousness.

Meningitis and encephalitis are two causes you would want to rule out but with no fever, these causes are less likely.

Hypoglycemia can also a cause of loss of consciousness, and you would do a blood sugar level in your ABCDE approach, but with the rash and hepatomegaly, this option is less likely.

Reye’s syndrome has no specific diagnostic test. Capillary blood glucose and coagulation studies should be monitored, as patients can develop hypoglycaemia and deranged coagulation. The treatment of Reye's syndrome is supportive, with close monitoring for signs of deterioration (e.g. cerebral oedema).

Further reading:

https://patient.info/doctor/reyes-syndrome-pro

Question:

A 66-year-old woman presents with constant pain in her left lower abdomen. The pain started 3 days ago and was dull but has now become sharp. She also describes constipation and nausea. She denies any weight loss but has noticed some blood in the stool and feels slightly feverish. She has no significant past medical history, however, she is allergic to iodinated contrast.

On examination, there is marked tenderness in the left iliac fossa with guarding and rebound tenderness.

A full set of observations shows she is haemodynamically stable, and appropriate blood tests are conducted, which reveal a CRP level of 312 mg/L (<5mg/L).

What is the most appropriate next investigation?

A. CT with contrast

B. Exploratory laparotomy

C. Colonoscopy

D. Non-contrast CT

E. Abdominal X ray

Correct Answer:Non-contrast CT

Explanation:

This woman is presenting with symptoms consistent with diverticulitis (left lower quadrant pain, constipation and fever). The transition of the pain from dull to sharp and the findings of guarding and rebound tenderness on examination indicate peritonitis. According to NICE guidance, patients with suspected complicated diverticulitis and raised inflammatory markers should be offered a CT with contrast within 24 hours of hospital admission to confirm the diagnosis and help plan management. However, this patient’s allergy to iodinated contrast is a contraindication to a contrast CT, and therefore a non-contrast CT is the most appropriate next investigation. Alternatives to non-contrast CT include MRI and ultrasound, depending on local expertise.

Any presentation of an acute abdomen generally requires a CT abdomen. Performing an abdominal X-ray adds little value to this and is much less sensitive than a CT at picking up pathology or the complications of diverticulitis.

A colonoscopy may be useful in the elective setting to diagnose diverticular disease, however, it is relatively contraindicated during acute diverticulitis due to the risk of perforation.

Although this patient may have had a perforation and therefore is likely to need surgery, an exploratory laparotomy is not the investigation of choice for complicated diverticulitis.

Further reading:

https://www.nice.org.uk/guidance/ng147/chapter/recommendations#complicated-acute-diverticulitis

Question:

A 35-year-old female presents to her GP with a 2-month history of joint pain in both hands, which is worse in the morning. She also reports ulcers in her mouth, patchy hair loss, and has recently noticed a facial rash made worse by sunlight. On examination, this rash spares the nasolabial folds.

The GP suspects a connective tissue disorder and arranges some blood tests.

Which of the following auto-antibodies is most likely to be raised in this patient's case?

A. Anti-centromere

B. Anti-CCP

C. c-ANCA

D. Anti-dsDNA

E. Anti-Jo1

Correct Answer:Anti-dsDNA

Explanation:

Anti-dsDNA levels are most likely to be raised in this case, as the clinical picture suggests a diagnosis of systemic lupus erythematosus (SLE). Anti-dsDNA auto-antibodies are highly specific markers of SLE and are used in the diagnosis and monitoring of the condition.

Raised Anti-Jo1 autoantibody levels are associated with polymyositis and dermatomyositis.

Raised anti-centromere autoantibody levels are associated with limited cutaneous systemic sclerosis.

Raised anti-CCP autoantibody levels are associated with rheumatoid arthritis.

Raised c-ANCA auto-antibody levels are associated with vasculitis, namely granulomatosis with polyangiitis.

Further reading:

https://patient.info/doctor/systemic-lupus-erythematosus-pro

Question:

A 43-year-old male, who was recently diagnosed with gout and started on allopurinol, presents to his GP with a painful rash. The rash began after a period of feeling generally unwell with coryzal symptoms. The rash is circular in nature and has two obvious colour zones. The patient notes that the rash started on his chest, before extending to his mouth causing painful ulcers. He is noted to also have diarrhoea. The GP estimates that less than 10% of the body surface is affected.

What is the most likely diagnosis?

A. Psoriasis

B. Steven Johnson syndrome

C. Toxic epidermal necrolysis

D. Eczema

E. Erythema multiforme

Correct Answer:Steven Johnson syndrome

Explanation:

The correct answer is Steven Johnson syndrome (SJS). SJS and toxic epidermal necrolysis (TENS) often present initially with a flu-like illness, followed by a painful rash on the trunk which spreads to the face and limbs. The skin lesions can be targetoid (as in this case), macules, diffuse erythema or blisters. SJS is also associated with mucosal involvement, which is severe and involves at least 2 mucosal surfaces (eyes, lips/mouth, genital area/urinary tract, upper respiratory tract or gastrointestinal tract). In this case mouth ulcers (mouth) and diarrhoea (gastrointestinal tract).

The amount of skin detachment differentiates SJS and TENS:

<10% is SJS

10-30% is SJS and TENS overlap

>30% is TENS

Erythema multiforme (EM) is considered to be a hypersensitivity reaction to infections or drugs. It typically presents with targetoid lesions, however, morphology can vary considerably, hence the name of the condition. It is usually self-limiting and rarely affects the mucous membranes. Erythema multiforme is considered to be part of a spectrum of disease which includes SJS and TEN (with EM being the mildest form of these conditions).

The initial target lesions of EM are sharply demarcated, round, red/pink and flat (macules). The target lesions become raised (papules/palpable) and gradually enlarge to form plaques (flat raised patches) up to several centimetres in diameter. Typical target lesions have three colour zones, the centre is dusky/dark red, the next ring is pale pink and the outermost ring is bright red. In the above scenario, the extent of the skin lesions makes a diagnosis of SJS more likely.

Eczema is a chronic, relapsing, inflammatory skin condition characterised by an itchy red rash that favours the flexural skin creases such as the folds of the elbows or behind the knees. The patients’ signs and symptoms do not suggest eczema.

Psoriasis typically presents with itchy, well-demarcated circular-to-oval bright red/pink elevated lesions (plaques) with overlying white or silvery scale, distributed symmetrically over extensor body surfaces and the scalp.

Further reading:

https://patient.info/doctor/stevens-johnson-syndrome

Question:

A 43-year-old man presents to his general practitioner with his wife after an episode of frank haematuria 3-days ago. He describes the urine as having an appearance like port wine. When questioned further, he reports that his clothes have felt looser than usual in recent months. His past medical history is significant for complications of untreated childhood schistosomiasis.

The patient grew up in rural Nigeria, where he worked in a factory before moving to the United Kingdom 3-years ago.

The patient is referred for an urgent cystoscopy, which shows multiple exophytic lesions that appear to invade the bladder wall, consistent with bladder cancer. Biopsies are sent for immunohistochemistry.

What is the most likely histology of the patient's cancer?

A. Sarcomatoid carcinoma

B. Transitional cell carcinoma

C. Small cell carcinoma

D. Adenocarcinoma

E. Squamous cell carcinoma

Correct Answer:Squamous cell carcinoma

Explanation:

The correct answer is squamous cell carcinoma. Although 95% of bladder cancers worldwide are considered urothelial tumours, schistosomiasis is a major cause of bladder cancer in many parts of the world where the parasite Schistosoma haematobium, is endemic. Individuals with chronic schistosomiasis are at increased risk of developing squamous cell carcinoma of the bladder, as Schistosoma haematobium induces chronic granulomatous cystitis and associated squamous metaplasia of the bladder's transitional epithelium.

Transitional cell carcinoma is incorrect. While 95% of bladder cancers are histologically confirmed as transitional cell carcinomas, this patient's history of schistosomiasis increases their risk of squamous cell carcinoma of the bladder. Chronic inflammation and granulomatous disease associated with schistosomiasis cause squamous metaplasia of the bladder's transitional epithelium.

Adenocarcinoma is incorrect, as this is considered a very rare histological subtype of bladder cancer. Squamous cell carcinoma is more likely in view of the patient's known history of schistosomiasis. Adenocarcinoma of the bladder is not associated with schistosomiasis.

Small cell carcinoma is incorrect, as this is considered a very rare histological subtype of bladder cancer. The aetiology of small cell carcinoma of the bladder is unknown, but a history of smoking is thought to be present in two-thirds of patients. Small cell carcinoma of the bladder is not associated with schistosomiasis.

Sarcomatoid carcinoma is incorrect, as this is considered a very rare histological subtype of bladder cancer. Sarcomatoid carcinoma of the bladder is not associated with schistosomiasis.

Further reading:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC88908/

Question:

A 25-year-old man is brought to the hospital by police after being found shouting at people in the street. He is concerned that the government has been spying on him and placing thoughts inside his head in order to arrest him.

His life has been stressful and he recently lost his job. He has a past medical history of depression and takes sertraline. He has smoked cannabis for 9 years but does not drink alcohol. He is of Afro-Caribbean ethnicity, and his older sister was recently diagnosed with schizoaffective disorder.

Given the most likely diagnosis, what is most likely to increase his risk the most?

A. Stressful life experiences

B. Cannabis use

C. Family history of schizoaffective disorder

D. Afro-Caribbean ethnicity

E. Depression

Correct Answer:Family history of schizoaffective disorder

Explanation:

Family history of schizoaffective disorder is correct. This patient has delusions of thought and delusions of persecution, making a psychotic disorder such as schizophrenia likely. The strongest risk factor for developing psychotic disorders is a family history of any psychotic disorder. His sister's diagnosis of schizoaffective disorder increases his risk the most out of the factors in his history. Specific genetic variants and pathways increasing susceptibility to schizophrenia have been identified.

Afro-Caribbean ethnicity, cannabis use, and stressful life experiences are incorrect. Although these all can contribute to the development of psychotic disorders, family history carries the highest risk.

Depression is incorrect. There is no known association between schizophrenia and depression.

Further reading:

https://geekymedics.com/schizophrenia/

Question:

A 64-year-old man is seen by his GP due to the new onset of palpitations. He was previously fit and well, and does not complain of any other symptoms. As part of the assessment, a 12-lead ECG is recorded:

Source: Ewingdo. Licence: [CC BY-SA 4.0] via Wikimedia Commons

What does this ECG show?

A. Atrial fibrillation

B. Sinus arrhythmia

C. Atrial flutter

D. First-degree heart block

E. Normal sinus rhythm

Correct Answer:Atrial fibrillation

Explanation:

The ECG shows atrial fibrillation. This is characterised by an irregularly irregular rhythm, absent P waves and the presence of fibrillatory waves. Atrial fibrillation may be asymptomatic or present with symptoms such as palpitations, syncope, angina and dyspnoea.

Atrial flutter is an atrial tachycardia caused by a re-entry circuit within the atria. The ECG would be characterised by a 'saw-tooth' baseline and may involve a fixed conduction block.

Normal sinus rhythm on an ECG is characterised by a regular rhythm, with each QRS complex preceded by a P wave.

Sinus arrhythmia is a physiological variation of normal sinus rhythm that is typically observed in healthy young people. The ECG is characterised by an irregular ventricular rate due to beat-to-beat variations in the R-R interval caused by respiration.

First-degree heart block is a type of atrioventricular block characterised by a PR interval of >200ms. This is typically an incidental finding on an ECG and no treatment is required.

Further reading:

https://litfl.com/atrial-fibrillation-ecg-library/

Question:

You are a doctor working in the neonatal ward. A newborn child is noted to have uneven gluteal folds. Subsequent physical examination of the left hip reveals that the hip can be easily dislocated in the posterior direction and then returned to its normal position. The patient has stable observations.

What is the most likely diagnosis?

A. Slipped capital femoral epiphysis

B. Legg-Calve-Perthes disease

C. Osgood-Schlatter disease

D. Development dysplasia of the hip

E. Septic joint

Correct Answer:Development dysplasia of the hip

Explanation:

This newborn child has developmental dysplasia of the hip (DDH) – a common condition which affects the development of the acetabulum and stability of the hip joint. Common examination findings include uneven gluteal folds and poor range of motion. Each hip joint should be examined with the Ortolani and Barlow manoeuvres. Clinical suspicion should be correlated with hip ultrasonography until the patient is approximately 6 months of age. Plain radiography has little diagnostic value in the first 6 months as the hip joint is unossified at this stage in life.

Septic joints are more likely to present with systemic manifestations and pain on movement of the joint.

Osgood-Schlatter disease is a benign and painful enlargement of the tibial tuberosity that most commonly affects male adolescents. Treatment is typically conservative.

Legg-Calve-Perthes disease refers to avascular necrosis of the femoral head that typically presents in children aged between four and eight. Clinical features include an antalgic gait and reduced internal rotation of the affected hip.

Slipped capital femoral epiphysis is the most common adolescent hip disorder that typically affects obese male adolescents. It is characterised by a dull ache in the hip and an antalgic gait.

Further reading:

https://patient.info/doctor/developmental-dysplasia-of-the-hip-pro

Question:

A 74-year-old male presents to his GP with a skin lesion on his cheek. He first noticed this approximately two months ago and it has grown slowly ever since. He denies any tenderness, itching or bleeding from the lesion. He had otherwise been well recently. He has a past medical history of angina for which he takes a GTN spray PRN. He has no allergies.

What is the most likely diagnosis?

Source: Public Domain

A. Bowen’s disease

B. Keratoacanthoma

C. Seborrhoeic keratosis

D. Squamous cell carcinoma

E. Basal cell carcinoma

Correct Answer:Basal cell carcinoma

Explanation:

The image clearly shows a basal cell carcinoma with typical features of telangiectasia, central ulceration and raised pearly edges. These are often referred to as ‘rodent ulcers’ due to their appearance. All the other options given could fit with the history, however, the appearance of the lesion makes basal cell carcinoma by far the most likely diagnosis. Basal cell carcinomas are the commonest type of skin cancer and are usually treated with surgical excision.

Keratoacanthomas typically have a symmetrical volcano appearance with a keratin-filled crater.

Bowen’s disease is the name given to a squamous cell carcinoma in situ before it has invaded the basement membrane. They are pink, scaly plaques with well-defined borders.

Seborrhoeic keratoses are also known as seborrhoeic warts. They are benign lesions that are pigmented and have a greasy, ‘stuck-on’ appearance. They can occur on the face but are more common on the trunk. They usually require no treatment and they do not undergo malignant transformation.

Squamous cell carcinomas are the second commonest type of skin cancer and commonly occur on sun-exposed sites such as the face. However, they are usually ulcerated nodules with an indurated margin. They do not commonly have telangiectasia on them.

Further reading:

https://patient.info/doctor/basal-cell-carcinoma

Question:

A 55-year-old gentleman presents with a 9-month history of abdominal pain. He mentions that he sometimes feels like he is going to be sick, although has never vomited. He also sometimes feels like he is exploding from the inside, although hasn’t noticed any change in the size of his tummy.

On examination, his pain is mainly in the centre of his abdomen, which seemed to get better when he sat forward. He looks unwell but there are no other clinical findings. He has a history of type 2 diabetes, hypertension, hyperlipidaemia and had an appendicectomy at the age of 20. He worked as a miner all his life, smokes 15-20 cigarettes a day and drinks 30-40 units of alcohol a week. He said sheepishly that he might have drunk more alcohol when he was younger.

What is the most likely diagnosis?

A. Colorectal cancer

B. Irritable bowel syndrome

C. Chronic pancreatitis

D. Acute pancreatitis

E. Pancreatic cancer

Correct Answer:Chronic pancreatitis

Explanation:

The most likely diagnosis is chronic pancreatitis.

This is a challenging question and all the answers could be right in some respects. In terms of the vignette, we have a middle-aged man with a chronic history of abdominal pain, nausea and bloating. He has a lot of vascular risk factors and in particular, he has a high alcohol intake. When thinking about the causes of chronic pancreatitis, there are more common aetiologies such as alcohol, smoking or autoimmune disease and then more unusual causes which include cystic fibrosis, congenital haemochromatosis and pancreatic duct obstruction.

Key points in the history were the alcohol history, the epigastric pain, relief by sitting forward and chronicity. The pain is sometimes described as ‘boring’ through to the back.

Pancreatic cancer is an important differential diagnosis, however, the most common location it develops in (head of the pancreas) takes a while to produce symptoms and these are often painless obstructive jaundice and weight loss.

Irritable bowel syndrome could cause bloating and abdominal pain but is unlikely to cause weight loss. It is also unlikely to present in this demographic and age group.

Acute pancreatitis can be differentiated based on the timeframe.

Colorectal cancer is another important differential diagnosis, but the absence of weight loss or change in bowel habit make this diagnosis less likely.

Further reading:

https://patient.info/doctor/chronic-pancreatitis-pro

Question:

A 20-year-old woman attends with a painful, diffusely red right eye that has been present for a couple of days. She describes the eye pain as severe and explains that it gets worse on looking at light. On further questioning, the patient describes a foreign body sensation, as well as a slight blurring of her vision. You establish that she is a contact lens wearer. On examination, the patient has reduced visual acuity on the affected side. Examining the eye under magnification reveals a red eye with a white spot on the cornea.

What is the MOST LIKELY diagnosis?

A. Episcleritis

B. Scleritis

C. Acute angle closure glaucoma

D. Keratitis

E. Blepharitis

Correct Answer:Keratitis

Explanation:

The most likely diagnosis is keratitis. Keratitis is a serious, potentially blinding condition resulting from bacterial, viral, fungal or protozoal infection of the cornea. Major risk factors include contact lens wearing, ocular trauma, dry eyes, blepharitis, immunosuppression and living in warm tropical climates.

Symptoms typical of keratitis include severe eye pain, photophobia, foreign body sensation and loss/reduction of vision. Contact lens wear is typically associated with bacterial keratitis which on examination under magnification appears as a yellow-white spot on the cornea representing the area of corneal inflammation. Examination under fluorescein light is likely to demonstrate an overlying epithelial defect (which appears green).

Scleritis is less likely in this case as the patient has a risk factor for keratitis (contact lens wear) and characteristic examination findings.

Episcleritis is indeed a cause of red eye but is not typically associated with pain.

Blepharitis is a cause of redness and inflammation of the eyelids.

Acute angle-closure glaucoma is less likely in this case as it tends to affect much older patients. It also presents with severe eye ache, nausea, vomiting and blurred vision with haloes around light sources. On examination there would be an oedematous cornea and a fixed, mid-dilated pupil.

Further reading:

https://geekymedics.com/keratitis/

Question:

A 70-year-old man presents to the medical assessment unit with a fever, muscle aches, and non-productive cough. He has felt unwell for the past 36 hours. He has a past medical history of hypertension and chronic obstructive pulmonary disease.

A chest X-ray demonstrates no focal consolidation. A throat swab has yielded a positive result for influenza. He has not received his vaccination this year.

What is the first-line management for this condition?

A. Acyclovir

B. Amoxicillin

C. Nystatin

D. Oseltamivir

E. Clarithromycin

Correct Answer:Oseltamivir

Explanation:

Influenza is caused by influenza viruses. Transmission occurs via droplets, aerosols, or direct contact with respiratory secretions from an infected person, and the usual incubation period is 1–3 days. Typical influenza disease is characterised by sudden onset of fever, aching muscles, sore throat, and a non-productive cough. Antivirals for the treatment and post-exposure prophylaxis of influenza are usually reserved for at-risk groups (e.g. over 65, respiratory conditions or immunocompromised). With this patient being 70 years old and having pre-existing chronic obstructive pulmonary disease, an antiviral such as oseltamivir would be indicated and should be started as soon as possible.

Acyclovir is an antiviral that is used in the management of HSV infections and shingles.

Amoxicillin and clarithromycin are both antibiotics often used in the management of pneumonia or LRTI.

Nystatin is an anti fungal often used in the management of candida infections.

Further reading:

https://bnf.nice.org.uk/treatment-summaries/influenza/

Question:

A 48-year-old woman presents with abdominal swelling, she is otherwise well. She has a past medical history of alcohol excess. On examination, she has spider naevi on her chest and face, and she has abdominal swelling with shifting dullness. Her renal function and sodium are normal. An ultrasound shows an enlarged liver with moderate volume ascites.

What is the most appropriate initial management of her ascites?

A. Eplerenone 25mg once daily

B. Spironolactone 100mg once daily

C. Large volume paracentesis with albumin cover

D. Fluid restriction to 1.5 litres per day

E. Furosemide 40mg once daily

Correct Answer:Spironolactone 100mg once daily

Explanation:

The most likely diagnosis is alcohol-related liver disease with ascites due to portal hypertension. The most appropriate initial management is spironolactone 100mg once daily. Spironolactone monotherapy is the treatment of choice for the first presentation of moderate ascites. The initial dose is 100mg once daily and this can be titrated up to 400mg with regular monitoring of renal function and sodium levels. Spironolactone can also be used in the treatment of heart failure with reduced ejection fraction, but initially at the lower dose of 25mg once daily.

Furosemide can be added as an adjunct for recurrent severe ascites but would be inappropriate on its own.

Large-volume paracentesis is used in drug-resistant ascites or if there is a large volume of ascites.

Fluid restriction in this population risks renal injury and should only be used in hypervolaemia with severe hyponatraemia.

Eplerenone, a similar drug to spironolactone, is also used in the treatment of heart failure with reduced ejection fraction but is not used in the treatment of ascites.

Further reading:

https://www.bsg.org.uk/wp-content/uploads/2020/10/gutjnl-2020-321790.full\_.pdf

Question:

A 61-year-old man presents to his GP with urinary problems lasting 5-months. He describes increased urinary frequency; however, he often notes he has difficulty initiating urination and is left straining to empty his bladder. He denies any pain associated with urination.

During this time, his symptoms have become bothersome during the night, as he wakes up frequently to urinate. He is upset at the effect the problem is having on his quality of life. Another doctor recommended lifestyle advice and pelvic floor exercises, but these have not helped.

He has no significant past medical history and is usually fit and well. He is allergic to penicillin, causing a rash.

On examination, the patient appears well; his vital signs are all within normal limits. Digital rectal examination reveals a non-tender but enlarged prostate without nodules; the rectal tone is normal.

What is the most appropriate initial management in this patient?

A. Advise on lifestyle factors

B. Refer for transurethral resection of the prostate

C. Prescribe mirabegron

D. Prescribe tamsulosin and oxybutynin

E. Prescribe tamsulosin

Correct Answer:Prescribe tamsulosin

Explanation:

The most likely diagnosis in this patient is benign prostatic hyperplasia (BPH) - glandular and stromal hyperplasia of the transitional zone of the prostate. BPH typically causes lower urinary tract symptoms (LUTS) which are classically subdivided into storage LUTS (e.g. frequency, urgency, nocturia, incontinence) and voiding LUTS (weak stream, dribbling, dysuria, straining). This patient reports his conservative management plan (i.e. pelvic floor training, lifestyle measures) has not relieved his symptoms. Therefore, NICE guidelines recommend transitioning to active management, using a medication such as an alpha-blocker, like tamsulosin, in the first instance.

NICE guidelines recommend that if a male patient has a mixed picture of symptoms (voiding LUTS and storage LUTS) that are not adequately controlled with an alpha-blocker alone, then an antimuscarinic drug such as oxybutynin should be considered as add-on therapy. Therefore, this patient should be trialled on an alpha-blocker in the first instance before initiating dual therapy with tamsulosin and oxybutynin.

If all active treatment fails to relieve symptoms adequately, patients should be referred to a urologist for secondary care management options such as transurethral resection of the prostate (TURP). This patient has not yet exhausted management options in the community; therefore, this would not be the most appropriate next step.

Mirabegron therapy is considered a second-line therapy in BPH and is only recommended in patients who are not sufficiently controlled on first-line medications. Mirabegron is licensed in the BNF for urinary frequency, urgency and urge incontinence.

This patient has previously been advised on how to decrease symptoms using lifestyle changes; however, this intervention alone has not sufficiently relieved symptoms. Therefore, whilst behavioural management is still recommended, it should form an adjunct to additional medical therapy.

Further reading:

https://cks.nice.org.uk/topics/luts-in-men/

Question:

A 22-year-old female presents to her general practitioner with complaints of a green, frothy vaginal discharge and vulvar itchiness for the last three days. The patient has been in a monogamous relationship with her husband for two years. She has no significant past medical history and takes no medications on a regular basis.

A speculum examination shows small punctate areas of haemorrhage on the cervix. Vulvar erythema is also present.

What is the most appropriate medication to prescribe for this condition?

A. Ceftriaxone

B. Penicillin

C. Metronidazole

D. Aciclovir

E. Doxycycline

Correct Answer:Metronidazole

Explanation:

This patient’s presentation is consistent with trichomoniasis, which is a sexually transmitted infection caused by Trichomonas vaginalis. Typically this infections leads to a frothy, green vaginal discharge often accompanied by pruritus, vaginitis and post-coital bleeding. Small punctate haemorrhages are commonly seen on speculum examination (often referred to as a ‘strawberry cervix’). First-line treatment involves the prescription of metronidazole.

Macrolides such as doxycycline are used in the treatment of Chlamydia trachomatis. A green, frothy discharge with a ‘strawberry cervix’ is more consistent with Trichomoniasis.

Ceftriaxone is a third-generation cephalosporin used in the treatment of Neisseria gonorrhoeae. N. gonorrhoeae is more likely to present with a mucopurulent discharge from the cervix of speculum examination.

Aciclovir is used in the treatment of herpes virus infections. HSV I/II infections typically present with either oral or genital lesions that are shallow and painful to touch.

Penicillin is used in the treatment of primary and secondary syphilis. Primary syphilis classically presents with a painless chancre on the genital region. Secondary syphilis has a varied presentation including a maculopapular rash (which typically involves the palms and soles), condylomata lata and hair loss. The patient in the above scenario has not presented with any of these findings and therefore treatment with penicillin is not indicated.

Further reading:

https://patient.info/doctor/trichomonas-vaginalis

Question:

A 67-year-old woman presents to the GP following a dual-energy X-ray absorptiometry scan (DXA).

The report of the DXA scan shows a T-score of -2.7 in her hip.

She has a past medical history of rheumatoid arthritis which is managed with methotrexate 10 mg orally once weekly. She has also previously been treated with short courses of prednisolone to manage acute flares. She has no known drug allergies.

When discussing other risk factors for osteoporosis the patient says she went through the menopause at 50-years-old and does not smoke or drink.

Given the results of her scan, what is the most appropriate initial management?

A. Denosumab

B. Romosozumab

C. No treatment required

D. Hormone replacement therapy

E. Alendronic acid

Correct Answer:Alendronic acid

Explanation:

This patient has osteoporosis which has been confirmed by a dual-energy x-ray absorptiometry scan (DXA). NICE recommends that postmenopausal women over 50-years-old who subsequently have a T-score of -2.5 or less should receive bone-sparing treatment. The first-line treatment for osteoporosis is typically alendronic acid (alendronate). All patients started on bisphosphonates should receive appropriate bisphosphonate counselling. Other important features in management include calcium and vitamin D supplementation.

Second-line management options include denosumab - a human monoclonal antibody that inhibits osteoclast function to decrease bone resorption. It is typically recommended if a patient has a contraindication to bisphosphonates or is unable to tolerate bisphosphonates.

NICE guidelines would not recommend no treatment in this patient as she is at a high risk of a fragility fracture.

Romosozumab is a humanised monoclonal antibody that inhibits sclerostin, thereby increasing bone formation and decreasing bone resorption. It is indicated in severe osteoporosis in postmenopausal women but is limited for specialist use only. Therefore, it would not be considered the first line.

As this woman went through menopause approximately 17 years ago, it would not be appropriate to initiate hormone replacement therapy (HRT). NICE recommends prescribing HRT to women who have premature menopause (menopause before 40 years of age).

Further reading:

https://cks.nice.org.uk/topics/osteoporosis-prevention-of-fragility-fractures/management/management/

Question:

You are asked to review a 67-year-old man who is being treated on the ward for community-acquired pneumonia. He has been complaining of palpitations and muscle weakness. An ECG taken on the ward that morning shows peaked T waves and a PR interval of 0.22 seconds.

Some of his recent blood tests are shown below:

Na+ 139 mmol/L

K+ 6.1 mmol/L

Bicarbonate 24 mmol/L

Urea 8.5 mmol/L

Creatinine 118 µmol/L

What is the most appropriate immediate management option?

A. IV calcium gluconate

B. IV fluids

C. Intravenous (IV) calcium resonium

D. IV insulin/dextrose infusion

E. Oral sodium zirconium cyclosilicate (Lokelma)

Correct Answer:IV calcium gluconate

Explanation:

This patient has severe hyperkalaemia as they are beginning to show ECG changes. The earliest changes due to hyperkalaemia are peaked T waves, followed by other changes such as widened P waves, an increased PR interval and widened QRS complexes. As such, the most appropriate immediate management is the administration of IV calcium gluconate, which stabilises the cardiac membrane and gives time for more definitive management to be established.

IV calcium resonium may be given as definitive management to help lower the patient's K+, however, it would not be the first step to take in management.

IV fluids may be required as this patient also appears to potentially have an underlying acute kidney injury (AKI) - which may have caused their hyperkalaemia. However, these would be prescribed after IV calcium gluconate. While AKI is potentially serious, hyperkalaemia is more likely to immediately result in a life-threatening arrhythmia.

An IV insulin/dextrose infusion would likely also form part of the management of this patient as it would help to quickly lower the patient's K+ in the short term. However, IV calcium gluconate should be given first to protect the cardiac membrane.

Oral sodium zirconium cyclosilicate acts as a selective potassium binder in the gastrointestinal tract. It would be a potential option for treating hyperkalaemia if It was not classed as severe.

Further reading:

https://litfl.com/hyperkalaemia-management/

Question:

A 59-year-old patient, Mrs Carlie Sturgeon, attends the Emergency Department complaining of a painful left arm. Mrs Sturgeon was jogging back from a Zumba class when she tripped over a pavement slab and fell onto her outstretched left arm. Since the fall, she has been experiencing shooting pain up the arm whenever it’s moved.

Mrs Sturgeon is a retired school teacher, she is right hand dominant and has a past medical history of migraines, depression and a previous tibial fracture. She is currently taking hormone-replacement therapy.

On examination, the left arm appears swollen, bruised and deformed at the wrist joint. Manoeuvring the arm causes severe pain. Her fingers appear pink and well perfused with normal sensation to touch.

Mrs Sturgeon's X-rays are shown below.

What is the most likely diagnosis?

Source: Lucien Monfils [CC BY-SA 4.0]

A. Colles' fracture

B. Chauffeur fracture

C. Smith fracture

D. Monteggia fracture

E. Galeazzi fracture

Correct Answer:Colles' fracture

Explanation:

The most likely diagnosis is Colles' fracture.

A Colles' fracture is the most common type of distal radius fracture. It commonly results from a fall onto an outstretched hand in a patient with osteoporotic bone disease. Colles' fractures consist of a fracture of the distal radial metaphyseal region with dorsal angulation and impaction. The vast majority of Colles' fractures can be treated with closed reduction and cast immobilisation, occasionally surgical intervention is required.

A Smith fracture is the ‘reverse’ of Colles' fracture. A patient will have a distal radius fracture with associated volar angulation and impaction of the distal fracture fragment. It is commonly caused by fall onto an outstretched hand.

A Chauffeur fracture is a distal radius fracture of the radial styloid and is usually sustained from direct trauma to the back of the wrist

A Monteggia fracture is a fracture of the ulnar shaft plus radial head dislocation whereas a Galeazzi fracture is a fracture of the distal part of the radius with dislocation of the distal radioulnar joint.

Further reading:

https://radiopaedia.org/articles/colles-fracture

Question:

A 50-year-old male patient attends his GP practice complaining of problems with his hands. He has noticed that he has gradually developed difficulty in manipulating objects with his hands, so much so that he tends to frequently drop items. Additionally, he explains that his hands feel stiff most of the day, occasionally cramp and sometimes can be seen twitching. On further questioning, the gentleman reveals noticing a change in the appearance of his hands. He describes them as looking ‘thinner’. All other neurological examination is unremarkable. The patient has no significant past medical or family history.

Which of the following is a LIFE-PROLONGING management option for this condition?

A. Positive pressure ventilation

B. Physiotherapy

C. Diazepam

D. Subcutaneous morphine

E. Hyoscine

Correct Answer:Positive pressure ventilation

Explanation:

The patient is most likely suffering from Motor Neurone Disease (MND) – a degenerative motor disease causing progressive paralysis and eventual death. This condition mainly affects the anterior horn cells of the spinal cord and the motor cranial nuclei. It can present with symptoms initially affecting the hands or lower limbs or can present with bulbar symptoms such as dysphagia and dysarthria. Positive pressure ventilation (mainly BIPAP) is used to prolong life in this disease and also has benefits on quality of life. Riluzole (a neuroprotective glutamate-release inhibitor) is a drug that can also prolong life by 3-6 months.

Hyoscine is used in MND, but for the symptomatic relief of drooling but is not life-prolonging.

Diazepam is used in MND, but for the symptomatic relief of muscle spasm and spasticity. Baclofen, phenytoin and quinine may be used to the same effect.

Physiotherapy is frequently used in patients with MND. It is not however life-prolonging.

Subcutaneous morphine is used for the symptomatic relief of dyspnoea in MND patients but is not life-prolonging.

Further reading:

https://patient.info/doctor/motor-neurone-disease-pro

Question:

A 68-year-old woman is seen in the 2-week wait dermatology clinic for a new pigmented lesion on her right forearm. There is no ulceration, bleeding or oozing from the lesion. Following an excision biopsy, she is diagnosed with stage I melanoma with a Breslow thickness of 0.9mm and a mitotic index of 1.5. She is otherwise fit and well, with no significant past medical history.

What is the most appropriate next step in management?

A. Wide local excision with a 2cm margin

B. Wide local excision with a 1cm margin

C. Wide local excision with a 0.5cm margin

D. Chemotherapy

E. Wide local excision and sentinel lymph node biopsy

Correct Answer:Wide local excision with a 1cm margin

Explanation:

The main treatment for melanoma is wide local excision with margins dependent on the Breslow thickness. For stages 0 to II, the excision margin can also be determined by the stage (0.5-1cm for stage 0, 1cm for stage I, and 2cm for stage II, according to NICE guidelines). Therefore, wide local excision with a 1cm margin is the most appropriate next step in this patient’s management.

Wide local excision with a 0.5cm margin would be appropriate if this were a stage 0 melanoma.

Wide local excision with a 2cm margin would be appropriate if this were a stage II melanoma.

Sentinel lymph node biopsy is only recommended where the Breslow thickness is >1 mm, or where the Breslow thickness is 0.8-1.0mm, and the patient has one of ulceration, lymphovascular invasion or a mitotic index of 2 or more. Therefore, wide local excision and sentinel lymph node biopsy would not be the most appropriate next step.

Chemotherapy is generally used only for advanced melanoma. It would not be appropriate for a stage 0 melanoma.

Further reading:

https://geekymedics.com/malignant-melanoma-of-the-skin/

Question:

A 21-year-old man attends A&E following an impulsive overdose. He describes severe nausea, vomiting, and ringing in his ears prior to his attendance, and on examination is tachypnoeic and diaphoretic. He appears slightly confused and is unable to tell you which medication he has taken. During your examination, he has an acute decrease in consciousness and begins seizing. An ABG performed during resuscitation reveals a metabolic acidosis.

Which of the following medications is this patient most likely to have overdosed on?

A. Digoxin

B. Paracetamol

C. Aspirin

D. Bisoprolol

E. Ferrous sulphate

Correct Answer:Aspirin

Explanation:

Aspirin (salicylate) overdose is associated with nausea, vomiting, tinnitus, and hyperventilation initially, with later development of fever, confusion and seizures. Because salicylates initially stimulate the respiratory centre, an ABG performed a short time after an overdose will typically reveal respiratory alkalosis, with later development of metabolic acidosis (caused both directly by salicylate, and its deleterious effect on cellular metabolism).

Bisoprolol overdose is associated with bradycardia, hypotension, and syncope.

Paracetamol overdose is usually asymptomatic in the initial stages, followed by the development of anorexia, nausea, vomiting, abdominal pain, and derangement of liver function tests.

Digoxin toxicity is associated with nausea, vomiting, anorexia, visual disturbance (blurred vision, or yellow/green tinted vision), palpitations, arrhythmias and dizziness/syncope.

Iron overdose does not commonly lead to significant problems, but in severe cases is associated with local gastrointestinal effects such as nausea, vomiting, abdominal pain and diarrhoea/malaena. This may be followed by systemic features hypotension, haematemesis and shock.

Further reading:

https://www.msdmanuals.com/en-gb/professional/injuries-poisoning/poisoning/aspirin-and-other-salicylate-poisoning?query=salicylates

Question:

A 52-year-old woman presents to her GP with a single episode of haemoptysis which occurred 24 hours ago. She describes a small amount of fresh red blood. She denies any new cough, shortness of breath, wheezing, fever, or weight loss. She has no significant past medical history and has never smoked.

A respiratory examination is unremarkable.

What is the most appropriate next step?

A. Non-urgent chest X-ray

B. CT chest abdomen pelvis

C. 2-week wait referral for suspected cancer

D. Urgent chest X-ray within 2 weeks

E. Spirometry

Correct Answer:2-week wait referral for suspected cancer

Explanation:

According to NICE guidelines, all patients over the age of 40 with unexplained haemoptysis should be offered a 2-week wait referral for suspected cancer.

An urgent chest X-ray within 2 weeks is incorrect; this woman has presented with haemoptysis and should therefore be offered a 2-week wait referral for an appointment rather than imaging alone.

A non-urgent chest X-ray is incorrect; this woman has presented with haemoptysis and should therefore be offered a 2-week wait referral for an appointment.

A CT chest abdomen pelvis is used to stage lung cancer. Although this patient may eventually need a CT chest abdomen pelvis if they are diagnosed with lung cancer, the most appropriate first step is to refer them under a 2-week wait pathway for suspected cancer.

Spirometry is the investigation of choice for diagnosing chronic obstructive pulmonary disease or asthma. These conditions do not typically present with haemoptysis. The absence of a cough, shortness of breath and wheeze in this patient further goes against the need for spirometry. Spirometry may be used in the assessment of lung function prior to treating lung cancer, however, it is not the most appropriate first step in this patient’s management.

Further reading:

https://www.nice.org.uk/guidance/ng12/chapter/Recommendations-organised-by-site-of-cancer#lung-and-pleural-cancers

Question:

A 62-year-old man presents to the emergency department with severe nausea and vomiting. He also reports a 2-month history of fatigue, haemoptysis, decreased appetite, polyuria, polydipsia, and constipation. He has a past medical history of type 2 diabetes and hypertension, for which he takes metformin, ramipril and hydrochlorothiazide. He has a 30-pack-year smoking history and drinks alcohol socially. Vital signs are unremarkable and physical examination is otherwise insignificant.

Blood tests demonstrate:

Test Result Reference Ranges

Calcium (adjusted)

4.4 mmol/L

2.2 – 2.6 mmol/L

Albumin

40 g/L

35-50g/L

Parathyroid hormone, intact

5 ng/L

10 – 65 ng/L

Creatinine

125 mmol/L

59 – 104 mmol/L

Urea nitrogen

11.1 mmol/L

2.5 – 78 mmol/L

Glucose

8.7 mmol/L

4.0 – 7.8 mmol/L

25-hydroxyvitamin D

65 nmol/L

50 – 125 nmol/L

1,25-hydroxyvitamin D

18 pg/mL

15 – 65 pg/mL

What is the most likely cause of this patient’s hypercalcaemia?

A. Hydrochlorothiazide-induced hypercalcemia

B. Chronic kidney disease

C. Hypercalcaemia of malignancy

D. Sarcoidosis

E. Primary hyperparathyroidism

Correct Answer:Hypercalcaemia of malignancy

Explanation:

Hypercalcaemia of malignancy can be categorised as either parathyroid hormone (PTH)-dependent (high-normal/increased PTH as in hyperparathyroidism) or PTH-independent (decreased PTH). Hypercalcaemia of malignancy (HHM) is the most common cause of PTH-independent hypercalcaemia and often presents with extremely high (>4.0 mmol/l) and symptomatic (polyuria, polydipsia, constipation) levels of calcium. HHM should be a top differential diagnosis in this patient, considering his systemic symptoms (nausea, fatigue, decreased appetite), extensive smoking history, haemoptysis and significantly elevated calcium levels in combination with a decreased PTH. HHM is caused by the secretion of PTH-related protein (PTHrP) by malignant cells and is associated with squamous cell (lung, head and neck), breast, renal, bladder and ovarian carcinomas. PTHrP increases bone resorption as well as reabsorption of calcium in the distal tubules of the kidneys. It does not, however, cause the conversion of 25-hydroxyvitamin D to 1,25-dihydroxyvitamin D to the same extent as PTH does, and so 1, 25-dihydroxyvitamin D levels will be low/low-normal.

Hydrochlorothiazide-induced hypercalcaemia is incorrect as hydrochlorothiazide increases urinary calcium reabsorption, which can mildly increase serum calcium levels (<3.0mmol/l); however, severe hypercalcaemia to this extent rarely occurs. In addition, his significant smoking history associated with haemoptysis points to malignancy as the underlying cause.

Sarcoidosis and other haematologic malignancies like lymphoma can cause hypercalcaemia as a consequence of increased conversion of 25-hydroxyvitamin D to 1,25-dihydroxyvitamin D. However, this patient has a normal 1,25-dihydroxyvitamin D level, making this a less likely cause of his hypercalcaemia.

Chronic kidney disease leads to a decreased renal production of vitamin D, which in turn, leads to hypocalcaemia, hyperphosphatemia and a rise in PTH (secondary hyperparathyroidism).

Primary hyperparathyroidism rarely causes severe hypercalcaemia (<3.5mmol/l), and this patient’s decreased PTH level rules out this diagnosis.

Further reading:

https://www.wikidoc.org/index.php/Hypercalcemia\_differential\_diagnosis

Question:

A 67-year-old man presents to the GP concerned about the side effects of medication that he has started recently. Around a month ago, he was admitted to the hospital with sudden-onset pain in his lower leg; angiography demonstrated occlusion of the posterior tibial artery, and bypass grafting was carried out. The patient recovered well from the procedure and states that he was started on a number of new medications before being discharged.

Over the past few weeks, he has noticed increasing abdominal pain, largely located in the epigastric region, especially after meals. He denies haematemesis or melaena but states that the pain is affecting his appetite. Having looked up the symptoms on the internet, he believes that his daily aspirin is likely to blame. The GP agrees and discusses the possibility of taking a proton pump inhibitor to reduce the gastrointestinal side effects that can arise with the drug. The patient is not keen, and would rather not add an additional medication, as he believes he is taking a number of drugs already.

The GP makes the decision to stop the patient's aspirin, and starts him on clopidogrel instead - he explains to the patient that this is the same as aspirin in terms of dosage and frequency, but has a slightly different mechanism of action.

What is the mechanism of action of the new drug that the patient is to be started on?

A. Inhibition of thromboxane A2

B. Inhibition of glycoprotein IIb/IIIa receptors

C. Inhibition of ADP platelet receptors

D. Phosphodiesterase-3 inhibitor

E. Direct inhibition of thrombin

Correct Answer:Inhibition of ADP platelet receptors

Explanation:

Clopidogrel functions by inhibiting the P2Y12 receptors; a specific form of ADP receptor that encourages the aggregation of platelets. This inhibition reduces the rate at which primary haemostasis can occur, thus giving a reduced risk of thrombosis. The drug is often given as an alternative to aspirin as prophylaxis of vascular events; in the setting of previous stroke and TIA, it is the antiplatelet therapy of choice.

Drugs such as abciximab and tirofiban function by inhibiting glycoprotein IIb/IIIa receptors; these act to allow for the binding of von Willebrand factor and the activation of platelets. They are now often being given to patients with acute coronary syndrome who are awaiting percutaneous coronary intervention.

Inhibition of thromboxane A2 is the mechanism by which aspirin exhibits its antiplatelet effect. Thromboxane A2 has a mediating effect on platelet aggregation, and thus aspirin is an inhibitor of primary haemostasis.

Dipyridamole is an antiplatelet agent that acts as a phosphodiesterase-3 inhibitor; this is less commonly used in clinical practice, but in some cases can be used as an adjunct to aspirin in those at risk of ischaemic stroke.

Dabigatran, an oral anticoagulant agent acts by directly inhibiting thrombin; this is also the mechanism of bivalirudin, which may be given to patients awaiting percutaneous coronary intervention. Thrombin plays a role in secondary haemostasis rather than the formation of the platelet plug, and thus these drugs are not regarded as true antiplatelet agents.

Further reading:

https://patient.info/medicine/clopidogrel-to-prevent-blood-clots-plavix

Question:

A 14-year-old boy presents to the GP with a red, irritated right eye that has spread to the left eye today. He describes a watery discharge from both eyes. He explains he has recently been unwell with a cold.

He does not have any significant medical history and does not wear contact lenses.

What is the most appropriate initial management step?

A. Sodium cromoglicate 2% drops

B. Chloramphenicol 0.5% drops

C. Chloramphenicol 1% ointment

D. No treatment required, recommend self-care measures

E. Fusidic acid 1% drops

Correct Answer:No treatment required, recommend self-care measures

Explanation:

The most likely diagnosis is viral conjunctivitis. NICE recommends patients suspected of having viral conjunctivitis should be reassured and given information regarding eye self-care measures. This is because non-herpetic viral conjunctivitis is self-limiting, usually within one to two weeks. Self-care advice includes information regarding how to bathe the eyelids, apply cool compresses and how to maintain good hygiene to prevent the spread of infection to the other eye or other people.

Topical antibiotics such as chloramphenicol drops and ointment and fusidic acid are only recommended in the context of bacterial conjunctivitis when the infection is severe or if circumstances require rapid resolution. Whilst differentiating between viral and bacterial conjunctivitis can be challenging, NICE guidelines suggest watery discharge and a history of recent viral infection favour viral conjunctivitis.

Sodium cromoglicate is recommended in the context of allergic conjunctivitis.

Further reading:

https://cks.nice.org.uk/topics/conjunctivitis-infective/management/management-in-primary-care/

Question:

Mark is a 24-year-old man with a diagnosis of schizophrenia. He has previously been treated with two anti-psychotics, but his symptoms have persisted.

Mark's psychiatrist ensures that he is fully compliant with his medication, and he is on the correct dose. It is determined that there is no evidence of any substance misuse, another mental health illness, or an underlying physical illness.

It is decided that Mark should be started on another anti-psychotic, to which Mark agrees.

What is the most appropriate medication to use next in Mark's case?

A. Paroxetine

B. Clozapine

C. Haloperidol

D. Lamotrigine

E. Quetiapine

Correct Answer:Clozapine

Explanation:

Clozapine is given to patients with schizophrenia, where they have not responded to treatment despite the use of at least 2 different anti-psychotics. Clozapine is associated with agranulocytosis, therefore regular blood testing is required to monitor for this.

Paroxetine is an SSRI, a class of anti-depressants. It would not be an appropriate medication to use in this case.

Haloperidol is a 1st generation, 'typical' anti-psychotic. It can be used to treat and manage schizophrenia but is not used in treatment-resistant schizophrenia.

Quetiapine is a 2nd generation, 'atypical' anti-psychotic. It can be used to treat and manage schizophrenia but is not used in treatment-resistant schizophrenia.

Lamotrigine is used as a mood stabilizer in the treatment of bipolar disorder. It is also used to treat epilepsy.

Further reading:

https://www.nice.org.uk/guidance/cg178/chapter/1-Recommendations

Question:

A 27-year-old woman presents to her GP complaining of cold hands and fingers. This occurs mainly when exposed to cold weather. She’s noticed her fingers change colour from white to blue and then red. Gloves and heat packs have been ineffective. She believes this is due to her “poor circulation”, like her mother and maternal grandmother.

She has no past medical history, takes no regular medications and is a non-smoker. The GP makes a referral to secondary care.

Based on the likely diagnosis, what is the most appropriate management option?

A. Aspirin

B. Valsartan

C. Ramipril

D. Nifedipine

E. Median nerve decompression

Correct Answer:Nifedipine

Explanation:

This case demonstrates Raynaud's disease. Raynaud's is characterised by vasospasm in response to cold temperatures or emotional events. The digits change colour from white to blue to red. It may be primary (Raynaud's disease) or secondary to other conditions, e.g. rheumatoid arthritis, scleroderma (Raynaud's phenomenon). Conservative management is the first-line management option including smoking cessation, lifestyle advice and preventing the fingers from cold exposure. However, these have been ineffective in this patient. Nifedipine (a calcium channel blocker) is the first-line medication.

Aspirin is an analgesic and anti-platelet agent. Analgesia is recommended in managing Raynaud's, however, aspirin would not be the most appropriate analgesia to prescribe. Aspirin is indicated in critical ischaemia associated with Raynaud's, but this is not the case in this patient.

Median nerve decompression may be indicated in carpal tunnel syndrome. This would present with numbness and tingling of the thumb and lateral fingers supplied by the median nerve. However, it would not cause the vascular symptoms that this patient is describing.

Ramipril is an ACE inhibitor that can also be used to manage Raynaud's. However, it is typically only used if calcium channel blockers are ineffective.

Valsartan is an angiotensin-II receptor antagonist, and like ramipril, it would be considered if calcium channel blockers were ineffective.

Further reading:

https://cks.nice.org.uk/topics/raynauds-phenomenon/

Question:

A 7-year-old girl is brought to the GP by her parents for a progressively worsening cough. Her parents explain that she has developed "coughing spells" over the past week. These coughing spells last about a minute and are accompanied by deep, noisy gasps of breath afterwards. She has also vomited on a number of occasions after a coughing fit. Her parents also report a "runny nose" in the week before the cough started.

The parents explain that the girl usually is fit and healthy. They describe a normal birth and development but admit she has not been vaccinated. She has no known allergies.

On examination, the girl is noted to have red eyes, and her temperature is 37.6°C; the remaining vital signs are within normal limits. The respiratory examination is normal.

What is the most likely diagnosis in this patient?

A. Whooping cough

B. Bronchiolitis

C. Bacterial pneumonia

D. Croup

E. Kawasaki disease

Correct Answer:Whooping cough

Explanation:

The most likely diagnosis in this patient is whooping cough, also known as pertussis, an infectious disease caused by the bacterium Bordetella pertussis. In this history, highly suggestive clinical features include an unvaccinated child, a persistent cough characterised by short expiratory bursts followed by an inspiratory gasp (making a 'whooping' noise) and post-tussive vomiting. Patients also typically report catarrhal symptoms in the week preceding the cough.

Patients with bronchiolitis classically present with a persistent but less severe cough and variable tachypnoea, chest recession, wheeze ± crackles on respiratory examination. The history and examination of this patient do not support this diagnosis.

Kawasaki disease is an acute, febrile systemic vasculitis that almost exclusively affects children under five years of age. The typical presentation of Kawasaki disease a young child with a polymorphous rash, conjunctival injection, enlarged cervical lymph nodes and persistent fever. The "red eyes" noted in this patient are likely due to excessive coughing; there are no other features that suggest Kawasaki disease in this presentation.

A common cause of respiratory distress in children is croup, also known as laryngotracheobronchitis. Croup characteristically presents with acute onset, seal-like barking cough and may be associated with stridor, voice hoarseness and sternal/intercostal indrawing. Patients with croup typically present with a sudden onset barking cough and rapidly develop respiratory distress. This patient has intermittent (paroxysmal) coughing fits, has experienced gradual worsening of symptoms and does not have any evidence of stridor; therefore, croup is a less likely diagnosis.

The diagnosis of bacterial pneumonia should be considered in children with a high fever (over 39°C), persistent focal crackles on auscultation, history of productive cough and history of respiratory disease. This patient does not have any suggestive features in the history or examination; therefore, this is a less likely diagnosis.

Further reading:

https://cks.nice.org.uk/topics/whooping-cough/

Question:

A 55-year-old woman presents to the GP with insomnia and low mood. Over the last 3 months, she has felt hopeless and guilty but denies plans of suicide. During this time period, she has had back pain, a low appetite, and associated nausea and constipation, along with feeling thirstier. She has a past medical history of depression and takes sertraline, however, this has not been helping during this 3-month period.

Investigations are performed:

Investigation Result Reference range

Haemoglobin 130 g/L (115 – 165 g/L)

Platelets 340 x109/L (140 – 400 x109/L)

White blood cells 9.0 x 109/L (3.6 – 11.0 x 109/L)

Sodium 140 mmol/L (135-145 mmol/L)

Potassium 4.0 mmol/L (3.5 - 5.0 mmol/L)

Urea 3.0 mmol/L (2.0-7 mmol/L)

Creatinine 67 mmol/L (55 - 120 µmol/L )

Calcium 3.3 mmol/L (2.1-2.6 mmol/L)

Phosphate 0.3 mmol/L (0.8-1.4 mmol/L)

Given the likely diagnosis, what is the most likely underlying cause for her presentation?

A. Multiple myeloma

B. Solitary parathyroid adenoma

C. Parathyroid hyperplasia

D. Chronic kidney disease

E. Vitamin D deficiency

Correct Answer:Solitary parathyroid adenoma

Explanation:

Solitary parathyroid adenoma is correct. This patient is presenting with features consistent with hypercalcaemia, which can be remembered using 'bones, stones, abdominal groans, and psychiatric moans', representing bone pain (her back pain), stones (renal stones, which are not present here), abdominal groans (her anorexia, nausea, and constipation) and psychiatric moans (her worsening mood). Hypercalcaemia is most commonly caused by hyperparathyroidism or malignancy, so it is essential that further investigations are carried out. The investigation findings demonstrate that phosphate is low, making hyperparathyroidism a more likely diagnosis. The increased levels of parathyroid hormone stimulate bone resorption and increased calcium absorption from the gut, and increase phosphate excretion in the urine, leading to high calcium and low phosphate. The most common cause of primary hyperparathyroidism is a solitary parathyroid adenoma.

Parathyroid hyperplasia is incorrect. Although this is another cause of primary hyperparathyroidism, a solitary parathyroid adenoma makes up most cases. Parathyroid hyperplasia may occur in patients who have successfully-treated secondary hyperparathyroidism (due to chronic kidney disease or a vitamin D deficiency). During the time they have secondary hyperparathyroidism, the parathyroid glands can be thought of as increasing in size to cope with the reduced level of calcium, leading to increased parathyroid hormone release.

Multiple myeloma is incorrect. Although this can cause hypercalcaemia and bone pain (her back pain), which are both seen in this patient, there are no other associated features of multiple myeloma. These features can be remembered using the mnemonic 'CRAB' - calcium (raised), renal dysfunction, anaemia, and bone pain. There is also no unexpected weight loss which may also be seen.

Chronic kidney disease is incorrect. This can cause secondary hyperparathyroidism, as the dysfunctional kidneys excrete less phosphate leading to the increased removal of calcium from the circulation as they are deposited in insoluble calcium phosphate salts. This would lead to an increased level of parathyroid hormone, but the calcium would be low, and phosphate would be raised, which is not seen here.

Vitamin D deficiency is incorrect. This can cause secondary hyperparathyroidism due to less calcium absorption. The results would show an increased level of parathyroid hormone, but the calcium would be low, which is not seen here.

Further reading:

https://patient.info/doctor/hyperparathyroidism-pro

Question:

A 3-year-old male child attends his GP accompanied by his parents with a fever and rash. His fever has been present for the past 36 hours and his rash has developed within the last day. The rash started on the torso and has now spread to the rest of the body, sparing the face. His parents also report a red looking tongue and throat, in addition to increased lethargy over the past 24 hours. On examination, the patient’s temperature is 39 oC and he looks fatigued. Cervical lymphadenopathy is present and associated with enlarged, red tonsils and a patchy white tonsillar coating. A ‘strawberry tongue’ is also observed. Perioral pallor is also present and associated with facial flushing. The rash comprises of fine, punctate erythema with a ‘sandpaper’ texture.

What is the MOST COMMON complication of the condition described?

A. Mastoiditis

B. Otitis media

C. Kawasaki disease

D. Septic arthritis

E. Meningitis

Correct Answer:Otitis media

Explanation:

The most likely diagnosis, in this case, is scarlet fever. This condition typically presents with:

Fever that usually lasts 24-48 hours

Malaise

Tonsillitis

‘Strawberry’ tongue

Rash (usually fine, punctate erythema that starts on the torso and spares the face, has a sandpaper texture)

Late-onset desquamation particularly around the fingers

The gold-standard investigation for scarlet fever is a throat swab, however, antibiotic therapy should be commenced immediately. The usual management for this condition is oral penicillin V for 10 days. The most common complication of scarlet fever is otitis media caused by the local spread of infection.

Kawasaki disease is not a complication of scarlet fever. It is instead a key differential diagnosis of scarlet fever that must be considered.

Mastoiditis is indeed a complication of scarlet fever but is not as common as otitis media.

Septic arthritis is indeed a complication of scarlet fever but is not as common as otitis media.

Meningitis is indeed a complication of scarlet fever but is not as common as otitis media.

Further reading:

https://patient.info/doctor/scarlet-fever-pro#nav-6

Question:

A 71-year-old male presents to his primary care doctor after seeing blood in his urine for 2 days. The patient does not report any dysuria or urinary hesitancy. He denies fevers or chills. His past medical history is significant for poorly controlled hypertension and there is no family medical history. He reports a 32-pack-year history of smoking.

Physical examination reveals a palpable mass in the right flank.

What is the most likely diagnosis?

A. Urinary tract infection

B. Transitional cell carcinoma of the bladder

C. Inguinal hernia

D. Squamous cell carcinoma of the bladder

E. Renal cell carcinoma

Correct Answer:Renal cell carcinoma

Explanation:

The patient in the above scenario has the classic presentation of renal cell carcinoma (RCC). Risk factors for RCC include smoking, hypertension, obesity and acquired cystic disease of the kidney. Carcinoma of the renal cortex is the most common form of renal cancer, followed by transitional cell carcinomas of the renal pelvis. The classic triad of RCC (flank pain, haematuria and a palpable mass in the abdomen) only occurs in about 10% of patients. Other clinical manifestations include scrotal varicoceles (typically left-sided), inferior vena cava involvement (which can lead to ascites, lower limb oedema and hepatic dysfunction) and paraneoplastic symptoms such as anaemia, hypercalcaemia and erythrocytosis.

Squamous cell carcinoma of the bladder typically arises from chronic irritation of the bladder from chronic cystitis, smoking or pathogens like Schistosoma haematobium (most commonly seen in the Middle East).

Transitional cell cancer of the bladder is a possibility in the above patient, however, his presentation of a palpable mass, smoking history and painless haematuria is more consistent with RCC.

An inguinal hernia is unlikely to lead to haematuria or a palpable mass in the right flank.

Urinary tract infections commonly present with haematuria in elderly patients, but are also likely to have other features such as fevers, chills and dysuria.

Further reading:

https://patient.info/doctor/renal-cancer

Question:

A 23-year-old gentleman is being investigated as an outpatient for recurrent episodes of diarrhoea and abdominal pain. He undergoes an ileocolonoscopy to try to establish an underlying diagnosis.

The ileocolonoscopy report states the presence of 'patchy inflammation in the colon and terminal ileum, with ulceration and early evidence of stricture formation'. A biopsy is taken which subsequently shows transmural inflammation in the affected areas.

What is the most likely diagnosis?

A. Crohn's disease

B. Ulcerative colitis

C. Carcinoma of the colon

D. Coeliac disease

E. Diverticulitis

Correct Answer:Crohn's disease

Explanation:

Patchy transmural inflammation affecting the colon and terminal ileum are classical of Crohn's disease. Ulceration, stricture formation and fistulation can occur and may require surgical intervention. Ileocolonscopy is widely used to directly visualise the lower GI tract and obtain histological samples to aid diagnosis. This is used in conjunction with imaging such as CT and MRI to confirm diagnosis, aid prognosis and guide management.

Ulcerative colitis, another form of inflammatory bowel disease, is characterised by the presence of continuous inflammation restricted to the mucosa and submucosa of the colon.

Coeliac disease is diagnosed histologically by the presence of intraepithelial lymphocytes and villous atrophy of the duodenal mucosa. Ileocolonoscopy would not be helpful here.

Diverticulitis refers to inflammation of diverticulae, outpouchings of the bowel wall, and usually occurs in older patients. Although diverticular disease can, like Crohn's disease, lead to fistulation, the histological findings here are more supportive of inflammatory bowel disease.

There are no features of carcinoma of the colon in this scenario - it is often visualised macroscopically in the form of a growth or abnormality in the colonic wall and confirmed with histology.

Further reading:

https://patient.info/doctor/crohns-disease-pro

Question:

A 10-month child is brought to the hospital by his mother after she went to wake him from an afternoon nap and discovered the presence of blood in his nappy. She has been concerned about him for several hours; he has had uncontrollable bouts of crying that seem to come and go and has been generally lethargic, refusing to feed at breakfast. She reports that she put him to sleep, in the hope that this would help, as she was not sure what else to do; when she checked on him, his nappy contained a significant amount of bloody stool.

Whilst sat in triage, the baby begins vomiting profusely; this has a tinge of green mixed within it. The paediatric consultant is called, who quickly examines the child; he notes a mass in the upper portion of the abdomen. The doctor obtains IV access and administers fluids, given the likely losses suffered by the child. He requests urgent investigations, including a full set of blood tests and an ultrasound of the abdomen.

What is the most likely diagnosis in this child?

A. Pyloric stenosis

B. Intusussception

C. Midgut malrotation with volvulus

D. Necrotising enterocolitis

E. Cow's milk protein allergy

Correct Answer:Intusussception

Explanation:

Intussusception is an abdominal pathology that most commonly affects children under the age of 1; it arises due to the invagination of a section of the bowel into a more distal section. This 'telescoping' can obstruct the lumen of the bowel, preventing the movement of faecal matter and eventually compromising the venous supply to this portion, resulting in ischaemia. Children with the condition can present with colicky abdominal pain, usually demonstrated through bouts of crying, as well as general lethargy. 'Redcurrant jelly stools' are a classical feature that can develop due to the sloughing of the intestinal mucosa.

As the condition progresses, vomiting can occur; this may become bilious. Investigations to confirm the diagnosis include an ultrasound, which may demonstrate the 'target sign', as well as general blood tests and possibly an X-ray of the abdomen. A 'drip and suck' approach to management is often established, with IV fluid provision and decompression of the bowel via the insertion of an NG tube. Definitive treatment is via an initial air enema, with the aim of reducing the section of invaginated bowel. If this fails, then laparotomy and resection of the segment involved will be necessary.

Pyloric stenosis is an important cause of significant vomiting in children; arising due to abnormal hypertrophy of the pyloric sphincter. It usually presents in the first month of life, and due to the fact that the obstruction is proximal to the sphincter of Oddi, will not result in bilious vomiting. Therefore, it is unlikely to account for this child's symptoms.

Midgut malrotation with volvulus is another cause of bilious vomiting worth considering in the paediatric population. However, it usually presents well before 1 year of age, and bloody stools are a less common feature.

Necrotising enterocolitis can cause abdominal pain and bloody stools in an infant; however, it usually affects those who are born significantly preterm, and normally presents between 2-4 weeks. Therefore, it is less likely than intussusception in this scenario.

Cow's milk protein allergy can cause abdominal pain, crying, and bloody stools in children; however, it is less likely to present as acutely as in this scenario. There is no mention of symptoms linked to feeding that may be expected if this was the cause of the patient's presentation.

Further reading:

https://patient.info/doctor/intussusception-in-children

Question:

A 90-year-old woman presents at the emergency department with worsening left lower quadrant abdominal pain. The pain came on gradually 5-days ago. She also complains of anorexia and bloody diarrhoea, which started around the same time. She opens her bowels 5-times per day but she has no urinary symptoms. She has a past medical history of ischaemic stroke, Parkinson's disease, and breast cancer. During the examination, she has guarding and rebound tenderness in her left iliac fossa and has a NEWS score of 6.

Observations:

Respiratory rate 18 breaths per minute

O2 saturation 95% on room air

Heart rate 120 beats per minute

Blood pressure 100/65 mmHg

Temperature 38.4° C

Which one of the following would be the most appropriate investigation?

A. MRI

B. Ultrasound

C. Abdominal X-ray

D. CT scan

E. Colonoscopy

Correct Answer:CT scan

Explanation:

This patient likely has acute diverticulitis. This classically presents with left lower quadrant pain, diarrhoea with or without PR bleeding, and can lead to serious complications such as abscesses or bowel perforations.

CT scans are routinely done in acute diverticulitis patients who present to the hospital (rarely done if the patient is managed with oral antibiotics in the community). This is to confirm diverticulitis as well as show any complications such as fistulae, perforations, and abscesses. It can also be helpful in assessing for any differentials such as malignancies.

Abdominal X-rays are rarely done nowadays due to the risks of radiation without providing detailed images. It is usually only performed in suspected cases of obstruction or megacolon (e.g. severe ulcerative colitis).

Colonoscopies should not be performed in the acute phase of acute diverticulitis due to the risk of perforation. However, once the patient is more stable and the symptoms are less troublesome, colonoscopy is usually performed to rule out an underlying malignancy that can present with similar symptoms (e.g. change in bowel habit and PR bleeding).

MRI could, in certain circumstances, be used for more detailed imaging in the future but is unlikely to be done in an acute episode of diverticulitis, especially as waiting times are longer and imaging takes longer, which may not be practical in an unwell patient who has to lie still.

Ultrasound is very rarely used for bowel pathologies and is usually reserved for gynaecological or biliary pathologies due to CT scans providing much more detailed imaging.

Further reading:

https://cks.nice.org.uk/topics/diverticular-disease/diagnosis/assessment/

Question:

A 73-year-old man develops severe nausea and vomiting lasting for three days, following a right hemicolectomy. In the last 12 hours, he has become increasingly agitated, sweaty, and confused. On examination, the abdomen is soft and non-tender. A neurological exam shows upper and lower limb rigidity, and he has difficulties following instructions. His heart rate is 125bpm, respiratory rate 25/min, and blood pressure is 164/125mmHg. He is unable to keep food or liquid down and has missed taking his regular medication. His past medical history includes Parkinson's disease and depression, for which he takes levodopa and sertraline.

What is the most likely explanation for his presentation?

A. Development of delirium

B. Administration of domperidone

C. Missed administration of sertraline

D. Administration of cyclizine

E. Missed administration of levodopa

Correct Answer:Missed administration of levodopa

Explanation:

Missed administration of levodopa is correct. This patient has developed neuroleptic malignant syndrome characterised by the signs of rigidity, agitation, sweating, tachycardia, and hypertension. This is a complication that can arise in patients with Parkinson's disease if they are not given their dopaminergic medication (e.g. levodopa) on time or due to other triggers such as surgery, dehydration, and anti-psychotic use. This patient has been unable to tolerate anything orally, and it is most likely he has missed some doses of his levodopa, leading to the development of neuroleptic malignant syndrome. Levodopa and other medications used in the management of Parkinson's disease are time-critical medications. NG tube insertion or rotigotine patches may be used in this case.

Administration of cyclizine is incorrect. Cyclizine tends to cause anticholinergic effects such as blurred vision and dry mouth, neither of which this patient has. Cyclizine is not known to cause neuroleptic malignant syndrome and is safe to use in patients with Parkinson's disease.

Administration of domperidone is incorrect. Although domperidone is a dopamine receptor antagonist, it is safe to use in Parkinson's disease as it does not cross the blood-brain barrier. This would not contribute to the development of neuroleptic malignant syndrome.

Missed administration of sertraline is incorrect. SSRI discontinuation symptoms usually include diarrhoea and abdominal discomfort and can cause sweating, agitation, and restlessness. Discontinuation of an SSRI does not cause neuroleptic malignant syndrome, nor does it cause the other signs and symptoms this patient is experiencing such as stiffness.

Development of delirium is incorrect. Delirium is usually associated with memory disturbances, agitation or withdrawal and visual hallucination. It would not explain the rigidity, sweating, tachycardia, and hypertension this patient is experiencing.

Further reading:

https://geekymedics.com/parkinsons-disease/

Question:

A 66-year-old man presents to the 2-week wait dermatology clinic with a new pigmented lesion on his chest. An excision biopsy is performed, which reveals a melanoma in situ. He is otherwise fit and well, with no significant past medical history.

What is the most appropriate next step in the management of this patient?

A. Wide local excision with a 0.5-1cm margin

B. Chemotherapy

C. Sentinel lymph node biopsy

D. Wide local excision with a 2cm margin

E. Imiquimod

Correct Answer:Wide local excision with a 0.5-1cm margin

Explanation:

The main treatment for melanoma is wide local excision with margins dependent on the Breslow thickness. For stages 0 to II, the excision margin can also be determined by the stage (0.5-1cm for stage 0, 1cm for stage I, and 2cm for stage II, according to NICE guidelines). Therefore, wide local excision with a 0.5-1cm margin is the most appropriate next step in this patient’s management.

Wide local excision with a 2cm margin would be appropriate if this were a stage II melanoma.

Imiquimod may be used to treat melanoma in situ (or stage 0 melanoma) where wide local excision with a sufficient margin would lead to unacceptable disfigurement or morbidity.

Sentinel lymph node biopsy is only recommended where the Breslow thickness is >1 mm or where the Breslow thickness is 0.8-1.0mm, and the patient has one of ulceration, lymphovascular invasion or a mitotic index of 2 or more. Sentinel lymph node biopsy should not be offered to those with stage 0 or IA melanoma. Therefore, wide local excision and sentinel lymph node biopsy would not be the most appropriate next step.

Chemotherapy is generally used only for advanced melanoma. It would not be appropriate for a stage 0 melanoma.

Further reading:

https://geekymedics.com/malignant-melanoma-of-the-skin/

Question:

A 65-year-old female patient attends her GP with ‘fullness’ of her lower abdomen. The patient mentions that she first noticed a ‘fullness’ of her lower abdomen 6 weeks previously. Since then her abdomen has become progressively larger. She has also experienced increasing fatigue, reduced appetite and unintentional weight loss of 5kg. She has no significant past medical history. On examination, you note generalised abdominal distension as well as a right adnexal mass.

Which of the following TUMOUR MARKERS would MOST LIKELY be raised given her history?

A. Calcitonin

B. CEA

C. C-kit

D. CA-125

E. CD20

Correct Answer:CA-125

Explanation:

The most likely diagnosis, in this case, is ovarian cancer. Ovarian cancer can be classified as epithelial (the most common form), germ cell or sex-cord stromal.

Risk factors for this condition include:

increasing age

lifestyle factors (smoking, obesity, lack of exercise)

hormonal factors (history of infertility, use of infertility drugs, nulliparity, early menarche, late menopause, hormone replacement therapy usage)

family history of ovarian cancer

presence of BRCA1 or 2 gene mutation

prior ovarian, breast or bowel cancer

Clinical features for this condition include:

abdominal discomfort

abdominal distension

abnormal uterine bleeding

constitutional symptoms (e.g. fatigue, weight loss, anorexia)

Investigations for suspected ovarian cancer include:

CA-125

Ultrasound abdomen and pelvis

CT abdomen and pelvis

CD20 would be appropriate if non-Hodgkin lymphoma was suspected.

C-kit would be appropriate if a gastrointestinal stromal tumour or mucosal melanoma was suspected.

Calcitonin would not be appropriate in this case. This would be appropriate in the presence of suspected medullary thyroid cancer.

CEA (carcinoembryonic antigen) would be appropriate in the presence of suspected colorectal cancer.

Further reading:

https://patient.info/doctor/ovarian-cancer-pro

Question:

Jamie Jackson is a 47-year-old man who presents to the GP with drooping of his upper eyelids. He complains that this worsens as the day goes on. He also reports a general feeling of weakness and sometimes experiences difficulty swallowing. On examination, the patient’s voice becomes less audible as you get him to count to 50 and on repetitive blinking, he continues to slow down.

A diagnosis of a neurological condition is made based on serological studies.

Which of the following investigations should also be performed as part of the workup for this patient's condition?

A. CT chest

B. Leg ultrasound

C. ECG

D. Abdominal X-ray

E. Fundoscopy

Correct Answer:CT chest

Explanation:

The presentation points to a clear diagnosis of myasthenia gravis. This condition is caused by autoantibodies to post-synaptic acetylcholine receptors at the neuromuscular junction. Serological studies detecting these autoantibodies are diagnostic.

Myasthenia gravis is associated with thymoma, a tumour of the thymus gland. Around 15% of patients with myasthenia gravis have a thymoma, but around 50% of patients with thymoma have myasthenia gravis. Thymomas can sometimes be seen as opacification on a chest x-ray, but are reliably diagnosed using CT scan.

Thymectomy is generally performed if a thymoma is detected. Research suggests that this can be of benefit to patients with myasthenia gravis.

Fundoscopy, abdominal x-ray, ECG, and leg ultrasound are not relevant in the workup for myasthenia gravis.

Further reading:

https://patient.info/doctor/myasthenia-gravis-pro

Question:

A 28-year-old woman presents to the emergency department with fever and abdominal pain. She denies nausea, vomiting or loose stools. She describes strong-smelling greenish vaginal discharge for the past six days. Her heart rate is 105bpm and her temperature is 38.1°C.

On examination, she is tender across her lower abdomen and in the right upper quadrant. A point of care pregnancy test is negative.

What is the most appropriate antibiotic treatment in this case?

A. Metronidazole

B. Doxycycline

C. Gentamicin

D. Ceftriaxone and doxycycline

E. Ceftriaxone and metronidazole

Correct Answer:Ceftriaxone and doxycycline

Explanation:

The most likely diagnosis in this scenario is pelvic inflammatory disease (PID). The patient has a systemic manifestation of a sexually transmitted infection, with symptoms of pyrexia, abdominal pain and offensive vaginal discharge. The presence of the offensive vaginal discharge means that other intra-abdominal causes such as appendicitis are less likely. This patient also has the upper abdominal pain characteristic of Fitz-Hugh-Curtis syndrome, a secondary complication of PID encompassing peritonitis and perihepatitis.

The underlying infections in PID would most likely be Chlamydia trachomatis or Neisseria gonorrhoea; although co-infection is not uncommon.

Given that this patient is systemically unwell, she would be admitted for inpatient treatment. Intravenous antibiotics would be appropriate. In PID, patients are treated empirically for both chlamydia and gonorrhoea in order to maximise the chance of recovery. Ceftriaxone is the treatment for gonorrhoea, and doxycycline is used for chlamydia infection. Intravenous ceftriaxone and doxycycline would, therefore, be the most effective initial choice, as per current guidelines. This would be switched to oral doxycycline and metronidazole when appropriate. Were the patient in the community, treatment would be with intramuscular ceftriaxone, oral doxycycline and oral metronidazole.

Metronidazole offers good overall gram-negative cover but is insufficient alone in PID. Ceftriaxone and metronidazole together are commonly used in intra-abdominal infection and had this patient presented without the symptom of offensive vaginal discharge this would be a reasonable choice.

Gentamicin intravenous therapy would not be entirely inappropriate as it does also offer gram-negative cover however this would not be the first-line choice.

Further reading:

https://www.bashh.org/guidelines

Question:

A 45-year-old man is brought to the emergency department by ambulance after collapsing at home, whilst holding his head. There was no history of trauma before the event, with the collapse being reported as 'coming out of the blue'. He is currently under investigation for suspected Ehler's Danlos syndrome.

On examination, vital signs include HR 37bpm, BP 153/104mmHg, RR 12, SpO2 99% with an FiO2 50%. GCS 6/15 with a secured away. Hyperreflexia and increased tone are noted. CT head reveals hyperdensity within the basal cisterns.

Considering the likely diagnosis, what is the approximate mortality rate of the condition?

A. 5%

B. 1%

C. 30%

D. 15%

E. 10%

Correct Answer:30%

Explanation:

Whilst it is difficult to determine the exact cause of this patient's symptoms given the sudden onset with limited history, subarachnoid haemorrhage (SAH) is the most likely diagnosis, given the finding of blood in the basal/subarachnoid cisterns of the brain on imaging. This can arise due to trauma, or (as is most probable in this scenario) due to the rupture of an aneurysm within the brain, allowing for blood to enter the subarachnoid space. The patient's history of suspected Ehler's Danlos syndrome puts him at an increased risk of this condition, as the vascular form can correspond with an increased risk of aneurysm formation.

This patient will potentially require angiography to confirm the diagnosis, and a neurosurgical referral is likely to be requested. The management of a subarachnoid haemorrhage usually involves the identification of the source of the bleeding and the use of clips or coiling to close the defect. However, even with urgent intervention, the condition is extremely serious with the average mortality rate remaining at around 25-30% (this will obviously depend on the size and severity of the bleed); Whilst neurosurgical advances mean that the treatment of patients with subarachnoid haemorrhage is improving, the mortality rate has not fallen as low as 15, 10, 5 or 1%.

Further reading:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4334863/

Question:

A 63-year-old patient attends her GP with a swollen right eye. She states that she noticed the lump several months ago but it seems to have gradually increased in size. Otherwise, she is well, and denies any pain, discharge, temperatures or fevers.

On examination, you note an inflamed lesion in the superior-lateral aspect of the patient's right eye that is non-tender on palpation. She has normal visual fields, unchanged visual acuity and her eye movements are unrestricted. Vital signs are unremarkable.

What is the most likely diagnosis?

Source: Jordan M. Graff, MD [CC BY-SA 3.0]

A. Hordeolum

B. Chalazion

C. Pre-orbital cellulitis

D. Blepharitis

E. Orbital cellulitis

Correct Answer:Chalazion

Explanation:

The most likely diagnosis is a chalazion.

This patient has presented with a chronic localised swelling of the right eye with no systemic features or change in visual acuity. A chalazion is caused by chronic inflammation or blockage of a meibomian gland with subsequent cyst formation. Typically patients present with a chronic, painless lump which has gradually increased in size and is not usually associated with pain or discharge. This patient's presentation best fits this clinical picture.

A hordeolum (stye) is a reasonable differential for this patient. Hordeola are caused by an acute bacterial infection of either the eyelash follicle or a meibomian gland. Clinically hordeola present with an acute tender lump in the eyelid associated with epiphora and local inflammation. Often pus will be visible and the lump will discharge.

Blepharitis is a local dermatitis of the eyelid and clinically appears as a crusting around the eyelashes. Blepharitis It most commonly due to staphylococci but can also be caused by viruses, mites or lice. Blepharitis is a risk factor for development of hordeola and chalazia however does not present with a lump as seen in the clinical photo.

Both preseptal and orbital cellulitis are serious conditions and should be on the list of differentials for every patient presenting with eye pain, swelling, or altered visual acuity. Preseptal cellulitis is associated with bacteria entering after local trauma to the skin (e.g. insect bites) whereas orbital cellulitis is most commonly caused by spread from the ethmoid sinuses (respiratory pathogens such as streptococci and Haemophilus influenzae type B are the usual culprits). Clinically, a patient with orbital cellulitis presents with proptosis, restricted, painful eye movements, relative afferent pupillary defect, and altered visual acuity. Moreover, patients with orbital cellulitis may be systemically unwell with shock and pyrexia. Preseptal cellulitis is usually preceded by a recent eye trauma or infection and rarely is accompanied by painful eye movements, visual changes or proptosis. Patients with preseptal cellulitis are usually systemically well.

This patient has presented with a chronic eyelid pathology, she is systemically well, has unaltered visual acuity or eye movements, all of these factors make orbital cellulitis and preseptal cellulitis less likely diagnoses. If any diagnostic uncertainty exists, junior clinicians should escalate for senior review or an ophthalmological opinion. Chalazions and localised infections can sometimes progress to cellulitis, therefore a low threshold to seek medical attention should be advised to patients presenting with infected or inflamed eyes.

Further reading:

https://www.rcemlearning.co.uk/references/atraumatic-red-eye/

Question:

A 32-year-old woman presents to the A&E department with a painful loss of vision in her left eye. She says her vision suddenly went blurry 3 days ago and has since deteriorated to the point she cannot see at all. She describes pain behind the eye that is made worse by eye movement.

She has no previous medical history.

On examination, there is no visible abnormality affecting the external surface of either eye. However, on further assessment, a left relative afferent pupillary defect (RAPD) is noted and her visual acuity is reduced to 6/60 in her left eye. Fundoscopy reveals a normal optic disc in both eyes. The remainder of the neurological examination is normal.

What is the most likely diagnosis?

A. Uveitis

B. Giant cell arteritis

C. Optic neuritis

D. Acute angle-closure glaucoma

E. Idiopathic intracranial hypertension

Correct Answer:Optic neuritis

Explanation:

The most likely diagnosis is optic neuritis, which involves inflammation of the optic nerve. Optic neuritis may involve the retrobulbar or the intrabulbar (papillitis) portion of the optic nerve. It typically presents with subacute or acute pain in the eye, reduced visual acuity and colour desaturation. Whilst optic neuritis may be idiopathic; it can also be the initial presentation of multiple sclerosis in about 20-30% of people. Retrobulbar optic neuritis is sometimes described as "first the patient sees nothing and then the doctor sees nothing", as there may be no apparent change to the optic disc.

Whilst the patient has eye pain, the normal external examination of the external eye makes a diagnosis of uveitis less likely. Uveitis typically presents with a red eye, photophobia and blurred vision.

Typically acute angle-closure glaucoma presents in a much older age group with severe eye pain, headache and nausea ± vomiting. The eye typically appears red with a mid-dilated, unresponsive pupil.

Most commonly seen in patients >50 years old, giant cell arteritis presents with visual changes accompanied by headache and jaw claudication.

Idiopathic intracranial hypertension typically presents with a history of worsening headaches and increasing visual loss. Due to the raised intracranial pressure, there is generally bilateral optic disc swelling and enlargement of the blind spot.

Further reading:

https://www.rnib.org.uk/eye-health/eye-conditions/optic-neuritis

Question:

A 65-year-old woman is referred to a neurologist after developing a tremor of her left hand that is present at rest. She adds that she has had some difficulty walking and that she is finding it hard to balance. The patient explains that her symptoms have gradually worsened over the past year. She denies any restlessness, personality changes or sensory disturbances.

She has never smoked, and her past medical history and family history are both unremarkable.

On gait examination, the neurologist notes reduced arm movement and a shuffling gait affecting the left side. Motor examination shows cogwheel rigidity of the left arm. A mini-mental state examination (MMSE) gives a score of 29/30.

Which of the following best describes the pathophysiology of the likely diagnosis?

A. Excess of dopamine

B. CAG trinucleotide repeat expansion

C. Destruction of the myelin sheath

D. Death of dopaminergic neurons

E. Multiple small-vessel infarcts

Correct Answer:Death of dopaminergic neurons

Explanation:

This patient is presenting with Parkinson’s disease, a neurological disorder characterised by the presence of resting tremor, bradykinesia, rigidity and postural instability. While the precise pathophysiology is unknown, the death of dopaminergic neurons in the basal ganglia is known to have a key role in the development of Parkinson’s disease.

A CAG trinucleotide repeat expansion of the gene that codes for the huntingtin protein leads to the development of Huntington’s disease. This is a mostly hereditary, neurodegenerative disorder that typically presents with restless, involuntary limb movements (chorea) alongside personality changes and a loss of coordination.

Destruction of the myelin sheath describes the pathophysiology of multiple sclerosis, a central nervous system condition associated with visual changes, muscle weakness and sensory disturbances. Multiple sclerosis usually affects women between 20 and 40 years of age.

It is a deficiency rather than an excess of dopamine that is associated with Parkinson’s disease. It’s thought that excess levels of dopamine may have a role in the development of schizophrenia.

Vascular dementia can be caused by multiple small-vessel infarcts, leading to a step-wise decline in general cognitive function. Patients with vascular dementia also often have a history of cardiovascular disease.

Further reading:

https://patient.info/doctor/parkinsonism-and-parkinsons-disease

Question:

A 55-year-old woman presents with a 6-month history of exertional dyspnoea, fatigue, and cough. During this time, she has had episodes of palpitations and reports waking up suddenly at night feeling short of breath.

On auscultation, a third heart sound is heard, and there are fine bibasal crepitations. Lower limb oedema is present. Her temperature is 37.2°C, heart rate 115 bpm, and blood pressure 163/92 mmHg.

A chest x-ray demonstrates an enlarged cardiac shadow and bilateral hilar lymphadenopathy. An ECG shows tachycardia with a left bundle branch block, and echocardiography demonstrates left ventricular dilation with an ejection fraction of 40%.

Blood tests are performed:

Test Result Reference range

Haemoglobin 130 g/L (115 – 165)

Platelets 350 x 109/L (140 – 400)

White cell count 4.3 x 109/L (3.6 – 11.0)

Sodium 140 mmol/L (135 - 145)

Potassium 4.3 mmol/L (3.5 - 5.0)

Calcium 3.1 mmol/L (2.1 - 2.6)

Serum angiotensin-converting enzyme 55 μmg/L (< 40)

NT-proBNP 175 pg/mL (< 125)

What underlying cause best explains this patient's presentation?

A. Myocarditis

B. Restrictive cardiomyopathy

C. Sarcoidosis

D. Dilated cardiomyopathy

E. Pericarditis

Correct Answer:Sarcoidosis

Explanation:

Sarcoidosis is correct. This patient has presented with signs and symptoms of heart failure, characterised by her progressive shortness of breath, cough, fatigue, cough, and paroxysmal nocturnal dyspnoea (waking up randomly at night feeling short of breath). She has also had associated palpitations, suggesting a problem with cardiac electrical conduction. The chest x-ray shows cardiomegaly, which is an expected feature in heart failure but also demonstrates bilateral hilar lymphadenopathy, suggesting an underlying cause may be involved. The investigations show a raised NT-proBNP, which supports a diagnosis of heart failure, but an underlying cause must be identified. The blood tests also show hypercalcemia and raised serum angiotensin-converting enzyme (ACE), which alongside bilateral hilar lymphadenopathy, suggests sarcoidosis. It is likely that this patient has developed cardiac sarcoidosis, which can lead to conduction abnormalities such as complete heart block and bundle branch blocks, and eventually lead to ventricular dilation and heart failure.

Myocarditis can lead to ventricular dilation, arrhythmias (which can cause palpitations), dilated cardiomyopathy and heart failure, however, this would not explain the bilateral hilar lymphadenopathy, increased serum ACE, and hypercalcaemia. Myocarditis usually presents in younger patients with chest pain following a viral infection.

Although restrictive cardiomyopathy can lead to decreased exercise tolerance, fatigue, arrhythmias and conduction blocks, echocardiography would show ventricular wall thickening with normal systolic function and poor diastolic function. However, this would not explain the bilateral hilar lymphadenopathy, increased serum ACE, and hypercalcaemia.

Dilated cardiomyopathy can present with signs and symptoms similar to heart failure, but it is usually the result of damage to the myocardium due to many conditions, including sarcoidosis. Idiopathic dilated cardiomyopathy would not explain the bilateral hilar lymphadenopathy, increased serum ACE, and hypercalcaemia.

Pericarditis would present with acute-onset retrosternal chest pain that is typically worse when lying down and improves on leaning forward. It may lead to a cardiac tamponade due to inflammatory effusions filling the pericardial space, restricting the heart's contractions. This would present with Beck's triad of hypotension, a raised jugular venous pressure, and muffled heart sounds.

Further reading:

https://patient.info/doctor/sarcoidosis-pro

Question:

A 79-year-old woman presents to the neurology clinic after a recent diagnosis of Parkinson's disease, with symptoms of bradykinesia and a worsening unilateral tremor. She struggles to mobilise around the house, and her motor symptoms are starting to interfere with her normal daily activities. Her past medical history includes hypertension, type 2 diabetes and recurrent gout, for which she takes amlodipine, metformin and allopurinol, respectively.

What is the most likely first-line medical therapy for this patient's Parkinson's disease?

A. Entacapone

B. Levodopa

C. Amantidine

D. Rasagiline

E. Cabergoline

Correct Answer:Levodopa

Explanation:

In cases of Parkinson's disease where motor symptoms are heavily impacting a patient's quality of life, levodopa should be considered as a first-line medication. Levodopa is a metabolic precursor to dopamine which can cross the blood-brain barrier, thus enabling more dopamine to be formed to compensate for the deficiency in Parkinson's disease. In combination with levodopa, patients are usually prescribed carbidopa (which decreases the peripheral breakdown of dopamine) to reduce the potential side effects of the medication.

Rasagiline is an example of a monoamine oxidase B (MAO-B) inhibitor. Current evidence suggests that MAO-B inhibitors are less effective than levodopa at reducing motor symptoms in Parkinson's disease. However, rasagiline may be offered as an adjunct to other medications in Parkinson's disease patients who do not respond to levodopa alone.

Cabergoline is an example of a dopamine agonist. While this may be offered as an adjunct to other medications in the later stages of Parkinson's disease, levodopa should be used first-line if motor symptoms significantly affect the patient's quality of life.

Entacapone is an example of a catechol-O-methyl transferase (COMT) inhibitor. This is sometimes considered as an adjunct to reduce motor symptoms in patients who are already on optimal levodopa therapy.

Amantadine is an antiviral agent which may have some benefit in reducing dyskinesia. However, it is not used as a first-line medication for the management of motor symptoms in Parkinson's disease.

Further reading:

https://www.nice.org.uk/guidance/ng71/chapter/Recommendations#pharmacological-management-of-motor-symptoms

Question:

A nulliparous 36-year old woman who is 30-weeks pregnant presents to A&E after experiencing a gush of clear fluid from her vagina. Speculum examination confirms pooling of amniotic fluid in the vaginal canal. She is not experiencing contractions or abdominal pain. The patient has thus far experienced an uneventful and low-risk pregnancy.

Her heart rate is 70 bpm, blood pressure 123/78 mmHg, respiratory rate 20, O2 saturation 99% on air and her temperature is 36.8o C. Her blood tests are unremarkable, with a white cell count of 6 x109 cells/L and a CRP of 5 ng/L.

Which of the following would form part of your management plan?

A. Immediate induction

B. Nifedipine

C. Cervical cerclage

D. Induce labour after 24 hours

E. Antibiotics

Correct Answer:Antibiotics

Explanation:

This patient is experiencing pre-term rupture of membranes. This condition is often associated with chorioamnionitis (which would require immediate induction); however, there is no evidence of infection (respiratory rate of 20 is normal for a pregnant woman). The loss of the amniotic membrane has put this patient is at increased risk for chorioamnionitis, so prophylactic oral antibiotics (usually erythromycin) are indicated. The overall aim will be to provide the foetus more time to develop while monitoring for signs of infection. As labour often occurs spontaneously once membranes are ruptured, steroids should also be given to accelerate lung development.

Cervical cerclage is a method for preventing premature labour; however, it is contraindicated once the membranes are ruptured, as it may act to seal in an infection.

It would be reasonable to induce labour after 24 hours if this baby was greater than 37 weeks gestation; however, doing now would deny the foetus valuable development time.

Immediate induction of labour would be indicated if there were signs of infection such as offensive liquor, abdominal tenderness, fever, or raised inflammatory markers. These are absent in this case.

Nifedipine is a tocolytic that can be used to delay premature labour in order to allow steroids time to work. It is indicated for premature labour, but only if membranes are unruptured. It is not recommended by NICE as a treatment for premature prolonged rupture of membranes as it does not improve outcomes.

Further reading:

https://patient.info/doctor/preterm-prelabour-rupture-of-membranes

Question:

A 60-year-old female presents to A&E with abdominal pain in the para-umbilical region. Her bowel movements have decreased lately and she has been passing hard stools. She mentions drinking more water than usual and going to the toilet more frequently. She has also been feeling lethargic.

She’s has a past medical history of type 2 diabetes and hypertension. Her current medication includes metformin 850mg TDS and hydrochlorothiazide 12.5mg OD.

Clinical examination reveals the following:

Alert, well orientated, dry mucous membranes

O2 sats 96% on air, RR 20, chest clear

BP 140/80, Cap refill < 3s, HR 105 bpm, H.S I+II+0

Soft-non tender, slightly distended abdomen with reduced bowel sounds

Calves not tender. No peripheral oedema.

Blood tests show the following:

Hb 78 g/L, WBC & platelets normal

U&Es normal

LFTs normal

Corrected calcium: 3.0g/L

A diagnosis of hypercalcemia is made and IV fluids are commenced.

What is the NEXT most appropriate management step?

A. Zoledronic acid

B. Administer 40mg Furosemide

C. Blood transfusion

D. Suspend hydrochlorothiazide

E. Dialysis

Correct Answer:Suspend hydrochlorothiazide

Explanation:

The most appropriate next management step is to suspend hydrochlorothiazide as this is likely contributing to the hypercalcaemia. Thiazides exert their antihypertensive effect through an increase in sodium excretion by blocking the thiazide-sensitive NaCl transporter in the distal convoluted tubule, which is closely linked to calcium transport. Thiazides have several metabolic effects contributing to higher serum calcium levels, but increased renal tubular reabsorption of calcium resulting in reduced urine calcium excretion is the most likely cause. 90% of hypercalcaemia is due to primary hyperparathyroidism or malignancy.

The first-line management strategy for hypercalcaemia involves aggressive IV fluid rehydration (typically with 0.9% NaCl) in addition to removing any potential causes or contributors to hypercalcaemia (i.e. medications). Definitive management involves identifying and treating the underlying cause.

Zoledronic acid is a bisphosphonate. It reduces bone and gastrointestinal calcium absorption. NICE only recommends zoledronic acid as a second-line treatment option for hypercalcaemia, because of its potential to cause hypocalcemia if there is evidence of vitamin D deficiency or suppressed levels of PTH.

According to NICE guidelines, dialysis is only recommended in severe renal failure and certainly not for isolated hypercalcaemia. Identifying and removing potential causes, intravenous fluids and close monitoring of electrolytes should be attempted as a first-line management strategy

NICE recommends blood transfusion should generally only be considered when Hb is <70g/L, with other options such as oral iron replacement being considered first. In some patient groups (i.e. acute myocardial infarction) or patient's who are very symptomatic (i.e. shortness of breath), the threshold for transfusion may be lowered. Blood transfusions do have significant associated risks, so they should only be performed when clinically necessary.

Furosemide is no longer used in the acute management of hypercalcaemia (https://www.ncbi.nlm.nih.gov/pubmed/18711156),

Further reading:

https://cks.nice.org.uk/hypercalcaemia

Question:

A 42-year-old male presents to the emergency department with a 4-day history of bilateral flank pain and red-coloured urine. 2 days prior to this he reported experiencing a sore throat with nasal discharge. He has no past medical or family history. He does not smoke cigarettes or drink alcohol. Review of systems is normal. Relevant vital signs are as follows:

Blood pressure: 125/65 mmHg

Pulse: 88 per minute

Temperature: 37.4 degrees Celsius

Respiratory rate: 14 breaths per minute

Physical examination reveals flank tenderness. Urinalysis is positive for blood and protein with no red blood cells or nitrites. Routine blood tests are normal. A computed tomography (CT) scan of the abdomen and pelvis is also normal.

What is the most likely diagnosis?

A. Alport syndrome

B. IgA nephropathy

C. Renal calculi

D. Minimal change disease

E. Acute post-streptococcal glomerulonephritis

Correct Answer:IgA nephropathy

Explanation:

The patient’s recent history of an upper respiratory tract infection, gross haematuria and flank pain are consistent with a diagnosis of IgA nephropathy. IgA nephropathy, or Berger's disease, is a cause of nephritic syndrome that occurs a few days after or even concurrently with an upper respiratory or gastrointestinal infection. Other clinical features like mild fevers, hypertension and oedema may also be present in some patients. Diagnosis is typically attained through a thorough clinical history and urine analysis. In atypical or severe cases, a renal biopsy with immunofluorescence studies can be performed to look for IgA deposits. Of note, coeliac disease is of often associated with IgA nephropathy.

Renal calculi are likely to present with colicky pain that typically radiates from the flank into the groin. CT scans of the abdomen and pelvis are very sensitive for kidney stones and so this is less likely in the above case.

Acute post-streptococcal glomerulonephritis occurs several weeks (2 – 10 weeks) following a streptococcal throat or skin infection. Patients are typically hypertensive with gross haematuria being an uncommon finding. The patient in the above scenario had a respiratory infection only four days ago and also has gross haematuria thus making acute post-streptococcal glomerulonephritis less likely.

Alport syndrome is an inherited disease with the majority of cases being X–linked. Patients typically present with haematuria, proteinuria and extrarenal manifestations like sensorineural hearing loss and retinopathy. Mutations in type IV collagen are to blame for this disease.

Minimal change disease is the commonest cause of nephrotic syndrome that mainly affects the paediatric population. Clinical features include oedema, heavy proteinuria, immunosuppression and hypercoagulability. Treatment with steroids is usually curative. The patient described in the above scenario is suffering from nephritic syndrome.

Further reading:

https://patient.info/doctor/iga-nephropathy-bergers-disease-pro

Question:

A 38-year-old female inpatient on the gastroenterology ward is diagnosed with autoimmune hepatitis (AIH) following a liver biopsy. She has evidence of moderately severe inflammation and deranged liver function tests and is commenced on prednisolone.

Which other medication, in conjunction with prednisolone, would be most useful as first-line treatment for her condition?

A. Rituximab

B. Vitamin K

C. Azathioprine

D. Adalimumab

E. Mesalazine

Correct Answer:Azathioprine

Explanation:

The mainstay of treatment for autoimmune hepatitis (AIH) is immunosuppression. This usually begins with a steroid such as prednisolone and azathioprine, a purine synthesis inhibitor. It is often recommended that the thiopurine methyltransferase (TPMT) activity is tested before initiating azathioprine to avoid giving this to patients at risk of excessive myelosuppression or severe haematopoietic toxicity.

Mesalazine is an agent typically used in ulcerative colitis management. Adalimumab is an anti-TNF monoclonal antibody with a role in multiple conditions including rheumatoid arthritis, Crohn's disease and psoriasis. Vitamin K may be used to manage coagulopathy as a result of liver dysfunction but would not treat the underlying condition. Rituximab is an anti-CD20 monoclonal antibody which is sometimes used as salvage therapy in AIH but would not be first line. It has a variety of other indications including rheumatoid vasculitis, myasthenia gravis and various cancers.

Further reading:

https://patient.info/doctor/autoimmune-hepatitis-pro

Question:

A 27-year-old man presents to his GP with increasing peripheral weakness beginning in his legs and now beginning to affect his hands. He had a gastrointestinal infection a few weeks ago.

Given the most likely diagnosis, what clinical sign is most consistent with this condition?

A. Positive Babinski reflex

B. Increased tone

C. Reduced reflexes

D. Spasticity

E. Hyperreflexia

Correct Answer:Reduced reflexes

Explanation:

The most likely diagnosis is Guillain-Barre, which tends to develop weeks after a GI infection (classically due to Campylobacter jejuni). It begins as a peripheral limb weakness that ascends proximally. This happens due to an inappropriate autoimmune response against the patient's neurons. It mainly has motor signs and sensory signs are limited if present at all. Lumbar puncture is useful and shows elevated protein with a normal white cell count, and the management is supportive with or without high-dose immunoglobulin or plasma exchange.

Reflexes are reduced in lower motor neuron conditions like Guillain-Barre syndrome. This is because the nerves conducting the information that a reflex is needed are damaged.

Hyperreflexia occurs due to upper motor neuron lesions and are complex in their aetiology. It can be simplified by thinking of the cause as a loss of physiological inhibition of the reflex, hence excessive reflexes in upper motor neuron disease.

Increased tone is an upper motor neuron lesion sign.

Positive Babinski reflex is also a sign of upper motor neuron disease. A normal plantar reflex is where the toes curl downwards as a point is run up the lateral aspect of the plantar surface of the foot. A positive Babinski reflex (also known as an upward going plantar reflex) is where the toes extend upwards instead. As a practical note: make sure you assess the toes when looking for a plantar reflex and not the entire foot; patients can extend their feet but curl their toes down, which may be confused for a positive Babinski.

Spasticity is an upper motor neuron sign.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK532254/

Question:

James, a 3-year-old boy is brought to the GP practice by his parents. Whilst in the waiting room the child collapses and starts shaking, with frequent jerking movements of all limbs. You carry out and ABCDE assessment and place the child into the recovery position. The jerking stops after approximately 3 minutes. Afterward, the child slowly comes round, appearing sleepy at first, but within 30 minutes appears back to their normal self. The parents report he had a febrile illness with mild upper respiratory symptoms, and they treated him with paracetamol and ibuprofen at home, however, he had not been improving so they booked this appointment. They took his axillary temperature at home and it was 39.0°C. He had been off his food and generally agitated but was still drinking and toileting as normal. The parents tell you this is the first time anything like this has happened. He is otherwise fit and well and has reached normal developmental milestones for his age. There is no relevant birth history and he has no siblings. His mother informs you she experienced “epilepsy” as a child around a similar age to her son but “grew out of it”, not requiring any treatment.

You carry out a thorough clinical examination that is unremarkable and other than a temperature of 38.5°C, all other observations are within normal ranges.

What would be the most appropriate management of this patient?

A. Prescribe buccal midazolam 5mg as a rescue medication and advise the parents when to use it in case another episode occurs

B. Advise that antipyretics should be used to reduce his fever if he appears uncomfortable/distressed and arrange a follow up in 1 week at the practice.

C. Arrange emergency ambulance transfer to Accident and Emergency

D. Non-urgent referral to a paediatric neurologist

E. Arrange immediate hospital assessment by a paediatrician

Correct Answer:Arrange immediate hospital assessment by a paediatrician

Explanation:

Based on the history and clinical signs and symptoms, this child has presented with the first episode of a simple febrile seizure. The International League Against Epilepsy (ILAE) defines febrile seizure as “an epileptic seizure occurring in childhood associated with fever, but without evidence of intracranial infection or defined cause". Typical features of a simple febrile seizure include:

Child aged between 6 months to 6 years old

Seizure lasting 2-3 minutes, and rarely longer than 10 minutes

Tonic-clonic type

There may be foaming at the mouth, dyspnoea, pallor or cyanosis

A short post-ictal phase, lasting no longer than 1 hour

The acute management of a febrile seizure is to carry out an ABCDE assessment, ensure the patient is safe and place in the recovery position, maintaining their airway. Should the seizure continue to last beyond 5 minutes, an ambulance should be called and use of rescue medication (if the patient already has it as per specialist advice) can be used.

In this instance, the patient has fully recovered, however, given that it is his first presentation of a febrile seizure, he would require immediate hospital assessment by a paediatrician.

Emergency ambulance transfer to Accident and Emergency would be required if there was suspected meningitis/meningococcal disease or signs of encephalitis. Also if there was evidence of sepsis, secondary to a potentially serious underlying infection. In this case, the likely underlying cause a mild viral URTI and the patient’s clinical examination and observations other than temperature are otherwise normal.

Non-urgent referral to a paediatric neurologist would be indicated in children with neurodevelopmental delay and/or signs of neurocutaneous syndromes or metabolic disorders. These patients may require further imaging and genetic testing in secondary care to determine an underlying cause for these seizures.

Prescribing buccal midazolam as rescue medication should only be initiated following specialist advice and would not be appropriate in a primary care setting. If a rescue medication is advised, this is in the form of buccal midazolam or rectal diazepam and would be given if the seizure lasts more than 5 minutes and repeated once after 10 minutes if the seizure continues.

Evidence suggests there is no role for antipyretics in reducing or preventing febrile seizure recurrence, however advising antipyretics to reduce fever if the patient is uncomfortable is appropriate, and a follow-up in primary care is sensible, however, given this is the first episode, the patient needs to be reviewed by a paediatrician first.

Further reading:

https://cks.nice.org.uk/febrile-seizure#!topicSummary

Question:

A 3-year-old girl is brought to the GP by her mother who describes a 2-day history of a barking cough and hoarse voice. The cough is worse at night and she also has a 'runny nose'. Her mother confirms she is fully up to date with her vaccinations.

On examination, she is pyrexial (37.8) but otherwise appears well with no evidence of respiratory distress. Auscultation reveals inspiratory stridor.

What is the most likely diagnosis?

A. Croup

B. Epiglottitis

C. Viral induced wheeze

D. Pneumonia

E. Bronchioloitis

Correct Answer:Croup

Explanation:

The most likely diagnosis is croup, also known as laryngotracheobronchitis. This is a common childhood viral illness involving inflammation of the upper respiratory tract. Parainfluenza virus types I, II, III and IV are responsible for approximately 80% of cases. Croup most commonly affects children aged 6 months to 3 years and is most prevalent in autumn and spring. Croup typically begins with coryzal symptoms. These symptoms progress over the course of a few days to include the characteristic barking cough and hoarse voice. The symptoms are typically worse at night. A mild-to-moderate fever may also be present.

Epiglottitis is a serious illness caused by inflammation of the epiglottitis. Children typically present looking very unwell. High fever and a sore throat are typically the first symptoms. The child may complain of painful swallowing which can result in drooling of saliva. The child may sit upright and lean slightly forward with their tongue protruding to open up their airway to improve airflow into their lungs. Epiglottitis is a medical emergency and the child needs to be treated in hospital. Haemophilus influenza type b (Hib) is the most common organism responsible for epiglottitis. Routine vaccination against Hib has made epiglottitis very rare in developed countries.

Pneumonia typically presents with a productive cough, fever, shortness of breath and hypoxia.

Bronchiolitis tends to affect infants under the age of 2 years. It is a lower respiratory tract viral infection caused by respiratory syncytial virus (RSV) in about 80% of cases. Signs and symptoms of bronchiolitis include fever, cough, tachypnoea and wheeze.

Viral induced wheeze is common among preschool children. The wheeze is associated with viral infections and it is absent between these illnesses.

Further reading:

https://patient.info/doctor/croup-pro

Question:

A 75-year-old male presents to his primary care doctor with complaints of blurred vision in his left eye. He also complains of intermittent loss of vision, which he describes as like a curtain moving vertically across his visual field. Each episode lasts 3-4 minutes. He has no eye pain, eye discharge or headaches.

He has a past medical history of type two diabetes and hypertension and he is not compliant with his medication regimen.

On examination, his pupils are of normal size and reactive to light. There is no scalp tenderness.

Routine blood tests reveal normal erythrocyte sedimentation rate (ESR).

Which of the following fits best with the patient's presentation?

A. Giant cell arteritis

B. Cluster headache

C. Retinal detachment

D. Migraine

E. Amaurosis fugax

Correct Answer:Amaurosis fugax

Explanation:

This elderly male patient with vascular risk factors presents with recurrent painless and transient vision loss, which is consistent with amaurosis fugax. Amaurosis is a common clinical syndrome indicative of transient retinal ischemia, which is typically secondary to atherosclerosis of the ipsilateral carotid artery. Therefore, this patient’s medication regime should be optimised and a referral to the stroke clinic should also be made. Routine blood tests for cardiovascular risk factors, carotid doppler ultrasound and an electrocardiogram should be requested and the patient should be advised not to drive for one month. Antiplatelet therapy should also be considered.

Retinal detachment may present with a history of a curtain across the visual field however this would not recover spontaneously.

Giant cell arteritis (temporal arteritis) is characterised by a sudden loss of vision, jaw claudication and scalp tenderness. Elderly females (> 65 years old) are most commonly affected and ESR is typically raised.

Although migraines can lead to transient vision loss, the vision loss associated with migraines typically lasts for a longer time and the patient has no headache. Additionally, given this patient’s elderly age and atherosclerotic risk factors, Amaurosis is a more likely diagnosis.

Cluster headaches are typically characterized by unilateral and severe headaches often associated with autonomic symptoms such as ptosis, miosis, conjunctival injection and excessive lacrimation. These headaches often affect patients in ‘clusters’ of 6-12 weeks followed by a period of remission.

Further reading:

https://patient.info/doctor/transient-ischaemic-attacks

Question:

A 65-year-old man presents to the GP with a 4-month history of increasing frequency of urination during the day and night. He denies any pain or burning associated with urination.

During this time, he has tried to limit his fluid consumption and caffeine intake throughout the day; however, it has not relieved his symptoms.

He has a past medical history of hypertension, which is managed with amlodipine only. He has no surgical history and no family history of prostate cancer.

On examination, the patient appears well; his vital signs are all within normal limits. Digital rectal examination shows a non-tender, firm and symmetrically enlarged prostate with no nodules; the rectal tone is normal.

What is the most likely diagnosis in this patient?

A. Acute prostatitis

B. Neurogenic bladder

C. Benign prostatic hyperplasia

D. Urethral stricture

E. Prostate cancer

Correct Answer:Benign prostatic hyperplasia

Explanation:

The most likely diagnosis in this patient is benign prostatic hyperplasia (BPH) - glandular and stromal hyperplasia of the transitional zone of the prostate. BPH typically causes lower urinary tract symptoms (LUTS) which are classically subdivided into storage LUTS (e.g. frequency, urgency, nocturia, incontinence) and voiding LUTS (weak stream, dribbling, dysuria, straining). In patients with BPH, digital rectal examination classically reveals a firm, smooth, enlarged and non-tender prostate. BPH is a common disorder affecting men over 50 years old.

Patients with prostatitis typically present with suprapubic or lower back pain, systemic symptoms (e.g. fever), and a large, tender prostate on rectal examination. This patient does not report any pain and has no evidence of recent or ongoing infection on examination.

Patients with neurogenic bladder typically present with increased urinary frequency, urinary retention and overflow incontinence; this often manifests in recurrent urinary tract infections. Patients with neurogenic bladder may also have signs, or an existing diagnosis, of an underlying neurological disorder (e.g. stroke, multiple sclerosis). Furthermore, a neurogenic bladder does not cause an enlarged prostate.

Patients with a urethral stricture typically have a history of urethral instrumentation or urogenital trauma and a weak urinary stream. However, a urethral stricture is not generally associated with urinary frequency or an enlarged prostate.

Prostate cancer is an important differential to consider in older men presenting with LUTS. However, as prostate cancer arises in the peripheral zone of the prostate, symptoms do not usually occur until patients have advanced disease. This patient does not have any constitutional symptoms (e.g. fatigue, weight loss), suggesting progressive disease. Furthermore, the prostate was smooth and symmetrical on examination, whereas prostate cancer typically manifests with a nodular prostate.

Further reading:

https://cks.nice.org.uk/topics/luts-in-men/

Question:

A 4-year-old boy is brought to the GP by his mother, who is very concerned about a rash that he has developed. She states that he has just recovered from a 'nasty cold', but has now been complaining of abdominal pain and pain in his ankles and his knees. She had initially assumed that that the symptoms were due to a reaction to something he had eaten, but this morning, she noticed a purple rash, mainly sited over his legs.

On examination, the boy is shy but appears interested in the train set in the corner of the room and plays happily when invited to by the GP. On examination, a non-blanching purpuric rash is clearly visible on the flexural aspect of his lower limb, this is notably palpable. Observations reveal the following:

Temperature - 37.2 degrees

Pulse rate - 120

Respiratory rate - 26

Capillary refill time - 2 seconds

Which of the following would be most in keeping with the likely diagnosis?

A. Elevated serum IgA

B. Low platelet count

C. Auer rods on blood film

D. Low fibrinogen levels

E. Low CRP

Correct Answer:Elevated serum IgA

Explanation:

IgA vasculitis (previously referred to as Henoch-Schonlein purpura) is a small vessel vasculitis most commonly affecting children. It frequently follows an upper respiratory tract infection; it is thought that this may trigger IgA deposition within vessel walls, resulting in the symptoms of the condition. An elevated serum IgA is often detected if serum antibodies are measured.

The condition is sometimes described as a triad, with the three cardinal features being:

Purpuric rash (classically over the buttocks and lower limb)

Abdominal pain

Arthralgia

The diagnosis is usually made clinically and will normally be self-limiting. The most important complication of the disease is renal involvement; there is significant overlap between the condition and IgA nephropathy; the underlying pathology is thought to be identical, and the two conditions can often coexist in the same patient. Patients with IgA vasculitis will be followed up with regular blood pressure monitoring and urinalysis, to screen for the development of glomerulonephritis.

A low platelet count is not commonly seen in IgA vasculitis, rather an elevated count is more commonly secondary to the ongoing inflammatory process. If a low platelet count was present, this would be more in keeping with immune thrombocytopenic purpura; a condition that can present similarly to IgA vasculitis, but would not give the classic rash distribution, nor the arthralgia or abdominal pain.

Auer rods on blood film are a pathognomonic feature of acute myeloid leukaemia. This can give a purpuric rash secondary to a low platelet count but is unlikely in this case due to the fact that the child appears otherwise well, with normal observations.

Low fibrinogen levels are a feature of disseminated intravascular coagulation, a disease with extremely high mortality. This can be triggered by other conditions with high morbidity, including sepsis and malignancy. There is nothing in the history to suggest that this child is severely unwell.

As vasculitis is an underlying inflammatory process, CRP will usually be raised if it is measured. The same is true for any infective/inflammatory conditions, with the exception of systemic lupus erythematosus, which can give a falsely normal CRP. A low CRP is, therefore, very unlikely to present in this scenario.

Further reading:

https://patient.info/doctor/henoch-schonlein-purpura-pro

Question:

A 90-year-old man presents to the cardiology clinic for a review due to a history of progressive exertional dyspnoea and chest pain over the last year. He has also experienced a single episode of syncope. His past medical history includes angina and hypertension.

On examination, he has an ejection systolic murmur over the aortic area and a diminished, single S2. Clinical examination is otherwise normal, as are his vital signs.

What is the most likely finding on echocardiography?

A. Narrowing of the aortic valve with elevated aortic pressure gradient

B. Narrowing of the aortic valve with reduced aortic pressure gradient

C. Incompetent aortic valve with reduced aortic pressure gradient

D. Incompetent aortic valve with elevated aortic pressure gradient

E. Calcification of the aortic valve with increased aortic valve area

Correct Answer:Narrowing of the aortic valve with elevated aortic pressure gradient

Explanation:

The most likely finding on echocardiography is narrowing of the aortic valve with an elevated aortic pressure gradient given the patient has clinical features typical of aortic stenosis.

In aortic stenosis, there is a narrowing of the aortic valve, typically due to calcification of the aortic valve leaflets.

An elevated aortic pressure gradient (rather than reduced) is also a common finding in aortic stenosis, due to both the increased pressure that must be generated in the left ventricle to force blood through the narrowed aortic valve, as well as the turbulent flow that occurs distal to the aortic valve due to the disrupted blood flow.

The finding of an incompetent aortic valve with reduced aortic pressure gradient is a finding associated with aortic regurgitation, not aortic stenosis.

Further reading:

https://patient.info/doctor/aortic-stenosis-pro

Question:

A 74-year-old gentleman with Parkinson’s disease is admitted to the acute medical ward with a chest infection. He was recently commenced on co-careldopa but is finding this difficult to tolerate currently due to nausea. He feels he receives good symptomatic benefit from the treatment however so he is keen to keep taking this, especially whilst he is treated in hospital for his chest infection. He is still able to take tablets.

Which of the following medications would be most appropriate as first-line management of his nausea?

A. Domperidone

B. Cyclizine

C. Prochlorperazine

D. Ondansetron

E. Metoclopramide

Correct Answer:Domperidone

Explanation:

Domperidone is a peripherally-acting anti-dopaminergic (D2) medicine which works by increasing gut emptying. It does not cross the blood-brain barrier and is considered safe in the context of Parkinson’s disease. It is therefore often used first-line in the management of nausea in these patients.

Metoclopramide is a similar agent but also acts centrally, potentially worsening the Parkinsonian symptoms.

Prochlorperazine is also liable to worsen these symptoms.

Ondansetron may be useful second-line or if the oral route is unavailable but is contraindicated if the patient is taking apomorphine.

Cyclizine is another useful alternative but is not usually trialled before domperidone as there are rare reports of worsening of extrapyramidal symptoms.

Further reading:

https://bnf.nice.org.uk/treatment-summary/parkinsons-disease.html

Question:

A 21-year-old female attends her GP with an uncomfortable, red-eye. Her right eye has become progressively redder and has developed a ‘gritty’ sensation over the last 24 hours. Her right eyelid has also become more swollen and the vision in the eye appears blurred. In addition, her right eye has also been discharging a white-yellow sticky liquid.

On further questioning, she reports that she has an appointment at a genitourinary medicine clinic later in the day as her boyfriend has recently been diagnosed with a sexually transmitted infection (STI).

Clinical examination reveals the following:

Unilateral conjunctival inflammation

Tender lid oedema

Profuse mucopurulent discharge

Keratitis (with oedema, increased fluorescein uptake, decreased visual acuity)

Preauricular lymphadenopathy

What is the GOLD STANDARD management for the condition described?

A. Topical antihistamines

B. Topical ganciclovir

C. Lubricant eye drops

D. IM and oral antibiotics

E. Watch and wait approach

Correct Answer:IM and oral antibiotics

Explanation:

The most likely diagnosis, in this case, is bacterial conjunctivitis (specifically gonococcal conjunctivitis). This form of conjunctivitis usually has an acute onset (within 12-24 hours). Clinical features typically include unilateral or bilateral conjunctival inflammation, tender lid oedema, mucopurulent discharge, keratitis and preauricular lymphadenopathy.

Risk factors include contact with an infected individual. The gold-standard management for this condition is antibiotic therapy (e.g. intramuscular ceftriaxone plus oral doxycycline). This management should be applied in conjunction with conservative measures (i.e. use of lubricant drops, removal of contact lenses and cleaning measures).

A watch and wait approach is not appropriate in this case as gonococcal conjunctivitis is a high-risk disease. It may lead to several serious complications including corneal invasion and subsequent globe perforation.

Whilst lubricant eye-drops may provide mild, temporary relief for the patient, they would not treat the underlying infection.

Topical antihistamines may be used in the presence of allergic conjunctivitis. Allergic conjunctivitis would more likely present bilaterally with pruritic eyes associated with exposure to a particular allergen (e.g. when outdoors in the case of hayfever).

Topical ganciclovir is an antiviral agent that may be used in the management of viral conjunctivitis.

Further reading:

https://patient.info/doctor/conjunctivitis

Question:

You are trying to take a history from a 78-year-old patient in A&E. The patient does not seem to understand what you are asking them but they are able to respond. Their response to you asking if they are in any pain is “I have a dog in the fence”. The patient does not seem aware that what she says does not make sense and is also repetitive with her speech. On review of her past medical history, you note that she had a stroke 4 months ago.

Which lobe of the brain was most likely affected by the stroke to produce these symptoms?

A. Right occipital lobe

B. Left frontal lobe

C. Right temporal lobe

D. Right frontal lobe

E. Left temporal lobe

Correct Answer:Left temporal lobe

Explanation:

This patient has receptive aphasia, demonstrated by her inability to understanding what is being said and her non-sensical statements. Patient's with receptive aphasia are unable to understand written or spoken word. They are able to speak fluently, however, the contents of their speech are typically non-sensical.

Wernicke's area is located in the left temporal lobe and is responsible for the ability to understand speech. It is supplied by the left middle cerebral artery and therefore strokes that affect this vascular territory can result in receptive aphasia.

The left frontal lobe is the location of Broca's area, which is involved in the expression of speech (written and spoken word). Damage to Broca's area results in expressive aphasia, in which the patient can understand speech but is unable to communicate their own thoughts.

The right occipital lobe is involved in the processing of visual stimuli and strokes affecting this region would typically result in isolated homonymous hemianopia.

Further reading:

https://patient.info/doctor/dysarthria-and-dysphasia

Question:

A 67-year-old patient presents to the emergency department with dyspnoea and confusion. He has a history of chronic obstructive pulmonary disease (COPD), type 2 diabetes mellitus and hypertension. He smokes 20 cigarettes a day and has done so for 50 years.

On examination, RR 27/min, SaO2 75% on FiO2 35%, HR 117/min, BP 132/89 mmHg and temperature 38.1°C. An arterial blood gas is carried out, which is shown below.

Result Reference

pH 7.27 7.35-7.45

pO2 7.3 11 - 13 kPa

pCO2 14.6 4.7 - 6.0 kPa

HCO3 31 22 - 26 mmol/L

Base excess +12 -2 to +2 mmol/L

What is the next most appropriate management option?

A. Intubation and ventilation

B. Continuous positive airway pressure (CPAP)

C. Non-invasive ventilation (NIV)

D. 15L oxygen via a non-rebreather mask

E. Continue current management

Correct Answer:Non-invasive ventilation (NIV)

Explanation:

This case demonstrates an acute infective exacerbation of chronic obstructive pulmonary disease (COPD). The arterial blood gas demonstrates respiratory acidosis with partial metabolic compensation. This can be classified as type 2 respiratory failure. Type 2 respiratory failure involves hypoxaemia (PaO2 <8 kPa) with hypercapnia (PaCO2 >6.0 kPa). It occurs due to alveolar hypoventilation and is seen in conditions such as COPD, chest wall abnormalities, and reduced respiratory drive.

With a pH <7.35 and failing to improve with a FiO2 of 35%, non-invasive ventilation (NIV) is required. Indications for NIV include:

COPD with respiratory acidosis (pH <7.35)

Hypercapnic respiratory failure secondary to chest wall deformity (scoliosis, thoracoplasty) or neuromuscular disease

Weaning from tracheal intubation

Non-invasive ventilation should not be confused with continuous positive airway pressure (CPAP). CPAP is less useful in managing type 2 respiratory failure and has greater use in cardiogenic pulmonary oedema, obstructive sleep apnoea, and severe pneumonia.

15L oxygen via a non-breather mask would not be appropriate in this patient. Increased and uncontrolled oxygen concentrations are likely to suppress the respiratory drive further, resulting in worsening hypercapnia and acidosis.

Whilst intubation and ventilation may be inevitable for this patient (presuming that they are suitable for admission to the critical care unit), NIV should be trialled first as it can be highly effective in correcting acute type 2 respiratory failure.

Continuing current management without escalation would be inappropriate for this patient. No information is given about the patient's ceiling of care or an advanced directive, and therefore treatment should be escalated as appropriate.

Further reading:

https://geekymedics.com/cpap-vs-niv-bipap/

Question:

A 1-year-old boy, originally from Nigeria presents to the paediatric outpatient department with faltering growth. He has been living in the UK for 6 months and since arriving his weight has dropped 3 centiles. His parents report that the whites of his eyes have become slightly yellow over the past month and his fingers have become swollen.

What is the inheritance of this condition?

A. X-linked dominant

B. Autosomal dominant

C. Autosomal recessive

D. X-linked recessive

E. Mitochondrial inheritance

Correct Answer:Autosomal recessive

Explanation:

The child most likely has a diagnosis of sickle cell disease, which is inherited in an autosomal recessive fashion. Sickle cells are easily destroyed, causing occlusion of the microcirculation and chronic haemolytic anaemia.

The symptoms of sickle cell disease can begin between 3 months and 6 months of age when fetal haemoglobin levels begin falling. Presenting features include anaemia, jaundice, lethargy, faltering growth, splenomegaly and dactylitis. People of Afro-Caribbean ethnicity are at higher risk of sickle cell disease.

All newborn babies in the UK are offered a “blood spot test” which tests for sickle cell disease, therefore it is unusual for a baby born in the UK with sickle cell disease not to be diagnosed shortly after birth. However false negatives can occur.

Further reading:

https://patient.info/doctor/sickle-cell-disease-and-sickle-cell-anaemia-pro#nav-2

Question:

A 55-year-old woman presents to the emergency department with right groin pain. She reports having had a lump there for some time, which became acutely swollen and painful after lifting some heavy boxes yesterday. There is no associated fever or vomiting, and she opened her bowels normally this morning. She reports losing 3 stone in weight recently through dieting.

On examination, her observations are normal, and her abdomen is soft and non-tender. There is a tender irreducible swelling in the right groin, which is located below and lateral to the pubic tubercle.

What is the most likely diagnosis?

A. Inguinal hernia

B. Richter's hernia

C. Femoral hernia

D. Spigelian hernia

E. Obturator hernia

Correct Answer:Femoral hernia

Explanation:

The most likely diagnosis, in this case, is an incarcerated femoral hernia. Femoral hernias pass through the femoral canal into the upper medial thigh. They pass behind the inguinal ligament and are typically located below and lateral to the pubic tubercle. They are much more common in older women. Weight loss is an important risk factor as it decreases the amount of fatty tissue within the femoral canal, creating an empty space which increases the likelihood of herniation. Femoral hernias are at very high risk of obstruction or strangulation, as the femoral canal is a narrow space bordered medially by the sharp lacunar ligament. This patient has no features of obstruction or strangulation, but the hernia is acutely incarcerated, so she should undergo urgent repair to prevent complications.

Inguinal hernias pass through the inguinal canal into the groin. They run along the upper edge of the inguinal ligament and are typically located above and medial to the pubic tubercle. They have a relatively low risk of obstruction or strangulation as the tissues around the neck of the hernia are softer. They are the commonest type of groin hernia but are much more likely to affect men.

Obturator hernias are very rare. They pass through the obturator foramen of the bony pelvis into the upper medial thigh. They typically present with small bowel obstruction and are often impalpable on clinical examination due to their small size and deep location within the tissues.

Spigelian hernias are a type of anterior abdominal wall (or ventral) hernia. They pass through the Spigelian fascia lateral to the rectus sheath. They are usually very small and present with localised pain or a lump immediately lateral to the rectus abdominis muscle.

A Richter’s hernia involves the partial herniation of one edge of the bowel wall as opposed to its whole circumference. This phenomenon can affect any type of hernia and may result in serious complications, as the herniated portion of the bowel wall can rapidly become strangulated and ischaemic. This patient is unlikely to have a Richter’s hernia as she has been symptomatic for two days yet has remained systemically well with normal vital signs.

Further reading:

https://geekymedics.com/hernias/

Question:

A 67-year-old lady presents to the GP with a history of intermittent rectal bleeding. She states that the blood is bright red and she notices it on the toilet paper when she wipes. She experiences no pain in her abdomen or when passing blood, instead she describes a discomfort down below. She has had no change in bowel habit and says that her normal stool frequency is 1-2 times per week. She has had no weight loss and otherwise feels fine.

Her past medical history includes asthma (diagnosed aged 19), hyperlipidaemia and hypertension. She is an ex-smoker. She is the mother of 5 children (and has 7 grandchildren!) and lives with her husband in a bungalow.

What is the most likely diagnosis?

A. Colorectal cancer

B. Anal fissure

C. Uterine vault prolapse

D. Haemorrhoids

E. Angiodysplasia

Correct Answer:Haemorrhoids

Explanation:

This is a fairly classic history of haemorrhoids. These vascular cushions in the anal canal can dilate in response to ageing, constipation, increased abdominal pressure (e.g. pregnancy, childbirth, chronic cough) and heavy lifting. When a patient is in the lithotomy position the commonest location to find haemorrhoids is at the 3, 7 and 11 o’clock positions, if you imagine it on a clock face. They present with bleeding, itching and discomfort. Pain may indicate thrombosis (i.e. the blood supply to the haemorrhoid has been compromised). Important points to pick up in the vignette were the age, chronic constipation history, intermittent nature of the bleeding, high parity, and potentially a chronic cough (from her asthma).

In terms of the differential diagnosis – colorectal cancer is important to consider but less likely due to the intermittent history of bleeding, lack of abdominal pain or other more malignant sounding symptoms.

Angiodysplasia is caused by the formation of arteriovenous malformations between previously healthy blood vessels resulting in painless occult rectal bleeding (in the majority of cases). It can be acquired or congenital. It is more common in this age group however is still fairly rare, and is unlikely to cause any discomfort or pain.

A prolapse would be unlikely to cause bleeding although is associated with discomfort down below and is more likely in women of higher parity.

Lastly, an anal fissure would cause pain on defecation, alongside bleeding when passing stools. Due to the lack of pain and intermittent nature of the presentation, this condition is less likely.

Further reading:

https://patient.info/doctor/haemorrhoids-piles-pro

Question:

An 82-year-old woman presents to the emergency department with a small wound on her right hand. Whilst crafting earlier today she cut her finger with a knife. The finger is wrapped in a clean cloth but has not stopped bleeding for the past 4 hours, despite compression and elevation.

She has a history of mitral stenosis, atrial fibrillation and hypercholesterolemia. Her current medications include warfarin, furosemide, bisoprolol and atorvastatin.

Point of care INR testing is performed:

Result Target

INR 6.3 (2.0-3.0)

What is the most appropriate management option for her anticoagulation?

A. Stop warfarin and give IV vitamin K 3mg

B. Stop warfarin and give IV vitamin K 5mg and prothrombin complex concentrate

C. Stop warfarin and give oral vitamin K 3mg

D. Continue warfarin and give IV vitamin K 3mg

E. Withhold warfarin for one day and monitor INR

Correct Answer:Stop warfarin and give IV vitamin K 3mg

Explanation:

In a patient with a non-major bleed and an INR <8.0, warfarin should be stopped and 3mg IV vitamin K given.

Withholding warfarin for one day and monitoring the INR is recommended in a non-bleeding patient with INR 5.0-7.9. This is inappropriate in this bleeding patient.

Continuing warfarin and giving IV vitamin K 3mg is incorrect as warfarin should initially be stopped in a bleeding patient.

Stopping warfarin and giving oral vitamin K 3mg is recommended in a non-bleeding patient with INR >8.0. IV vitamin K should be given over oral vitamin K in a bleeding patient.

Stopping warfarin and giving IV vitamin K 5mg and prothrombin complex concentrate is recommended in a patient with a major limb or life-threatening bleed. However, this injury is not life-threatening.

Further reading:

https://bnf.nice.org.uk/treatment-summary/oral-anticoagulants.html

Question:

A 30-year-old-man attends his GP due to a problem with his right foot. He reports intense itchiness and redness in the crease next to his little toe which has been present for the past week. The patient mentions that he is an avid gym attendee, walks barefoot in the gym changing rooms and has a tendency to sweat excessively. He has a past medical history of type 1 diabetes. On examination, you note erythematous erosions and scale between the 4th and 5th digits.

Which of the following is the most appropriate DIAGNOSTIC investigation for the condition described?

A. Skin scrapings sent for microscopy and culture

B. Monofilament test

C. Liver function tests

D. HbA1C

E. Blood glucose levels

Correct Answer:Skin scrapings sent for microscopy and culture

Explanation:

The most likely diagnosis is dermatophytosis, specifically a tinea pedis infection or "athletes' foot". The gold-standard diagnostic investigation for a suspected tinea pedis infection is skin scrapings sent for microscopy and culture. Tinea pedis can be defined as the most common dermatophyte fungus. Risk factors for tinea pedis include male gender, regularly walking barefoot in public changing rooms, occlusive footwear, excessive sweating and immunodeficiency (including diabetes mellitus). Clinical features for this condition include itchy erosions plus scaling (especially between the 4th and 5th toes) or peeling of the sides and sole of the feet. The differential diagnosis for tinea pedis includes eczema of the feet, contact allergic dermatitis or psoriasis affecting the feet. Management for this condition should involve conservative measures including avoidance of occlusive footwear, drying of feet after washing and topical anti-fungal therapy. Oral antifungal therapy may be used but is rarely needed (this would be a second-line therapy).

Blood glucose levels should regularly be checked in all diabetic patients, however, this is not the gold-standard investigation for tinea pedis

HbA1c is an important indicator of long-term diabetic control, however, it is not the first-line investigation for tinea pedis.

Although this patient complains of pruritus, which is sometimes associated with liver disease, there is nothing else in the history of examination that would suggest a diagnosis of liver disease. As a result, liver function tests would not be an appropriate first-line investigation in this case.

A monofilament is typically used to assess peripheral sensation in diabetic patients as part of a routine diabetic foot assessment. It is not a gold-standard investigation for tinea pedis.

Further reading:

https://www.dermnetnz.org/topics/tinea-pedis/

Question:

A 54-year-old male presents to the emergency department following an episode of right-sided weakness and slurred speech earlier today. This lasted for around 60 minutes and has since been resolved. On further questioning, he describes palpitations and a 'funny heartbeat' for the last week.

On examination, his pulse is irregularly irregular. However, the examination is otherwise unremarkable, with no neurological features. He weighs 110 kg. A transient ischaemic attack is suspected.

What important investigation should be carried out to exclude a potential differential?

A. Prothrombin time

B. Carotid doppler

C. Echocardiogram

D. Serum lipids

E. Serum glucose

Correct Answer:Serum glucose

Explanation:

This patient has likely experienced a transient ischaemic attack (TIA). This is an episode of temporary neurological dysfunction caused by reversible cerebral ischaemia. Hypoglycaemia should be ruled out in all patients with new-onset neurological disturbances, so the serum glucose should be checked. Other differentials of a TIA include stroke, space-occupying lesions, drug and alcohol toxicity, complex migraine, seizure and peripheral neuropathy.

A carotid doppler is offered to all those suitable for carotid endarterectomy to determine the degree of carotid artery stenosis. This is part of the secondary prevention of a further cerebrovascular event but does not exclude an alternative diagnosis.

Whilst serum lipids are important as hypercholesterolemia is a risk factor for cerebrovascular disease, they have no role in excluding an alternative diagnosis.

An echocardiogram may be requested if the cause of the TIA is suspected to be secondary to a cardiac abnormality. However, it has no role in excluding an alternate diagnosis.

Coagulation screening, including prothrombin time and INR, is sometimes requested in patients presenting with persistent neurological symptoms, to exclude coagulopathy and haemorrhage as the potential cause. This patient's symptoms have resolved, and so serum glucose is more important to exclude hypoglycaemia.

Further reading:

https://cks.nice.org.uk/topics/stroke-tia/

Question:

A 24-year-old woman presents with a history of a ‘fishy-smelling’ vaginal discharge. There is no associated pain, or itch, and she is otherwise systemically well.

Investigations reveal a vaginal pH of 6.5, and speckled vaginal epithelial cells are seen on microscopy of a vaginal swab.

What is the most likely diagnosis?

A. Chlamydia

B. Bacterial vaginosis

C. Gonorrhoea

D. Syphilis

E. Candidiasis

Correct Answer:Bacterial vaginosis

Explanation:

Bacterial vaginosis is characterised by overgrowth of bacteria, commonly Gardnerella Vaginalis, which replace normal bacterial organisms and cause an increase in the normal vaginal pH (i.e. render the environment more alkaline). Bacterial vaginosis, unlike many other infections, is not thought to be sexually transmitted, though it does occur more often in sexually active people. Bacterial vaginosis is associated with an unpleasant smelling, painless discharge. A significant proportion of patients, up to 50%, are asymptomatic. ‘Clue cells’ are seen on microscopy, representing vaginal epithelial cells covered with bacteria, giving them a ‘speckled’ appearance.

Gonorrhoea is caused by infection with Neisseria Gonorrhoeae. It may be asymptomatic in up to 50% of women (though only 10% of men), but in those with symptoms it is associated with mucopurulent endocervical discharge, easy bleeding of the endocervix upon contact, and rarely abdominal/pelvic pain.

Chlamydia is caused by infection with Chlamydia trachomatis. It is often asymptomatic and detected on routine screening, but those who are symptomatic may complain of dysuria, dyspareunia, intermenstrual or post-coital bleeding, or vaginal discharge. Chlamydia should be considered in patients presenting with reactive arthritis – arthritis, uveitis, conjunctivitis.

Syphilis is caused by infection with the spirochaete Treponema Pallidum. Symptoms are variable depending on the stage of infection (primary, secondary, tertiary) and whether there is organ systemic involvement such as neurological or cardiovascular; this can be read about in detail on the Geeky Medics STI page. Primary syphilis is associated with a painless, usually small and single, ulcer termed a chancre, which may be associated with a clear serous discharge.

Candidiasis is caused by a fungal infection, with the vast majority as a result of Candida albicans. It is strongly associated with pruritus, with other symptoms including ‘cottage-cheese’ discharge which is not malodorous, dyspareunia, and dysuria.

Further reading:

https://patient.info/doctor/bacterial-vaginosis-pro

Question:

A 57-year-old male presents to the GP with weakness in his right wrist and left foot. He describes developing weakness of his right wrist 2 weeks ago and then developing left foot weakness approximately 2 days ago, causing him to trip several times. He has also developed a rash over a similar time period and has noticed his testicles are tender. On direct questioning, he admits to significant weight loss over the last few months, but he is unsure how much. He has a past medical history of hepatitis B infection but is not currently taking any regular medication. He does not smoke or drink and has no relevant family history.

On examination, there is a significant weakness of wrist extension on the right and foot drop present in the left leg. There are also purpuric skin lesions on the distal extremeties. Vital signs are unremarkable.

Which of the following is the most likely diagnosis?

A. Takayasu arteritis

B. Henoch-Schonlein purpura

C. Polyarteritis nodosa

D. Granulomatosis with polyangiitis

E. Thromboangiitis obliterans

Correct Answer:Polyarteritis nodosa

Explanation:

The most likely diagnosis is polyarteritis nodosa (PAN).

PAN is necrotising arteritis of medium or small arteries without glomerulonephritis or vasculitis in arterioles, capillaries, or venules, and not associated with antineutrophil cytoplasmic antibodies (ANCAs).

PAN most commonly affects peripheral nerves and skin. This patient has both mononeuritis multiplex (clinical evidence of two separate peripheral nerve lesions) and purpuric skin lesions. PAN can affect many other body areas, including the kidneys (acute kidney injury, hypertension), testicles (orchitis), gastrointestinal tract (abdominal pain) and muscles (myalgia). Weight loss is also a common feature of the condition. PAN is associated with hepatitis B infection.

The constellation of symptoms, signs and past medical history of hepatitis B make PAN the most likely diagnosis. Most of the other options could present with similar symptoms, but none of the options fit better with the entire clinical picture.

Further reading:

https://patient.info/doctor/polyarteritis-nodosa-pro

Question:

A doctor wishes to find out whether a new drug developed for irritable bowel syndrome with diarrhoea (IBS-D) is as effective as loperamide, the current first-choice anti-motility agent in those with IBS-D, at relieving patient symptoms. A group of 100 patients with IBS-D are randomly divided into two groups, with one group receiving the new drug and the other group receiving loperamide. All patients are aware of which treatment they are receiving. Patients are asked to score their symptoms before and one month after taking the medication. Results are then compared between the two groups.

What type of study is described?

A. Randomised controlled trial

B. Case-control

C. Blind trial

D. Double-blind trial

E. Observational study

Correct Answer:Randomised controlled trial

Explanation:

This is a randomised controlled trial. Randomised controlled trials involve randomly assigning subjects to a treatment arm or a control arm of the experiment and following them up over time to study any differences in outcome. The purpose of the randomisation step is to avoid bias that could result in the treatment and control arms having subjects with significant differences in baseline characteristics.

A blind trial is one in which the patient is not aware of which treatment they are receiving.

A double-blind trial is one in which neither the patient nor the researcher is aware of which treatment they are receiving.

Studies can be divided into observational and interventional studies. An observational study is one in which no intervention is offered. Here, the patients are given either the new drug or the control (loperamide), therefore, this study is an interventional study.

Case-control studies are typically used to study the cause of a condition rather than to investigate the efficacy of treatments for a condition. They involve comparing a group of cases with a group of controls and seeing if there are different rates of risk factor exposure between the two groups.

Further reading:

https://guides.himmelfarb.gwu.edu/prevention\_and\_community\_health/types-of-studies

Question:

An 18-year-old female attends the GP clinic with acne. She reports ongoing acne and skin changes for more than 2 years. She is not currently taking any medication and is otherwise well. On examination, there are widespread visible comedones, pustules and some scarring evident.

What is the most appropriate management option?

A. Oral lymecycline

B. Referral to dermatology

C. Topical fusidic acid

D. Combined oral contraceptive pill

E. Topical clindamycin

Correct Answer:Referral to dermatology

Explanation:

The most appropriate management in this scenario is to offer a referral to dermatology, given the visible scarring present and the future risk of further scarring.

Although the combined oral contraceptive, oral lymecycline and topical treatments such as clindamycin can be considered in the management of acne, the severity and presence of scarring, in this case, suggest a referral is the most appropriate next step.

Topical fusidic acid is typically used to treat staphylococcal skin infection rather than acne.

Further reading:

https://cks.nice.org.uk/acne-vulgaris#!scenariorecommendation

Question:

A 65-year-old man presents to his GP with a 6-month history of a cough productive of clear sputum and shortness of breath on exertion. He denies any haemoptysis, fever, or weight loss. He has no significant past medical history, however, he has been smoking 20 cigarettes a day for the past 40 years.

On examination, his chest is hyper-expanded with a reduced cricosternal distance. There is hyper-resonance on percussion. On auscultation, there are reduced breath sounds throughout, a prolonged expiratory phase, and coarse inspiratory crackles.

What is the most likely diagnosis?

A. Heart failure

B. Lung cancer

C. Pneumonia

D. Chronic obstructive pulmonary disease

E. Idiopathic pulmonary fibrosis

Correct Answer:Chronic obstructive pulmonary disease

Explanation:

This patient is presenting with a long history of exertional dyspnoea, a productive cough and significant smoking history. Combined with the examination findings of hyper-expansion, hyper-resonance on percussion, reduced breath sounds, prolonged expiratory phase of respiration, and coarse inspiratory crackles, these findings make chronic obstructive pulmonary disease (COPD) the most likely diagnosis.

Lung cancer is an important differential in any patient presenting with a new cough lasting more than 3 weeks. However, although investigations must be carried out to rule out lung cancer, the characteristic examination findings make COPD the more likely diagnosis.

Although heart failure can cause exertional dyspnoea and a wet cough, it would not explain the examination findings, which are characteristic of COPD. Note that the crackles heard in heart failure are usually fine, whereas those heard in COPD are typically described as coarse.

Although pneumonia can cause a productive cough, exertional dyspnoea and coarse crackles, the cough usually produces yellow or green sputum, and the patient usually has a fever.

Idiopathic pulmonary fibrosis typically presents with a non-productive cough and exertional dyspnoea. Patients with idiopathic pulmonary fibrosis may also experience weight loss and fatigue.

Further reading:

https://geekymedics.com/chronic-obstructive-pulmonary-disease-copd/

Question:

A 40-year-old public health researcher presents to the clinic with complaints of fatigue, headache, multiple joint pains and fever. The fever is said to be irregular in pattern and is mildly relieved by oral paracetamol. Further questioning reveals that he visited Ghana three weeks prior to presentation and did not take any medications or vaccines prior to leaving and after returning.

On examination, he is mildly pale and ill-looking, there is normal muscle tone across all muscles and reflexes are normal as well. His temperature is 38.80C, pulse is 100 beats per minute, blood pressure is 128/80 mmHg. His blood film results show ring forms of Plasmodium falciparum in his red blood cells.

Based on the likely diagnosis, which of the following is the greatest risk factor?

A. Ingestion of contaminated food

B. Camping in rural villages

C. Multiple sexual partners

D. Swimming in freshwater

E. Bite from an infected reptile

Correct Answer:Camping in rural villages

Explanation:

This patient most likely became ill by camping in rural villages. Malaria is a disease caused by the protozoa Plasmodium species (falciparum, vivax, ovale and malariae) and spread through the bite of the female anopheles mosquito. The P. falciparum specie is the most common and the deadliest of the four. Although it is widely eradicated by most countries, it is endemic in some areas of Africa, especially western Africa (e.g. Ghana). The mosquito is notorious for breeding in rural areas. Upon biting, it injects the infective form of the protozoa (sporozoite) into the bloodstream, which eventually migrates to the liver. The sporozoites mature into schizonts, which contain numerous merozoites (exo-erythrocytic stage). Merozoites infect red blood cells, mature into trophozoites and later, schizonts (erythrocytic stage). Schizonts release merozoites into the bloodstream, destroying the red blood cell and releasing cytokines. This periodic hemolysis and release of the protozoa is responsible for the periodic symptoms seen in malaria which are usually fever, headache, anaemia and joint pain, as in this patient.

Malaria is not spread faeco-orally and so, ingestion of contaminated food will not cause it.

The vector for malaria transmission is an insect and not a reptile. Hence, a reptile bite will not transmit it.

While the mosquito dwells in riverine areas and swamps, it is not spread by swimming in freshwater. Rather, it is spread by the bite of a carrier mosquito.

Multiple sexual partners will increase a person's risk of contracting sexually transmitted infections, not malaria.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK8584/

Question:

A 65-year-old man presents to his GP with a 2-day history of redness, swelling and pain in his right lower leg. He explains that he was gardening 3-days ago when he was bitten by a few insects. He decided he should see a doctor this morning about the "big red patch" that appeared on his leg overnight.

He has a past medical history of hypertension and type 2 diabetes. His current medications include ramipril, amlodipine and metformin. He has no known drug allergies.

His temperature is 38°C, pulse 81/min, blood pressure 130/72 mmHg and SpO2 98% on room air. On examination of the right leg, there is a large erythematous lesion with poorly demarcated borders; the area is warm and quite tender but non-fluctuant.

What is the most likely diagnosis in this patient?

A. Cellulitis

B. Calciphylaxis

C. Necrotising fasciitis

D. Erysipelas

E. Superficial thrombophlebitis

Correct Answer:Cellulitis

Explanation:

The most likely diagnosis in this patient is cellulitis - an acute, spreading infection of the deep dermis and subcutaneous tissue. Characteristic features of cellulitis include acute onset of diffuse redness, swelling, heat and tenderness, most commonly occurring in one of the lower limbs (bilateral leg cellulitis is rare). Cellulitis develops when micro-organisms gain entry into the dermal and subcutaneous tissues. This patient has class II cellulitis (Eron classification), as he is mildly systematically unwell but has comorbidities (diabetes, hypertension) that may complicate the infection.

An important consideration in all patients with skin infection is necrotising fasciitis, also known as Eron class IV cellulitis. Highly suggestive clinical features include pain out of proportion to the exam, crepitus and symptoms of systemic toxicity (e.g. pyrexia, hypotension). Given this patient has mild pain and fever only, this is an unlikely diagnosis at this stage.

Patients with superficial thrombophlebitis (SVT) typically present with a history of varicose veins or recent trauma to the veins (e.g. recent vein instrumentation, cannulation). Patients with SVT usually present with pain, tenderness, and erythema isolated to the path of a superficial vein. On examination, key findings include a palpable, tender, warm and nodular cord (vein). This is an unlikely diagnosis in this patient.

Erysipelas is a subtype of cellulitis and describes a superficial skin infection involving the upper dermis only. Erysipelas is characterised by a prominent, raised and sharply demarcated erythematous lesion. This is a less likely diagnosis given the appearance of the patient's leg.

Calciphylaxis is characterised by painful, erythematous lesions, often located below the knee. After infarction occurs, the lesions turn black, and the skin surrounding becomes indurated. Calciphylaxis is an uncommon disease; it is mainly seen in patients with end-stage renal disease, especially in dialysis patients. This is an unlikely diagnosis in this patient.

Further reading:

https://cks.nice.org.uk/topics/cellulitis-acute/

Question:

A 19-year-old man presents to the emergency department with a 3-day history of a productive cough and lethargy associated with headaches and joint pain.

On examination, he has a GCS of 14/15 (E4V5M5), a heart rate of 100bpm, a respiratory rate of 26, an SpO2 of 93% on room air, a blood pressure of 98/72 mmHg and a temperature of 38.1ºC. There is also a widespread rash of erythematous target lesions.

Blood results are demonstrated below:

Test Result Reference range

Haemoglobin 150 g/L (130 - 180)

Platelets 320 x 109 (140 - 400)

WCC 13.0 x 109/L (3.6 - 11.0)

CRP 35 mg/L (<5)

A chest x-ray shows multiple bilateral interstitial opacities.

Given the likely diagnosis, what is the most likely causative organism?

A. Klebsiella pneumoniae

B. Staphylococcus aureus

C. Streptococcus pneumoniae

D. Mycoplasma pneumoniae

E. Legionella pneumophilia

Correct Answer:Mycoplasma pneumoniae

Explanation:

The patient in the vignette has features consistent with atypical pneumonia caused by Mycoplasma pneumoniae (arthralgia, erythema multiforme, and characteristic interstitial infiltrates on the chest radiograph). M. pneumoniae is an atypical community-acquired pneumonia that typically affects young adults and children. M. pneumonia has multiple extra-pulmonary manifestations, which include CNS involvement (headaches, meningoencephalitis), dermatological manifestations (erythema multiforme, steven johnson syndrome), haematological manifestations (autoimmune haemolytic, anaemia, thrombocytopenia and DIC), gastrointestinal manifestations (nausea, vomiting, and abdominal pain), and musculoskeletal manifestations (myalgia and arthralgia). The most common radiographic manifestation of M. pneumonia is interstitial infiltrates instead of lobar consolidation.

Klebsiella pneumoniae is typically seen in alcoholics and is associated with a characteristic "red-currant jelly" sputum. K. pneumoniae would typically cause lobar pneumonia.

Legionella pneumophilia is an atypical pneumonia that characteristically results in lymphopenia and is associated with SIADH (syndrome of inappropriate ADH secretion). L. pneumophilia would typically cause lobar pneumonia.

Staphylococcus aureus is typically observed in post-influenza infection in young patients. S. aureus has a range of radiographic features, including multi-lobar shadowing, cavitations, pneumatoceles, and pneumothorax.

Streptococcus pneumonia is the most common cause of community-acquired pneumonia and may result in the reactivation of herpes (presenting with herpes labialis). S. pneumoniae would typically cause multifocal and bilateral lobar pneumonia.

Further reading:

https://medicine.yale.edu/intmed/pulmonary/education/pccm/ashley\_losier-atypical\_pneumonia\_310087\_284\_21138\_v2.pdf

Question:

A 14-year-old girl is referred to the surgical assessment unit by her general practitioner after presenting with acute abdominal pain, nausea and vomiting. On examination, the patient demonstrates tenderness to palpation over the right iliac fossa. Urinalysis and a urine pregnancy test are both negative.

Which of the following is the most common cause of this presentation?

A. Stricture

B. Lymphoid hyperplasia

C. Caecal tumour

D. Testicular torsion

E. Faecolith obstruction

Correct Answer:Faecolith obstruction

Explanation:

The most common cause of acute abdominal pain in children is appendicitis. This presentation is typically seen in children (second decade of life), and statistically, girls are more likely to be affected. The most common pathophysiology causing acute appendicitis is faecolith obstruction. A faecolith is a small pellet of impacted stool which occludes the lumen of the appendix, allowing multiplication of bacteria and acute inflammation which produces symptoms of abdominal pain (peri-umbilical later migrating to the right iliac fossa) and gastrointestinal upset. If untreated, inflammation may lead to perforation of the appendix causing peritonitis and intra-abdominal sepsis.

Other, less common causes of acute appendicitis include lymphoid hyperplasia (plausible in a girl this age) and appendiceal stricture. Malignant causes of obstruction (e.g. appendiceal or caecal tumours) are unlikely to present in a 14-year-old.

Testicular torsion is an important differential diagnosis to consider for an acute abdomen in male patients. The appendix is not known to twist upon itself and the patient in the question is female.

Further reading:

https://geekymedics.com/appendicitis/

Question:

A 45-year-old woman with a history of breast cancer is being investigated for a 2-day history of right-leg pain. There is no history of trauma or previous thromboembolism. Her last course of chemotherapy was three months ago.

On examination, there is tenderness on palpation along the posterior aspect of the right calf and popliteal fossa. There is no significant erythema, oedema, or swelling.

The radiology department has communicated that they will be able to report scan results within 3 hours.

What is the next best investigation for this patient?

A. D-dimer test

B. CT pulmonary angiogram

C. High sensitivity troponin

D. Distal leg vein ultrasound scan

E. Proximal leg vein ultrasound scan

Correct Answer:Proximal leg vein ultrasound scan

Explanation:

The patient in the vignette has a 2-level DVT Wells score of at least 2 (Active cancer treatments in the past 3 months (1) + Localised tenderness along the distribution of the venous system (1)). There is also no expected delay in reporting results (<4 hours). Therefore, the next best step in management is to arrange a proximal leg vein ultrasound scan; to diagnose a potential deep vein thrombus.

To diagnose a potential pulmonary embolus, a CT pulmonary angiogram is required for patients with a 2-level PE Wells score of more than 4. The patient in the vignette has a maximum possible PE Wells score of 4 (Active cancer treatments in the past 3 months (1) + Clinical signs and symptoms of DVT (3)). Therefore a CTPA is not warranted at this time.

A D-dimer test is for patients with a 2-level DVT Wells score less than or equal to 1. D-dimer testing has a high specificity and is used as a rule-out test. As the patient in the vignette has a DVT Wells score of 2, the D-dimer test is unnecessary as the patient will require a proximal lower limb doppler ultrasound scan regardless.

Arranging a distal leg vein ultrasound scan is not routinely performed in diagnosing a DVT guiding management. Most distal DVTs do not extend to the distal veins and have an uneventful disease course without management. In contrast, proximal DVTs are more likely to result in a pulmonary embolism, requiring management. Therefore, patients with a DVT Wells score of more than 2 require a proximal rather than a distal leg vein ultrasound scan.

A high-sensitivity troponin (I or T) is used in patients with suspected acute coronary syndrome (ACS), to confirm the diagnosis. The patient in the vignette has no features suggestive of ACS (cardiac chest pain +/- pain radiating to the arms/back/jaw +/- breathlessness, lasting more than 15 minutes). Troponin may also be raised in an acute pulmonary embolism, however, it should not be used as a marker for determine further investigation or management.

Further reading:

https://www.nice.org.uk/guidance/ng158/chapter/recommendations#diagnosis-and-initial-management

Question:

A 45-year-old man presents to the GP with pain in the large toe of his right foot. He is unable to walk more than a few metres because of the pain, which came on suddenly yesterday. He has not previously had any similar episodes of pain. His toe feels stiff and looks red and swollen.

He has a past medical history of hypertension and type 2 diabetes mellitus. He consumes 4 units of alcohol a day, and he has been advised by his GP to lose weight to help with diabetic control.

On examination, his observations are stable and he is apyrexial. The first toe on his right foot is swollen and erythematous, tender upon palpation and feels warm to touch. The swelling is particularly centred around the metatarsophalangeal joint. There is a limited range of movement in the toe. There are no other noticeable signs of dermatological or rheumatological disease.

Initial blood tests are taken which demonstrate a serum uric acid level of 8mg/dL, but all other tests are within the normal range. Blood cultures are negative. He is referred to the local hospital for arthrocentesis of the joint which demonstrates a white cell count of 3x109/L and negatively birefringent needle-shaped crystals in the fluid when it is examined under polarised light.

What is the most likely diagnosis in this patient?

A. Gout

B. Psoriatic arthritis

C. Septic arthritis

D. Reactive arthritis

E. Pseudogout

Correct Answer:Gout

Explanation:

The most likely diagnosis in this patient is gout. Gout is characterised by sudden onset severe joint pain, and patients will often present with swelling and erythema of the affected joint. It is caused by hyperuricaemia (typically defined in men as a serum uric acid level of >7mg/dL), which results in the deposition of uric acid crystals in joints. Commonly affected joints include the first toe, foot and ankle, but it can also affect joints such as those in the hands and the knee. Multiple acute episodes can lead to joint destruction. Diagnosis is achieved by arthrocentesis of the affected joint, which will typically demonstrate synovial fluid containing needle-shaped crystals that are negatively birefringent under polarised light. Also, the synovial fluid will typically have an elevated white blood cell count (i.e. >2x109/L). The acute episode is typically treated with NSAIDs such as ibuprofen or naproxen, or colchicine. Although colchicine is toxic at high doses, it is not associated with fluid retention as NSAIDs may be, and it can be co-administered with anticoagulants. Also, it is useful for patients with reduced renal function. NSAIDs will need to be co-prescribed with a gastro-protective agent such as a proton pump inhibitor. In the long-term, usually 2-3 weeks after the acute episode resolves, a uric acid lowering agent such as allopurinol can be administered, which is a xanthine oxidase inhibitor.

Septic arthritis is incorrect. Although septic arthritis can present similarly to gout, the presence of raised uric acid and the absence of raised inflammatory markers in the blood tests are less suggestive of septic arthritis. A raised white cell count in the synovial fluid can occur in gout and is not indicative of septic arthritis alone. The synovial fluid analysis is consistent with a diagnosis of gout, but not with septic arthritis; in septic arthritis, a positive culture would be more typical.

Pseudogout is also incorrect; again, it can present similarly to gout but the synovial fluid analysis will typically demonstrate the presence of rhomboid-shaped crystals that are positively birefringent under polarised light.

Reactive arthritis is incorrect. The risk factors are more suggestive of gout, and there is typically a history of recent gastrointestinal or genitourinary infection. The typical triad of symptoms in reactive arthritis is post-infectious arthritis, urethritis and conjunctivitis, which may commonly be alluded to as ‘can’t see (conjunctivitis), can’t pee (urethritis) and can’t climb a tree (arthritis)’.

Psoriatic arthritis is unlikely; there is no history or examination suggestive of psoriasis, with no dermatological findings on examination. It more commonly affects the distal interphalangeal joints and would not show these results on synovial fluid analysis.

Further reading:

https://patient.info/doctor/gout-pro

Question:

A 50-year-old woman presents to the emergency department with a 24-hour history of worsening abdominal pain, distension, and vomiting. She has no notable past medical or surgical history. On examination, she has a distended abdomen and a tender inguinal hernia.

Your initial impression is of small bowel obstruction and you place a nasogastric tube for decompression. Your registrar requests a CT scan to investigate the cause of obstruction.

CT confirms a small bowel obstruction with an incarcerated tubular structure, which is thought to be the appendix, in an inguinal hernia sac.

What is the name of the hernia causing this obstruction?

A. Richter’s hernia

B. Amyand’s hernia

C. De Garengeot hernia

D. Littre’s hernia

E. Cooper’s hernia

Correct Answer:Amyand’s hernia

Explanation:

Amyand’s hernia refers to an inguinal hernia sac that contains the appendix, as described in the CT report.

De Garengeot hernia refers to a femoral hernia sac that contains the appendix.

Littre’s hernia refers to a hernia sac that contains Meckel’s diverticulum. On imaging, it is described as a blind-ending fluid-filled and/or gas-filled tubular structure in continuity with distal ileum. The CT results of this case describe an inguinal hernia with an incarcerated appendix and no other tubular structure (excluding Meckel’s diverticulum and Littre’s hernia).

Richter’s hernia refers to a hernia with only half of the intestinal wall is protruding into the hernia sac, most commonly seen in femoral and obturator hernias. Imaging often describes a focal protrusion of the antimesenteric wall of a bowel loop into the hernia sac. The CT results of this case describe an incarcerated appendix (excluding a Richter’s hernia).

Cooper’s hernia refers to a femoral hernia with two sacs. The first sac is in the femoral canal, and the second sac passes through a defect in the superficial fascia and appears immediately beneath the skin.

Further reading:

https://radiopaedia.org/articles/amyand-hernia-1?lang=us

Question:

A 7-year-old boy is brought to the GP by his aunt as she is worried about his recent development of ear pain and discomfort. The symptoms began about 2 weeks previously, and are now affecting his sleep; the boy states that the itch is unbearable. He is a keen kayaker, and his aunt wonders if river water getting in his ears may have something to do with the symptoms he is experiencing. However, wearing earplugs whilst kayaking has not led to any improvement in his symptoms.

The boy is otherwise well, with no past medical history of note. He appears well on general examination, with observations all in the normal range, and a normal temperature. Otoscopy is challenging, with severe pain reported when attempting to place the otoscope into the ear. The boy is willing to put up with the pain, however, and a quick inspection reveals significant erythema of the external auditory meatus, the walls of the ear canal appear significantly swollen, but there is no evidence of scaling or other dermatological features.

The GP tells the boy that he is likely to need some ear drops to manage the condition; he also takes a swab of the ear canal, given the severity of the symptoms. This reveals the presence of a gram-negative, aerobic rod; the GP starts an appropriate treatment based on this result.

Given the likely diagnosis and organism implicated, what is the mechanism of action of the treatment likely to be started?

A. Inhibition of RNA polymerase

B. Inhibition of DNA gyrase

C. Inhibition of ergosterol synthesis

D. Targeting of 30S ribosome

E. Targeting of 50S ribosome

Correct Answer:Inhibition of DNA gyrase

Explanation:

The most likely diagnosis, in this case, is diffuse otitis externa, which typically presents with widespread inflammation of the skin and sub-dermis of the external ear canal. The condition most commonly arises due to bacterial infection, with Pseudomonas aeruginosa and Staphylococcus aureus being the two most frequently isolated organisms. Given the findings of the ear swab, Pseudomonas aeruginosa is the most likely diagnosis, as this fits with the type of organism identified. Exposure to water as described by this boy is a significant risk factor for the entry of the pathogen into the ear canal.

Pseudomonas is resistant to a number of antibiotics, and only certain preparations are available as topical drops, which will be the method of administration required in this scenario. Fluoroquinolones are the first-line drugs used for suspected otitis externa due to Pseudomonas, ciprofloxacin and ofloxacin both being available as topical drops. These function by inhibiting DNA gyrase and topoisomerase IV, two enzymes that have important roles in bacterial DNA synthesis.

A variety of anti-fungal agents function by inhibiting ergosterol synthesis, an important component of the fungal cell wall. Pseudomonas is not a fungal infection, and therefore these drugs will be ineffective in this case.

Rifampicin is an example of an antibiotic that works via the inhibition of RNA polymerase. This is most frequently given in the treatment of tuberculosis.

Macrolide antibiotics work via inhibiting the 50S ribosome, and tetracyclines and aminoglycosides function by inhibiting the 30S ribosome. These are not commonly used to treat Pseudomonas infection.

Further reading:

https://cks.nice.org.uk/topics/otitis-externa/management/acute-diffuse-otitis-externa/

Question:

A 50-year-old woman presents to the GP with symptoms of weight gain, fatigue, constipation, cold intolerance and low mood. Her blood tests demonstrate an abnormal level of one of her hormones.

Which one of the following is associated with the likely diagnosis in this scenario?

A. Proximal muscle weakness

B. Weight loss

C. Proptosis

D. Carpal tunnel syndrome

E. Pretibial myxoedema

Correct Answer:Carpal tunnel syndrome

Explanation:

This patient most likely has a diagnosis of hypothyroidism, given the classical symptoms and reference to a hormonal abnormality.

Hypothyroidism can present with a wide range of symptoms including fatigue, cold intolerance, dry skin, hair loss, constipation, weight gain, memory impairment, reduced libido and deepening of the voice. Clinical signs of the condition include cool peripheries, dry coarse skin, bradycardia, myxoedema and carpal tunnel syndrome.

Of the options presented, only carpal tunnel syndrome is associated with hypothyroidism.

Carpal tunnel syndrome involves compression, entrapment or irritation of the median nerve within the carpal tunnel. Patients typically present with tingling, loss of sensation or pain in the distribution of the median nerve (the thumb, index, middle finger and medial half of the ring finger). Clinical examination may reveal a weakened grip and wasting of the thenar eminence.

Pretibial myxoedema is an infiltrative dermopathy, resulting as a rare complication of Graves' disease It usually presents itself as a waxy, discoloured induration of the skin on the anterior aspect of the lower legs, spreading to the dorsum of the feet, or as a non-localised, non-pitting oedema of the skin in the same areas.

Proptosis describes the protrusion of the eyeballs, which is typically associated with Graves' disease.

Proximal muscle weakness and weight loss are more commonly associated with hyperthyroidism.

Further reading:

https://patient.info/doctor/carpal-tunnel-syndrome-and-median-nerve-lesions

Question:

A 27-year-old male attends his GP for a follow-up appointment after a diagnosis of obsessive-compulsive disorder (OCD) six months ago. The patient has engaged in a series of cognitive behavioural therapy (CBT) sessions, however, he explains that he continues to clean his entire house twice a day due to an intense fear of bacteria.

He is aware that his behaviour is irrational, however, he cannot resist the urge to clean his house. The patient denies low mood but explains that he becomes anxious if he cannot carry out his cleaning routine.

He does not currently take any medication.

What further intervention is it most appropriate for the GP to offer?

A. Eye movement desensitization and reprocessing (EMDR)

B. Dialectical behavioral therapy (DBT)

C. Propranolol

D. Risperidone

E. Fluoxetine

Correct Answer:Fluoxetine

Explanation:

Patients with OCD suffer from frequent, intrusive thoughts which are often followed by a particular behaviour or routine. The first line of treatment is CBT, which involves exposure and response prevention. If this fails to treat the patient’s symptoms, or if their symptoms are particularly severe, NICE recommend adding a selective serotonin reuptake inhibitor (SSRI) such as fluoxetine.

Propranolol is a beta-blocker that targets the physical symptoms of anxiety. It is particularly effective for patients with panic disorder, but it is unlikely to benefit this patient. It would be more appropriate to target the underlying cause of the anxiety by continuing the CBT alongside fluoxetine.

Dialectical behavioural therapy is a type of talking therapy proven to help patients manage distressing emotions. It is usually used to treat psychiatric conditions such as anorexia nervosa, borderline personality disorder and depression. However, it is not currently recommended as a treatment for OCD.

Patients suffering from post-traumatic stress disorder can benefit from eye movement desensitization and reprocessing, a specialist type of psychotherapy that helps patients process distressing memories. While some research suggests that EMDR may be beneficial to patients with advanced OCD, at this stage in the patient’s treatment it is more appropriate to use fluoxetine.

Risperidone is a second-generation antipsychotic, which is sometimes used to treat OCD at a secondary care level. However, such treatment is only offered after therapy with CBT and SSRIs have failed to improve symptoms, and it would not be appropriate for a GP to start.

Further reading:

https://www.nice.org.uk/guidance/CG31/chapter/1-Guidance#steps-35-treatment-options-for-people-with-ocd-or-bdd

Question:

A 72-year-old man is seen in the emergency department with painless visual disturbance that started 2-hours ago. There is no recent history of trauma. The patient has a past medical history of hypertension, raised cholesterol, and atrial fibrillation.

Visual acuity is 6/6 in both eyes. Visual field assessment demonstrates the following defect:

Damage to which of the following anatomical structures accounts for this defect?

A. Optic nerve

B. Optic chiasm

C. Optic tract

D. Occipital cortex

E. Optic radiation

Correct Answer:Occipital cortex

Explanation:

This visual field defect is a left homonymous hemianopia with macular sparing. It is classically seen when disease affects the calcarine sulcus of the occipital cortex. The patient's acute onset visual disturbance, past medical history of cardiovascular disease and absence of recent trauma renders acute stroke a likely diagnosis here. This question is based on a patient presenting with right posterior circulation syndrome (POCS). The macula of each visual field is spared because this area of the retina is supplied by both the middle and posterior cerebral arteries, meaning blood supply is preserved if one or the other is occluded.

Common visual defects caused by damage to the distractors:

Optic nerve - ipsilateral anopia / monocular blindness

Optic chiasm - bitemporal hemianopia

Optic tract - contralateral homonymous hemianopia

Optic radiation - contralateral homonymous quadrantanopia

Further reading:

https://geekymedics.com/visual-pathway-and-visual-field-defects/

Question:

An 8-year-old boy is brought to the GP by his mother because of a rash on his face that developed two days ago. The boy says the rash is "not itchy or sore at all". The boy is otherwise well and has no history of fever, coryzal symptoms or diarrhoea.

He has no significant past medical history and is up-to-date on all childhood vaccinations. He has no known drug allergies.

On examination, the boy appears well; his temperature is 37.2°C and pulse 88/min. Close inspection of the face reveals superficial erosions of the skin with a golden crust located around the mouth.

What is the most likely diagnosis in this patient?

A. Non-bullous impetigo

B. Pemphigus vulgaris

C. Erythema multiforme

D. Kawasaki disease

E. Bullous impetigo

Correct Answer:Non-bullous impetigo

Explanation:

The most likely diagnosis in this patient is non-bullous impetigo - a superficial infection of the skin caused by the bacteria Staphylococcus aureus or Streptococcus pyogenes. Impetigo is a common condition affecting paediatric populations; non-bullous impetigo accounts for most cases (about 70%). Non-bullous impetigo is characterised by the formation of lesions on the face, limbs or flexures; these lesions begin as thin-walled vesicles and quickly rupture, releasing exudate and forming a characteristic golden crust. Non-bullous impetigo is usually asymptomatic but may be associated with mild pruritus and regional lymphadenopathy.

Bullous impetigo, which is exclusively caused by Staphylococcus aureus, accounts for the remaining 30% of cases and is characterised by the development of vesicles that progress to form large, flaccid bullae, which persist for up to 2-3 days. When these blisters rupture, they leave behind a thin, flat, yellow/brown crust. Bullous impetigo can occur anywhere on the body but is most commonly seen on the flexures, face, trunk and limbs. If large areas of skin are affected, the patient may also present with systemic symptoms. On examination, this patient did not have any evidence of bullae and is systemically well; therefore, this is a less likely diagnosis.

Patients with pemphigus vulgaris typically present with large, flaccid blisters that are very painful but non-pruritic; there is often prominent mucosal involvement. Additionally, pemphigus vulgaris commonly affects older patients.

Patients with Kawasaki disease classically present with fever, conjunctivitis, polymorphous exanthem, diffuse mucosal erythema and periungual desquamation of fingers and toes. This child is systemically well and has a rash that is isolated to the peri-oral region only.

Erythema multiforme (EM) is a type IV hypersensitivity reaction typically triggered by an infection or drug reaction. EM presents with target-like lesions on the skin with a crusted or necrotic centres. This patient does not have any history of predisposing factors, and the rash described is not in keeping with EM.

Further reading:

https://cks.nice.org.uk/topics/impetigo/

Question:

A 69-year-old male presents to the emergency department with a distended abdomen. He has presented to the same hospital in the past for alcohol intoxication, hepatic encephalopathy and variceal bleeding. He has known liver cirrhosis secondary to chronic alcohol abuse.

His observations are as follows:

Temperature: 36.8 degrees Celsius

Blood pressure: 126/99 mmHg

Respiratory rate: 15 breaths/minute

Heart rate: 71 beats/minute

SpO2: 97% on room air

Physical examination is significant for hepatomegaly and shifting dullness on percussion. Diagnostic paracentesis is performed and analysis of the ascitic fluid confirms the presence of neutrophils > 250/mm3.

Which medication would be most appropriate to treat this patient’s condition?

A. Azithromycin

B. Omeprazole

C. Ceftriaxone

D. Propranolol

E. Trimethoprim-sulfamethoxazole (co-trimoxazole)

Correct Answer:Ceftriaxone

Explanation:

The patient in the above scenario has a clinical situation concerning for spontaneous bacterial peritonitis (SBP). The analysis of the ascitic tap confirms this diagnosis. SBP is typically caused by enteric bacteria and therefore examples of antibiotics that would provide coverage for organisms such as E.coli and Klebsiella, for example, include ceftriaxone or cefotaxime.

Co-trimoxazole is typically used in the prophylaxis of SBP for patients who are at high risk of developing further episodes. High-risk patients include those who have had previous episodes of SBP, those with liver cirrhosis or those with poor liver synthetic function.

Macrolide antibiotics such as azithromycin provide coverage for atypical organisms and are not indicated in the management of SBP.

Propranolol is used in the prophylaxis of variceal bleeding but does not have a role in the treatment of SBP.

Omeprazole is a proton-pump inhibitor used in the management upper gastrointestinal bleeding secondary to peptic ulcer disease and for reflux but does not have a role in the treatment of SBP.

Further reading:

https://patient.info/doctor/intra-abdominal-sepsis-and-abscesses

Question:

An 80-year-old female is brought into A&E following a fall in her own home. She was found on the floor by her carers on their morning visit, vomiting and confused. Her past medical history includes atrial fibrillation, type 2 diabetes, hypertension, dementia and osteoporosis. Her medication history includes metformin, gliclazide, rivaroxaban, ramipril, bisoprolol and alendronic acid.

She smells strongly of urine. On examination, you note a small gash above her right eye, but no other evidence of injury. She has vomited once whilst in A&E. Her vital signs are normal, blood glucose is 8.0 and she is alert.

Which of the following investigations is most important to arrange next?

A. Urinalysis

B. Creatinine kinase

C. X-ray of the pelvis

D. CT chest, abdomen and pelvis

E. CT head

Correct Answer:CT head

Explanation:

The patient has had an unwitnessed fall and is confused. It is likely she hit her head, given the laceration to her face. She was also found covered in her own vomit at home, and vomited again in A&E (hence vomited more than once). As per NICE CT head guidelines, it is important to arrange a CT head to rule out an intracranial haemorrhage from the fall, and this should be performed within an hour. Hence, this is the next most important investigation to arrange.

Urinalysis is a quick bedside test that can be helpful in ruling out urinary tract infection. This information is potentially useful in investigating the cause of the fall and the patients’ confusion. However, it is a less important investigation than a CT head to rule out intracranial haemorrhage (particularly given the absence of any signs of sepsis).

Creatinine kinase may be elevated secondary to rhabdomyolysis as a result of the fall and subsequent indeterminate period of lying on the floor However, again, this is not an immediate priority.

A CT chest, abdomen and pelvis and/or an x-ray of the pelvis could yield useful information about any fractures the patient may have sustained, such as a neck of femur fracture. However, given the patient is haemodynamically stable, it is more important to rule out intracranial haemorrhage first.

Further reading:

https://www.nice.org.uk/guidance/cg176/resources/imaging-algorithm-pdf-498950893

Question:

A 52-year-old male is reviewed in general practice. He was advised to attend for review following a raised cholesterol level of 7 mmol/L identified on recent routine blood testing.

He has no personal or family history of cardiovascular disease and is otherwise well with no other medical problems. He is overweight, has a sedentary job and admits to a poor diet. He is a non-smoker. His QRISK2 score is calculated and is less than 10%.

What is the most appropriate initial intervention for this gentleman with regards to primary prevention of cardiovascular disease?

A. Initiate pravastatin

B. Lifestyle modification

C. Initiate ezetimibe

D. Initiate atorvastatin

E. Initiate aspirin

Correct Answer:Lifestyle modification

Explanation:

Advice regarding lifestyle modification is an appropriate intervention for this patient. NICE recommends consideration of lipid-lowering therapy with an agent such as atorvastatin or pravastatin for the following groups:

Patients with a QRISK2 score of 10% or greater

Patients with conditions such as chronic kidney disease, familial hypercholesterolaemia or type 1 diabetes

Patients aged 85 years or older.

This gentleman does not fulfil any of these criteria and therefore the initial NICE recommendation is for lifestyle modification such as increasing exercise levels and improving diet.

Aspirin is an antiplatelet agent which no longer has a role in primary prevention of cardiovascular disease.

Ezetimibe is a cholesterol-lowering agent typically offered as a second-line alternative to statins.

Further reading:

https://cks.nice.org.uk/cvd-risk-assessment-and-management

Question:

A 39-year-old woman presents with a 6-month history of bilateral ankle pains and swelling, in addition to marked fatigue. On further questioning, she admits to several months of sharp chest pains that come and go over the course of days. There is a significant past medical or family history.

On examination, there is bilateral oedema to the ankles. Passive range of movement is normal in all joints, but the pain is present upon joint movement. Blood pressure is measured at 185/96 mmHg, and urine dipstick demonstrates 3+ blood 3+ protein.

Blood tests demonstrate:

Blood test Result Reference Range

Haemoglobin (Hb) 78 g/L 115 – 165

White cell count (WCC) 3.02 x 109/L 3.6 – 11.0

Neutrophils 1.2 x 109/L 1.8 – 7.5

Platelets 102 x109/L 140 – 400

CRP 27 mg/L < 5

ESR 88 3 – 9

Prothrombin time (PT) 14 seconds 10 – 14

Activated partial thromboplastin time (APTT) 70 seconds 24 – 37

Creatinine 196 μmol/ L 45–84

Complement C3 and C4 levels are both returned as low but autoantibody testing is awaited.

What is the most likely cause for her presentation?

A. Lupus nephritis

B. ANCA glomerulonephritis

C. IgA nephropathy

D. Scleroderma renal crisis

E. Diabetic nephropathy

Correct Answer:Lupus nephritis

Explanation:

This patient is presenting with glomerulonephritis as evidenced by dipstick haematoproteinuria, hypertension and ankle swelling. In this case, the diagnosis is lupus with renal involvement (lupus nephritis). These patients will often have non-specific symptoms but almost universally report fatigue.

Extra-renal disease manifestations such as serositis (here presenting as pleuritic pain) and joint pains may, or may not be present. These extra-renal disease manifestations form part of the diagnostic criteria for lupus, along with photosensitivity, leukopenia, anti-DNA antibodies and others (see further reading link). The cause of the prolonged APTT is likely to reflect lupus anticoagulant antibodies which have a higher incidence in lupus patients but are also commonly found in patients without lupus.

ANCA glomerulonephritis can also present similarly, but would not usually cause hypocomplementaemia or features of lupus such as serositis. It more commonly presents with symptoms of vasculitis such as renal impairment, peripheral neuropathy, rash, joint pains and haemoptysis.

Scleroderma can present with renal involvement and typically exhibits abrupt onset hypertension. It can also exhibit hypocomplementaemia. Usually, however, notable skin thickening and other extrarenal features of scleroderma are present.

IgA nephropathy is the commonest cause of glomerulonephritis worldwide however, it is usually a renal restricted disorder and therefore should not present with the extrarenal inflammatory manifestations described here.

Although diabetic nephropathy is commonly associated with hypertension, this would not account for the extrarenal manifestations of disease observed here.

Further reading:

https://patient.info/doctor/systemic-lupus-erythematosus-pro

Question:

A 48-year-old woman presents to the GP with a worsening headache. She reports the headache has been there almost constantly for the last two weeks. She describes the headache as dull and non-throbbing in character but always worse in the morning. She also experienced one episode of vomiting this morning. She has not had any recent head trauma.

She is currently undergoing treatment with tamoxifen 20mg for oestrogen receptor-positive breast cancer. She is allergic to NSAIDs, resulting in a skin rash.

What is the most appropriate initial investigation?

A. Cancer antigen 15-3 (CA15-3)

B. MRI head

C. PET scan

D. Biopsy

E. CT head

Correct Answer:MRI head

Explanation:

The most likely diagnosis is brain metastases (cerebral metastases). Any cancer can spread to the brain, but the most likely to cause brain metastases via haematogenous spread are lung, breast, colon, kidney and melanoma. This patient has a significant medical history of breast cancer. There are also red flags for raised intracranial pressure in the history, including worsening of symptoms, morning headaches and new-onset vomiting. NICE recommends that all patients suspected of having brain metastases should be offered a standard structural MRI as part of the initial work-up. An MRI is considered the gold standard.

A CT head would only be indicated in this patient if they had an obvious contraindication to MRI. NICE guidelines state that MRI is preferred over CT to investigate suspected cerebral metastases, so it is not the most appropriate choice.

A biopsy may be indicated in the further work-up of the patient, however, would not precede any imaging modality, as imaging is required to confirm the suspected diagnosis first.

Whilst PET scans may be used to identify sites of metastatic disease spread, they are not recommended as first-line imaging in the context of suspected cerebral metastases.

The biomarker cancer antigen 15-3 (CA15-3) is a protein mainly produced by breast cancer cells. While elevated levels are often seen in breast cancer, it is not considered diagnostic and should not be used in isolation to confirm either primary or metastatic cancer.

Further reading:

https://pathways.nice.org.uk/pathways/brain-tumours-and-metastases#path=view%3A/pathways/brain-tumours-and-metastases/brain-metastases.xml&content=view-node%3Anodes-follow-up

Question:

A 30-year-old lady presents to the cardiology outpatient clinic for assessment of a new heart murmur.

On examination, a high-pitched mid-systolic murmur can be heard at the apex, with a mid-systolic click preceding the murmur.

What is the most likely cause?

A. Tricuspid regurgitation

B. Mitral stenosis

C. Mitral valve prolapse

D. Tricuspid stenosis

E. Mitral regurgitation

Correct Answer:Mitral valve prolapse

Explanation:

The examination findings are all consistent with mitral valve prolapse:

When the mitral valve prolapses into the left atrium mid-way during ventricular systole, this causes a mid-systolic click.

The murmur following the mid-systolic click represents the retrograde (backwards) flow of blood from the left ventricle into the left atrium.

Mitral valve prolapse can predispose patients to mitral regurgitation. But mitral regurgitation typically causes a pan-systolic murmur (throughout the whole of ventricular systole).

Mitral stenosis causes an end-diastolic murmur.

Tricuspid murmurs are best heard in the 4th intercostal space at the left sternal edge. Tricuspid stenosis causes an end-diastolic murmur and tricuspid regurgitation causes a pan-systolic murmur.

Further reading:

https://www.youtube.com/watch?v=Bjnw\_jwDt1Q

Question:

A 49-year-old man presents to his GP with problems with his left leg. He has noticed this for the past two days and did not initially seek help because he thought he’d simply ‘slept funny’ after a post-match night out with his rugby teammates. However, he has been tripping regularly and keeps catching his left foot on curbs and stairs. On examination, he walks with a high-stepping gait on his left side. There is also weakness on left ankle dorsiflexion and sensory examination reveals numbness over the dorsum of the foot and the lateral side of the leg.

What is the most likely cause of his neurological deficit?

A. L5 radiculopathy

B. Common peroneal neuropathy

C. Amyotrophic lateral sclerosis

D. Stroke

E. Multiple sclerosis

Correct Answer:Common peroneal neuropathy

Explanation:

The clinical description here is of a left-sided foot drop. The most common cause of foot drop is common peroneal nerve palsy, which innervates the tibialis anterior muscle, responsible for dorsiflexing the ankle. The common peroneal nerve is also responsible for sensation over the lateral leg and dorsum of the foot.

Common peroneal nerve palsy often occurs as a result of trauma in the region of the fibular head or local compression (e.g. due to positioning or leg crossing).

Less commonly foot drop may be due to L5 radiculopathy, sciatic neuropathy, lumbar plexopathy or other diseases such as motor neuron disease or myopathies. In this case, this gentleman has probably either injured his common peroneal nerve playing rugby or indeed compressed it whilst asleep following a night out.

Further reading:

https://www.ninds.nih.gov/disorders/all-disorders/foot-drop-information-page#disorders-r1

Question:

A 67-year-old patient presents to the emergency department with dyspnoea and confusion. He has a history of chronic obstructive pulmonary disease (COPD), type 2 diabetes mellitus and hypertension. He smokes 20 cigarettes a day and has done so for 50 years.

On examination, RR 27/min, SaO2 75% on air, HR 117/min, BP 132/89 mmHg and temperature 38.1°C. An arterial blood gas is carried out, which is shown below.

Result Reference

pH 7.27 7.35-7.45

pO2 7.3 11 - 13 kPa

pCO2 14.6 4.7 - 6.0 kPa

HCO3 31 22 - 26 mmol/L

Base excess +12 -2 to +2 mmol/L

What is the most likely diagnosis?

A. Type 5 respiratory failure

B. Type 4 respiratory failure

C. Type 3 respiratory failure

D. Type 2 respiratory failure

E. Type 1 respiratory failure

Correct Answer:Type 2 respiratory failure

Explanation:

This case demonstrates an acute infective exacerbation of chronic obstructive pulmonary disease (COPD). The arterial blood gas demonstrates respiratory acidosis with partial metabolic compensation. This can be classified as type 2 respiratory failure. Type 2 respiratory failure involves hypoxaemia (PaO2 <8 kPa) with hypercapnia (PaCO2 >6.0 kPa). It occurs due to alveolar hypoventilation and is seen in conditions such as COPD, chest wall abnormalities, and reduced respiratory drive.

Type 1 respiratory failure involves hypoxaemia (PaO2 <8 kPa) with normocapnia or hypocapnia (PaCO2 <6.0 kPa). It occurs as a result of ventilation/perfusion (V/Q) mismatch. Ventilatory causes include pulmonary oedema and bronchoconstriction, with perfusion causes including pulmonary embolism.

Type 3 respiratory failure is defined as perioperative respiratory failure, caused by postoperative atelectasis.

Type 4 respiratory failure results from hypoperfusion of the respiratory muscles, seen in various forms of shock.

Type 5 respiratory failure is not a recognised classification.

Further reading:

https://geekymedics.com/abg-interpretation/

Question:

Thomas, a 12-year-old boy attends A&E with his mum. His mum tells you she is very worried because he has broken out in a rash all over his body which he can’t stop scratching. There is no obvious trigger. He has no significant past medical history or family history. He isn't currently taking any medication.

Thomas shows you the lesions on his arms but he says that some of the worst ones have now gone. On inspection, they are raised erythematous lesions that are paler centrally. You can see several scratch marks. On systemic examination his airway and chest are clear and observations are all within the normal range.

What is the most appropriate management?

A. IV hydrocortisone

B. Ibuprofen

C. Cetirizine

D. Oral prednisolone

E. IM adrenaline

Correct Answer:Cetirizine

Explanation:

The most likely diagnosis given the history and examination finding is acute urticaria. Urticaria occurs when mast cells become activated in the skin, resulting in the release of histamine and other inflammatory mediators. These chemicals cause the development of wheals, which appear as a central pruritic white papule or plaque with a surrounding erythematous flare. The lesions vary in size and shape. Individual lesions are transient, appearing and disappearing over minutes to hours. There may also be associated swelling of the eyelids, lips and tongue (angioedema).

Acute urticaria is defined as symptoms developing and then resolving relatively quickly (often within 48 hours). Urticaria persisting for more than 6 weeks is definited as chronic urticaria. A trigger is only identified in half of the cases and can include allergies, viral infections, chemicals, firm rubbing (dermatographism) and cold or hot water (i.e. from the shower).

Non-sedating antihistamines are the first-line treatment for urticaria (i.e. cetirizine, loratadine and fexofenadine), in addition to avoiding any possible trigger.

Rarely, in severe refractory cases, a trial of steroids may be appropriate but there is no evidence to suggest that intravenous steroids confer any benefit over those taken orally.

Intramuscular adrenaline is reserved for anaphylaxis, a severe life-threatening allergic reaction. There are no features of anaphylaxis in this scenario (no angioedema, normal vital signs, clear airway).

Ibuprofen can be an urticarial trigger and is not usually used in the management of the condition.

Further reading:

https://patient.info/doctor/urticaria-pro

Question:

You are called to see an elderly patient on the dementia and delirium unit, who was admitted with a lower respiratory tract infection a few weeks ago. He is currently medically stable and awaiting placement in a care home. He has had a couple of episodes of constipation related urinary retention during his hospital stay, however, he is now experiencing frank haematuria. The nurses are very worried about him as he looks distressed, and he has been tugging on his catheter trying to pull it out. You see in the catheter bag there is dark red, but translucent fluid, with lots of small to medium-sized clots. You look at his fluid balance chart:

3pm – 100mls urine output | 50mls oral intake

4pm – 25mls urine output | 250mls oral intake

5pm – 2mls urine output | 250mls IV bolus

6pm – 0mls urine output | 100mls IV meds

7pm – 0mls urine output | 250mls IV bolus

You next look at his vital signs:

HR 115 bpm

BP 120/85 mmHg

RR 26

SpO2 97% on room air

Temp 37.4 oC

What is your initial management plan?

A. Insert a three way catheter and irrigate the bladder

B. Assess for sepsis and prescribe antibiotics for presumed UTI

C. Activate the major haemorrhage protocol

D. Give analgaesia and a light sedative

E. Give a further bolus of IV fluids, and prescribe some background IV fluids

Correct Answer:Insert a three way catheter and irrigate the bladder

Explanation:

This situation of anuria despite fluid input should make you question the patency of the catheter. The distressed patient with a mild tachycardia and a mild tachypnoea should make you consider a pain response. These two scenarios combined are leading you to consider that this patient may have gone into clot retention. The most appropriate management of clot retention would be the insertion of a 3-way catheter to allow for bladder irrigation.

It is very difficult to bleed enough from haematuria to meet the requirements to activate the major haemorrhage protocol, however, in the elderly patient, it is worth considering that their physiological reserve will be lower. In addition, you should check if they are taking any anticoagulants.

Prescribing IV fluids alone in this scenario is just going to make matters worse as it will increase his urine production. Chasing the urine output with IVT will not work, as it is an outflow obstruction leading to the decreased U/O.

Analgesia is not a bad idea, but it would be inappropriate to sedate this patient.

Assessing for sepsis could be appropriate, but this will not solve the underlying problem of urinary retention.

Further reading:

https://patient.info/doctor/haematuria-pro

Question:

A 65-year-old male is reviewed in the haematology outpatient department. He was referred by his General Practitioner following routine blood tests which showed an incidental highly elevated white cell count. Following history and examination, and having ruled out several other causes, the consultant is suspicious of chronic myeloid leukaemia (CML).

What is the most appropriate diagnostic investigation to arrange?

A. Bone marrow aspiration and biopsy

B. Bone scan

C. CT chest/abdomen/pelvis

D. Lymph node biopsy

E. PET scan

Correct Answer:Bone marrow aspiration and biopsy

Explanation:

Chronic myeloid leukaemia (CML) is a haematological malignancy of pluripotent haematopoetic stem cells. In the vast majority of cases, this is due to a genetic abnormality known as the Philadelphia chromosome - t(9;22). This results in a shortened chromosome 22 and direct communication between the BCR-ABL genes, which ultimately results in the changes seen in CML. It is typically first identified incidentally as a result of blood tests which show a leucocytosis, in the chronic phase of the disease. As the disease progresses, patients may experience constitutional symptoms such as fatigue, weight loss and night sweats as well as signs such as hepatosplenomegaly. In order to obtain tissue for cytogenetic analysis, to examine for fibrosis and to quantify blast percentages, a bone marrow aspirate and biopsy is required.

Lymph node biopsies are used in cases of suspected lymphoma, amongst other diagnoses. Although lymph nodes may be enlarged in CML, a biopsy of these is not typically used in diagnosis. CT scans of the chest/abdomen/pelvis are required to stage malignancy and to examine for metastases and so are not useful in CML. Bone scans are used for bony metastases and PET scans may be used in the diagnosis of lymphoma as well as bony metastases.

Further reading:

https://patient.info/doctor/chronic-myeloid-leukaemia-pro

Question:

A 19-year-old university student presents to his GP with painful bilateral swelling near the jaw and cheeks. He finds it increasingly difficult to swallow. This swelling was preceded by a 3-day history of a headache, fever and general malaise. He received all of his childhood vaccines.

What is the most likely causative organism of the disease?

A. Parainfluenza virus

B. Haemophilus influenzae type B

C. Bordetella pertussis

D. Respiratory syncytial virus

E. Paramyxovirus

Correct Answer:Paramyxovirus

Explanation:

This case demonstrates mumps, which is caused by the highly infectious paramyxovirus and is a notifiable disease. It is spread by respiratory droplets and saliva and is commonly seen in children and young adults. Despite having both MMR vaccines, there is still a risk of contracting mumps.

Parainfluenza virus is the common causative organism of croup, which presents with a barking cough and stridor. Viral upper respiratory tract symptoms commonly precede the cough. It is most common in children aged 6 months - 3 years old.

Haemophilus influenzae type B is the most common cause of epiglottis. It is characterised by a sore throat, dysphagia, drooling of saliva and a fever. Children are commonly seen in the tripod position, leaning forward with their tongue out. This is a respiratory emergency and requires urgent senior support to manage the airway. It is now rare, thanks to the vaccination programme.

Respiratory syncytial virus is the common causative organism of bronchiolitis. It typically presents with a dry cough, dyspnoea and respiratory distress. It is most common in children aged 3-6 months old.

Bordetella pertussis causes pertussis or whooping cough. It typically presents with a 2-3 day coryzal illness followed by a dry, hacking cough which is usually worse at night and after eating. Persistent coughing can lead to vomiting, cyanosis and apnoeas. A forceful inspiratory whoop may be present but is not always.

Further reading:

https://geekymedics.com/mumps/

Question:

A 25-year-old woman presents to A&E with lower abdominal pain and fever that has worsened over the past month. She hasn’t noticed a correlation to her cycle but she complains of an unusual vaginal discharge. She is otherwise fit and well and she has a Mirena coil in situ. She has had the HPV (human papillomavirus) vaccine but has never had a smear test.

On examination, she very tender across the lower abdomen during palpation. Her vital signs are as follows: HR 110 bpm, BP 125/95 mmHg, T 38 oC, RR 16, SpO2 99% on air.

What is the most likely diagnosis?

A. Endometriosis

B. Ectopic pregnancy

C. Irritable bowel syndrome

D. Cervical cancer

E. Pelvic inflammatory disease

Correct Answer:Pelvic inflammatory disease

Explanation:

Of the options presented, the most likely diagnosis is pelvic inflammatory disease (PID), given the several week history of abdominal pain, fever and abnormal vaginal discharge, in addition to significant tenderness in the suprapubic region on palpation.

PID involves infection of the upper female genital tract, including the uterus, fallopian tubes and ovaries. The infection usually begins at the cervix and spreads upwards. Infections are often polymicrobial and can include mycoplasmas, vaginal flora, streptococci and sexually transmitted infections such as chlamydia and gonorrhoea. Risk factors include unprotected sexual intercourse (STIs), multiple sexual partners and recent insertion of an intrauterine contraceptive device (i.e. Mirena coil). It should be noted that the increased risk associated with intrauterine devices is only present in the 20 days after insertion, with the risk of PID then returning to that of a woman without an intrauterine device.

Typical presenting symptoms include lower abdominal pain, abnormal vaginal discharge, deep dyspareunia and abnormal vaginal bleeding. Clinical examination usually reveals bilateral lower abdominal tenderness, fever, mucopurulent cervical discharge and cervicitis (on speculum examination) and adnexal/cervical motion tenderness on bimanual vaginal examination.

Ectopic pregnancy is less likely, given the length of the history and absence of vaginal bleeding, however, this diagnosis would need to be ruled out with a urine pregnancy test.

Irritable bowel syndrome (IBS) typically presents with abdominal pain and an abnormal bowel habit (often alternating between constipation and diarrhoea). There is no mention of bowel habit issues and a diagnosis of IBS would not explain the fever or abnormal vaginal discharge.

Endometriosis is possible, however, the patient denies any association between the symptoms and her menstrual cycle, making this diagnosis less likely.

Cervical cancer is very unlikely given the patient is young and has had the HPV vaccination. The patient should be advised to attend routine cervical screening.

Further reading:

https://patient.info/doctor/pelvic-inflammatory-disease-pro

Question:

A 60-year-old woman presents to her GP with a new skin lesion on her left arm, which she first noticed a year ago. She does not drink alcohol, however, she has been smoking 20 cigarettes a day for the past five years.

On examination, there is an asymmetric, flat, pigmented lesion with irregular borders and measures 6 mm in diameter. A whole body skin exam shows a large number of melanocytic naevi and numerous cherry angiomas.

Based on the likely diagnosis, what is this patient's most significant risk factor?

A. Being female

B. Location of the lesion

C. Smoking

D. Presence of cherry angiomas

E. Large number of melanocytic naevi

Correct Answer:Large number of melanocytic naevi

Explanation:

This patient most likely has melanoma. The only risk factor for melanoma listed is the large number of melanocytic naevi, or moles. The presence of cherry angiomas and being female are not associated with an increased risk of melanoma. The commonest location of the lesion in melanoma in women is on the legs and in men on the trunk. Note that although smoking increases the risk of squamous cell carcinoma, it does not increase the risk of melanoma.

The risk factors for melanoma are listed below:

Fair skin, freckling, light hair, light-coloured eyes

Previous skin cancer or atypical naevi

Large number of moles

Family history of melanoma

Pale skin (Fitzpatrick type I and II)

Being male

Previous sunburn, outdoor occupation, sunbed use

Immunosuppression

Certain genetic conditions, e.g. xeroderma pigmentosum

Further reading:

https://geekymedics.com/malignant-melanoma-of-the-skin/

Question:

A 59-year-old woman presents to the emergency department with a 24hr history of fever, dysuria and decreased urine output. She appears unwell and observations show a temperature of 38.5 oC, blood pressure 80/40 mmHg and a heart rate of 110 bpm.

Blood tests reveal the following:

CRP 300

WBC 19.8

Neut 18.8

Sodium 145 mmol

Potassium 4.9 mmol

Creatinine 250 umol

Bicarbonate 18 mmol

Normal LFTs

Normal coagulation profile

Intravenous saline and antibiotics are prescribed and the blood pressure returns to normal. The patient remains febrile and generally unwell.

An urgent ultrasound scan shows left hydroureter and hydronephrosis but a normal right urinary system.

What is the next most appropriate management plan ?

A. CT KUB

B. Haemodialysis

C. Nephrostomy insertion to left kidney

D. Cystoscopy and retrograde ureteric stent insertion

E. Intravenous sodium bicarbonate

Correct Answer:Nephrostomy insertion to left kidney

Explanation:

This patient is presenting with pyonephrosis until proven otherwise. In this particular case, the patient is unwell and will require rapid drainage of pus from the left kidney by percutaneous nephrostomy tube insertion. This will allow source control of sepsis and avoid prolonged obstruction to the left kidney which can cause permanent loss of function.

There is no clinical or biochemical indication for haemodialysis, and dialysis would result in a delay to definitive treatment for the obstructed left kidney, which requires urgent drainage.

Cystoscopy and stent insertion is an option here and would be useful in decompressing the obstructed left ureter. However, this requires general anaesthesia, which in this patient is not appropriate because she is too unwell, and the nephrostomy is available.

Guidelines state that sodium bicarbonate should not be used for fluid resuscitation in the treatment of sepsis. Additionally, the patient is only mildly acidaemic, so sodium bicarbonate is not indicated.

A CT scan is usually performed if patients are presenting with renal colic, but that is not the case here. The urgency is to decompress the left kidney to avoid permanent loss of function and allow drainage of infected urine thereby controlling sepsis. Sufficient information is available to do this using ultrasound guidance, without a CT scan. A CT scan might be later indicated, after nephrostomy insertion, to delineate the underlying cause of the hydronephrosis.

Further reading:

https://cks.nice.org.uk/acute-kidney-injury#!scenario

Question:

A 55-year-old man presents with recurrent episodes of haemoptysis over the past two weeks. He also mentions that his allergies have been ‘playing up’ with his asthma requiring multiple doses of his ‘blue pump’. He also describes his nose feeling constantly blocked, in addition to shortness of breath with minimal exertion. He also thinks he has lost approximately 5kg in weight unintentionally over the last month or so.

His past medical history includes asthma and allergic rhinitis. He does not smoke, has not recently travelled, and drinks alcohol rarely.

General inspection reveals normal vital signs, purpuric lesions on his limbs and thorax and conjunctival pallor. Lymphadenopathy and clubbing are not present. Percussion of the chest reveals some dullness over both lung bases. Auscultation of the chest reveals a widespread wheeze with some reduced air entry at the bases. Within the nasal cavity are bilateral polyps with erythematous mucosa.

Blood tests reveal anaemia, eosinophilia and positive pANCA. cANCA is negative and sputum results are still pending. Serum calcium and serum ACE levels are normal. A chest x-ray shows small bilateral pleural effusions.

What is the most likely diagnosis?

A. Wegener's granulomatosis

B. Sarcoidosis

C. Tuberculosis

D. Churg-Strauss syndrome

E. Bronchial carcinoma

Correct Answer:Churg-Strauss syndrome

Explanation:

Churg-Strauss syndrome (also known as eosinophilic granulomatosis with polyangiitis) is a rare vasculitic disease affecting pulmonary, coronary, cerebral, abdominal viscera and blood vessels supplying the skin. The disease typically affects small/medium-sized arteries and veins. The condition has a known association with asthma.

The American College of Rheumatology identified 6 criteria for the diagnosis of Churg-Strauss syndrome (CSS):

Asthma

Eosinophilia

Paranasal sinusitis

Pulmonary infiltrates

Histological confirmation of vasculitis

Mononeuritis multiplex or polyneuropathy

If 4 or more criteria are present, it makes the diagnosis of CSS likely.

Other investigations to help support a diagnosis include:

p-ANCA - present in 30-40% of patients

FBC - anaemia is common

CXR - pulmonary infiltrates / pleural effusions

CT Chest - ground-glass attenuation

Bronchiolar lavage - may show eosinophilia

Tuberculosis typically presents with chronic cough, haemoptysis, weight loss and night sweats. On CXR there may be visible consolidation (typically apical) and sputum testing for acid-fast bacilli (AFB) can help confirm the diagnosis. TB is not usually associated with P-ANCA or eosinophilia. It is important to note in practice a single negative AFB does not exclude TB and it is normal to repeat these multiple times.

Sarcoidosis is a granulomatous condition that can present similarly to CSS however you would expect calcium levels and serum-ACE to be raised, which isn't the case in this scenario. Further to this, on CXR bilateral hilar lymphadenopathy is more characteristic of sarcoidosis.

Bronchial carcinoma can present in a similar way to CSS however you would not expect eosinophilia or positive P-ANCA. It is, however, important to note that a normal CXR cannot exclude lung cancer.

Further reading:

https://patient.info/doctor/churg-strauss-syndrome-pro

Question:

A 74-year-old post-menopausal female presents to her GP with new vaginal bleeding. The bleeding is small volume, irregular and has persisted for two months. She is otherwise well. Her last cervical smear was aged 64-years-old, and the results have always been normal. She experienced menopause at 55 years old and has never been pregnant. Her BMI is 35 kg/m2.

What is the most likely diagnosis?

A. Coagulopathy

B. Endometrial cancer

C. Cervical cancer

D. Leiomyoma

E. Endometriosis

Correct Answer:Endometrial cancer

Explanation:

This case demonstrates endometrial cancer, which typically presents with postmenopausal bleeding or persistent intermenstrual bleeding and menorrhagia in premenopausal patients. Obesity, nulliparity, polycystic ovary syndrome, family history, hormone replacement therapy, and oestrogen receptor agonists (e.g. tamoxifen) are risk factors.

Postmenopausal bleeding is endometrial cancer until proven otherwise.

Cervical cancer typically presents in younger patients who may be multiparous and have not had a cervical smear for a long time. Vaginal bleeding is usually provoked (e.g. post-coital).

Endometriosis typically presents with pelvic pain, dyspareunia and painful defecation/urination and is most common in younger, premenopausal patients.

Leiomyomas (uterine fibroids) typically present with abnormal vaginal bleeding and urinary urgency or constipation secondary to pressure on the bladder or rectum. They are more common in premenopausal patients. As this patient is presenting with new vaginal bleeding and no previous symptoms, this is less likely.

With no history of coagulopathy this is an unlikely diagnosis, and gynaecological causes of the new vaginal bleeding should be excluded first.

Further reading:

https://cks.nice.org.uk/topics/gynaecological-cancers-recognition-referral/

Question:

A 48-year-old obese woman presents to the GP with pain in both knees that has worsened over the last year. It is aggravated by walking and alleviated by rest. She never resorted to any medications for the pain, but warm compresses temporarily relieved her pain. Past medical history includes type 2 diabetes mellitus and hyperlipidemia.

On examination, a “grating” sound is heard while palpating over the knee joints bilaterally.

What is the most appropriate initial management option?

A. Naproxen

B. Oral corticosteroid

C. Intra-articular corticosteroid

D. Allopurinol

E. Paracetamol

Correct Answer:Paracetamol

Explanation:

Considering her age, obesity, and bilateral knee pain, which worsens with activity and is relieved by rest, osteoarthritis (OA) is the most likely diagnosis. If she complained of morning stiffness longer than 30 minutes and systemic symptoms, rheumatoid arthritis would have been the likely diagnosis. OA is non-inflammatory arthritis that results in eroding cartilage in the intra-articular joints. This causes joint crepitus (a “grating” or popping sound) that occurs when the surfaces of the joint grind against each other. Paracetamol is the first-line treatment for mild to moderate OA, and can be combined with topical NSAIDs, particularly for hand or knee involvement.

Allopurinol is a xanthine oxidase inhibitor used in the prophylaxis of gout. It acts by decreasing the production of uric acid. It is not used in the treatment of osteoarthritis.

Naproxen is a non-steroidal anti-inflammatory drug (NSAID) which is highly effective in the treatment of osteoarthritis. However, oral NSAIDs are considered a second-line agent in OA if paracetamol ± topical NSAIDs are ineffective.

There is no role for oral corticosteroids in the management of osteoarthritis.

Intra-articular corticosteroid injections lead to short-term pain relief by reducing the volume of synovitis in osteoarthritis. They are used in the management of acute flares of joint pain rather than the initial treatment of osteoarthritis.

Further reading:

https://cks.nice.org.uk/topics/osteoarthritis/management/management/

Question:

A 67-year-old male patient is diagnosed with type 2 diabetes mellitus (T2DM) by his general practitioner (GP). The GP initiates metformin monotherapy in order to achieve glycaemic control. The patient has no past medical or surgical history.

What side effect is most likely to be seen as a result of this medication?

A. Flushing

B. Hypoglycaemia

C. Myopathy

D. Poor vitamin B12 absorption

E. Syndrome of inappropriate anti-diuretic hormone (SIADH)

Correct Answer:Poor vitamin B12 absorption

Explanation:

This question focuses on the side effects of a very commonly prescribed medication. Metformin is a commonly prescribed first-line medication in the management of T2DM. Common side effects of metformin include gastrointestinal problems (metallic taste, nausea, diarrhoea), lactic acidosis (particularly in patients with renal or hepatic disease) and poor vitamin B12 absorption. Although metformin reduces vitamin B12 absorption is approximately 25-30% of patients, it uncommonly causes a low concentration of vitamin B12 in the serum.

Medication-induced myopathy is seen with medications such as lipid-lowering drugs, glucocorticoids, cocaine and antimalarial drugs.

Hypoglycaemia is a commonly seen side effect of second-line diabetic medications such as insulin, sulfonylureas, meglitinides and alcohol. Metformin does not cause hypoglycaemia.

SIADH is a commonly seen side effect in certain antiepileptic medications such as carbamazepine, high doses of cyclophosphamide and most commonly selective serotonin reuptake inhibitors (SSRIs).

Metformin does not commonly cause flushing in patients. Medications that commonly cause flushing include niacin, sildenafil, direct vasodilators like hydralazine and nitroglycerin, and calcium channel blockers.

Further reading:

https://bnf.nice.org.uk/drug/metformin-hydrochloride.html

Question:

A 25-year-old woman who is 37 weeks pregnant presents with a 2-day history of headaches with associated flashing lights. Her pregnancy to date has been uncomplicated, although she has missed multiple routine appointments. She has a past medical history of asthma and uses salbutamol and beclometasone inhalers.

On examination, her foetus is small for gestational age, her blood pressure is 170/100 mmHg, and her urinalysis shows 2+ protein. There is lower limb oedema. During the consultation, she experiences a generalised tonic-clonic seizure.

What is the most appropriate next step in her management?

A. Labetalol

B. IV magnesium sulphate

C. Nimodipine

D. Oral magnesium sulphate

E. Perform emergency caesarean section

Correct Answer:IV magnesium sulphate

Explanation:

IV magnesium sulfate is correct. Any patient presenting with new-onset hypertension after 20 weeks of pregnancy and proteinuria or signs of organ involvement (e.g. headaches, visual disturbances, right upper quadrant pain etc.) should raise suspicion of a diagnosis of pre-eclampsia, which can have potentially fatal complications on both the mother and foetus. Pre-eclampsia can cause intrauterine growth restriction, explaining the foetus' small for gestational age size. Routine monitoring usually detects cases of pre-eclampsia, so early intervention can occur, however, this patient has missed these appointments. This patient has developed seizures following their pre-eclampsia, meaning they now have eclampsia, which can lead to convulsions and multi-organ failure. The first and most appropriate step would be to terminate the seizures and this is done by giving IV magnesium sulphate until 24 hours after delivery, or 24 hours following the last seizure, whichever is the longest.

Oral magnesium sulphate is incorrect. Oral magnesium sulfate would not have a quick enough effect in an emergency scenario like this. It is also not licensed for the treatment of eclampsia.

Labetalol, and nimodipine are incorrect. Although these are antihypertensives used in the management of pre-eclampsia, the seizures must be dealt with first. After administering IV magnesium sulphate, the blood pressure can then be controlled to reduce the risk of hypertensive complications, such as strokes. This patient is asthmatic, meaning labetalol (a beta-blocker) is contraindicated, so nimodipine would be used instead.

Perform emergency caesarean section is incorrect. Although one of the main principles of managing eclampsia is prompt delivery of the baby, even if premature, the seizures must be dealt with first, followed by immediate blood pressure management and delivery.

Further reading:

https://geekymedics.com/pre-eclampsia/

Question:

A 52-year-old female presents to A&E complaining of fever and abdominal pain. She reports this started approximately 2 days ago and she has been feeling progressively worse over this time. She has no other past medical history.

Vital signs:

Heart rate - 110 beats per minute

Respiratory rate - 16 breaths per minute

Blood pressure - 110/75

SpO2 - 98%

Temperature - 38.1˚C

Inspection reveals an overweight woman clearly uncomfortable at rest with evidence of jaundice. Abdominal palpation reveals right upper quadrant pain and Murphy’s sign is positive.

Bloods and blood cultures are taken, and she is commenced on intravenous fluids.

What is the most appropriate next step in management?

A. Endoscopic lithotripsy

B. Intravenous broad-spectrum antibiotics

C. Emergency endoscopic retrograde cholangiopancreatography (ERCP)

D. Emergency surgical biliary decompression

E. Oral broad-spectrum antibiotics

Correct Answer:Intravenous broad-spectrum antibiotics

Explanation:

This patient presents with Charcot’s triad (fever, jaundice and right upper quadrant pain), indicative of acute cholangitis. The next most appropriate step in the management of this patient would involve the administration of intravenous broad-spectrum antibiotics, such as piperacillin/tazobactam.

Oral antibiotics would be insufficient as acute cholangitis can quickly progress to severe sepsis.

Emergency endoscopic retrograde cholangiopancreatography (ERCP) would be a reasonable next step if the patient continued to deteriorate despite initial intravenous antibiotic treatment.

Emergency surgical biliary decompression would be inappropriate. Surgery for biliary decompression has largely been replaced by non-operative means (such as ERCP).

Endoscopic lithotripsy would not be used alone, but could be used alongside ERCP for bile duct stones that are difficult to remove.

Further reading:

https://geekymedics.com/cholangitis/

Question:

A 31-year-old man presents with loss of libido, progressively worsening erectile dysfunction and a mild headache. He has no significant past medical history. On examination, he has bilateral gynaecomastia and a normal genitourinary exam. Visual field testing reveals bi-temporal hemianopia.

Blood tests reveal low testosterone, luteinising hormone (LH) and follicle-stimulating hormone (FSH). His prolactin is 38,000 mIU/L (normal <300 mIU/L). An MRI shows a suprasellar extension of a large pituitary lesion with compression of the optic chiasm.

Given the likely diagnosis, what is the first-line management?

A. Bromocriptine

B. Sellar radiotherapy

C. Octreotide

D. Trans-sphenoidal surgery

E. Cabergoline

Correct Answer:Cabergoline

Explanation:

The most likely diagnosis is a prolactinoma, a prolactin-secreting pituitary adenoma. Secretion of prolactin inhibits gonadotrophin-releasing hormone (GnRH) pulses from the hypothalamus, in turn, reducing the secretion of LH, FSH and thus testosterone. Low testosterone leads to loss of libido and erectile dysfunction.

The first-line medical management for a prolactinoma is cabergoline. Cabergoline is a dopamine agonist which helps normalise prolactin and reduce tumour size.

Bromocriptine is also a dopamine agonist. Bromocriptine is less tolerated and has poorer outcomes than cabergoline.

Trans-sphenoidal surgery is the second line when medical management is not tolerated or is unsuccessful.

Sellar radiotherapy targets the sella turcica, where the pituitary gland sits. Radiotherapy is the third line where medical and surgical management fails, or in rare cases of malignant prolactinomas.

Octreotide mimics the action of somatostatin and helps manage growth hormone-secreting pituitary adenomas. However, it has no role in the management of prolactinoma.

Further reading:

https://geekymedics.com/brain-tumours/

Question:

A 55-year-old male presents with increased difficulty walking on a background of mid-thoracic back pain. He reports a recent diagnosis of prostate cancer. On clinical examination, he demonstrates full power in the lower limbs, normal reflexes, normal pin-prick and temperature sensation but reduced vibration sensation and joint position sensation bilaterally. No bladder or bowel disturbance is noted.

Damage to which tract is most likely responsible for his symptoms?

A. Dorsal columns (posterior columns)

B. Rubrospinal tract

C. Corticospinal tract

D. Internal capsule

E. Spinothalamic tract

Correct Answer:Dorsal columns (posterior columns)

Explanation:

The patient demonstrates impaired joint position sensation and vibration sensation. These sensory modalities alongside two-point discrimination are carried by the dorsal columns.

The spinothalamic tract is responsible for pain, temperature and light touch. These remain intact in the above scenario.

The corticospinal tract is responsible for voluntary movement, the patient described does not display any weakness.

The rubrospinal tracts originate in the red nucleus of the midbrain. Its is involved with control of flexor muscle tone.

The internal capsule is a white matter structure containing both motor and sensory axons. Lesions of this area commonly lead to a hemiparesis or hemiplegia, with associated sensory disturbance.

Further reading:

https://geekymedics.com/the-descending-tracts-of-the-central-nervous-system/

Question:

A 67-year-old man presents to his GP with a longstanding cough; he also reports daily thick and yellow sputum that is sometimes spotted with blood. On further questioning, he does not report any significant weight loss or night sweats.

He cannot accurately pinpoint when the cough began but confidently states it has worsened since he had a stroke two years ago. He does not have any residual deficit from the stroke. He says he finds the cough challenging to manage these days as strangers accuse him of having COVID-19 in public.

He has never smoked and is an occasional drinker (3 units of alcohol a week).

His past medical history is significant for hypertension, stroke (two years ago) and multiple courses of antibiotics for upper respiratory tract infection over the last five years. No drug allergies are known.

On examination, the patient appears short of breath with an audible wheeze. Vital signs are noted as temperature 37.2°C, RR 20/min, pulse 92/min, blood pressure 143/83mmHg and SpO2 93% on room air. Examination of the respiratory system reveals coarse crackles focussed in the lower zones bilaterally, high-pitched inspiratory squeaks and rhonchi.

What is the most likely diagnosis in this patient?

A. Pulmonary embolism

B. Chronic obstructive pulmonary disorder

C. Bronchiectasis

D. Aspiration pneumonia

E. Lung cancer

Correct Answer:Bronchiectasis

Explanation:

The most likely diagnosis in this patient is bronchiectasis - a condition characterised by permanent dilation of bronchi due to destruction of the elastic and muscular components of the bronchial wall. Bronchiectasis should be suspected in all patients with persistent cough (>8 weeks), daily expectoration of sputum, dyspnoea, recurrent chest infections and haemoptysis. Suggestive features on examination include the presence of coarse crackles focussed in the lower zones, wheeze, high-pitched inspiratory squeaks and large airway rhonchi.

This patient has a history of stroke; however, he does not report any residual deficit. Aspiration pneumonia typically presents acutely with pyrexia, dyspnoea, and cough, in patients with impaired swallow following stroke. Therefore, this is a less likely diagnosis given the chronic nature of symptoms and absence of relevant systemic findings on examination.

Lung cancer is an important differential diagnosis in all patients presenting with long-term respiratory symptoms, especially those with a history of haemoptysis and chronic cough. In patients with lung cancer, there is typically a history of mild and non-productive cough, which is associated with systemic symptoms such as weight loss, night sweats and fever. The absence of relevant symptoms makes lung cancer a less likely diagnosis, however, it must be formally excluded during the workup of this patient.

Patients with pulmonary embolism (PE) typically present acutely with tachypnoea, cough, haemoptysis and pleuritic chest pain. This patient has presented with a history of chronic cough, sputum production and a range of examination findings that are not in keeping with PE, which suggests this is a less likely diagnosis.

Bronchiectasis and chronic obstructive pulmonary disorder (COPD) may co-exist. However, patients with COPD characteristically present diminished breath sounds and evidence of hyperinflation on examination, which is not seen in this patient. Furthermore, the presence of high-pitched inspiratory squeaks and absence of smoking history makes this a less likely diagnosis. Further respiratory function testing during the initial workup of this patient can formally exclude this diagnosis.

Further reading:

https://cks.nice.org.uk/topics/bronchiectasis/

Question:

A 58-year-old man with metastatic prostate cancer presents to the emergency department with constipation, vomiting, abdominal pain and excessive urination. His wife says that he has become increasingly confused and has complained of increased thirst.

Blood tests reveal the following:

Value Reference range

Calcium (adj) 3.6 2.1-2.6 mmol/l

Phosphate 1.7 0.8-1.4 mmol/l

Albumin 29 35-50 g/L

Alkaline phosphatase 204 30-130 umol/l

What is the most appropriate initial management option?

A. Vitamin D and calcium supplementation

B. Haemodialysis

C. IV zoledronic acid

D. Calcitonin

E. IV 0.9% sodium chloride

Correct Answer:IV 0.9% sodium chloride

Explanation:

This case demonstrates hypercalcaemia of malignancy. Hypercalcaemia typically presents with the four features of 'bone, stones, abdominal moans and psychiatric groans.' These are bone pain, renal stones, abdominal pain and confusion/depression. In addition, constipation, polyuria, polydipsia, weight loss and weakness are other common features.

IV 0.9% sodium chloride is the initial treatment, as these patients are likely severely volume depleted and require fluid resuscitation urgently. IV bisphosphonates (e.g. zoledronic acid) can then be used to prevent bone resorption by inhibiting osteoclast activity. Calcitonin can be used alongside bisphosphonates as it more rapidly lowers calcium, however, their effect is transient.

Vitamin D and calcium supplementation would be inappropriate in this case, as the patient is hypercalcaemic.

Haemodialysis is rarely used in the management of hypercalcemia and is not an appropriate initial management option.

Further reading:

https://patient.info/doctor/hypercalcaemia

Question:

Harriet Mason, a 74-year-old female, presents to her GP with a 3-month history of dysphagia. At first, Harriet could still swallow liquids easily, but more recently she has even struggled to swallow water. She has also lost around 8kg in weight unintentionally. She is a non-smoker and doesn’t drink alcohol, but she has a long-standing history of refractory acid reflux.

You send her for an urgent upper GI endoscopy with biopsy.

On biopsy, which out of the following pathologies is most likely to be found?

A. Sarcoma

B. Large cell carcinoma

C. Adenocarcinoma

D. Small cell carcinoma

E. Squamous cell carcinoma

Correct Answer:Adenocarcinoma

Explanation:

The symptoms of progressive, unrelenting dysphagia combined with weight loss in this age group make oesophageal cancer a likely diagnosis. Oesophageal cancer can be divided by its pathology into squamous cell carcinoma or adenocarcinoma.

The correct answer here is adenocarcinoma, which is now the most common pathology in developed countries, but is also hinted at by the long history of acid reflux. Other risk factors (not present here) include obesity and smoking. Barrett’s oesophagus is a term for when long-standing reflux causes the squamous epithelium of the lower oesophagus to be replaced by columnar epithelium, which predisposes to malignant change into adenocarcinoma.

Squamous cell carcinoma is the less common subtype, and Harriet doesn’t have any of the risk factors, so this is less likely. Risk factors for squamous cell carcinoma include alcohol, smoking, or certain predisposing conditions such as Plummer–Vinson syndrome.

Once the diagnosis is confirmed with a biopsy, CT scans can stage the disease. In the early stages, surgical resection can be curative, usually with preoperative chemo-radiation therapy. In later stages, palliative therapy is often the only realistic option.

Sarcomas are malignancies usually found in connective tissue or bone (osteosarcoma).

Small cell carcinomas are malignancies that are usually found in the lungs and have a tendency to secrete ectopic hormones.

Large cell carcinomas are malignancies that are usually found in the lungs.

Further reading:

https://www.bsg.org.uk/resource/bsg-guidelines-for-the-management-of-oesophageal-and-gastric-cancer.html

Question:

A 63-year-old male is brought into the emergency department by ambulance with a 2-hour history of severe tearing chest pain that radiates through to his back. He has a history of hypertension, type 2 diabetes mellitus and a 60 pack-year smoking history.

On examination, his heart rate is 97bpm regular. Blood pressure is 194/92mmHg in the right arm and 159/76mmHg in the left.

What is the diagnostic investigation for the most likely diagnosis?

A. ECG

B. Abdominal aorta ultrasound

C. Invasive coronary angiography

D. Chest X-ray

E. CT angiogram

Correct Answer:CT angiogram

Explanation:

The case demonstrates an aortic dissection. A history of sudden onset sharp/tearing chest pain that radiates to the back is highly suggestive of an aortic dissection. Unequal blood pressure between both arms is a hallmark of a dissection due to compression/occlusion of the left subclavian artery.

An urgent CT angiogram of the whole aorta is the diagnostic investigation, which allows for classification of the dissection and management planning.

A chest X-ray may demonstrate a widened mediastinum, irregular aortic contour or pleural effusion. However, it is of limited diagnostic value and is normal in 10-15% of patients.

An ECG may demonstrate evidence of myocardial ischaemia. However, this may be due to an alternative diagnosis.

Invasive coronary angiography is indicated in conditions such as acute coronary syndrome or ischaemic heart disease. It has no role in the diagnosis of aortic dissection.

Abdominal aorta ultrasound is indicated for a suspected abdominal aortic aneurysm. An aortic aneurysm may proceed to a dissection; however, ultrasound is not a diagnostic investigation for a dissection.

Further reading:

https://geekymedics.com/aortic-dissection/

Question:

A 65-year-old woman is seen in the breast clinic after she noticed a lump in her left breast two weeks ago and was referred by the GP. The lump is not painful and does not seem to have changed since she first noticed it. She is otherwise well in herself. There is no associated nipple discharge, but she has noticed that the nipple and skin around the lump seem to have changed in appearance.

She has no past medical history but has previously been prescribed hormone replacement therapy to treat menopausal symptoms. She is now post-menopausal. There is no personal or family history of breast disease.

On examination, there is a firm lump in the outer upper quadrant of the left breast. There is left-sided nipple inversion and skin thickening over the same region. There are also palpable axillary nodes on the left side.

A mammogram is conducted which demonstrates a small irregular spiculated mass in the outer upper quadrant of the left breast, and histology of the core biopsy obtained suggests that this is an invasive ductal carcinoma. There is only one peripheral solitary lesion, and histological analysis reveals that the tumour is ER+ (oestrogen receptor-positive) and HER2- (HER2 receptor-negative). Anaesthetic pre-operative assessment deems that she is a suitable candidate for surgery.

What is the most appropriate management of this patient?

A. No surgical therapy - tamoxifen and trastuzumab only

B. Wide local excision with axillary lymph node removal and adjuvant anastrozole

C. Mastectomy with sentinel lymph node biopsy and no adjuvant therapy

D. Mastectomy with axillary lymph node removal and adjuvant tamoxifen

E. Wide local excision with axillary lymph node removal and adjuvant tamoxifen

Correct Answer:Wide local excision with axillary lymph node removal and adjuvant anastrozole

Explanation:

The most appropriate management of this patient would be a wide local excision with axillary lymph node removal and adjuvant anastrozole. In terms of surgical management of breast cancer, a wide local excision will usually be performed for a peripheral solitary lesion; mastectomy is typically reserved for multiple or central lesions that are less easy to remove. If axillary lymph nodes are palpable on examination, they will typically all be removed at the time of surgery. If there are no palpable lymph nodes, USS of the axillary lymph node region is performed and if positive a sentinel node biopsy will be performed at the time of surgery. This involves an injection of radioactive dye to identify affected lymph nodes so that they can be removed. Adjuvant therapy can also be given in addition to surgery. This is dependent on histological analysis – if a patient is ER (oestrogen receptor) positive they can be given tamoxifen if they are pre or peri-menopausal or an aromatase inhibitor such as anastrozole if they are post-menopausal. If the patient is HER2 receptor positive, they can be treated with trastuzumab (which may also be referred to as Herceptin, a common brand name).

Wide local excision with axillary lymph node removal and adjuvant tamoxifen is incorrect. This patient is post-menopausal and therefore although she can receive targeted treatment for an ER+ tumour she would receive an aromatase inhibitor such as anastrozole rather than tamoxifen (which is given to pre-/peri-menopausal women with ER+ tumours). This is because most oestrogen production in postmenopausal women is generated through peripheral aromatisation and therefore it is most effective to block this process directly.

Mastectomy with sentinel lymph node biopsy and no adjuvant therapy is incorrect. This patient has a peripheral solitary lesion and therefore wide local excision may be more appropriate. Also because she has palpable axillary lymph nodes on examination all axillary lymph nodes would be removed at the time of surgery. Also, she is possibly eligible for adjuvant therapy in the form of an aromatase inhibitor, as her tumour is ER+.

Mastectomy with axillary lymph node removal and adjuvant tamoxifen is incorrect. As she is ER+ and post-menopausal, an adjuvant aromatase inhibitor such as anastrozole would be considered rather than tamoxifen. As it is a peripheral solitary lesion, a wide local excision may be more appropriate.

No surgical therapy - tamoxifen and trastuzumab only is incorrect. Surgical intervention is possible, although it may not be indicated for further reasons, such as patient preference. If adjuvant therapy were given, trastuzumab would not be indicated as she is HER2-, and if she were given adjuvant therapy to target the ER, an aromatase inhibitor would be given rather than tamoxifen as she is post-menopausal.

Further reading:

https://patient.info/doctor/breast-cancer-pro

Question:

A 44-year-old manual worker presents to the GP worried about a skin lesion that has developed on his shoulder. He states that it has been growing over the past 2 months and has almost doubled in size. The lesion is pigmented and is now beginning to itch.

An excision biopsy is carried out, which reveals abnormal melanocytic proliferation in the epidermis. Further investigation suggests lymphatic spread. Immunohistochemistry is ordered on the biopsy sample.

What gene is likely contributing to the probable diagnosis?

A. APC

B. n-MYC

C. p53

D. BRCA

E. BRAF

Correct Answer:BRAF

Explanation:

This case demonstrates malignant melanoma, which can present with a rapidly changing symptomatic, pigmented lesion on sun-exposed areas. Cytology findings of abnormal melanocytic proliferation in the epidermis are typical for malignant melanoma. BRAF is an oncogene that is mutated in a large number of malignant melanoma cases. This has been identified relatively recently, and this has allowed targeted therapy against this mutation to be developed. Chemotherapy drugs such as vemurafenib can directly inhibit BRAF and have been shown to improve outcomes in patients who have tumours that cannot be completely excised. Therefore, immunohistochemistry is becoming increasingly performed in those with an incurable disease on staging.

p53 is a tumour suppressor gene that plays a key role in regulating the cell cycle; it induces apoptosis in cells that have escaped normal growth controls. Li-Fraumeni syndrome is the name given to patients with mutations in this gene; due to the failure of cell cycle regulation, these patients have a greatly increased risk of osteosarcoma, soft tissue sarcomas, leukaemia, breast cancer and a number of other tumours.

The APC gene is mutated in patients with familial adenomatous polyposis (FAP); these patients can develop a huge number of polyps within the bowel, and almost always develop adenocarcinoma of the bowel at some point in their lifetime. As a result, a prophylactic total colectomy is often considered.

The amplification and overexpression of n-MYC can be present in a number of tumours, however, it is not frequently associated with melanoma, rather, it is most commonly seen in the setting of neuroblastoma.

The BRCA gene is well-known to be associated with a greatly increased risk of both breast and ovarian cancer; it is frequently screened for in patients with a significant family history of these conditions.

Further reading:

https://www.bad.org.uk/for-the-public/patient-information-leaflets/melanoma-stage-4/?showmore=1&returnlink=https%3A%2F%2Fwww.bad.org.uk%2Fpatient-information-leaflets#.YM8OXWhKhPY

Question:

A 32-year-old male is reviewed in the hypertension clinic. He reports frequent thirst and that he regularly passes lots of urine through the day. He saw his GP who noted that he was significantly hypertensive and carried out some initial investigations. He is otherwise well with no other medical problems. He was commenced on an ACE inhibitor by his GP and this is his only regular medication.

Blood tests performed by his GP revealed a normal full blood count, normal fasting glucose and HbA1c levels and normal urea and creatinine. His sodium was 148 mmol/L and his potassium was 3.2 mmol/L.

On examination in the clinic, his blood pressure is elevated at 171/93 mmHg.

What is the most likely diagnosis?

A. Essential hypertension

B. Primary adrenal insufficiency (Addison's disease)

C. Primary hyperaldosteronism (Conn's syndrome)

D. Diabetes mellitus

E. Prolactinoma

Correct Answer:Primary hyperaldosteronism (Conn's syndrome)

Explanation:

The most likely diagnosis is Conn's syndrome, which is primary hyperaldosteronism usually due to an adrenal adenoma. Excess aldosterone secretion causes sodium and water retention and decreased renin release. It should be considered when a hypertensive patient presents with hypokalaemia, in cases of refractory hypertension (requiring 3 or more antihypertensive agents) or in hypertension occurring before the age of 40. Approach to investigation is controversial and requires specialist input, although an aldosterone/renin ratio may be a good starting point provided the patient is not taking ACE-inhibitors.

Addison's disease, or primary adrenal insufficiency, would not usually present with hypertension. Indeed, hypotension is more likely. In addition, the classical biochemical disturbance is hyperkalaemia and hyponatraemia. Essential hypertension alone would not yield abnormal blood tests. A prolactinoma is a prolactin-secreting pituitary tumour and therefore symptoms are due to either prolactin excess or compression symptoms from the tumour itself. These may include amenorrhea, galactorrhea (infrequent in men), gynecomastia, erectile dysfunction, hypogonadism and bitemporal hemianopia. Diabetes mellitus may cause thirst and polyuria and be associated with hypertension, but a normal HbA1c level in a patient with no reason for the HbA1c to be inaccurate rules this out.

Further reading:

https://patient.info/doctor/hyperaldosteronism

Question:

A 69-year-old woman presents with a 6-month history of breathlessness and cough. The cough is present throughout the whole day, and she recently noticed spots of blood in a tissue. She denies night sweats or fevers, however, admits to feeling tired all of the time and feels she has lost weight. She has a past medical history of rheumatoid arthritis and hypertension.

On examination, there is tobacco staining on her fingers and teeth. On chest auscultation, there is widespread wheeze and reduced air entry at the left lung base. Vital signs reveal RR 20/min, SpO2 of 94% on air and a temperature of 36.4oC.

Blood results demonstrate the following:

Hb 125 g/L (130 – 180)

WCC 8.0 x 109/ L (3.6 – 11.0)

CRP < 5 mg/L (<5)

Her plain film chest radiograph is shown below.

Source: [CC BY-SA 2.5]

What is the most likely diagnosis?

A. Tuberculosis

B. Cardiac failure

C. Empyema

D. Pneumonia

E. Lung cancer

Correct Answer:Lung cancer

Explanation:

The patient is a long term smoker with a chronic cough, haemoptysis, progressive breathlessness, weight loss and fatigue, making lung cancer the most likely diagnosis.

The chest radiograph shows a unilateral left-sided pleural effusion likely related to underlying carcinoma. Pleural effusions can be caused by a wide range of pathologies, but in the context of this scenario, malignancy is the most likely cause.

Tuberculosis is a reasonable differential for a patient presenting with a long-standing cough, however, the absence of night sweats and fevers, in combination with a significant smoking history makes lung cancer the more likely diagnosis for this patient.

Pneumonia is more likely to present with short term acute symptoms and elevated inflammatory markers. Likewise, an empyema may show a unilateral effusion on plain film imaging, but a patient would usually present with swinging fevers, purulent sputum, and raised inflammatory markers.

Cardiac failure often presents with progressive shortness of breath, however, the absence of previous cardiac disease, weight loss and unilateral pleural effusion make a diagnosis of lung cancer more likely.

Further reading:

https://patient.info/doctor/lung-cancer-pro

Question:

A 35-year-old woman attends her GP with painful fingers. The patient reports that some fingers of her right hand have become increasingly painful over the past couple of weeks. She describes pain, associated with pins and needles, in her lateral 3.5 digits. The pain is worse at night and often relieved by shaking her hand. She mentions that her mother suffered from a similar set of symptoms. She takes the combined oral contraceptive pill and suffers from hypothyroidism. Examination reveals thenar muscle wasting of her right hand.

Which is the following additional examination findings would you expect to elicit given the likely diagnosis?

A. Elbow pain on wrist flexion against resistance

B. Lateral palm pain

C. Positive Finkelstein’s test

D. Elbow pain on wrist extension against resistance

E. Positive Phalen’s test

Correct Answer:Positive Phalen’s test

Explanation:

The most likely diagnosis is carpal tunnel syndrome (CTS). This condition can be defined as the compression and subsequent ischaemia of the median nerve as it enters the hand under the flexor retinaculum of the carpal tunnel.

Major risk factors for this condition include:

Female gender

Family history of CTS

Fluid retention (e.g. caused by pregnancy or the combined oral contraceptive pill)

Other musculoskeletal conditions (e.g. rheumatoid arthritis, osteoarthritis)

Endocrine disorders (e.g. diabetes mellitus, obesity, hypothyroidism, acromegaly)

Trauma (e.g. to the distal radius)

Pain associated with CTS affects the median nerve distribution (lateral 3.5 digits), is worse at night and often relieved by shaking. Paraesthesia is often also present, along with thenar muscle wasting. A positive Phalen’s test involves symptoms being provoked by wrist hyperflexion for 2 minutes. Tinel’s test (i.e. tapping over the anterior carpal tunnel) may also be performed in cases of suspected carpal tunnel syndrome, but is less sensitive than Phalen’s test.

A positive Finkelstein’s test would be expected in the presence of De Quervain’s tenosynovitis. Finkelstein’s test is flexion of the thumb across the palm encompassed in a fist along with ulnar deviation of the wrist.

Lateral palm pain is not seen in CTS. This is because the superficial palmar branch of the median nerve is given off proximal to the flexor retinaculum.

Elbow pain on wrist extension against resistance is associated with lateral epicondylitis (a.k.a. tennis elbow).

Elbow pain on wrist flexion against resistance is associated with medial epicondylitis (a.k.a. golfer’s elbow).

Further reading:

https://patient.info/doctor/carpal-tunnel-syndrome-and-median-nerve-lesions

Question:

A 73-year-old man with a history of excess alcohol consumption presents to the emergency department, accompanied by his neighbour. The neighbour reports that he has become increasingly confused over the past week. His medical records reveal that he presented to the emergency department two weeks earlier with a minor occipital scalp injury requiring a few sutures. On examination, he appears confused and is not orientated to time or space. Neurological examination reveals a left pronator drift.

What is the most likely underlying pathology?

A. Spontaneous subarachnoid haemorrhage

B. Right extradural haemorrhage

C. Intracerebral haemorrhage

D. Chronic right subdural haemorrhage

E. Acute left subdural haemorrhage

Correct Answer:Chronic right subdural haemorrhage

Explanation:

The most likely pathology underlying this patient’s presentation is a chronic right subdural haemorrhage. The patient in this scenario has several risk factors for chronic subdural haemorrhage: his age (he may have some degree of cerebral atrophy), alcohol excess (he may suffer from a bleeding diathesis due to alcoholic liver disease and may suffer from minor trauma on a frequent basis) and history of minor trauma. The history is also characteristic (confusion developing over a few weeks, and a minor head injury prior to this, which the patient may not be able to recall). The presence of a left pronator drift (when the patient is asked to stretch out his arms, palms facing upwards, and to maintain the posture with his eyes closed the left slowly pronates; this is a subtle and very useful sign during neurological examination) indicates focal pathology on the right. A CT scan of the head is indicated. It is very important to remember that one of the many causes of worsening confusion in older patients may be a chronic subdural haemorrhage. A neurological examination forms a crucial part of the clinical assessment. The underlying mechanism is thought to arise through the tearing of bridging veins as they cross the subdural space and drain into the superior sagittal sinus. The haemorrhage then accumulates slowly. A healing membrane may form, which contains fragile vessels prone to further haemorrhage (a vicious circle may ensue).

The typical history of a right extradural haemorrhage is that of a blow to the head which may be followed by a short lucid interval and collapse, thereafter. The cause of the bleeding is thought to be arterial in nature and typically involves the middle meningeal artery. Treatment involves urgent neurosurgical intervention with a decompressive craniotomy and evacuation of the clot without delay.

Although this patient has several risk factors for a subdural haemorrhage (age, alcohol excess and previous minor trauma), the progressively worsening history of confusion over a week in duration suggests an underlying chronicity to this presentation, rather than an acute left subdural haemorrhage. The examination finding of a left pronator drift also strongly indicates focal pathology impinging upon the right hemisphere (damage to the right motor cortex produces weakness on the contralateral (opposite) side to the lesion due to descending motor fibres decussating at the level of the medulla).

A spontaneous subarachnoid haemorrhage is characterised classically by a history of sudden onset severe “thunderclap” headache which may be associated with nausea, vomiting and signs of meningeal irritation (photophobia, neck stiffness). The underlying mechanism is often due to aneurysmal rupture which creates catastrophic haemorrhage and bleeding within the subarachnoid space. Hypertension, berry aneurysms and polycystic kidney disease are key risk factors that should be explored when taking any history.

The presentation of an intracerebral haemorrhage is that of sudden onset focal neurological deficit (stroke) +/- collapse. Although the examination findings in this patient identify focal neurological weakness (left pronator drift), the progressive rather than sudden worsening of his confusion is less in keeping with stroke pathology. The absence of other acute symptoms commonly associated with underlying stroke pathology - facial drooping, speech difficulties, lower limb weakness - also makes intracerebral haemorrhage less likely as a diagnosis. Risk factors for intracerebral haemorrhage include hypertension, smoking and alcohol excess.

Further reading:

https://geekymedics.com/subdural-haemorrhage-an-overview/

Question:

An 83-year-old lady presents to A&E following a fall in which she landed on her left-hand side. On examination, she is very tender across her upper arm and is having trouble extending her wrist and fingers; she is also complaining of numbness and tingling across the back of her left hand.

Which nerve has she most likely damaged?

A. Musculocutaneous nerve

B. Radial nerve

C. Ulnar nerve

D. Axillary nerve

E. Median nerve

Correct Answer:Radial nerve

Explanation:

In older people who have so-called “low impact” falls (i.e. from standing height or less) it is always important to rule out a fracture. Examination of this lady raises the possibility of a humeral fracture and given the associated neurology it is likely she has damaged her radial nerve resulting in wrist drop and impaired sensation across the back of the hand. Humeral fractures can be associated with radial nerve palsy due to the anatomy of the radial nerve and the way it wraps around the humeral shaft.

Further reading:

https://patient.info/doctor/radial-nerve-lesion-c5-c8

Question:

A 70-year-old man presents to the Emergency Department with severe chest pain and breathlessness. He says he feels very anxious. His symptoms have been ongoing for 3-hours now, getting worse throughout the day. He has had similar episodes like this in the past, which were relieved by medication. However, on this occasion the pain is unbearable.

He has a past medical history significant for hypertension and type 2 diabetes. He has a 30-pack year smoking pack history.

On examination, he appears to be in severe pain but observations are reported as follows:

Heart Rate - 97 beats per minute

Blood Pressure - 149/92 mmHg

Oxygen Saturations - 97% on air

Respiratory Rate - 19 breaths per minute

Temperature-37.3 oC

As part of his initial management, you perform a set of blood tests and complete an ECG and chest-X-ray

What is the most appropriate next management step?

A. GTN, aspirin, oxygen and paracetamol

B. GTN, aspirin and morphine

C. GTN, aspirin, oxygen and naproxen

D. GTN, aspirin, oxygen and morphine

E. GTN, aspirin and oxygen

Correct Answer:GTN, aspirin and morphine

Explanation:

Based on the history and past medical history, the diagnosis appears to be a myocardial infarction (MI). Severe chest pain and breathlessness are quite typical presentations of MI. It is important to note that this patient is diabetic, and diabetic patients may also present with silent MIs.

The best answer to this question is GTN, aspirin and morphine. Whilst commonly as medical students you are taught to follow the acronym MOAN: morphine, oxygen, aspirin and nitrates (Glyceryl trinitrate - GTN). That is not the case in this patient as the patient's oxygen saturation is within the normal range recommended by guidelines (94-98%)

GTN, aspirin, oxygen and morphine. This would have been a suitable option if not for the oxygen as there is evidence that over-oxygenation can trigger a worsening of an MI.

GTN, aspirin, oxygen and naproxen. Naproxen is a non-steroidal- anti-inflammatory drug (NSAID). NSAIDs are avoided in acute coronary events due to their interactions with aspirin. Interactions between the two may result in decreased cardioprotective effects of aspirin.

GTN, aspirin and oxygen. The patient is in severe pain therefore not giving any pain relief would not be appropriate. Additionally, the patient is not hypoxic therefore oxygen is not required.

GTN, aspirin, oxygen and paracetamol. paracetamol would not be appropriate pain relief in this case. If the pain was not in much pain/mild discomfort then paracetamol would be more appropriate in line with the analgesic pain ladder.

Further reading:

https://geekymedics.com/acute-coronary-syndrome/

Question:

A 28-year-old man presents to his GP with severe back pain. The patient reports a 2-year history of intermittent lumbar back pain with sudden worsening today when he bent down to pick up a sock. He complains of pain radiating down the posterior aspect of his right leg and associated altered sensation over the same area.

On examination, there is sensory loss over the posterior aspect of his right leg and lateral aspect of his foot. In addition, there is weakness of plantar flexion and an absent ankle jerk reflex.

Where is the most likely site of neural compression?

A. L3

B. L4

C. S1

D. L2

E. L5

Correct Answer:S1

Explanation:

The most likely diagnosis in this scenario is a herniated intervertebral disc causing secondary neural compression of the exiting local nerve root. The nucleus pulposus of the intervertebral disc is usually contained by the annulus fibrosus, however if the nucleus herniates, it can compress the adjacent nerve root. Given the patient's clinical history (pain and paraesthesia in the distribution of the S1 dermatome) and examination findings (e.g. weakness of plantarflexion and an absent ankle jer reflex) the most likely nerve effected is the right S1 nerve root.

Further reading:

https://geekymedics.com/lower-limb-neurological-examination/

Question:

A 70-year-old woman is brought into A&E after collapsing at home. The patient explains that she was in the kitchen cooking and felt well before the collapse. She denies experiencing any palpitations, headaches, dizziness or weakness prior to the episode. The next thing she remembers is waking up on her kitchen floor. She currently feels back to her usual self, other than some bruising to her face and body as a result of the fall. The fall was unwitnessed, but her husband reports hearing a ‘loud bang’ and then finding her on the floor. He explains that his wife quickly regained consciousness and was not confused. He denies noticing any jerking movements and the patient did not experience any incontinence. The patient has no significant medical history and takes no regular medication.

Clinical examination is largely unremarkable, other than some evidence of bruising on the patient's face, shoulder and hip on the right side of her body. Vital signs are normal other than a heart rate of 38 bpm. An ECG does not reveal any evidence of ischaemia, however, the rate appears abnormal (see below).

What is the most likely cause of this patient’s presentation?

Source: Public Domain

A. Transient ischaemic attack

B. Seizure

C. Vasovagal syncope

D. Sick sinus syndrome

E. Ventricular tachycardia

Correct Answer:Sick sinus syndrome

Explanation:

The most likely diagnosis is sick sinus syndrome.

Sick sinus syndrome is characterised by sinus node dysfunction resulting in an inappropriately low atrial rate (bradycardia). The most common cause of sick sinus syndrome is idiopathic fibrosis of the sinus node.

Common presenting symptoms can include fatigue, dizziness, palpitations, syncope or presyncope. Some patients may present with alternating episodes of bradycardia and tachycardia, known as tachy-brady syndrome.

Typical ECG findings can include sinus bradycardia (as is the case on the Lead II ECG above), sinus pauses or Mobitz type I/II block.

Management of sick sinus syndrome involves the placement of a pacemaker, to maintain an adequate heart rate and prevent pauses.

Although ventricular tachycardia (VT) can also present with syncope, it is an unlikely diagnosis, given the ECG shows sinus bradycardia. Typical ECG findings in the context of VT would be a broad complex tachycardia.

Vasovagal syncope is less likely given the absence of any prodrome (i.e. dizziness, ringing in ears, visual disturbance) and any obvious trigger.

A transient ischaemic attack (TIA) is unlikely in this scenario, as TIAs do not present with loss of consciousness. TIAs typically present with transient neurological dysfunction such as weakness of a particular limb, speech disturbance or visual disturbance.

A seizure is less likely given the absence of any post-ictal phase after the loss of consciousness (the patient was almost immediately fully orientated with no evidence of amnesia). In addition, there were no reported jerking movements or associated incontinence.

Further reading:

https://patient.info/doctor/sick-sinus-syndrome

Question:

A 21-year-old male presents to the GP with penile discharge. He has had greenish discharge from his urethra for 3 days, associated with dysuria. He had unprotected sexual intercourse with a new female partner around 7 days ago. Examination reveals discharge as described, without testicular tenderness.

What is the most appropriate next step in this case?

A. Send a urine sample for gonorrhoea and chlamydia testing; treat with both intramuscular ceftriaxone and oral doxycycline

B. Send a urine sample for gonorrhoea and chlamydia testing; await results prior to treating

C. Send a urine sample for gonorrhoea and chlamydia testing; treat with oral doxycycline

D. Send a urine sample for gonorrhoea and chlamydia testing; treat with intramuscular ceftriaxone

E. Refer on to sexual health centre for same-day full assessment

Correct Answer:Refer on to sexual health centre for same-day full assessment

Explanation:

In this case, the most likely diagnosis is a sexually transmitted infection (STI). The most appropriate response would be to refer the patient on to a sexual health centre for a full assessment. A full sexual history should encompass an exploration of symptoms, a detailed history of sexual contacts, HIV risk assessment, past medical history, menstrual history and contraceptive history if applicable including the risk of pregnancy. Other important parts of a sexual health assessment include clinical examination, microscopy if a discharge is present and further investigations such as PCR, culture and serology.

On the spot treatment is available at sexual health clinics. Diagnosis and treatment of STIs can be performed at the GP, however GP surgeries do not have the facilities to perform partner notification and contact tracing, which are an essential part of STI management. Microscopy is also unavailable in most GP settings.

Sexually transmitted causes of penile discharge, in this case, could represent chlamydia, gonorrhoea, mycoplasma genitalum or non-gonococcal urethritis.

Should there be no facilities for an assessment at a sexual health centre, it would not be inappropriate to send an STI screen and to treat empirically for both gonorrhoea and chlamydia.

Further reading:

https://patient.info/doctor/urethritis-in-men

Question:

A 52-year-old right-handed man is brought to A&E with right-sided weakness. His symptoms started 1 hour ago whilst at work. He has a history of hypertension for which he takes 3 tablets. On examination, he has right-sided weakness and sensory loss, he also has right-sided neglect.

What is the most likely location of the lesion?

A. Right internal carotid artery

B. Right middle cerebral artery

C. Left middle cerebral artery

D. Basilar artery

E. Left vertebral artery

Correct Answer:Left middle cerebral artery

Explanation:

This man is having a stroke in the region of his left middle cerebral artery with contralateral signs. Strokes involving the middle and anterior cerebral arteries can present with some (PACS) or all (TACS) of the following features:

Contralateral weakness (and/or sensory deficit) of the face, arm and leg

Homonymous hemianopia

Higher cerebral dysfunction (dysphasia, visuospatial disorder)

A stroke related to the right middle cerebral artery or right internal carotid artery would present with left-sided symptoms (not right-sided as in this scenario).

Basilar artery strokes cause an interruption in the myriad of neuronal pathways enabling communication between the cerebrum, cerebellum and spinal cord. This can result in complete paralysis of all voluntary muscle groups, sparing those controlling the eyes. Individuals suffering from damage to the pons are fully conscious and cognitively intact (i.e. locked-in syndrome).

Vertebral artery stokes are usually asymptomatic unless the contralateral vessel is diseased in which case they can present with any of the following features:

Cranial nerve palsy and a contralateral motor/sensory deficit

Bilateral motor/sensory deficit

Conjugate eye movement disorder (e.g. horizontal gaze palsy)

Cerebellar dysfunction (e.g. vertigo, nystagmus, ataxia)

Isolated homonymous hemianopia

Further reading:

https://geekymedics.com/stroke-classification/

Question:

A 35-year old primigravida woman is admitted to the labour ward at 40+6 weeks to be induced. She has gestational diabetes managed with metformin and has a BMI of 45.

A vaginal examination is performed, and her cervix is found to be fully dilated at 10cm. She is experiencing regular contractions every 2-3 minutes, each lasting around 40 seconds. She has currently been pushing for 20 minutes. On CTG the baseline fetal heart rate is 130bpm, with good variability and no decelerations. Her observations taken 10 minutes ago were: BP 110/70mmHg, HR 70bpm, RR 20bpm, and temperature 36.8⁰C.

After delivery of the head, the midwife is unable to deliver the rest of the body and the registrar is called. On examination, the head has retracted onto the perineum. Baseline fetal heart rate has risen to 150bpm and variable decelerations can be seen on CTG. A diagnosis of shoulder dystocia is made, and the emergency call bell is pressed.

What is the most appropriate initial management step?

A. Adopt the all-fours position and consider episiotomy

B. Lie the woman flat, ask her to move to the edge of the bed and encourage her to push

C. Lie the woman flat and discourage pushing, bring her thighs to her abdomen and prepare to apply suprapubic pressure

D. Lower the head of the bed and prepare to deliver the posterior arm with internal rotation maneuvers

E. Discourage pushing, ask the woman to bring her thighs to her abdomen and apply fundal pressure

Correct Answer:Lie the woman flat and discourage pushing, bring her thighs to her abdomen and prepare to apply suprapubic pressure

Explanation:

The most appropriate initial management step is to lie the woman flat and discourage pushing, bring her thighs to her abdomen and prepare to apply suprapubic pressure. Shoulder dystocia is an obstetric emergency in which the baby’s anterior shoulder becomes stuck beneath the pubic bone. It classically presents as a ‘turtling’ baby, in which the head retracts back onto the perineum after it is delivered. Usually, it occurs unexpectedly and is difficult to predict, but the risk is increased in maternal diabetes, if maternal BMI is >30, in induced labours, and in large babies.

In the majority of cases, the shoulders can be released by applying simple maneuvers to delay descent. First, the mother is asked to stop pushing, and then she is laid flat with her legs hyperflexed and abducted at the hips (also known as McRobert’s maneuver or ‘thighs to abdomen’). Suprapubic pressure is then applied in a downward and lateral direction to try and release the shoulder. If these measures fail further techniques may need to be considered - such as internal rotation maneuvers, manually delivering the posterior arm, episiotomy, or placing the woman into an ‘all fours position’. The order of these steps can be remembered with the useful acronym ‘ALARMER’ – Ask for help, legs, apply suprapubic pressure, rotational maneuvers internally, manual delivery of the posterior arm, evaluate for episiotomy and roll onto all fours. In rare circumstances, transfer to theatre may be necessary for the pubic bone to be cut (symphysiotomy) or to reverse delivery of the head in order to perform a C-section (Zavanelli maneuver).

Although it is reasonable to initially lie the woman flat and bring her closer to the edge of the bed, it is incorrect to encourage her to push, as this is likely to impact the shoulder further. As soon as shoulder dystocia is diagnosed, maternal pushing should be discouraged.

Lowering the head of the bed would facilitate the woman to lie flat, but internal rotation maneuvers would only be considered after discouraging maternal pushing, repositioning using McRobert’s maneuver, and applying suprapubic pressure.

It is incorrect to apply fundal pressure as this will encourage the impaction of the shoulder against the pubic bone. Instead, suprapubic pressure should be applied in a downward and lateral direction as this will help to release the shoulder.

It can be helpful to adopt the all-fours position and consider episiotomy but these steps are usually reserved if previous steps fail to release the shoulder. In terms of positioning McRobert’s maneuver should be tried first before adopting an all-fours position. Episiotomy can be useful to enlarge the vaginal opening and prevent tears but would not be an immediate consideration.

Further reading:

https://www.rcog.org.uk/globalassets/documents/guidelines/gtg\_42.pdf

Question:

A 48-year-old woman is brought to the emergency department by her husband, with new onset weakness. This weakness was present upon waking this morning. The patient has a past medical history of type 1 diabetes and is right-handed.

On examination, she has right-sided hemiplegia, right-sided hemianaesthesia, right-sided hemianopia and global aphasia.

What is the most likely location of the lesion?

A. Dominant middle cerebral artery

B. Non-dominant posterior cerebral artery

C. Non-dominant anterior cerebral artery

D. Non-dominant middle cerebral artery

E. Dominant posterior cerebral artery

Correct Answer:Dominant middle cerebral artery

Explanation:

This lady is having a dominant middle cerebral artery (MCA) stroke. The hemiparesis, hemianopia and hemianaesthesia point to an MCA stroke. Her symptoms are all right-sided, and so the lesion must be on the left side of her brain. She is right-handed and therefore most likely to be left-hemisphere dominant, however, it is the presence of aphasia that confirms this is a dominant MCA stroke. The fact that she woke up with her symptoms means there is no clear onset time, so thrombolysis would not be an option.

Further reading:

http://www.derangedphysiology.com/files/Cerebrovascular%20Accident.pdf

Question:

A 14-year-old boy is brought to the A&E department by his parents. They explain he has a severe headache that has worsened over the last 24 hours and is unresponsive to paracetamol. He has now also developed a fever, stiff neck and has vomited twice in the past hour.

He has no significant past medical history. There is no history of recent travel abroad.

On examination, fever is confirmed to be 39°C. The patient's neck stiffness limits neck flexion; however, the remaining neurological examination is normal. There is no evidence of papilloedema.

Which of the following investigations would be most appropriate to perform first to reach a diagnosis?

A. Electroencephalogram

B. Lumbar puncture

C. CT head

D. MRI head

E. Inflammatory markers

Correct Answer:Lumbar puncture

Explanation:

The most likely diagnosis in this patient is meningitis - inflammation of the meninges. NICE guidelines recommend that a lumbar puncture be performed within 1 hour of arrival at the hospital and ideally before giving antibiotics. However, investigations must never delay treatment. Analysis of cerebrospinal fluid (CSF) is considered the gold standard investigation for diagnosing bacterial meningitis. Whilst viral meningitis is more common than bacterial meningitis, all cases should be suspected as bacterial until proven otherwise due to the high mortality. A lumbar puncture enables clinicians to distinguish between different aetiologies and is, therefore, the most appropriate investigation to perform first.

A CT scan is typically only considered in patients if there are focal neurological deficits or fluctuating levels of consciousness, as this helps to exclude other causes or co-existing encephalitis. In some patients, neuroimaging may be required before lumbar puncture. However, NICE guidelines state that clinical assessment, as opposed to a CT scan, should decide whether it is safe to perform a lumbar puncture, as CT is unreliable for identifying raised intracranial pressure. As this patient is alert, has a normal neurological examination and no evidence of papilloedema, it is unlikely a CT scan would be indicated first.

An MRI scan is not routinely required in meningitis, especially as it is likely to delay treatment; therefore it would not be the most appropriate investigation to perform first.

Meningitis can sometimes cause patients to have a seizure, especially if there is parenchymal involvement. Therefore, an electroencephalogram (EEG) may be considered useful during the course of managing patients with meningitis, however, an EEG is not diagnostic or regarded as the most appropriate investigation to perform first.

Inflammatory markers such as erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) are not considered specific or sensitive and cannot be used for diagnostic purposes in the presentation of meningitis. Therefore, they would not be the most appropriate initial investigation to arrange in this patient.

Further reading:

https://www.nice.org.uk/guidance/cg102/chapter/guidance

Question:

A 17-year-old woman presents to her GP with a sore throat and fever that has developed over the last 7 days. She generally feels unwell and has noticed an increased difficulty in swallowing over the past 24 hours. She does not know anyone else who is unwell at the moment. Her recent COVID-19 swab was negative.

She has no significant past medical history and takes the combined oral contraceptive pill daily. She has no known allergies.

On examination, she is febrile and appears unwell. She has marked tender cervical lymphadenopathy and exudative pharyngitis. On closer examination of the abdomen splenomegaly and petechiae are noted.

What is the most likely diagnosis?

A. Measles

B. Mumps

C. Infectious mononucleosis

D. Rubella

E. Acute viral hepatitis

Correct Answer:Infectious mononucleosis

Explanation:

The most likely diagnosis is infectious mononucleosis, also known as 'glandular fever'. According to NICE guidelines, infectious mononucleosis should be suspected in patients aged between 15-24 year presenting with fever, lymphadenopathy, severe sore throat and splenomegaly. The most common causative organism in ~90% of cases is Epstein-Barr Virus (EBV). The petechiae noted on examination are due to transient thrombocytopenia.

Measles typically presents with a prodromal phase of cough, conjunctivitis and coryzal symptoms, followed by the development of a maculopapular rash, spreading from the trunk to extremities. Koplik's spots, red spots with a bluish-white central dot, on the buccal mucosa are pathognomonic for measles.

Acute viral hepatitis typically presents with fever, right upper quadrant pain, jaundice, and malaise. In acute viral hepatitis, the presence of hepatomegaly is more characteristic than splenomegaly.

Mumps classically presents with parotitis and non-specific symptoms, including headache, fever, malaise, and myalgia.

Rubella while lymphadenopathy may precede other symptoms of rubella; it is typically associated with a maculopapular rash, arthralgia and non-specific symptoms including headache and fever.

Further reading:

https://cks.nice.org.uk/topics/glandular-fever-infectious-mononucleosis/

Question:

A 44-year-old woman presents to the emergency department complaining of diffuse abdominal pain over the past three days. The pain has been growing in intensity since onset. She describes intermittent waves of severe crampy abdominal pain, associated with nausea and vomiting. She last opened her bowels 5 days ago. Clinical examination reveals abdominal distension and tinkling bowel sounds. Imaging reveals multiple dilated loops of small bowel, with a transition point visible in the proximal jejunum.

What is the most likely finding on a venous blood gas?

A. Hypokalaemic, hyperchloraemic metabolic alkalosis

B. Hyperkalaemic, hyperchloraemic metabolic acidosis

C. Hypokalaemic, hypochloraemic metabolic alkalosis

D. Hypokalaemic, hypochloraemic metabolic acidosis

E. Hyperkalaemic, hypochloraemic metabolic alkalosis

Correct Answer:Hypokalaemic, hypochloraemic metabolic alkalosis

Explanation:

The most likely diagnosis in this scenario is small bowel obstruction (specifically jejunal obstruction).

In a patient with small bowel obstruction, fluid and electrolyte abnormalities can range from mild to severe. The location of the obstruction has a big impact on potential disturbances. The more proximal the obstruction, the more likely the patient is to vomit. Vomiting causes pre-renal loss of fluid and electrolyte disturbances by several mechanisms. The most straightforward is loss of gastric hydrochloric acid (with retention of bicarbonate), causing a hypochloraemic alkalosis. There is a small amount of potassium in gastric contents as well. Enough fluid loss from emesis also stimulates the renin-aldosterone system which causes further loss of potassium and retention of sodium. Finally, the alkalosis induced by vomiting causes a transcellular shift in potassium levels to the intracellular compartment, thus reducing plasma potassium levels further. Hence, the correct answer is hypokalemic, hypochloremic metabolic alkalosis.

Further reading:

https://geekymedics.com/abg-interpretation/

Question:

A 74-year-old woman presents to the emergency department with left wrist pain following a fall onto an outstretched hand, earlier today. On examination, there is tenderness over the anatomical snuff box. A plain radiograph and scaphoid series demonstrates no acute fracture.

The patient's wrist is immobilised, and they attend fracture clinic two weeks later. Repeat radiographs do not reveal a fracture, however, there is still tenderness on palpation over the anatomical snuffbox.

What is the most appropriate next step?

A. Analgesia and immobilisation for a further 2 weeks

B. Repeat plain radiograph series in 2 weeks

C. Urgent repeat plain radiograph series

D. Ultrasound wrist

E. MRI wrist

Correct Answer:MRI wrist

Explanation:

This case demonstrates a suspected scaphoid fracture. Tenderness on palpation of the anatomical snuffbox is highly suggestive of a scaphoid fracture and should not be ignored. The blood supply to the scaphoid travels proximal to distal, and so a fracture can compromise the blood supply and lead to avascular necrosis. Scaphoid fractures are not always detected on initial radiographs, and so if there is clinical suspicion, the wrist should be immobilised and repeat radiographs performed in 2 weeks. An MRI wrist should be requested if these subsequent radiographs are negative, but clinical suspicion of a fracture remains.

Further delay through discharging with analgesia and immobilisation or repeating a radiograph series would unlikely be helpful and delay diagnosis and management.

Ultrasound of the wrist may be used as an adjunct in imaging a scaphoid fracture, however, an MRI is the most sensitive imaging modality.

Further reading:

https://geekymedics.com/fractures-of-the-distal-radius-wrist-fractures/

Question:

A 34-year-old, 20 weeks pregnant female attends for her second-trimester ultrasound scan. Her pregnancy has been uncomplicated so far and she has attended all of her antenatal appointments. She is gravida 2, para 1, with a previous child born by caesarean section.

The scan shows a healthy fetus but reveals an abnormally low lying placenta that covers the cervical os.

A follow-up ultrasound scan at 32 weeks shows that the placenta has not changed position. The patient’s observations are normal and a CTG trace is reassuring. She denies any vaginal bleeding.

What is the most appropriate management?

A. Elective caesarean section at 36 weeks

B. Induction of labour at 37 weeks

C. Elective caesarean section at 34 weeks

D. Emergency caesarean section

E. Arrange for a vaginal birth at a high risk maternity unit

Correct Answer:Elective caesarean section at 36 weeks

Explanation:

This patient has developed complete placenta praevia, where the placenta lies abnormally low and covers the cervical os. Attempting a vaginal birth in such a patient is associated with a significant risk of a severe haemorrhage. Therefore patients presenting in this way should have an elective caesarean section at 36 weeks or slightly later.

An elective caesarean section at 34 weeks is less appropriate because the fetus should remain in utero as long as reasonably possible in order to improve clinical outcomes after birth. Current guidelines recommend waiting until at least 36 weeks before performing a caesarean section as long as there are no signs of fetal distress.

It would be inappropriate to arrange for a vaginal birth at a high-risk maternity unit, as a vaginal birth in a patient with complete placenta praevia is associated with an unacceptably high risk of haemorrhage.

An emergency caesarean section would be inappropriate in this case as the mother is haemodynamically stable and the fetus is not showing any signs of distress. However, if the situation deteriorated then an emergency caesarean section may be indicated.

It would not be appropriate to induce labour at 37 weeks, as a vaginal birth in a patient with complete placenta praevia is likely to result in a severe haemorrhage. All patients with placenta praevia that covers the cervical os should deliver by caesarean section.

Further reading:

https://geekymedics.com/antepartum-haemorrhage-aph/

Question:

A 47-year-old man presents to the emergency department with a 5-day history of fever, productive cough, and shortness of breath. He describes coughing up four tablespoons of yellow-green sputum a day. He denies haemoptysis, night sweats or unexplained weight loss. The patient has a past medical history of human immunodeficiency virus (HIV), which is well-controlled with antiretroviral therapy.

On examination, respiratory rate 23/min, SpO2 89% on air and temperature 38.2°C. There is a dull percussion note at the left lung base and audible coarse crackles over the same area.

What is the most likely causative organism of this patient's presentation?

A. Chlamydia pneumoniae

B. Streptococcus pneumoniae

C. Mycobacterium tuberculosis

D. Pneumocystis jirovecii

E. Haemophilus influenzae

Correct Answer:Streptococcus pneumoniae

Explanation:

This patient is likely to have a typical community-acquired pneumonia (CAP), most likely caused by Streptococcus pneumoniae. Patients with a typical CAP often present with a short history of productive cough, shortness of breath, and features of systemic upset such as fever and malaise. Typical examination findings include dull percussion notes and reduced breath sounds in the affected areas of the lung, due to lung consolidation and potential pleural effusion. Among adults, including adults with HIV, the most common cause of CAP is S. pneumoniae.

Haemophilus influenzae may also present with similar features. However, it is a less common cause of CAP and is more commonly associated with infective exacerbations among patients with chronic obstructive pulmonary disease (COPD).

Pneumocystis jirovecii is more commonly associated with a dry cough and desaturating on exercise. Moreover, it is an AIDS-defining illness, and so is more commonly seen among HIV patients who are not well controlled with antiretroviral therapy.

Mycobacterium tuberculosis is more commonly associated with symptoms such as night sweats, fevers and weight loss over a longer time frame. Like pneumocystis, tuberculosis is an AIDS-defining illness more commonly seen among patients who are not well controlled with antiretroviral therapy.

Chlamydia pneumoniae is a cause of atypical pneumonia, so is more commonly associated with a dry cough and an absence of lung consolidation.

Further reading:

https://erj.ersjournals.com/content/39/3/730#sec-1

Question:

A 34-year-old woman presents to her GP with a three-year history of chronic pelvic pain. The pain is worse during menstruation and sometimes spreads to the posterior aspect of her thighs. In addition, she describes deep dyspareunia and occasional pain on defecation. She married her husband five years ago, and they have been trying to conceive ever since.

There is generalised tenderness during vaginal examination, and the uterus appears fixed and retroverted.

What is the diagnostic investigation for the most likely diagnosis?

A. Laparoscopy

B. Semen analysis

C. Hysteroscopy

D. Transvaginal ultrasound

E. FSH and LH

Correct Answer:Laparoscopy

Explanation:

This case demonstrates endometriosis, where endometrial tissue is found outside the uterine cavity, most commonly around the pelvic peritoneum and ovaries. Endometriosis typically presents with chronic or cyclical pelvic pain, deep dyspareunia, dysmenorrhoea and subfertility. In addition, non-gynaecological symptoms such as dysuria and dyschezia may also be seen. There is commonly diffuse tenderness during vaginal examination, and the uterus is typically fixed and retroverted.

Laparoscopy is the diagnostic investigation, with biopsy to confirm the presence of ectopic endometrial tissue. Excision or ablation of the endometrial tissue can also be carried out during the procedure.

A transvaginal ultrasound may show the presence of endometriomas (cyst containing endometrial tissue), however, is it commonly normal, and a normal ultrasound scan does not exclude endometriosis.

A hysteroscopy would visualise the inside of the uterus, where endometrial tissue should be found. Therefore, it would not aid in diagnosing endometriosis.

As this couple has struggled to conceive for five years, semen analysis and FSH and LH may be appropriate at some point to exclude an alternative differential for their subfertility. However, with the most likely diagnosis being endometriosis, laparoscopy is the diagnostic investigation.

Further reading:

https://geekymedics.com/endometriosis/

Question:

Mr F is a 62-year-old gentleman who presents to his GP complaining of a hot, red swollen big toe on his left foot. It started a few days ago and is extremely painful to touch. He is finding it difficult to walk. He has never had anything like this in the past.

He has a past medical history of hypertension, depression and recurrent bleeding duodenal ulcers. He is currently taking amlodipine 5mg OD, sertraline 50mg OD and lansoprazole 30mg BD. He has no allergies.

The GP suspects gout.

What is the most appropriate first-line treatment for this gentleman?

A. Allopurinol

B. Colchicine

C. Paracetamol

D. Naproxen

E. Ibuprofen

Correct Answer:Colchicine

Explanation:

The first-line treatment for a patient's first episode of gout is ibuprofen, however NSAIDs would be contraindicated in this gentleman given his peptic ulcer disease. This would also make naproxen contraindicated as it is also an NSAID. As a result, the most appropriate first-line treatment would be colchicine. The primary mechanism of action of colchicine is tubulin disruption. This leads to subsequent down-regulation of multiple inflammatory pathways and modulation of innate immunity.

Paracetamol is a good first-line analgesic generally and it is the first step on the WHO pain ladder; however, in the case of gout, anti-inflammatory medications are specifically recommended as the first-line option. Paracetamol (with or without codeine) can also be used as an alternative if both NSAIDs and colchicine are contraindicated.

Allopurinol is a xanthine oxidase inhibitor which reduces uric acid levels. It is therefore used in the prophylaxis of gout. NICE recommends it is used after two episodes or more of gout in a 12 month period.

Further reading:

https://cks.nice.org.uk/gout#!management

Question:

A 74-year-old man presents to his GP with painful legs. He is complaining of a burning sensation in both his feet up to his ankles, particularly bad at night. He reports falling occasionally because of less awareness of where his feet are located in space. These symptoms have been progressive over months.

On examination, he has a loss of sensation bilaterally up to the shins.

He is of large body habitus but is a non-smoker, and drinks infrequently.

His regular medications include ramipril, amlodipine, atorvastatin, bisoprolol, rivaroxaban, Adcal D3, and insulin.

Which of the following is the most likely diagnosis?

A. B12 deficiency

B. Guillain-Barré syndrome

C. Diabetic neuropathy

D. Friederichs’s ataxia

E. Multiple sclerosis

Correct Answer:Diabetic neuropathy

Explanation:

Diabetic neuropathy is the correct answer. This patient is presenting with signs and symptoms indicative of peripheral neuropathy, which are loss of sensation, and burning pain indicative of neuropathic pain. This patient is on insulin, indicating a history of diabetes that is likely to be type 2 (he has several cardiovascular risk factors indicated by his drug history and is of large body habitus). Being on insulin indicates that he has poor control or has had the diagnosis for a long time, both of which increase the risk of severe diabetic neuropathy.

Guillain-Barré syndrome most commonly presents with loss of sensation and weakness ascending from the peripheries to the trunk. It is autoimmune in nature, commonly secondary to Campylobacter gastrointestinal infections. Onset is acute and patients often develop respiratory compromise.

B12 deficiency can present with symptoms of peripheral neuropathy. A lack of B12 damages the myelin sheath that surrounds and protects the nerves. This is commonly secondary to severe alcoholism. This patient does not drink heavily, and while lack of dietary B12 can precipitate deficiency, diabetic neuropathy is more likely in this case.

Multiple sclerosis can present with difficulty walking, coordination, and balance problems. In addition, patients can present with neuropathic pain as burning, pins and needles, and loss of sensation. Symptoms of MS are classically described as ‘disseminated in time and space’, because of symptoms present in one area for a period before remitting and presenting in another bodily area later. Optic neuritis is one of the most common first presentations. Additionally, MS classically presents in middle-aged women.

Friedrich's ataxia is a genetic condition that presents with progressive neurodegeneration in motor neurons. The typical age of onset is between 10-15 years, with symptoms including unsteady posture, frequent falling, and progressive difficulty in walking due to impaired ability to coordination.

Further reading:

https://patient.info/doctor/diabetic-neuropathy-pro

Question:

A 32-year-old lady presents to the GP with a 6-week history of tender lesions on her shins (shown below). She denies any trauma or bites to the area and has otherwise been well recently. She is 28 weeks pregnant and this is her first pregnancy. She has no past medical history of note and takes no regular medications.

What is the most likely diagnosis?

Source: Medicalpal [CC BY-SA 4.0]

A. Pemphigus gestationis

B. Erythema multiforme

C. Pruritic urticarial papules and plaques of pregnancy (PUPPP)

D. Erythema nodosum

E. Erythema marginatum

Correct Answer:Erythema nodosum

Explanation:

Erythema nodosum is an uncommon skin condition that causes dusky red/blue tender nodules due to inflammation of the underlying subcutaneous tissue. It is most commonly found on the shins and calves and is frequently symmetrical. The image shown demonstrates the typical features of erythema nodosum with poorly demarcated edges and the dusky blue/red colouration. Erythema nodosum has many causes including some infections, malignancies and inflammatory bowel disease. It can also occur in pregnancy, as in this case in this scenario. It is usually self-limiting.

Pemphigus gestationis is a rare skin condition that occurs in pregnancy. It usually presents later in pregnancy and causes pruritic urticarial plaques that develop into severe tense bullae.

PUPPP is another dermatosis of pregnancy but, unlike pemphigus gestationis, it is very common. As the name suggests, it causes highly pruritic papules and plaques that are most commonly found on the abdomen.

Erythema marginatum is a rash that is associated with rheumatic fever and is a major criterion in the modified Jones criteria. It causes asymptomatic pink rings on the trunk and abdomen. It is not associated with pregnancy.

Erythema multiforme is a hypersensitivity skin reaction that causes targetoid lesions. It is most commonly associated with the herpes simplex virus. It can be caused by pregnancy but its typical targetoid appearance does not fit with the image presented in this scenario.

Further reading:

https://patient.info/doctor/erythema-nodosum-pro

Question:

You are called urgently to review an elderly patient on the ward, who over the course of the evening has become more confused and whom the nursing staff are concerned is now less responsive. On assessment, the patient does not respond to your voice and does not follow commands. She opens her eyes to supra-orbital pressure, pulls her head away from you and groans but does not form discernible words.

What is her current Glasgow Coma Score (GCS)?

A. GCS 11/15: E3 V3 M5

B. GCS 8/15: E2 V2 M4

C. GCS 9/15: E2 V3 M4

D. GCS 8/15: E3 V1 M4

E. GCS 7/15: E1 V3 M3

Correct Answer:GCS 8/15: E2 V2 M4

Explanation:

Professors Teasdale and Jennett’s GCS facilitates the objective assessment of patients’ neurological states. Verbal then tactile stimuli are applied to determine the highest function in three separate domains to give a score between 3 (worst: deeply unconscious/dead) and 15 (fully conscious). A 1994 study of 59,713 head-injured trauma patients found a high correlation between low GCS and increased mortality, and a more recent study of similar size demonstrated the differential value of individual GCS domains and the importance of considering each domain individually for prognostication.

This patient has a GCS of 8/15:

Eye-opening to a painful stimulus (E2)

Vocalising incomprehensible sounds (V2)

Withdrawing from pain (M4)

All domains are scored in a stepwise regression from normal. The eye-opening domain is scored out of four, and helpfully corresponds to the ‘AVPU’ scale for measuring consciousness: Alert, with eyes open spontaneously (E4); eyes open to Voice (E3), eyes open to Pain (E2), Unresponsive with no eye-opening (E1).

The verbal domain is scored out of 5, from normal speech down through confusion, dysphasia, simple sounds and no noise.

The motor domain is scored from 6, from obeying commands with movements, through to localising to pain with purposeful movements; withdrawing from pain, abnormal flexion, abnormal extensor posturing and no movement.

Gennarelli TA, Champion HR, Copes WS, Sacco WJ. Comparison of mortality, morbidity, and severity of 59,713 head-injured patients with 114,447 patients with extracranial injuries. J Trauma 1994 Dec:37(6):962-8;

Reith FCM, Lingsma HF, Gabbe BJ et al. Differential effects of the Glasgow Coma Scale Score and its components: an analysis of 54,069 patients with traumatic brain injury. Injury. 2017 Sep:48(9):1932-1943. Doi: 10.1016/j.injury.2017.05.038.

Soure: Glasgow Coma Scale

Further reading:

https://www.glasgowcomascale.org/

Question:

A 55-year-old female presents to the GP with stiff painful shoulders. The pain is worse in the morning, and she often feels lethargic and has difficulty getting out of bed. On further questioning, she also experiences unilateral temporal headaches and finds it painful to comb her hair.

Her observations are stable. She is tender on palpation of the shoulder girdle and has a limited range of movement in her shoulders bilaterally when asked to raise her arms. She is also tender on palpation of the temporal region of her scalp, and there is some skin thickening in this region.

Blood tests are conducted and demonstrate a raised ESR and CRP but are otherwise normal. She is referred to secondary care for a temporal artery ultrasound scan and commenced on a course of corticosteroid treatment. On review by her GP two weeks later she reports that her shoulder pain has improved.

What is the most likely underlying cause of shoulder pain in this patient?

A. Tendonitis

B. Temporal arteritis

C. Fibromyalgia

D. Polymyalgia rheumatica (PMR)

E. Rheumatoid arthritis

Correct Answer:Polymyalgia rheumatica (PMR)

Explanation:

The most likely underlying cause of her shoulder pain is polymyalgia rheumatica (PMR). This is a condition in which there is inflammation around the neck and shoulder girdle which manifests typically as morning stiffness. It may be isolated, or it may be associated with temporal arteritis, as it appears to be in this case, in which the patient is complaining of unilateral temporal headaches and pain when combing her hair. Her examination findings of a limited range of movement in the shoulder girdle, as well as tenderness on palpation of the temporal region, are also supportive of the diagnosis. ESR and CRP are typically raised. PMR will usually respond very well to a short course of corticosteroids (such as prednisolone), which will usually be started at a dose of 12.5-25mg once daily then gradually reduced to a smaller dose over 1-2 months.

Temporal arteritis is linked with PMR and would explain her scalp tenderness. However, the question asks for the most likely underlying cause of her shoulder pain, and therefore PMR is a more appropriate answer. Both conditions have an underlying pathology of giant cell arteritis (i.e. inflammation of the arterial lining).

Fibromyalgia can present with a variety of clinical findings and is more often used as a diagnosis of exclusion. CRP and ESR would usually be normal.

Rheumatoid arthritis will not typically respond to a low-dose corticosteroid course and there are no other symptoms or examination findings supportive of an arthritic condition.

Tendonitis will typically cause unilateral shoulder stiffness. In addition, the ESR will usually be normal and the concurrent suggestion of temporal arteritis is supportive of PMR.

Further reading:

https://patient.info/doctor/polymyalgia-rheumatica-pro

Question:

A 30-year-old woman presents with a history of multiple episodes of palpitations over the past month, in which she feels that her heart is racing and becomes short of breath. The symptoms do not seem to be precipitated by anything in particular and have only occurred at rest. Although she often feels lightheaded during the episodes, she has never blacked out and she does not experience any chest pain. Each episode usually lasts a few minutes before resolving.

She has a past medical history of asthma, for which she uses a salbutamol inhaler. She does not drink alcohol, does not use recreational drugs and has one cup of tea each morning.

Cardiovascular and respiratory examinations are both normal, with baseline observations as follows - heart rate 76bpm, respiratory rate 20bpm, blood pressure 125/75mmHg, O2 saturations 98% and temperature 36.8⁰C.

Her resting ECG reveals no abnormalities and blood is taken to perform thyroid function tests and U&Es. She is provided with a 24-hour Holter monitor and experiences a self-terminating episode of palpitations during the 24-hour recording period, which is shown below. During the episode ECG findings are as follows: heart rate rises to 160bpm, rhythm is regular, there is no obvious p wave, the QRS complex is narrow and there is a visible pseudo-R wave in lead V1 that is not visible on the resting ECG.

What is the most likely underlying diagnosis?

Life in the fast lane (LITFL) - litfl.com

A. Atrial fibrillation

B. Slow-fast (typical) AV node re-entrant tachycardia

C. Atrial flutter

D. Fast-slow (atypical) AV node re-entrant tachycardia

E. Atrioventricular re-entrant tachycardia

Correct Answer:Slow-fast (typical) AV node re-entrant tachycardia

Explanation:

A tachycardia with a narrow QRS complex is indicative of a supraventricular tachycardia originating above the ventricles (unlike a ventricular tachycardia which would produce a wide QRS complex). Supraventricular tachycardias will classically present with episodes of palpitations as described in this case.

There are many different causes of a supraventricular tachycardia, but in this case, the most likely diagnosis is slow-fast (typical) AV node re-entrant tachycardia (AVNRT). AVNRT occurs when there is a re-entrant circuit around the AV node, that allows conduction signals to circulate and stimulate the ventricles more frequently than the rate at which the sinoatrial node operates. The circuit will have a slow pathway and a fast pathway, each carrying the signal in either an anterograde direction (toward the ventricles) or retrograde direction (away from the ventricles). If the anterograde signal travels along the slow pathway this is known as slow-fast (typical) AVNRT. This is recognised on ECG by the pseudo-R wave in lead V1, which is essentially when the p wave of atrial depolarisation is buried within the QRS wave of ventricular depolarisation because the fast pathway carries the retrograde signal very rapidly back to the atria.

The pseudo-R wave in lead V1 would not be present in fast-slow (atypical) AVNRT – as the slow pathway carries the retrograde signal more slowly back to the atria, the p wave occurs after the QRS complex rather than being buried within it.

Atrial flutter is a cause of narrow complex tachycardia but it would not produce the pseudo-R wave in lead V1. The classic appearance of atrial flutter on ECG is a saw-tooth appearance in the inferior leads.

Although atrial fibrillation is a supraventricular tachycardia, it produces a distinctive ECG appearance with an irregularly irregular rhythm and a loss of p waves. In this case, the rhythm is regular, and although the p waves are buried in the QRS complex to form the pseudo-R wave, they are still present. In AF there is a loss of p waves due to disorganised atrial depolarisation.

Atrioventricular re-entrant tachycardia (AVRT) is when there is a re-entrant circuit consisting of the normal AV conduction pathway and an accessory pathway. A classic cause is Wolff-Parkinson White syndrome, which produces a resting ECG with a classic delta wave (or ‘slurred upstroke’) preceding the QRS complex in between episodes. A pseudo-R wave would not be present.

Further reading:

https://geekymedics.com/narrow-complex-tachycardia/

Question:

A 25-year-old man attends his regular rheumatology follow up. He reports a 5-month history of intermittent stiffness and pain in his back. During these periods, he experiences extreme fatigue and occasionally has fevers. He also says that the pain is worst first thing in the morning and eases as the day goes by.

On examination, he is tender to palpation over the lumbar spine and sacroiliac joints. He has a positive Schober’s test.

Given the most likely explanation for his symptoms, which of these investigations is most useful in making a definitive diagnosis?

A. DEXA T-score of -1

B. ESR of 20mm

C. ALP of 150 U/L

D. X-ray showing sacroiliitis

E. CRP of 35 mg/L

Correct Answer:X-ray showing sacroiliitis

Explanation:

This patient has a 5-month history of inflammatory back pain associated with systemic symptoms (fatigue and fever). This coupled with his age and positive Schober’s test points towards a diagnosis of ankylosing spondylitis (AS).

The British Society for Rheumatology advocates the use of the modified New York criteria in the diagnosis of AS which requires the presence of sacroiliitis on X-ray and at least one core clinical criterion.

Non-specific markers of inflammation such as ESR or CRP can be elevated in AS but are not diagnostic. Likewise, ALP can be raised in AS especially during periods of high disease activity but is not used in diagnosis.

Patients with AS are predisposed to osteoporosis and so dual-energy X-ray absorptiometry (DEXA) scans are useful in the diagnosis of low bone mineral density, but they are not diagnostic of AS.

Further reading:

https://patient.info/doctor/ankylosing-spondylitis-pro#ref-10

Question:

A 67-year-old man presents to the ED with sudden onset, severe left-sided chest pain. He has no past medical history and takes no regular medications, but has a 20 pack-year smoking history. An ECG demonstrates lateral lead ST-elevation and he undergoes primary percutaneous coronary intervention (PCI).

With regard to anticoagulation following PCI in this patient, what is the most appropriate strategy?

A. Dual antiplatelet therapy with long-term aspirin and clopidogrel

B. Aspirin for 3 months

C. No anticoagulation indicated following reperfusion procedure

D. Warfarin for 12 months

E. Dual antiplatelet therapy with aspirin long-term and clopidogrel for 12 months

Correct Answer:Dual antiplatelet therapy with aspirin long-term and clopidogrel for 12 months

Explanation:

Anticoagulation following percutaneous coronary intervention for AMI reduced the risk of stent thrombosis, but can also cause bleeding events so should be monitored carefully.

Dual antiplatelet therapy with aspirin long-term and clopidogrel for 12 months is currently recommended in patients following AMI and with no contraindications to anticoagulation.

Long-term aspirin and clopidogrel will increase the risk of bleeding events and so it is recommended that only aspirin be continued beyond 12 months. Studies are looking in to whether a further reduction in DAPT is safe (e.g. to aspirin long-term and clopidogrel for 3 months).

Warfarin has many factors affection its absorption and therefore efficacy. Furthermore, regular monitoring is required. It is not recommended in patients following AMI.

Aspirin for 3 months will likely not provide sufficient anticoagulation and therefore put the patient at risk of stent thrombus and reinfarction.

Further reading:

https://academic.oup.com/eurheartj/article/39/2/119/4095042

Question:

A 76-year-old man is being reviewed by his GP for a 2-week history of worsening breathlessness. This is associated with exertional dyspnoea and orthopnoea. He has a background of ischaemic heart disease and hypertension.

On examination, he is alert, afebrile and hemodynamically stable. There is moderate pitting oedema extending to the mid-shin. Mild bi-basal creps are heard bilaterally on auscultation, with normal heart sounds.

Preliminary investigations are performed, which show:

Test Result Reference range

N-terminal pro-B-type natriuretic peptide level (NT-pro-BNP) 2500

Age < 75 : <125 pg/mL

Age>75 : <450 pg/mL

What is the next best investigation for this patient?

A. High sensitivity troponin level

B. Chest X-ray

C. Creatinine kinase level

D. CT thorax

E. Echocardiography

Correct Answer:Echocardiography

Explanation:

The patient in the vignette has progressively worsening shortness of breath with features of fluid overload (orthopnoea, pitting oedema, bi-basal creps on auscultation of the lungs) and a significantly elevated NT-pro-BNP consistent with heart failure. NICE guidance recommends that patients with an NT-pro-BNP level >2000 ng/L require urgent referral for specialist assessment and echocardiography (to be seen within 2 weeks). Significantly elevated NT-pro-BNP levels are associated with a poorer prognosis; therefore, patients require an urgent assessment to optimise treatment. Echocardiography is the gold standard for diagnosing and evaluating chronic heart failure as it can assess cardiac chamber size and structure, ventricular function, valvular function and haemodynamic parameters.

A chest X-ray is a useful basic investigation in patients who present acutely with chest pain or breathlessness. However, the patient in the vignette has chronic breathlessness and signs suggestive of chronic heart failure. A chest X-ray would be more useful in a patient who is more acutely unwell with fluid overload, as it can quickly confirm pulmonary oedema-related breathlessness. As the patient in the vignette is currently clinically stable, the next best investigation would be an echocardiogram, as this is a more detailed investigation, and a chest X-ray is currently not required.

Although a CT thorax can detect chronic heart failure and assess structural abnormalities, the echocardiogram is far superior. It is more validated for evaluating changes in haemodynamic parameters associated with chronic heart failure.

A high-sensitivity troponin (I or T) is used in patients with suspected acute coronary syndrome (ACS) to confirm the diagnosis. The patient in the vignette has no features suggestive of ACS (cardiac chest pain +/- pain radiating to the arms/back/jaw +/-, lasting more than 15 minutes). Although the patient is breathless, this is in the context of fluid overload. The patient may have an elevated troponin level due to myocardial injury; however, this will not aid in assessing the nature and extent of their heart failure.

Creatinine kinase (CK) levels are primarily used to confirm the presence of muscle injury in conditions such as muscular dystrophy and rhabdomyolysis. Creatine phosphokinase-MB is used mainly to test for re-infarction in patients with a recent myocardial infarction as it has a shorter half-life than high-sensitivity troponins. The patient may have an elevated CK level due to myocardial injury; however, this will not aid in assessing the nature and extent of their heart failure.

Further reading:

https://cks.nice.org.uk/topics/heart-failure-chronic/diagnosis/how-to-assess/

Question:

A 50-year-old woman presents to A&E complaining of chest pain, nausea and breathlessness. The chest pain is central, and the patient describes it as a ‘crushing’ sensation that radiates to the shoulder. She is accompanied by a police officer who explains she has just witnessed an armed theft in a local shop, and her symptoms developed whilst giving a statement to the police.

Her current observations are as follows: blood pressure of 130/90mmHg, heart rate of 90bpm and respiratory rate of 22bpm. An ECG is performed which demonstrates a sinus tachycardia but no acute ST or T wave changes. She has a troponin level of 9ng/L. A referral to cardiology is made.

She has no previous history of cardiac disease but takes regular nifedipine to treat her hypertension. She has previously been diagnosed with an anxiety disorder and takes sertraline. She does not have any allergies.

On cardiology review, a bedside echocardiogram is performed. The cardiology registrar reports that apical ballooning is visible on her echocardiogram and her ejection fraction is low. Coronary angiography is arranged for further assessment.

What is the most likely diagnosis?

A. Stable angina

B. Takotsubo cardiomyopathy

C. Myocardial infarction

D. Inherited cardiomyopathy

E. Anxiety

Correct Answer:Takotsubo cardiomyopathy

Explanation:

The most likely diagnosis is Takotsubo cardiomyopathy, also known as acute stress-induced cardiomyopathy or ‘broken heart syndrome’. Takotsubo is a Japanese term for ‘octopus trap’ and is used to describe the shape of the left ventricle in this condition, which has a narrow neck and round bottom similar to an octopus trap. It is an acquired cardiomyopathy typically occurring in response to a stressful event. The left ventricle dilates and the ejection fraction reduces as the left ventricular function becomes less efficient. Patients often present with symptoms similar to those of acute coronary syndromes, including chest pain and shortness of breath, and therefore it is essential to perform appropriate investigations such as an ECG and measurement of troponin levels. In Takotsubo cardiomyopathy, troponin is usually normal and the ECG will not reveal typical ACS findings such as ST elevation and T wave inversion. Apical ballooning is a cardinal sign for Takotsubo on echocardiography, and a key buzzword to look out for in examination questions.

Although this lady has a past medical history of anxiety, this would not account for the clinical findings described in the case scenario. Anxiety can cause a sinus tachycardia but the apical ballooning and low ejection fraction are indicative of the diagnosis in this case. In a patient with shortness of breath and chest pain, anxiety is a diagnosis of exclusion; cardiac causes of chest pain must always be considered and investigated.

Takotsubo cardiomyopathy presents with very similar symptoms to acute coronary syndromes including unstable angina and myocardial infarction, such as chest pain and breathlessness. However, in this scenario, the lack of ECG changes, normal troponin levels and typical structural abnormalities (apical ballooning) on echocardiography makes Takotsubo cardiomyopathy a more likely diagnosis than myocardial infarction.

Again, chest pain and breathlessness are also features of stable angina and may occur in response to a stressful event. However, these symptoms will usually resolve at rest and would not produce the typical structural abnormalities visualised on echocardiography.

Takotsubo is an acquired cardiomyopathy rather than an inherited cardiomyopathy. There is no suggestion of a family history of cardiac disease, and no previous history of cardiac symptoms prior to the stressful event experienced. Echocardiography will likely show structural changes but not apical ballooning which is indicative of Takotsubo.

Further reading:

https://gpnotebook.com/simplepage.cfm?ID=x20121110173113605084

Question:

A 34-year-old woman with a known history of relapsing-remitting multiple sclerosis is brought to the accident & emergency department by her husband.

Over the past 48 hours, she has developed blurred vision, fatigue, and worsening weakness to the extent that she is now debilitated and unable to walk. She had been previously well for the past 3 months prior to this episode.

An infection screen is performed and found to be negative.

What is the most appropriate next step in the management of this patient?

A. Ocrelizumab

B. Methylprednisolone

C. Plasma exchange

D. Peginterferon beta 1a

E. Glatiramer

Correct Answer:Methylprednisolone

Explanation:

This patient is suffering from a severe, debilitating relapse of her multiple sclerosis. NICE recommend in such circumstances that first-line treatment is with methylprednisolone. This can be oral, or IV for patients who fail/don’t tolerate oral therapy, or who require admission to hospital. It is worth noting that the long-term course of the disease is not affected by corticosteroids.

Additionally, in cases of apparent MS relapse, it is important to perform a thorough infection screen, particularly for UTI and respiratory infections, as infection may present as a pseudo-relapse.

Ocrelizumab is the only drug that has been shown to be of benefit in slowing primary progressive MS, it would not be used in the management of an acute relapse of relapsing-remitting MS.

Glatiramer can be used in the long term treatment of relapsing-remitting multiple sclerosis, but would not be the first choice for the acute management of a debilitating relapse.

Plasma exchange can be considered as a management option for acute MS relapses which fail to respond to steroids, but would not be first-line prior to a trial of methylprednisolone.

Peginterferon beta 1a can be considered as a management option for relapsing-remitting MS, but would not be the first choice for the acute management of a debilitating relapse.

See the MS Society website for further information on disease-modifying therapies

Further reading:

https://geekymedics.com/multiple-sclerosis

Question:

A 35-year-old patient presents to the GP explaining that she is currently trying for a baby for the first time and wants some medication advice. She has a past medical history of epilepsy and is not keen to stop her lamotrigine.

Which of the following is the most appropriate to take whilst trying to conceive and throughout the first trimester?

A. Vitamin D 100 micrograms OD

B. Folic acid 5mg OD

C. Vitamin D 50 micrograms OD

D. Ferrous sulphate 200mg OD

E. Folic acid 400 micrograms OD

Correct Answer:Folic acid 5mg OD

Explanation:

This patient should be prescribed folic acid 5mg OD to be taken whilst trying to conceive and throughout the first trimester. The patient is taking lamotrigine which is associated with an increased risk of neural tube defects and therefore the patient requires a higher dose of folic acid than otherwise healthy women to reduce the risk of neural tube defects (the standard dose is 400 micrograms once daily).

NICE recommends that women should be on 5mg of folic acid if they:

(or their partner) have a neural tube defect

have had a previous baby with a neural tube defect

(or their partner) have a family history of neural tube defects

have diabetes

have sickle cell disease

take anti-epileptic medication

Women with epilepsy need careful assessment to weigh up the risks versus benefits of continuing their current antiepileptic treatment regime. If a patient has been seizure-free for 3 years, they may be advised to stop taking the medication during pregnancy. Alternatively, the patient may be switched to the least teratogenic antiepileptic option (i.e. lamotrigine or carbamazepine).

Pregnant women should also be advised to take vitamin D 10 micrograms daily throughout pregnancy. This is particularly important for women with darker skin or those with minimal sun exposure. The vitamin D doses provided as answer options are incorrect.

Ferrous sulphate is not routinely prescribed to pregnant women and is typically used in the management of iron deficiency anaemia.

Further reading:

https://cks.nice.org.uk/antenatal-care-uncomplicated-pregnancy#!scenario

Question:

A 40-year-old female patient, who is 34 weeks pregnant, attends Accident and Emergency with a new-onset, severe headache. She reports a persistent frontal headache that has been present for 3 days. She does not usually suffer from headaches and this morning she noticed that her vision was intermittently blurred. She has no significant past medical history and this is her first pregnancy.

Clinical findings are as follows:

Blood pressure of 160/110mmHg

Oedema of the hands and feet

Mild epigastric tenderness on palpation

Urinalysis (+++ protein)

Platelets - 70 x 10 9/ L

ALT - 105 μmol/ L

Creatinine - 120 μmol/ L

What is the only DEFINITIVE management of the condition described?

A. Magnesium sulfate

B. IV labetalol

C. Watch and wait approach

D. Fluid restriction

E. Delivery of the placenta and fetus

Correct Answer:Delivery of the placenta and fetus

Explanation:

The most likely diagnosis is pre-eclampsia. Pre-eclampsia can be defined as pregnancy-induced hypertension associated with proteinuria.

The only definitive management for pre-eclampsia, especially beyond 34 weeks gestation, is delivery of the placenta and fetus.

IV labetalol is an antihypertensive agent used to control blood pressure in pre-eclampsia.

Magnesium sulfate is used to reduce the risk of eclampsia (seizures) in patients with pre-eclampsia.

A watch and wait approach is not appropriate in this scenario as the mother and fetus will likely continue to deteriorate.

Fluid restriction can aid in controlling blood pressure in patients with pre-eclampsia.

Further reading:

https://patient.info/doctor/pre-eclampsia-and-eclampsia

Question:

Ian Broadwell, 67, arrives in A&E as a ‘stroke call’. His partner tells you that he was suddenly unable to move his right arm and leg, his face looking ‘droopy’ on the right. The symptoms started one hour ago.

On examination, you confirm he has a right hemiparesis and right upper motor neuron facial palsy. His observations are stable and he has normal blood glucose.

What is the best initial investigation to allow you to plan his emergency treatment?

A. CT perfusion scan

B. Carotid dopplers

C. Electrocardiogram

D. CT brain and angiography

E. MRI brain with diffusion weighted imaging

Correct Answer:CT brain and angiography

Explanation:

All of the above investigations can be useful in acute stroke; an ECG is important to identify atrial fibrillation, carotid dopplers can identify significant stenosis. However, this patient is within the time window for thrombolysis and may be eligible for mechanical thrombectomy. He needs the most accessible and rapid brain imaging to determine his eligibility. A CT brain with angiography of the neck and head vessels will allow you to determine whether (1) his symptoms are due to intracerebral haemorrhage or (2) there is a proximal occlusion in the anterior circulation. If the latter is proven, he may be eligible for mechanical thrombectomy. If neither are present, or while mechanical thrombectomy is being considered, he may be eligible for intravenous thrombolysis provided there are no other contraindications.

MRI brain with diffusion-weighted imaging and a CT perfusion scan are appropriate in patients presenting between 6-24 hours after symptom onset as part of an assessment for late mechanical thrombectomy.

Further reading:

http://stroke.ahajournals.org/content/49/3/e46

Question:

Lilith is a 13-year-old girl, who presents to the A&E with abdominal pain. On questioning, she reports that the pain started in the periumbilical region and moved to the right iliac fossa. She is anorexic, and has been nauseous but has not vomited. She last opened her bowels 3 days ago.

Lilith is normally fit and well, and has had no preceding illness. She is on no regular medications. She started her periods 1 year ago and is currently at the end of her cycle.

On examination, she is alert and talking to you. Abdominal examination reveals tenderness and guarding in the right iliac fossa and she has a positive Rovsing's sign. Her vital signs are as follows; temperature 38.2 oC, pulse 87bpm, respiratory rate 14, SpO2 98% on air.

Her blood results reveal a CRP of 37 and a WCC of 14.3. All other blood tests are within normal limits.

What is the most likely diagnosis in this case?

A. Constipation

B. Appendicitis

C. Mesenteric adenitis

D. Mittelschmerz

E. Ovarian torsion

Correct Answer:Appendicitis

Explanation:

This is a very typical history of appendicitis; in reality, it can be much more difficult to diagnose. The pain moving from the periumbilical region to the right iliac fossa is due to the process of progressive inflammation (visceral pain is felt generally in the abdomen, once the appendix gets further inflamed and touches against the omen-tum/abdominal wall, the pain becomes localised). White cells increase (particularly neutrophils), as does CRP - though there can be a lag in CRP rise, so it may appear normal in early appendicitis.

Abdominal ultrasound is a useful investigation when considering appendicitis, as it can identify the inflamed appendix and free fluid in the peritoneal cavity. However, it is not uncommon for an abdominal ultrasound to appear normal in early appendicitis, so a normal ultrasound does not completely rule out the condition.

In a girl of this age ovarian torsion is possible, though less likely with this history. It usually happens due to a large cyst (mostly follicular) on the ovary which then causes the ovary to tort. Torsion generally presents very acutely with sudden onset pain and vomiting.

Constipation is a very common condition and GPs often refer children with possible appendicitis who are actually constipated. Often faeces are palpable during abdominal palpation. Constipation would not cause fever or raised inflammatory markers.

Mesenteric adenitis is the diagnosis most difficult to differentiate from appendicitis. This condition involves the swelling of lymph nodes within the abdominal cavity (typically secondary to a viral infection) which results in abdominal pain. The significantly raised inflammatory markers, nausea, fever and right iliac fossa tenderness with Rovsing's sign are slightly more indicative of appendicitis.

Mittelschmerz is a condition involving abdominal pain associated with ovulation. The pain is typically felt in the right iliac fossa and occurs mid-point in the menstrual cycle. The pain typically settles within 48 hours. In this scenario, this diagnosis is unlikely given the patient is at the end of her menstrual cycle and has a fever, raised inflammatory markers as well as positive Rovsing's sign.

Further reading:

https://patient.info/doctor/appendicitis-pro

Question:

A 37-year-old man presents to his GP with a rash on his legs, feeling tired all the time and weight loss. He feels as though this has been happening over the past year but has never had anything like this prior. Systemic enquiry reveals occasional fever and some testicular pain but no respiratory complaints. He is an ex-intravenous drug user and has a past medical history of pancreatitis and hepatitis B. He has no relevant family history, he lives with his partner and does not drink or smoke.

Clinical examination reveals a livedoid rash on both of his legs but no other dermatological findings.

What is the most likely diagnosis?

A. Polyarteritis nodosa

B. Systemic lupus erythematosus (SLE)

C. Dermatomyositis

D. Erythema ab igne

E. Tuberculosis

Correct Answer:Polyarteritis nodosa

Explanation:

This case is most suggestive of polyarteritis nodosa, a small/medium-sized vasculitis, given the history of skin changes, fatigue and weight loss. These alone are non-specific but when combined with fever, testicular and a past medical history of hepatitis B make polyarteritis nodosa the most likely diagnosis. Polyarteritis nodosa is reported to occur in 30% of individuals with hepatitis B.

All of the diagnosis listed can result in livedoid skin changes but not all of the other information in the vignette matches.

With SLE you may expect a history of a photosensitive malar or discoid rash and chest pain as a result of pleural or pericardial serositis.

Erythema ab igne is a livedoid rash associated with heat contact and would cause systemic symptoms or be widespread over both legs.

Tuberculosis is possible in an ex-intravenous drug user but would likely present with some respiratory symptoms and fever is more classically described as night sweats.

Dermatomyositis can present with weakness and livedo reticularis but more commonly the skin changes are macular rashes and classically a heliotrope rash (on the eyelids with associated oedema). Dermatomyositis is also not associated with hepatitis B but is associated with smoking.

Further reading:

https://patient.info/doctor/polyarteritis-nodosa-pro

Question:

You are a junior doctor reviewing a 62-year-old male in the Emergency Department who presented with acute urinary retention. He was catheterised at triage and had routine blood tests taken prior to catheterisation showing normal full blood count, clotting screen and renal function.

He gives a short history of nocturia and terminal dribbling culminating in the current episode of acute retention. He has no significant past medical history.

His abdominal examination is unremarkable. Digital rectal examination reveals an enlarged and irregular feeling prostate. You are preparing to discharge him home with a referral to the urology clinic for urgent outpatient follow up.

Which tumour marker is most likely to be useful in aiding diagnosis of the possible underlying condition?

A. CA 27.29

B. Carcinoembryonic antigen (CEA)

C. Prostate-specific antigen (PSA)

D. CA 19-9

E. CD117 (c-kit)

Correct Answer:Prostate-specific antigen (PSA)

Explanation:

Prostate cancer is a possible underlying diagnosis, especially given the patient's large irregular prostate and relatively abrupt onset of symptoms. Prostate-specific antigen (PSA) is important in investigation of possible prostate cancer. Catheterisation and digital rectal examination (DRE) can both raise the PSA level and so should be added to the patient’s pre-catheterisation blood tests if possible. Urinary tract infections, vigorous exercise and recent ejaculation amongst other things may also falsely raise the PSA level so consideration of this should be made.

The other tumour markers are not appropriate in consideration of prostate cancer. Carcinoembryonic antigen (CEA) as associated with colorectal cancer, CA 19-9 is associated with pancreatic cancer, CD117 (c-kit) is a tyrosine kinase receptor sometimes implicated in gastrointestinal stromal tumours and CA 27.29 is associated with breast cancer.

Further reading:

https://www.nice.org.uk/guidance/ng131

Question:

A 70-year-old male presents to his GP with a 6-month history of alternating episodes of constipation and diarrhoea. He has occasionally noticed a small amount of blood in his stool but denies any fevers, abdominal pain or weight loss, and is otherwise fit and well. Colonoscopy shows small openings in the mucosa, which appear to extend into pouch-like cavities. The intervening mucosa appears normal.

What is the most likely diagnosis?

A. Bowel perforation

B. Carcinoma of the colon

C. Diverticular disease

D. Ulcerative colitis

E. Crohn's disease

Correct Answer:Diverticular disease

Explanation:

The most likely diagnosis, given the above scenario, is diverticular disease. The clinical history comprising alternating episodes of constipation and diarrhoea in combination with blood in the stool (albeit only in small quantities), pouch-like cavities on colonoscopy, and this gentlemen's age (increased likelihood in those aged 50 and above) are all in keeping with the diagnosis. The outpouchings of large bowel mucosa identified on colonoscopy are commonly found in the left colon (particularly the sigmoid colon) and occur through mucosal herniations at weak points in the muscularis propria where penetrating arteries enter the wall of the colon. Diverticular disease is often asymptomatic, but there may be small amounts of blood loss from the diverticula, which can be seen as blood in the stool. In the above scenario, the patient has presented with a change in bowel habit and with blood in the stool. The most important differential diagnosis given his age is, therefore, adenocarcinoma of the colon which should be excluded in the first instance, but diverticular disease is common, and a patient may have both. However, the colonoscopy findings are reassuring and confirm the presence of diverticular disease, and no tumour has been identified.

Bowel perforation is a complication of diverticular disease but usually presents with severe abdominal pain and peritonitis due to free air in the abdomen, and patients are often unstable and require urgent surgical intervention.

Colonoscopy findings of Crohn's disease typically reveal inflammation, deep ulceration, skip lesions and cobblestoning of bowel mucosa rather than outpouching of bowel mucosa.

Carcinoma of the colon is a key differential in older patients presenting with a change in bowel habit and/or blood in the stool, however, is less likely given the absence of any malignancy identified on colonoscopy.

Ulcerative colitis more commonly identifies on colonoscopy with red and raw mucosa with widespread shallow ulceration and submucosal inflammation.

Further reading:

https://www.nice.org.uk/guidance/NG147

Question:

A 72-year-old gentleman presents to the GP hoping for a change in his glasses prescription - he was unable to book an appointment with his optician. He thinks he requires new glasses, as he has noticed that his vision is notably poorer, particularly if he closes his right eye. He particularly struggles driving at night, as he says that he can be blinded by the headlights of oncoming cars. He has also noticed that colours appear less sharp when watching the television.

The patient is otherwise well and of normal BMI. The only regular medication he takes is levothyroxine after thyroidectomy for Graves' disease 10 years previously. He does not smoke and drinks alcohol only on special occasions.

Assessment of visual acuity via Snellen chart gives a score of 6/12 in the right eye and 6/36 in the left, neither of which is fully corrected by viewing the chart through a pinhole. On ocular examination, the GP notices that the red reflex is dimmer in the left eye.

Given the history and examination findings, which of the following is the most likely diagnosis?

A. Age-related macular degeneration

B. Cataract

C. Diabetic retinopathy

D. Worsening presbyopia

E. Accommodative esotropia

Correct Answer:Cataract

Explanation:

This patient has presented with a classical history of cataract; altered colour vision, glare and a reduction in visual acuity are all common complaints of sufferers of the condition. Cataracts arise due to abnormal clouding of the lens. The crystallin proteins undergo structural alterations, most frequently due to age-related processes, with ocular trauma, steroid use and diabetes also being relevant risk factors. The normal fundal reflex can often be dulled in the affected eye, as the lens clouding prevents the light from being reflected by the retina. Slit-lamp examination is usually used to confirm the diagnosis, and most cases that are having a significant impact on quality of life are managed surgically via a procedure referred to as phacoemulsification.

Worsening presbyopia is what the patient believes might be going on, stating that his vision problems are due to a need for new glasses. Presbyopia occurs due to age-related degeneration preventing effective accommodation, resulting in myopia (short-sightedness). It can worsen over time, warranting a new glasses prescription; however, it is unlikely to cause the other symptoms described by the patient.

Age-related macular degeneration can cause issues with colour vision, as the cone cells responsible for detecting colour are located within the macula. However, it would not explain the absent red reflex, and glare is far more common in the presence of cataracts.

Diabetic retinopathy is a very common cause of chronic visual loss; however, the patient has no history of diabetes. Whilst the disease can go undiagnosed and cause visual issues without the patient being aware of it, this is less likely in this patient, who is of normal weight, and has symptoms that point towards an alternative diagnosis.

Accommodative esotropia is a disorder that is far more commonly diagnosed in childhood. Strabismus occurs when an individual attempts to focus on a near object, normally due to an underlying degree of hyperopia (long-sightedness). It does not cause chronic visual loss.

Further reading:

https://cks.nice.org.uk/topics/cataracts/

Question:

A 21-year-old student presents to the GP to request a prescription of the combined oral contraceptive pill as she has recently entered a sexual relationship with a new partner. As part of the work-up before agreeing to the prescription, the patient has their blood pressure measured, with a reading of 168/108 obtained. The patient is surprised to learn this, as she has a normal BMI, and adheres to a healthy diet.

The GP carries out an examination and finds no abnormalities on palpation of the abdomen, and thyroid status assessment appears normal. However, on cardiac auscultation, a murmur is present, this is heard best under the left clavicle and appears to be continuous. Prompted by this, a blood pressure measurement is taken from the lower limb, this is notably different from the previous reading at 128/86. The GP tells the patient that she will require further investigations before she can be prescribed the oral contraceptive pill, as they are concerned about the possibility of an underlying medical condition.

Which of the following investigation findings is in keeping with the most likely diagnosis?

A. Notching of the ribs seen on chest X-ray

B. XXY genotype on karyotyping

C. Regurgitant flow through the mitral valve on echocardiogram

D. Dextrocardia on chest X-ray

E. Epsilon wave on ECG

Correct Answer:Notching of the ribs seen on chest X-ray

Explanation:

This patient has presented with secondary hypertension; this should always be suspected in any young patient with elevated blood pressure and no risk factors for essential hypertension. There are a number of organ systems that can be implicated in secondary hypertension, renal most commonly (the kidneys play an essential role in blood pressure regulation), but also endocrine, cardiac and certain medications.

Given the discrepancy between the blood pressure in this patient's upper and lower limbs, and the presence of a heart murmur, the most likely diagnosis, in this case, is coarctation of the aorta; an area of abnormal narrowing, most commonly in close relation to the ductus arteriosus. Whilst this condition is most commonly detected at birth during the newborn and infant physical examination (NIPE) when the femoral pulses are palpated and the heart auscultated, smaller narrowings may not be detected. The condition can remain undetected until adulthood in rare cases, when upper limb hypertension is noted, due to restricted flow through the narrowed region causing a build-up of pressure. The coarctation can also cause turbulent blood flow, resulting in a murmur. This can be continuous and heard best below the clavicle, or possibly as an ejection systolic murmur, radiating backwards between the scapulae. Radio-femoral delay may be present, as the narrowing results in a reduced flow rate to the lower limbs.

Coarctation of the aorta can arise sporadically or can be associated with underlying medical conditions. Turner's syndrome is the most well-known, but in a large number of cases (up to 60%), patients have a concurrent bicuspid aortic valve. This can in itself cause an ejection systolic murmur and can give an increased risk of the valve becoming stenosed.

Investigation of suspected coarctation of the aorta involves imaging studies - rib notching may be seen on chest X-ray; this arises due to an increased flow through the internal thoracic arteries, secondary to a build-up of pressure caused by the distal narrowing. Echocardiography is normally required for a definitive diagnosis to be made; management is principally surgical, with adult patients such as that in this vignette usually having a stent inserted to relieve the narrowing.

XXY genotype on karyotyping would indicate an underlying diagnosis of Klinefelter's syndrome, a form of chromosomal abnormality. Karyotyping may be carried out in the setting of coarctation of the aorta, but this is to screen for Turner's syndrome (genotype XO) which does have an association. Klinefelter's is not known to increase the risk of coarctation of the aorta.

Regurgitant flow through the mitral valve on an echocardiogram would indicate a diagnosis of mitral regurgitation. There are a number of causes of this condition, including papillary muscle rupture, mitral valve prolapse, and infective endocarditis, but the condition is not associated with coarctation of the aorta.

An Epsilon wave on ECG may be seen in the setting of arrhythmogenic right ventricular dysplasia, rather than coarctation of the aorta.

Dextrocardia on chest X-ray can be present asymptomatically in a small proportion of the population; it can also be present in the setting of underlying conditions such as situs inversus or Kartagener's syndrome. It is not associated with coarctation of the aorta.

Further reading:

https://patient.info/doctor/coarctation-of-the-aorta-pro

Question:

A 3-year-old boy is brought to the emergency department with a 3-day history of fever and a skin rash. His mother reports that the child suffered from an upper respiratory infection approximately 5 days ago. He does have any other medical problems, takes no regular medications, has met all of his developmental milestones and has no significant family medical history. His vaccinations are all up to date.

He is febrile and tachycardic. His other observations are normal. An erythematous skin rash covers his face, chest and back and there are also multiple tender bullae present.

What is the most likely diagnosis?

A. Stevens-Johnson syndrome

B. Kawasaki disease

C. Erythema multiforme

D. Staphylococcal scalded skin syndrome

E. Impetigo

Correct Answer:Staphylococcal scalded skin syndrome

Explanation:

This boy most likely has staphylococcal scalded skin syndrome, a condition characterised by a generalised erythematous rash caused by certain strains of Staphylococcus aureus. Patients typically present with fever, irritability, skin lesions and a positive Nikoslky sign (separation of the epidermal layer with gentle rubbing).

Impetigo is a bacterial infection caused by group A beta-haemolytic streptococci or S. aureus which typically yields ‘honey-crusted’ lesions. Treatment for localised disease is with topical antibiotics (mupirocin or fusidic acid).

Stevens-Johnson syndrome is a life-threatening dermatological problem characterised by fever and skin necrosis with the involvement of two or more mucous membranes. It is typically associated with adverse drug reactions to drugs such as allopurinol, lamotrigine and other anti-epileptic medications.

Kawasaki disease is an acute vasculitis with an unknown aetiology. Clinical manifestations of Kawasaki disease include fever for longer than 5 days, bilateral conjunctival injection, unilateral cervical lymphadenopathy, mucous membrane changes and a polymorphous rash on the trunk.

Erythema multiforme is a dermatological disorder characterised by macules and papules which resemble targets. It is usually associated with infections such as Mycoplasma pneumoniae or medications such as sulfa- drugs and phenytoin.

Further reading:

https://patient.info/doctor/staphylococcal-scalded-skin-syndrome

Question:

A 57-year-old woman with known lung cancer is admitted through oncology triage with metastatic spinal cord compression. The tumour is beginning to compress on the ventral horns of her spinal cord, bilaterally.

Given the site of compression, what neurological manifestation might be expected in this patient?

A. Sensory loss below the level of the lesion

B. Proprioception loss below the level of the lesion

C. Sensory loss above the level of the lesion

D. Paresis below the level of the lesion

E. Pain and temperature loss below the level of the lesion

Correct Answer:Paresis below the level of the lesion

Explanation:

Paresis below the level of the lesion is correct as the anterior (ventral) horns of the spinal cord contain motor neurone cell bodies, which run along the ventral corticospinal tract. Along with the lateral corticospinal tract, this is responsible in part for voluntary bodily movement. Therefore, compression by a tumour against the ventral part of the spinal cord may cause paresis or paralysis below the level of the lesion (as nerve roots above the lesion will bud off the spinal cord and not be impinged, retaining voluntary movement above the lesion).

Pain and temperature loss below the level of the lesion is incorrect, as this would be seen in compression of the spinothalamic tract, which runs more laterally in the spinal cord. While there are slightly ventrally placed aspects to the spinothalamic tract (which accounts for pain and temperature), the corticospinal tract would more likely be affected as it is located more anteriorly.

Proprioception loss below the level of the lesion is incorrect. Proprioception, along with fine touch and vibration, is neurologically tied to the dorsal-column medial-lemniscus tract, which runs dorsally. This may be affected in a posterior spinal artery occlusion, for example.

Sensory loss above the level of the lesion is incorrect, as spinal lesions affect sensory experience below the level of the lesion rather than above.

Sensory loss below the level of the lesion is incorrect. A combined sensory loss and motor loss could occur in complete transection of the spine, which would also give complete paralysis. It would not be seen in a specifically ventrally-compressing tumour.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK557604/

Question:

A 71-year-old male presents to A&E confused. His son tells you he has become increasingly confused over the past week and that he also has lost a lot of weight over the past two months. Past medical history includes COPD, angina pectoris and generalised epilepsy. He is an active smoker. Drug history includes aspirin, carbamazepine, GTN spray, simvastatin, sodium valproate and respiratory inhalers.

Observations are unremarkable. He is afebrile. On examination, he has slightly reduced right-sided breath sounds. He is clinically hydrated and euvolaemic.

Investigations reveal a serum sodium of 119 and a chest x-ray demonstrates a right lower zone well-demarcated opacity.

He is admitted for further investigations:

Serum osmolality is 227 mOsm/kg

Urine osmolality is 278 mOsm/kg

Urine sodium is 37 mmol/L

What is the MOST likely underlying diagnosis causing this presentation?

A. Carbamazepine toxicity

B. Small cell lung cancer

C. Hypothyroidism

D. Community-acquired pneumonia

E. Tuberculosis

Correct Answer:Small cell lung cancer

Explanation:

This patient’s biochemical picture is indicative of SIADH (syndrome of inappropriate ADH secretion). There are multiple causes for SIADH – including all of the above – but small cell lung cancer (SCLC) is the most likely underlying diagnosis in this scenario. A Na of 119 is classed as severe hyponatraemia; this can present with an altered GCS and seizures.

The history of weight loss and smoking together with radiological evidence of a pulmonary lesion suggests a diagnosis of lung cancer. Several malignancies can cause SIADH, but SIADH is a common paraneoplastic syndrome associated with SCLC.

SIADH is also caused by multiple infections including pneumonia and tuberculosis; although this gentleman is confused, there are no other clinical indicators of active infection. Additionally, pulmonary tuberculosis predominantly infects the upper lung zones.

Anti-epileptics, anti-psychotics and proton pump inhibitors along with many other drugs can also cause SIADH; carbamazepine toxicity can present with confusion but it would not explain the weight loss or radiological findings.

Hypothyroidism can cause memory problems and “mental slowing” but is associated with weight gain. Hypothyroidism, alongside hyperlipidaemia, hyperglycaemia and primary adrenal insufficiency, is a recognised cause of pseudohyponatraemia.

The diagnostic criteria for SIADH are as follows:

hyponatraemia with low serum osmolality (<275 mOsm/kg)

raised urine osmolality (>100 mOsm/kg)

clinical euvolaemia

raised urine sodium (>30 mmol/L)

no recent use of diuretics

exclusion of renal, adrenal and thyroid insufficiency

Further reading:

https://patient.info/doctor/hyponatraemia-pro

Question:

A 45-year-old woman presents to the emergency department with a 2-week history of an intermittent intensely itchy rash. She describes the lesions as ‘coming and going’ over short periods of time. The lesions are mostly on her trunk and are well defined. Some areas appear raised with a smooth surface. She has not noticed anything exacerbating the lesions but has had a similar rash to this in the past.

Given the most likely diagnosis, what type of hypersensitivity reaction is occurring in the patient?

A. Type four hypersensitivity reaction

B. Type three hypersensitivity reaction

C. Type two hypersensitivity reaction

D. Type one hypersensitivity reaction

E. Non-allergy hypersensitivity reaction

Correct Answer:Type one hypersensitivity reaction

Explanation:

The correct answer is type one hypersensitivity reaction, with the most likely diagnosis being urticaria. Type one hypersensitivity reaction is also called an immediate hypersensitivity reaction. It is mostly due to an environmental allergen that causes mast cell activation within the epidermis. The urticarial rash typically appears as an itchy erythematous and well-circumscribed rash that has well-defined papules and plaques with a smooth surface. The urticaria is transient and can come and go within hours.

Type two hypersensitivity reaction is also called an antibody-mediated reaction. These antibodies target cell-bound antigens and induce a reaction such as tissue damage. Haemolytic disease of the newborn is an example of a type two hypersensitivity reaction. In haemolytic disease of the newborn, a typical 'blueberry muffin' rash may be present. This will be visible on the skin as blue/purple nodules on the face and body.

Type three hypersensitivity reaction is also called an immune complex-mediated reaction. Tissue damage is then caused by the deposition of immune complexes in host tissues. Rheumatoid arthritis is an example of a type three hypersensitivity reaction. Patients with rheumatoid arthritis will complain of joint pain and swelling, typically on the extremities such as their fingers. There may also be a family history or personal history of autoimmune diseases.

Type four hypersensitivity reaction is also called a cell-mediated or delayed reaction. This is caused by environmental infectious agents and self-antigens. An example of a type four hypersensitivity is contact dermatitis. Lymphocytes and macrophages are involved in the disease process rather than an antibody. The patient may complain of dry and itchy skin. They may also mention a known trigger that brought the rash on. The rash is typically confined to the area affected by the trigger.

Non-allergy hypersensitivity reaction is a non-immune anaphylactic reaction to certain drugs or food. Some may refer to it as a pseudoallergic reaction. This differs from the hypersensitivity reaction types above as they are all allergic reactions. These reactions are can be hard to distinguish from allergic reactions. This type of reaction typically causes symptoms directly and without the release of antibodies.

Further reading:

https://geekymedics.com/hypersensitivity-reactions/

Question:

A 48-year-old man presents to his GP with several months' history of feeling tired all the time and a worsening dry cough. The patient has not had any recent fevers, night sweats, or haemoptysis, but has noticed he is losing weight. He has a history of chronic obstructive pulmonary disease secondary to alpha-1 antitrypsin deficiency, does not drink alcohol, and works as a teacher.

What clinical features would prompt an urgent chest radiograph?

A. Non-smoker > 40 years old + fatigue

B. Non-smoker > 40 years old + history of COPD

C. Non-smoker > 40 years old + cough

D. Non-smoker > 40 years old + history of alpha-1 antitrypsin deficiency

E. Non-smoker > 40 years old + cough + fatigue

Correct Answer:Non-smoker > 40 years old + cough + fatigue

Explanation:

The current NICE criteria to receive an urgent chest radiograph depend on whether patients smoke, their age, and the symptoms and signs present in the history and examination:

Smokers Non-Smokers

> 40 years old and have at least 1 of the following

Cough

Fatigue

Shortness of breath

Chest pain

Weight loss

Appetite loss

> 40 years old and have at least 2 of the following

Cough

Fatigue

Shortness of breath

Chest pain

Weight loss

Appetite loss

>40 years old and any of:

Persistent or recurrent chest infection

Finger clubbing

Supraclavicular lymphadenopathy

Chest signs consistent with lung cancer

Thrombocytosis

Because this patient does not smoke, the patient must meet at least 2 of the listed criteria to be eligible for a chest radiograph to investigate for lung cancer. Therefore, being a non-smoker > 40 years old + cough + fatigue makes this patient eligible.

Although a history of COPD or a history of alpha-1 antitrypsin deficiency does increase patients' risk of lung cancer, neither of these conditions are currently listed as indications for an urgent chest radiograph. However, a high degree of clinical suspicion for lung cancer should be maintained among these patients.

Fatigue and cough are both clinical features listed as indications for an urgent chest radiograph. However, because this patient does not smoke, they need to meet at least 2 of the listed criteria to be eligible for an urgent radiograph.

Further reading:

https://www.nice.org.uk/guidance/ng12/chapter/1-Recommendations-organised-by-site-of-cancer#lung-and-pleural-cancers

Question:

An 82-year-old patient is admitted to the hospital after falling over on his way to church; he landed awkwardly on the curb and is complaining of severe pain in his forearm. There is an obvious deformity on examination, but no signs of a break in the skin, and neurovascular examination reveals no abnormalities.

A radial fracture is suspected, and an X-ray is ordered. This shows an oblique fracture of the proximal 1/3 of the radial shaft, without articular involvement or comminution. The radiologist reporting the scan has also commented on abnormalities of the bone itself; stating that there are several small areas of lucency visible, and the shaft of the radius appears bowed. The cortex of the bone appears abnormally thickened.

The patient is otherwise well, with no known medical conditions, other than a recent diagnosis of hearing loss. This came on relatively rapidly but was diagnosed as presbyacusis by the GP. Investigations reveal a normal FBC and U&Es. A bone profile shows an elevated alkaline phosphatase with calcium levels being within the normal range.

The consultant responsible for the patient's care is suspicious of a pathological fracture and orders a bone scintigraphy scan.

Given the likely diagnosis, which of the following is likely to be utilised as management after the fracture itself has been treated?

A. Bortezomib

B. Targeted radiotherapy

C. Bisphosphonates

D. Conservative management alone

E. Strontium ranelate

Correct Answer:Bisphosphonates

Explanation:

The most likely diagnosis, in this case, is Paget's disease of bone; a slowly progressive bone disease that is characterised by excessive bone turnover, resulting in the development of abnormal woven bone that is prone to fracture. The condition often remains asymptomatic for many years and is usually diagnosed incidentally when a pathological fracture occurs. Other possible symptoms include deafness (due to skull bone overgrowth and vestibulocochlear nerve compression) and evidence of deformities such as bowed shins and/or increasing head size.

A significantly elevated alkaline phosphatase is classically found in the condition. ALP can be used as a marker of osteoblast function as these cells are overly active in the disease. Bone scintigraphy typically reveals areas of focal hyperactivity within the bone, and individual X-rays (often taken in the setting of fracture) may demonstrate bony expansion and cortical thickening.

Management of Paget's disease is generally via the prescription of bisphosphonates; alendronic acid and zoledronic acid being common examples. These drugs are absorbed into the bone, and help to bring about apoptosis of osteoclasts. Whilst the features of Paget's are principally those due to the overactivity of osteoblasts, the trigger for the condition is thought to be excessive bone resorption, and the excessive laying down of bone is simply compensating for this.

Bortezomib is a proteasome inhibitor that may be used as part of the chemotherapy regime for multiple myeloma; it is thought to reduce the number of adhesion molecules that allow for the 'nesting' of plasma cells within the bone marrow.

Strontium ranelate is a drug previously used for the treatment of osteoporosis. It is now used infrequently, due to studies suggesting an increased cardiovascular risk in those receiving it.

Targeted radiotherapy may be useful in pathological fractures that arise due to a single lesion such as a primary bone tumour. As Paget's disease is a systemic pathology, it will not be a useful option in the management of the condition.

This patient is otherwise well, and is likely to be able to tolerate bisphosphonate treatment; therefore there is no reason not to give him the drugs, as they are likely to prevent further complications. Conservative management alone is not the most appropriate option here.

Further reading:

https://patient.info/doctor/pagets-disease-of-bone-pro

Question:

A patient with suspected systemic lupus erythematosus (SLE) undergoes an anti-dsDNA test. This test has a specificity of 95%.

What can be concluded about the test based on the specificity?

A. The test has a low false positive rate

B. Nothing can be concluded about the test’s false positive or false negative rate

C. The test has a high false negative rate

D. The test has a low false negative rate

E. The test has a high false positive rate

Correct Answer:The test has a low false positive rate

Explanation:

If a test has a high specificity, it is unlikely to be positive in an individual without the condition. Therefore, the test has a low false positive rate.

Further reading:

https://geekymedics.com/statistics-for-medical-students/

Question:

A 66-year-old man presents with increasing shortness of breath. He has a past medical history of chronic obstructive pulmonary disease, for which is takes salbutamol inhaler as required, salmeterol 50mcg INH twice daily, and beclomethasone 200mcg INH twice daily. He is a current smoker of 15 cigarettes a day.

Observations: RR 19/min, SpO2 93% on air

A chest X-ray is performed.

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What is the most appropriate option at this stage?

A. High flow oxygen via non-rebreathe mask

B. Needle thoracentesis

C. Chest drain insertion

D. Observe and repeat X-ray in 24 hours

E. Nebulised salbutamol

Correct Answer:Chest drain insertion

Explanation:

Chest drain insertion is the correct management option. This patient has developed a secondary pneumothorax on the background of chronic obstructive lung disease. As they are breathless (and the pneumothorax is greater than 2cm), a chest drain should be inserted according to the British Thoracic Society guidelines.

Needle thoracentesis is incorrect as this patient has a secondary pneumothorax and is breathless. Needle aspiration (thoracocentesis) can be considered for primary pneumothoraces (where there is no underlying lung disease) or small secondary pneumothoraces (<2cm) if the patient is not breathless.

High flow oxygen is incorrect as this patient has COPD and their oxygen saturations aren't particularly low in this context (typical target range is 88-92%). High flow oxygen may cause the patient to develop type 2 respiratory failure, so a fixed-rate oxygen delivery device should be used if oxygen is required (i.e. Venturi mask).

Observe and repeat X-ray in 24 hours is incorrect as this patient requires a chest drain to be inserted.

Nebulised salbutamol is incorrect as this patient has a pneumothorax, therefore requires treatment of this. Salbutamol is used to manage bronchospasm and wheeze.

Further reading:

https://thorax.bmj.com/content/65/Suppl\_2/ii18

Question:

A 35-year-old man is brought to the emergency department after being found shouting at people in the street. He is insistent that he is infested with parasites and is demanding treatment.

On examination, he is confused and disoriented to place or time, and there is a coarse tremor when his arms are outstretched with his fingers spread apart. He is anxious, his heart rate is 115 bpm, his blood pressure is 134/75 mmHg, and his temperature is 38.3°C.

He mentions that his last alcoholic drink was 3 days ago, and does not know how much he ordinarily drinks.

What is the most likely diagnosis?

A. Hepatic encephalopathy

B. Acute alcohol withdrawal

C. Wernicke's encephalopathy

D. Korsakoff syndrome

E. Delirium tremens

Correct Answer:Delirium tremens

Explanation:

Delirium tremens is correct. This patient is presenting with hallucinations, confusion, agitation, and a coarse tremor, on a background of alcohol withdrawal. Given that his last drink was 72 hours ago (3 days), and he is now experiencing these symptoms, particularly the hallucinations, this patient is likely to be experiencing delirium tremens, a complication of alcohol withdrawal which typically occurs 48-72 hours after alcohol has stopped in people who are dependent on alcohol. Any patient experiencing hallucinations after alcohol withdrawal should be considered to have delirium tremens and should be urgently treated, as it is a medical emergency and can lead to seizures and death. Symptoms of acute alcohol withdrawal occur due to the upregulation of NDMA (excitatory) receptors and downregulation of GABA (inhibitory) receptors, and when alcohol is suddenly stopped, this can lead to excess excitatory activity due to an imbalance between NDMA and GABA systems.

Wernicke's encephalopathy is incorrect. This would present with confusion, ataxia, and ophthalmoplegia, and can occur during periods of alcohol consumption, not just after sudden cessation. Hallucinations are not seen in Wernicke's encephalopathy

Hepatic encephalopathy is incorrect. Although this can present with confusion and hallucinations, there are no stigmata of liver disease in this patient. Hepatic encephalopathy is caused by excess ammonia in the blood due to liver dysfunction, It is important to note that complications regarding alcohol withdrawal do not require liver disease to be present.

Korsakoff syndrome is incorrect. This is characterised by memory problems seen in patients with chronic excessive alcohol consumption and is not associated with hallucinations. If Wernicke's encephalopathy is left untreated, it can progress to Korsakoff syndrome which is characterised by anterograde and retrograde amnesia and confabulation.

Acute alcohol withdrawal is incorrect. This is a general term for the signs and symptoms seen following sudden alcohol cessation in patients who have a history of chronic excessive alcohol consumption. Symptoms typically start 6-12 hours following the last drink and are characterised by agitation, tachycardia, and sweating. If left untreated, this can progress to delirium tremens, which is what this patient is experiencing.

Further reading:

https://patient.info/doctor/acute-alcohol-withdrawal-and-delirium-tremens

Question:

A 72-year-old man presents with constant, progressive pain in his left lower abdomen, which started two days ago. This is associated with diarrhoea, although he denies blood in the stool. He mentions he has had several similar episodes in the past, but the pain has always been milder and intermittent. He has not noticed any weight loss or change in appetite and has not vomited, although he feels nauseous.

His observations are

Oxygen saturation: 99% on room air

Respiratory rate: 20 breaths per minute

Heart rate: 92 beats per minute

Blood pressure: 124/79 mmHg

Temperature: 38.1 °C

What is the most likely diagnosis?

A. Crohn’s disease

B. Colorectal cancer

C. Gastroenteritis

D. Diverticulitis

E. Ulcerative colitis

Correct Answer:Diverticulitis

Explanation:

This patient is presenting with constant left lower quadrant pain, diarrhoea and a fever, which all point towards a diagnosis of diverticulitis. Please note that diverticulitis does not always present with blood in the stool. The history of previous intermittent left lower quadrant pain and diarrhoea is likely explained by diverticular disease.

Although gastroenteritis can cause abdominal pain, diarrhoea and a fever, the mention of previous diverticular disease makes diverticulitis the more likely diagnosis.

Colorectal cancer is an important diagnosis to consider in someone presenting with a change in bowel habit, however, the acute presentation with abdominal pain, diarrhoea and a fever are more characteristic of diverticulitis. Furthermore, the patient does not have any weight loss, which would make colorectal cancer more likely.

Ulcerative colitis typically causes bloody diarrhoea, presents in young adults, and may be associated with weight loss. The absence of these features makes ulcerative colitis less likely.

Similarly, Crohn’s disease usually presents in young adults and causes weight loss due to malabsorption. These are features which are absent in the history.

Further reading:

https://teachmesurgery.com/general/large-bowel/diverticular-disease/

Question:

A 7-year-old boy is brought to the emergency department having a high-grade fever for the last three days. He has a swollen right arm and he cannot move it due to the pain. This is his second presentation this month; earlier in the month, he presented with pallor and acute onset hepatosplenomegaly.

Investigations:

Haemoglobin - 60 g/L (115 – 140)

Haemoglobin electrophoresis - No HbA

Reticulocytes count - 20% (0.2 – 2)

X-ray right arm- deep soft tissue swelling, a periosteal reaction, cortical irregularity, and demineralization

What is the most likely diagnosis?

A. Sickle cell disease

B. Haemolytic anaemia

C. Sickle cell trait

D. Beta thalassemia

E. Acute myeloid leukemia

Correct Answer:Sickle cell disease

Explanation:

The most likely diagnosis is sickle cell disease. Young age, low haemoglobin, absent HbA, increased reticulocyte count, and hepatosplenomegaly are significant features of sickle cell disease. High-grade fever, arm swelling, and X-ray findings are all pointing towards osteomyelitis, which is a complication of sickle cell disease, most commonly caused by Salmonella typhi.

People with sickle cell traits are generally asymptomatic and have no abnormal physical findings. Moreover, HbA is not absent in sickle cell traits.

Haemolytic anaemia is a disorder in which red blood cells are destroyed faster than they can be made. The destruction of red blood cells is called haemolysis. It can cause bone pain, but there is no significant evidence of osteomyelitis in haemolytic anaemia.

Acute myeloid leukaemia usually develops over a few weeks and becomes worse over time. Symptoms can include: pallor, fatigue, breathlessness, frequent infections, unusual and frequent bruising or bleeding, such as bleeding gums or epistaxis, and unintentional weight loss.

Beta thalassemia can make the expansion of bone marrow, which causes bones to widen. This can result in abnormal bone structure, especially in the face and skull. Bone marrow expansion also makes bones thin and brittle, increasing the chance of broken bones. An enlarged spleen is also a common finding in beta-thalassemia. However, emphysematous osteomyelitis caused by Salmonella typhi is a rare infection in beta-thalassemia major patients.

Further reading:

https://patient.info/doctor/sickle-cell-disease-and-sickle-cell-anaemia-pro

Question:

A 27-year-old male presented to his GP with nausea. Investigations were broadly normal apart from deranged LFTs. Clinical examination revealed Kayser-Fleischer rings but nothing else of significance. He is unsure of his family history due to being adopted as a small child. He does not smoke or drink alcohol and describes himself as generally well.

Which of the following investigation results would be expected in this patient?

A. Low level of amino acids in the urine

B. Low levels of glucose and phosphates in the urine

C. Decreased serum caeruloplasmin

D. Decreased basal 24h urinary excretion of copper

E. Elevated serum caeruloplasmin

Correct Answer:Decreased serum caeruloplasmin

Explanation:

Wilson's disease is an autosomal recessive genetic disorder that results in abnormal deposition of copper in body tissues, most often the liver, kidneys, eyes and brain. The disease is caused by mutations in the ATP7B gene. The deposition of copper in these tissues causes oxidative damage which then produces the symptoms associated with the disease. The usual age of onset is between 20-30 years old.

Presenting features of Wilson's disease can vary significantly, depending on the tissues most affected. Potential presenting features include unexplained abnormal LFTs, movement disorders (i.e. tremor), acute liver failure, liver cirrhosis, behavioural problems, Kayser-Fleischer rings (greenish-gold ring on the cornea), nephrocalcinosis, cardiomyopathy, pancreatitis and hypoparathyroidism.

Investigations typically reveal decreased serum careuloplasmin with increased copper excretion. This in combination with the clinical finding of Kayser-Fleisher rings is sufficient to establish a diagnosis.

A sequela of Wilson's disease is Fanconi syndrome, a rare disorder of the renal tubule leading to an inability to re-absorb certain molecules. Fanconi syndrome is characterised by high levels of glucose (with normal serum levels), phosphate and amino-acids in the urine.

Further reading:

https://patient.info/doctor/wilsons-disease-pro

Question:

Alice Wade, a 2-year-old girl, is brought to A&E by her mother. She has had a 2-day history of cough (which her mother describes as “barking”) and a runny nose. She has no past medical history and has had all of her vaccinations. On examination she is feverish and you note intercostal recession. Auscultation of the chest reveals harsh, high pitched inspiratory noises. In A&E she has been given salbutamol, however this has had little effect on her symptoms.

Given the symptoms above, what is the most likely diagnosis?

A. Epiglottitis

B. Laryngomalacia

C. Croup

D. Inhaled foreign body

E. Asthma

Correct Answer:Croup

Explanation:

The sound heard on auscultation is stridor, a high pitched sound seen in turbulent airflow due to partial airway obstruction. The correct answer here is croup, a condition usually caused by the parainfluenza virus. Clinical features of croup include fever, stridor and a “barking” cough. It usually occurs in children aged 6 months to 5 years with varying severity. Depending on the severity of the condition, treatment can include oxygen and dexamethasone.

Epiglottitis would also cause stridor, but this condition is caused by haemophilus influenzae type B and the patient has been fully vaccinated making this unlikely.

An inhaled foreign body is possible, but there is no mention of this in the history. An inhaled foreign body could cause stridor but not a fever or a barking cough.

Asthma causes wheeze, which is similar to but different from stridor. They can be difficult to differentiate but wheeze is usually expiratory and stridor is usually harsher. Although coughing is common is asthma the barking cough points more towards croup. Salbutamol has had not helped making asthma less likely.

Further reading:

https://patient.info/doctor/croup-pro

Question:

A 60-year-old woman attends her GP practice with difficulty swallowing. She says the dysphagia was initially intermittent with only solids, but now occurs constantly with both solids and liquids. On further questioning, she also reports episodic substernal chest pain that mainly occurs after eating. She has had no significant weight loss. The GP suspects she may have achalasia.

What is the most appropriate first-line investigation?

A. Manometry

B. Endoscopy

C. Computed tomography (CT)

D. Barium swallow

E. Plain chest radiograph (CXR)

Correct Answer:Endoscopy

Explanation:

Achalasia is the failed relaxation of the lower oesophagus, preventing food from passing into the stomach. It commonly presents with dysphagia and regurgitation. Some patients also have retrosternal pain after eating.

However, this patient's symptoms could be secondary to a malignant mass. As per NICE guidelines, patients presenting with dysphagia should be directly referred for urgent endoscopy, to be performed within 2 weeks. This is used to assess for the presence of oesophageal carcinoma that presents similarly to achalasia and sometimes develops as a complication.

A barium swallow can be used in the investigation of dysphagia but is not the gold standard. In some cases, a barium swallow is performed prior to endoscopy in order to reduce the risk of perforating an unassessed malignant mass; however, the NICE guidelines are explicit in recommending direct referral to endoscopy rather than for barium swallow. In achalasia, a barium swallow typically shows a narrowing of the lower oesophagus with proximal dilatation (known as the ‘bird beak sign’) with/without the presence of an air/fluid level.

Manometry is not an appropriate first-line investigation for dysphagia. It is the gold-standard diagnostic test for achalasia. In achalasia, this would demonstrate increased pressure across the lower oesophageal sphincter.

Computed tomography is not an appropriate initial investigation for dysphagia but may be utilised later to investigate the spread of the disease.

Plain chest radiography may sometimes be used as part of the assessment of dysphagia but is neither first-line, gold-standard or diagnostic. In achalasia, it may illustrate a small or absent gastric bubble and dilated oesophagus, but these findings are rare in practice.

Further reading:

https://patient.info/doctor/achalasia-pro

Question:

A 45-year-old man is brought to the emergency department by his wife because of confusion and difficulty maintaining his balance. He is unable to provide a history. His wife explains that three months ago, he underwent Roux-en-Y gastric bypass surgery for weight management. Since the surgery, she describes he has developed gradually increasing confusion and difficulty walking. She does not remember any complications with the surgery but reports frequent episodes of postoperative vomiting and inadequate oral intake.

On examination, his temperature is 37.3°C, pulse 84/min, blood pressure 128/93mmHg and SpO2 98% on room air. On neurological examination, he is oriented only to person; there is bilateral horizontal nystagmus, finger-nose incoordination and a broad-based gait.

Which of the following investigations are required before initiating treatment?

A. CT head

B. CSF analysis

C. Serum thiamine

D. MRI FLAIR

E. No investigations required

Correct Answer:No investigations required

Explanation:

The most likely diagnosis in this patient is Wernicke's encephalopathy - an acute but reversible condition caused by severe thiamine (vitamin B1) deficiency. Suggestive features in this presentation include a recent history of GI surgery, associated with postoperative vomiting and poor oral intake, as well as acute cognitive dysfunction, ataxia, impaired balance and nystagmus. Wernicke's encephalopathy is a neurological emergency, and treatment should be initiated as soon as possible without waiting for confirmatory investigations. Therefore, no investigations are required before starting treatment with parenteral thiamine in suspected cases of Wernicke's.

Patients presenting with acute neurological dysfunction, 'cerebellar signs' and an ambiguous history may be offered a CT scan as part of their initial workup to exclude differentials. However, clinical suspicion of Wernicke's encephalopathy should be high in this patient, and further investigation should not delay the administration of thiamine.

Patients with Wernicke's encephalopathy may have an MRI scan of the brain to exclude other differential diagnoses, especially if there is an ambiguous history. Patients with Wernicke's encephalopathy may have bilateral, increased signal intensity in the mammillary bodies and thalami regions on fluid-attenuated inversion recovery (FLAIR) images. However, whilst an MRI may help confirm the diagnosis, it is not required before initiating treatment.

Ordering blood thiamine levels may form part of the initial workup of patients with suspected Wernicke's encephalopathy, especially in those with ambiguous presentations. However, it is essential to note that whilst blood thiamine levels are usually low, they are not required before starting treatment and are also not required to make a diagnosis. Furthermore, the concentrations of thiamine for treating the condition have also not been determined.

Analysis of cerebrospinal fluid (CSF) may also be indicated if features in the history suggest meningitis, encephalitis or subarachnoid haemorrhage. However, if clinical suspicion of Wernicke's encephalopathy is high, treatment should be initiated without this additional investigation.

Further reading:

https://www.nice.org.uk/guidance/cg100/chapter/Recommendations

Question:

A 62-year-old patient presents with sudden onset right-sided abdominal pain, nausea and vomiting, which began around an hour ago and has increased in intensity. The pain now appears in waves, and he scores it a 9 out of 10. He denies opening his bowels or passing flatus since the symptoms began. He has no significant past medical history, takes no regular medication, and has never had any form of abdominal surgery.

On examination, the abdomen is distended. A large mass is visible in the lower right quadrant that is irreducible and exquisitely tender to palpation. Bowel sounds are absent.

An abdominal X-ray reveals loops of small bowel with a diameter of 5cm.

What is the most likely diagnosis?

A. Diverticular stricture

B. Small bowel adhesions

C. Strangulated Spigelian hernia

D. Psoas abscess

E. Retrocaecal appendicitis

Correct Answer:Strangulated Spigelian hernia

Explanation:

This patient has presented with acute bowel obstruction, as indicated by the abdominal distension, lack of passing of flatus, colicky abdominal pain and absent bowel sounds. Dilated loops of small bowel on an abdominal radiograph support this diagnosis; the measured diameter of 5cm is greater than the 3cm expected for this section of the gastrointestinal tract on imaging. The sudden onset of symptoms in combination with a non-reducible mass makes the most likely underlying diagnosis a strangulated hernia. Given its location, this is most likely to be the rare Spigelian hernia, a protrusion of intraabdominal contents through the junction between the linea semilunaris and the arcuate line. These frequently strangulate and can lead to an acute bowel obstruction.

Both diverticular strictures and small bowel adhesions can cause bowel obstruction; however, these are less likely given the prominent mass seen on examination and the lack of past medical history. There is no evidence to suggest that the patient has a history of diverticular disease, and adhesions usually form after previous abdominal surgery.

A psoas abscess can present with pain and a flank mass, but will not result in bowel obstruction; rather it will present with fever and potentially signs of sepsis. The disease is far more common in those who use IV drugs, as this allows a port of entry for bacteria.

Retrocaecal appendicitis can present with right flank tenderness and colicky abdominal pain, but would not explain the patient being in bowel obstruction.

Further reading:

https://patient.info/doctor/abdominal-wall-hernias

Question:

A 67-year-old man presents to the emergency department with a 40-minute history of central chest pain. He describes the pain as a ‘heavy pressure’ on his chest, radiating to his left jaw. It started whilst sitting and watching TV at home. On further questioning, he has experienced two previous episodes like this over the last week whilst at rest; they each did not last longer than 15 minutes and he did not seek help.

On examination, he’s pale and sweaty. He is not short of breath. His observations are stable. An ECG 30 minutes ago demonstrated normal sinus rhythm. 300mg aspirin and pain relief have been prescribed and administered. Bloods including troponin have been sent to the lab.

What is the next most appropriate management step?

A. Repeat ECG

B. Apixaban

C. Exercise tolerance test

D. Arterial blood gas

E. Percutaneous coronary intervention

Correct Answer:Repeat ECG

Explanation:

This patient is experiencing a central, pressure-type chest pain at rest which radiates to the left jaw. This makes acute coronary syndrome (ACS) the likely diagnosis. The history of two similar episodes over the last week increases the likelihood of ACS. Acute coronary syndrome includes unstable angina, non-ST elevation myocardial infarction (NSTEMI) and ST-elevation myocardial infarction (STEMI). These three conditions can be differentiated by:

Unstable angina: an ECG may demonstrate non-specific signs of ischaemia or may be normal. Troponin levels are not significantly raised.

NSTEMI: an ECG may demonstrate non-specific signs of ischaemia or may be normal. Troponin levels are raised.

STEMI: an ECG will demonstrate ST elevation or new-onset left bundle branch block. Troponin levels are raised.

ECG changes can be dynamic in these patients, meaning there may be ongoing ischaemia. With ACS a likely diagnosis and the first ECG appearing normal, a repeat ECG should be performed 20/30 minutes after the first, to identify new ischaemic changes.

An arterial blood gas would be indicated if a respiratory aetiology was suspected or if the patient was significantly dyspnoeic or hypoxic. This patient does not complain of shortness of breath, and his observations are stable.

Percutaneous coronary intervention (PCI) is indicated within 120 minutes of an ST-elevation myocardial infarction (STEMI) diagnosis. However, this patient's first ECG was normal, and so PCI is not currently indicated.

An exercise tolerance test may form part of diagnostic investigations for stable angina or ischaemic heart disease. However, it is not appropriate in this acutely unwell patient.

Apixaban is a direct oral anticoagulant, which is not commonly used in the management of ACS. Other intravenous anticoagulants such as fondaparinux and unfractionated heparin are used in preference.

Further reading:

https://patient.info/doctor/acute-coronary-syndrome-pro

Question:

A 37-year-old woman presents to her GP with a two-month history of diarrhoea and heat intolerance. She does not drink alcohol, however, she smokes ten cigarettes a day.

On examination, the patient appears underweight, her face is flushed, and she appears sweaty despite the normal room temperature. Her eyes appear protruded, and when moving her eyes to look downwards, her eyelid lags behind her eye.

She is treated with propranolol and carbimazole and is given smoking cessation advice. She is also given advice on using artificial tears and eye taping at night.

What is the main complication that artificial tears and eye taping aim to prevent?

A. Bell’s palsy

B. Oculomotor nerve palsy

C. Corneal ulcers

D. Worsening of lid lag

E. Worsening of exophthalmos

Correct Answer:Corneal ulcers

Explanation:

Patients with thyroid eye disease can develop dry eyes due to incomplete closure of the eyelids, which can lead to corneal ulcers, as well as other complications like exposure keratitis and, occasionally, vision loss. These complications can be prevented with artificial tears and eye taping at night.

Artificial tears and eye taping do not prevent the worsening of lid lag or the worsening of exophthalmos. The only way to prevent these is through the treatment of Grave’s disease and smoking cessation.

Grave’s disease can cause a restrictive orbitopathy, leading to restricted eye movements and very rarely, optic nerve compression. However, it does not typically cause oculomotor nerve palsy.

Bell’s palsy is an idiopathic facial nerve palsy. Artificial tears and eye taping are used in its treatment, however, they do not prevent it. Bell’s palsy is not a known complication of Grave’s disease.

Further reading:

https://geekymedics.com/thyroid-eye-disease/#:~:text=Thyroid%20eye%20disease%20(TED)%20is,and%20more%20common%20in%20females.

Question:

A 45-year-old woman presents to A&E complaining of severe upper abdominal pain. This began approximately 2 hours previously and has increased in severity; it initially appeared to come in waves - however, it is now present almost constantly. She is now feeling extremely unwell, and has vomited twice; she feels extremely hot and sweaty.

On examination, the patient is significantly overweight and looks pale and unwell. Her sclerae appear slightly icteric, and general observations reveal a pulse rate of 128, respiratory rate of 24 and temperature of 38.8 degrees. Abdominal examination exhibits severe tenderness in the right upper quadrant with guarding, although there are no masses, nor any evidence of rigidity or rebound tenderness. Murphy's sign is negative. Blood tests taken on admission reveal neutrophilia and an elevated CRP.

The admitting doctor is concerned that the patient is exhibiting signs of sepsis, and orders blood cultures to attempt to identify the cause of the infection.

Given the likely diagnosis, which of the following organisms is most likely to be isolated on culture?

A. Campylobacter jejuni

B. Proteus mirabilis

C. Shigella dysenteriae

D. E-coli

E. Pseudomonas aeruginosa

Correct Answer:E-coli

Explanation:

The most likely diagnosis, in this case, is ascending cholangitis; a potentially life-threatening infection of the biliary system, arising due to bile stasis allowing for the colonisation of the tract with bacteria. The most common trigger for this stasis is choledocholithiasis (gallstones), although any pathology causing obstruction can potentially be implicated (such as biliary strictures, tumours etc...). The classic presentation is with Charcot's triad of clinical features, which consists of fever, jaundice, and right upper quadrant pain - the patient is displaying all of these, and this is therefore the most likely diagnosis.

E-coli is the most common causative organism identified in the setting of ascending cholangitis; as the name suggests, bacteria enter the biliary system by ascending from the gastrointestinal tract into the biliary system via the sphincter of Oddi. Other common culprits include Klebsiella species as well as Enterococcus.

Whilst Campylobacter jejuni and Shigella dysenteriae are both relatively common causes of gastrointestinal infection, neither frequently lead to the development of ascending cholangitis.

Pseudomonas aeruginosa is a pathogen that most frequently causes disease of the respiratory system; it is not a common cause of ascending cholangitis. The same is true of Proteus mirabilis; this pathogen normally affects the urinary tract.

Further reading:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5823698/

Question:

A 78-year-old woman presents to the emergency department with painless, sudden loss of vision in her right eye. This started six hours earlier when she suddenly saw "wavey lines" followed by a complete loss of her vision. She reports a similar episode about a month ago, which resolved within seconds.

She has a past medical history of osteoarthritis, hypercholesterolemia, hypertension, type 2 diabetes mellitus and stable angina. She usually wears glasses for reading and also has bilateral nuclear cataracts. Her medications include metformin, atorvastatin, atenolol, amlodipine, aspirin, paracetamol and glyceryl trinitrate.

Her vitals are as follows: temperature 37.2°C, HR 82bpm, BP 153/75 mmHg and SpO2 97% on room air. Her visual acuity is recorded as 20/30 in the left eye and no perception of light (NPL) in the right. Fundoscopy reveals a pale, swollen retina in the right eye with a normal optic disc. Neurological examination is otherwise normal. Cardiovascular examination reveals a right carotid bruit. An ECG is requested, which is normal with no evidence of ischaemia.

What is the most appropriate initial investigation?

A. Carotid duplex ultrasonography

B. Temporal artery biopsy

C. CT head

D. Echocardiogram

E. Vasculitis screen

Correct Answer:Carotid duplex ultrasonography

Explanation:

The most likely diagnosis is a central retinal artery occlusion (CRAO) - the sudden occlusion of the artery supplying the inner retina leading to hypoperfusion of the retina, hypoxic damage, retinal cell death and visual loss. This patient has significant risk factors for atherosclerosis and evidence of a right-sided carotid bruit, suggesting an embolic aetiology. Furthermore, her previous history of visual loss is suggestive of amaurosis fugax. In patients with CRAO, a thorough physical exam should be performed to identify an underlying cause. As this patient has evidence of right carotid bruit, there is likely underlying carotid stenosis. Therefore, the most appropriate investigation to offer this patient is carotid duplex ultrasonography (doppler).

A CT head is indicated in patients if a cerebrovascular accident (i.e. stroke, transient ischaemic attack, amaurosis fugax) is thought to be responsible for their visual impairment. However, as this patient does not report a history of any other neurological symptoms, and the remaining neurological examination did not reveal any localising signs, a cerebrovascular accident is an unlikely diagnosis.

A vasculitic screen including (ANA, ENA, ANCA, ACE) is typically recommended in younger patients if a vasculitic aetiology is suspected; it would not be suitable for this patient.

A temporal artery biopsy is considered the gold standard investigation for suspected giant cell arteritis (GCA). Whilst CRAO can be a presenting sign of GCA, she lacks any additional symptoms to suggest this as a likely diagnosis (e.g. myalgia, malaise, temporal headache, jaw claudication).

An echocardiogram can be used to evaluate the presence of mural thrombus, which is a key cardiac risk factor for retinal artery occlusion. Whilst echocardiography may be used in the workup of this patient, and as part of a holistic assessment, it is not the most appropriate initial investigation. This patient has clear signs of carotid artery stenosis, which should be diagnosed and managed urgently to reduce the risk of another embolic event. Furthermore, the ECG and physical examination do not point towards a cardiac pathology, suggesting this is not the most pressing investigation.

Further reading:

https://geekymedics.com/central-retinal-artery-occlusion/

Question:

A 35-year-old man presents to the emergency department with a five-day history of fever and productive cough. He has no past medical history. He is allergic to erythromycin.

On examination, he is alert and oriented; he has a heart rate of 70bpm, a respiratory rate of 22/min, and blood pressure of 110/79mmHg, and a temperature of 38.3ºC.

A chest X-ray shows consolidation in the right middle zone.

Bloods are requested and are demonstrated below:

Test Result Reference range

Haemoglobin 160 g/L (130 - 180)

Platelets 300 x 109 (140 - 400)

WBC 14.6 x 109/L (3.6 - 11.0)

Na+ 142 mmol/L (133 - 146)

K+ 4.0 mmol/L (3.5 -5.3)

Urea 6.5 mmol/L (2.5 - 7.8)

Creatinine 100 µmol/L (59 - 104)

CRP 47 mg/L (<5)

What is the most appropriate first-line antibiotic regimen for this patient?

A. IV amoxicillin/clavulanic acid (co-amoxiclav)

B. IV ceftriaxone

C. Oral clarithromycin

D. Oral amoxicillin

E. IV doxycycline

Correct Answer:Oral amoxicillin

Explanation:

Oral amoxicillin is the correct answer. The patient in the vignette has a CURB-65 score of 0. Therefore, based on the history, this patient has a low severity of community-acquired pneumonia (CAP) and does not require hospital admission. The antibiotic of choice for treatment is oral amoxicillin, a penicillin-type antibiotic.

The components of the CURB-65 score are as follows (each scoring 1 point):

C Confusion (abbreviated mental test score ≤ 8/10)

U urea > 7 mmol/L

R Respiration rate ≥ 30/min

B Blood pressure: systolic ≤ 90 mmHg and/or diastolic <= 60 mmHg

65 Aged ≥ 65 years

IV amoxicillin/clavulanic acid (co-amoxiclav) is commonly used in treating severe CAP (CURB score of 2 or more). The patient in the vignette has a CURB score of 0; treatment with amoxicillin alone is sufficient. Intravenous administration will also require hospital admission, which is unnecessary for this patient, who is low-risk.

Ceftriaxone is a third-generation cephalosporin that may be used to treat severe CAP (CURB score of 2 or more). The patient in the vignette has a CURB score of 0; treatment with amoxicillin alone is sufficient. Intravenous administration will also require hospital admission, which is unnecessary for this patient, who is low-risk.

Doxycycline is a tetracycline antibiotic that may be used to treat pneumonia. It may be used as an alternative for penicillin allergy patients. Although the patient in the vignette has an allergy to erythromycin, as there is no evidence of penicillin allergy, amoxicillin would be the first-line choice. Intravenous administration will also require hospital admission, which is unnecessary for the patient in the vignette as his CURB score is 0.

Clarithromycin is a macrolide antibiotic that may be used to treat pneumonia. It may be used as an alternative in patients with a penicillin allergy or in combination with amoxicillin in patients with more severe pneumonia. The patient in the vignette was known to be allergic to macrolide antibiotics (erythromycin). Therefore, this option would be inappropriate.

Further reading:

https://www.nice.org.uk/guidance/ng138

Question:

A 56-year-old man is referred to the haematology department after a routine blood test revealed a haemoglobin of 195 g/L (130 – 180 g/L). Upon further questioning, it is revealed that he has been suffering from headaches for the past 6-months and itchy skin after having a hot bath. He has no significant past medical history and is not currently taking any medications. The patient does not smoke or drink alcohol.

On examination, the patient appears plethoric. Cardiac, respiratory, and abdominal examinations are all normal.

Observations are all within normal limits.

Blood test show:

Hb 195 g/L (130 – 180 g/L)

Haematocrit 0.6 L/L (0.40 – 0.54 L/L)

WCC 5 x 109/L (3.6 – 11.0 x 109/L)

Platelets 250 x109/L (140 – 400 x109/L)

Erythropoietin 1.5 mU/mL (2.6-18.5 mU/mL)

What is the most likely underlying genetic aberration?

A. JAK2 kinase mutation

B. Deletion of chromosome 7

C. TET2 mutation

D. t(15;17) forming PML-RARA fusion protein

E. t(9;22) forming BCR-ABL fusion protein

Correct Answer:JAK2 kinase mutation

Explanation:

This patient presents with an isolated polycythaemia with raised haematocrit and suppressed erythropoietin which points towards a myeloproliferative neoplasm in this case polycythaemia vera (PV). This is supported by the history of headaches and itchy skin after exposure to heat which is classically associated with PV. The most common underlying genetic aberration in PV is the JAK2 kinase mutation (specifically V617F).

TET2 is another mutation associated with PV but is less common than JAK2 kinase mutation (15% of patients vs >95% of patients with JAK2 kinase mutation).

t(9;22) forming BCR-ABL fusion protein is classically associated with chronic myeloid leukaemia but is also implicated in acute lymphoblastic leukaemia.

t(15;17) forming PML-RARA fusion protein is the chromosomal aberration which underlies acute promyelocytic leukaemia (a sub-type of acute myeloid leukaemia).

Deletion of chromosome 7 can be found in myelodysplastic syndrome and acute myeloid leukaemia but not polycythaemia vera.

Further reading:

https://cks.nice.org.uk/topics/polycythaemia-erythrocytosis/diagnosis/diagnosis/

Question:

A 56-year-old woman presents to the GP with a chronic progressive eczematous lesion arising from the right nipple. There is a lump under the areola and it has bled several times. She has felt stony hard lumps under her armpit and has experienced significant weight loss.

Imaging of the breast is performed, which shows a lesion under the nipple. A biopsy is taken.

What are the most likely tumour characteristics?

A. High-grade, oestrogen-receptor negative and progesterone-receptor negative

B. Low-grade, oestrogen-receptor negative (ER-) and progesterone-receptor negative (PR-)

C. Low-grade, oestrogen-receptor positive (ER+) and progesterone-receptor positive (PR+)

D. High-grade, oestrogen-receptor positive (ER+) and progesterone-receptor negative (PR-)

E. High-grade, oestrogen-receptor positive (ER+) and progesterone-receptor positive (PR+)

Correct Answer:High-grade, oestrogen-receptor negative and progesterone-receptor negative

Explanation:

This patient most likely has a metastatic Paget's disease of the breast. Paget's disease of the breast is a rare type of cancer of the nipple-areola complex presenting as an eczematous lesion of the nipple. It is often associated with an underlying in-situ or invasive carcinoma of the breast

These breast tumours are most likely to be high-grade, oestrogen receptor-negative (ER-) and progesterone receptor-negative (PR-).

Further reading:

https://patient.info/doctor/pagets-disease-of-breast

Question:

A 25-year-old male presents to his GP with complaints of an itchy lower back and elbows for the last 3 weeks. The symptoms have been present previously and generally worsen in colder weather. However, this is the first time he has sought medical attention. He states that his mother and father have the same problem but do not adhere to treatment. He has no past medical or surgical history.

Physical examination reveals several well-circumscribed red papules with a silvery-white scale on his lower back and the extensor surfaces of both elbows.

Which of the following is the most likely diagnosis?

A. Lichen planus

B. Plaque psoriasis

C. Dermatitis herpetiformis

D. Bullous pemphigoid

E. Contact dermatitis

Correct Answer:Plaque psoriasis

Explanation:

This young patient has signs and symptoms consistent with plaque psoriasis – a chronic and recurrent disease characterised by well-demarcated papules and plaques that have a silvery scale. Other features like the Auspitz sign (bleeds from minute points when the scale is removed) can also be seen. Commonly affected areas include extensor surfaces of the arms, lumbar spine, scalp and nails. A biopsy is usually reserved to confirm atypical cases, with clinical examination typically being sufficient for diagnosis in the primary care setting.

Contact dermatitis refers to cutaneous inflammation caused by an external agent. The above patient has not had any recent exposure to external agents. Additionally, the distribution of lesions in the above patient is more consistent with plaque psoriasis.

Bullous pemphigoid is an autoimmune blistering disease that typically affects older patients, presenting with tense, fluid-filled bullae and severe pruritus.

Dermatitis herpetiformis is a skin disease characterised by grouped vesicles or papules that have severe pruritus, burning or stinging. Of note, it is strongly associated with coeliac disease.

Lichen planus typically presents with lesions on flexural surfaces of the skin or on mucous membranes. The lesions are typically papular and pruritic. Of note, lichen planus is associated with hepatitis C virus. Its presentation in patients with risk factors should, therefore, prompt serological testing.

Further reading:

https://patient.info/doctor/chronic-plaque-psoriasis

Question:

A 25-year old woman presents to her GP with a flare-up of her eczema, which was initially diagnosed when she was a teenager but has so far been controlled with regular emollient use. Over the past two weeks, it has become incessantly itchy and red during the day, and her prescribed emollients no longer seem to be helping with her symptoms.

On examination, there are widespread areas of dry skin over her forearms, hands and calves. The skin is red with clear excoriation marks and bleeding points from the itching. On her hands, there is skin thickening and cracking. There are no pustules or obvious areas of infection, and she is apyrexial with stable observations.

Apart from her eczema, she has a past medical history of asthma, for which she uses a combination of salbutamol and beclomethasone inhalers. She has no known drug allergies.

What would be the most appropriate management of this patient?

A. Refer to hospital, swab the skin and prescribe flucloxacillin

B. Prescribe chlorphenamine

C. Prescribe a potent topical corticosteroid

D. Prescribe an oral corticosteroid

E. Prescribe a different emollient and review in 1 week, advising to avoid triggers

Correct Answer:Prescribe a potent topical corticosteroid

Explanation:

The most appropriate management for this patient would be to prescribe a potent topical corticosteroid, such as betamethasone 0.1%, to be used on the affected areas. As she is already prescribed emollients and these are ineffective, the addition of a steroid should help to improve her symptoms. It is useful to categorise eczema based on the severity to determine the best management options. The presence of bleeding and cracking of the skin makes this more likely to be classified as severe rather than moderate eczema, which could be treated with a less potent topical corticosteroid such as betamethasone 0.025%. The absence of pustules and systemic symptoms such as fever and malaise makes this less likely to be infected eczema which may require antibiotic therapy and consideration of hospital referral. With the use of topical corticosteroids regular review is required, usually at around 3 months, and a step-down management plan put in place to manage symptoms. Emollient use should be reviewed and continued regularly, and if management is not controlling eczema a referral to dermatology should be arranged. Regular review is also useful to monitor for any infective signs, which can occur as a consequence of skin inflammation and cracking providing a route for infection. A non-sedating antihistamine may also be useful to relieve itching.

It would be incorrect to just prescribe chlorphenamine. Although antihistamines can help to relieve itching in eczema, this is a case of severe eczema topical corticosteroids are indicated to control the symptoms. An antihistamine may be appropriate to prescribe in addition to a steroid treatment, but as the symptoms are most prominent during the day and not reported to be affecting her sleep a non-sedating antihistamine (such as cetirizine) would be more appropriate.

The patient is currently on a regimen of emollients that are not working, and therefore it would be inappropriate to simply prescribe emollients and review in 1 week, advising to avoid triggers. It would be helpful to review her current emollients, but a step-up in her treatment to use of a topical corticosteroid is required. There may be triggers that would be useful to investigate and advise her to avoid as part of the management plan, but this would be in addition to further pharmacological treatment with corticosteroids.

Although corticosteroid use is indicated, a topical corticosteroid should be tried before prescribing an oral corticosteroid. If topical corticosteroids are unsuccessful an oral corticosteroid such as 30mg prednisolone could be prescribed for a trial period of around 1 week with follow-up review, but this may be more appropriate to be commenced following a dermatology referral.

It would be incorrect to refer to hospital, swab the skin and prescribe flucloxacillin. There should be a thorough investigation for any signs of infected eczema that can appear as areas of weeping and pustulation, or in extreme cases areas of vesicles and punched out erosions that coalesce to form denuded bleeding areas. Severe infections are also likely to cause systemic symptoms such as fever and malaise. There are no obvious infective signs at this stage, so antibiotics and hospital referral are not the first line of management of this stage. However, the patient should be warned to look out for signs of infection and seek medical help if they occur.

Further reading:

https://cks.nice.org.uk/topics/eczema-atopic/management/severe-eczema/

Question:

A 25-year-old woman presents to her GP with a 4-month history of fatigue and shortness of breath on exertion. She denies any chest pain, palpitations, cough, wheeze, altered bowel habit, large amounts of bleeding or weight loss. Her past medical history is significant only for appendicectomy at age 12. She drinks 1-2 glasses of wine per week and reports that her diet is "excellent", having followed a vegan diet for 3-years.

The examination is unremarkable with the exception of mild conjunctival pallor.

The results of the full blood count are shown:

Hb: 101 g/L (115-160)

MCV: 72 fL (76-96)

Plt: 226 x109/L (150-400 x109)

WCC: 6.9 x109/L (4-11 x109)

What is the most appropriate initial management step?

A. Oral ferrous fumerate

B. Intramuscular vitamin B12 (hydroxocobalamin) followed by oral vitamin B12

C. Oral folic acid

D. Blood transfusion

E. Intravenous iron

Correct Answer:Oral ferrous fumerate

Explanation:

This patient is presenting with features of anaemia. The full blood count shows microcytic anaemia (low Hb, low MCV), which is most likely due to iron deficiency anaemia (IDA).

In this patient, the most appropriate initial treatment is with oral ferrous fumerate. The aim of this treatment is to increase the patient's iron stores. and should be continued for 3 months after the Hb is back in the normal range. Ferrous fumerate's side effects include nausea, altered bowel habit and black stools (which may be mistaken for malaena).

It may also be important to investigate for a possible cause of a patient's IDA. NICE CKS (see further reading link) suggests 2-week-wait referral for patients aged over 60 with IDA to investigate for malignancy.

Intravenous iron is not used frequently for the management of IDA, and would require hospital attendance. There is nothing in the history to suggest that oral iron would be impractical for this patient.

Blood transfusion is used acutely to treat significant anaemia (NICE suggest a Hb level of 70g/L as a restrictive threshold for transfusion) . However, this would also require hospital attendance for this patient and this patient is not unwell enough to justify this.

Oral folic acid and intramuscular B12 are used to treat folate and B12 deficiency respectively. Whilst following a vegan diet is a risk factor for B12 deficiency, this patient has a microcytic anaemia. Folate and B12 deficiency would present with a megaloblastic, macrocytic anaemia.

Further reading:

https://cks.nice.org.uk/topics/anaemia-iron-deficiency/management/management/#referral

Question:

A 63-year-old lady presents to A&E in excruciating pain; she reports that this started around an hour ago, and appears to come and go in waves. When asked to localise the pain, she points to her right-hand side and states that it radiates down into her groin. She has felt extremely nauseous, but has not vomited, and is desperate for some medication to relieve the pain.

The patient informs you that she is currently undergoing chemotherapy for high-grade diffuse large B-cell lymphoma; she is now on her third round of treatment. Other than this, she takes no regular medications. Observations reveal an elevated pulse rate, but no fever, with normal blood pressure.

The clerking doctor is suspicious she may have renal colic and orders several investigations. Urinalysis reveals blood (++) but no protein, leukocytes or nitrites. FBC reveals no signs of neutropenia. An abdominal X-ray is taken in A&E, as a CT scan cannot be arranged; this is reported as showing no evidence of a stone within the urinary tract.

Blood tests reveal the following:

Na+ - 137 mmol/L

K+ - 5.7 mmol/L

Ca2+ - 2.0 mmol/L

Urea - 6.8 mmol/L

Creatinine - 72 μmol/L

The doctor tells the patient that her symptoms are likely to be a side effect of the chemotherapy she is receiving for her lymphoma; he asks her whether she was started on prophylactic medication before the regime was started.

Which of the following would have been appropriate to give to the patient before her chemotherapy regime as prophylaxis for the complications described above?

A. Cincalcet

B. Colchicine

C. Vincristine

D. Doxorubicin

E. Rasburicase

Correct Answer:Rasburicase

Explanation:

This patient is most likely suffering from a uric acid calculus secondary to tumour lysis syndrome. This arises most commonly due to some form of excessive cell turnover; classically in those with aggressive, high-grade malignancies, or those undergoing chemotherapy. In these scenarios, there is a high level of cell breakdown, meaning intracellular products are released in high quantities. Uric acid production will be high, explaining the stone formation, and potassium is also predominantly an intracellular ion; thus explaining the hyperkalemia on the blood results. Calcium classically falls in tumour lysis syndrome, as the phosphate released causes excessive binding with the ion, leading to reduced levels of free calcium within the blood.

Tumour lysis syndrome is usually managed prophylactically via the provision of xanthine oxidase inhibitors such as allopurinol, or drugs such as rasburicase, which act to convert uric acid into a non-active form that is more easily excreted. If the condition does develop, close monitoring of potassium levels is essential due to the risks associated with hyperkalemia.

Vincristine and doxorubicin are both components of the classic R-CHOP chemotherapy regime that is frequently used to treat non-Hodgkin's lymphoma - they do not protect against tumour lysis syndrome.

Colchicine is frequently given for acute gout, another condition that can arise due to excessive uric acid levels. However, the drug targets the inflammatory response rather than the excessive uric acid itself and is therefore not used as prophylaxis in hyperuricemia.

Cinacalcet is a calcimimetic drug that functions to activate the calcium-sensing receptor; in doing so, helping to reduce the production of PTH. It is often used in the setting of secondary hyperparathyroidism, or in those awaiting surgery for primary hyperparathyroidism.

Further reading:

https://patient.info/doctor/oncological-emergencies

Question:

A 34-year-old female presents to her GP with a 6-month history of episodic vertigo and hearing problems which have been getting worse. The patient describes several recent episodes in which it feels as though the room is spinning and she feels very nauseated. During these episodes, the patient reports also experiencing transient symptoms in her left ear which include a sense that ‘the volume has been turned down’ with regard to her hearing, a simultaneous high pitched ringing noise and a sense of pressure within the ear. The episodes typically last between 15-30 minutes, but more recently some have lasted an hour or two with the high pitched ringing lasting even longer. There is no clear trigger for these episodes which appear to occur at random. The patient denies any recent illness and feels otherwise well.

She has a past medical history of migraines, however, she has not experienced one in several years and takes no medication. There is no significant family history.

On examination, the patient’s vital signs are within normal limits. Inspection of the eyes reveals some horizontal nystagmus. Otoscopy is unremarkable. Rinne’s test is positive in the left ear and Weber’s test reveals lateralisation of sound to the right ear. Romberg’s test is positive. A cerebellar examination is unremarkable.

What is the most likely diagnosis?

A. Acute labyrinthintis

B. Multiple sclerosis

C. Acoustic neuroma

D. BPPV

E. Ménière's disease

Correct Answer:Ménière's disease

Explanation:

The most likely diagnosis is Ménière's disease which typically presents with a triad of vertigo, tinnitus and fluctuating hearing loss with a sensation of aural pressure. These symptoms are typically unilateral and occur episodically (lasting 20 minutes up to 12 hours), progressing over time to be more frequent and severe (bilateral symptoms may develop as the disease worsens).

Hearing loss is sensorineural in nature and needs to be confirmed with audiometry to reach a diagnosis. Individuals who suffer from migraines are thought to be at greater risk of developing the condition.

BPPV can also present with vertigo, however, this is typically triggered by sudden head movements such as turning over in bed. Episodes of vertigo in BPPV are also typically brief lasting 30 seconds to 1 minute. The absence of an obvious trigger, the prolonged duration of episodes and the presence of tinnitus/aural fullness all make Ménière's disease a much more likely diagnosis.

Acute labyrinthitis also typically presents with vertigo, however, the onset is typically sudden, severely debilitating and often preceded by a viral infection. Patients with labyrinthitis may also develop hearing loss and tinnitus, however, aural fullness is uncommon and much more characteristic of Ménière's disease.

Acoustic neuroma typically presents with progressive unilateral hearing loss, vestibular dysfunction and tinnitus. The episodic nature of the patient’s symptoms, horizontal nystagmus (typically associated with peripheral causes of vertigo) and sense of aural fullness are much more supportive of a diagnosis of Ménière's disease.

Multiple sclerosis can also present with vertigo, however, the presence of horizontal nystagmus and absence of any other neurological signs relating to other areas of the central nervous system make this diagnosis less likely.

Further reading:

https://cks.nice.org.uk/topics/menieres-disease/diagnosis/making-a-diagnosis/

Question:

A 56-year-old man presents to the GP complaining of problems with swallowing. He has noticed that larger pieces of food appear to get stuck, and it takes a great deal of effort to 'get them down'. This has been present for approximately 3 weeks, has not progressed, and affects solids only. He denies weight loss, any change in appetite, and has not noticed any abdominal pain or blood in his stools. He admits to having suffered from acid reflux for a number of years; he believes that this is likely to be linked to the fact that he is obese and has a poor diet, and has not presented to the GP about this.

The GP ascertains that the patient meets the criteria for a 2-week-wait referral, and refers him for an upper GI endoscopy via this pathway. This reveals the presence of salmon-pink extensions of mucosa located 3cm above the gastro-oesophageal junction; biopsies are taken from this region, which reveals the presence of goblet cells. The pathologist has reported that there are no features of pleomorphism and that the architecture of the cells appears to be normal. The consultant informs the patient that he does not have cancer, much to his relief, rather, his oesophagus shows signs of metaplasia, where one cell type differentiates into another.

Given the patient's history and endoscopy findings, which of the following changes is most likely to have occurred?

A. Replacement of cuboidal epithelium with stratified columnar epithelium

B. Replacement of pseudostratified squamous epithelium with columnar epithelium

C. Replacement of stratified squamous epithelium with columnar epithelium

D. Replacement of stratified squamous epithelium with cuboidal epithelium

E. Replacement of columnar epithelium with stratified columnar epithelium

Correct Answer:Replacement of stratified squamous epithelium with columnar epithelium

Explanation:

Barrett's oesophagus is a form of intestinal metaplasia that most commonly arises due to chronic acid reflux. The cellular trauma caused by the acid results in the replacement of stratified squamous epithelium (normal oesophagus epithelium) with columnar epithelium (normally found in the stomach and the remainder of the alimentary canal). The condition fits with the patient's history of prolonged dyspeptic symptoms; with the classic endoscopy appearance often described as areas of salmon-pink mucosa. Goblet cells are usually only found within columnar epithelium; the presence of these on histology makes Barrett's extremely likely.

Replacement of columnar epithelium with stratified columnar epithelium is the opposite of the change that occurs in Barrett's oesophagus; this form of metaplasia occurs most commonly in the transformation zone of the cervix.

Pseudostratified squamous epithelium is located within the respiratory tract; it is not located within the oesophagus and is therefore not involved in the metaplasia that occurs in Barrett's oesophagus.

Cuboidal epithelium is located within the sweat, salivary and mammary glands; it is not implicated in Barrett's oesophagus.

Further reading:

https://patient.info/doctor/barretts-oesophagus-pro

Question:

A 73-year-old woman is diagnosed with type 2 diabetes having attended a well-woman clinic. She has an HbA1c of 51 and has no major comorbidities. Previously she worked as a school teacher, but she has recently retired. She drinks socially and does not smoke.

What is the most appropriate initial intervention?

A. Metformin

B. Gliclazide

C. Refer to a diabetes clinic

D. Lifestyle advice

E. Insulin

Correct Answer:Lifestyle advice

Explanation:

Lifestyle advice and dietary control should be initiated in all patients with type 2 diabetes, with or without additional pharmacological management. However, lifestyle changes should be attempted before commencing pharmacological therapy.

Metformin or gliclazide would be reasonable, but given her low HbA1c lifestyle advice and dietary control would probably be sufficient.

She does not require insulin or referral to a diabetes clinic.

Further reading:

https://www.nice.org.uk/guidance/ng28

Question:

An 18-year-old man attends A&E with his partner, complaining of testicular pain. The pain began around 3 hours ago; it was initially an 'aching' feeling, which has gradually increased in severity. The patient has noticed that his scrotum has become hot and swollen, particularly on the left side. He denies any dysuria and penile discharge, although he believes that the testicular pain does increase slightly on urinating.

The patient has no past medical history of note and takes no regular medication. A sexual history reveals that he and his partner have only just started their relationship, and have been having regular unprotected sexual intercourse. Both deny any history of sexually transmitted infections.

The doctor clerking the patient believes that the history is likely to be indicative of orchitis, but is concerned about the possibility of testicular torsion.

Which of the following clinical signs may be relevant in helping to make a decision about the origin of this patient's testicular pain?

A. Prehn's sign

B. Boas' sign

C. Kehr's sign

D. Hutchinson's sign

E. Courvoisier's sign

Correct Answer:Prehn's sign

Explanation:

This patient has presented with a typical history of orchitis - inflammation of the testicles. The condition usually arises due to either a urinary tract infection (more commonly in older patients) or due to sexually transmitted diseases such as chlamydia or gonorrhoea. In this scenario, given the patient's age and history of unprotected sex with a new partner, a sexually transmitted infection is the most likely. Whilst neither has admitted to having a previous STI, chlamydia, in particular, can be asymptomatic and can be transmitted without either party knowing.

Prehn's sign refers to a reduction in testicular pain upon elevation of the scrotum; this is positive (the pain is reduced) in the setting of orchitis or epididymitis but negative in the more serious testicular torsion. Should elevating the testicles relieve this patient's pain, it would increase the likelihood that the presentation is that of orchitis rather than torsion. However, the sign should not be relied upon to exclude testicular torsion; all testicular pain is torsion until proven otherwise, and surgical exploration should be carried out if there is any diagnostic doubt.

Kehr's sign refers to acute shoulder tip pain, arising due to irritation of the diaphragm. It is classically associated with splenic rupture; blood within the peritoneal cavity can come into contact with the diaphragm and cause referred pain to the shoulder tip via the phrenic nerve.

Courvoisier's sign (derived from Courvoisier's law) is the presence of a palpable enlarged gallbladder in combination with jaundice. This indicates that the cause is unlikely to be gallstones and that a neoplasm obstructing the biliary system (classically pancreatic cancer) should be considered most likely.

Hutchinson's sign refers to vesicles on the tip of the nose, indicating the presence of herpes zoster ophthalmicus.

Boas' sign refers to altered sensation below the right scapula. This can be present in the setting of acute cholecystitis, although its sensitivity is limited.

Further reading:

https://patient.info/doctor/epididymo-orchitis-pro

Question:

You are a junior doctor working in general practice. You are reviewing a 54-year-old lady who reports a 5-month history of intermittent tingling sensation and numbness to her index finger, middle finger and lateral half of her ring finger. You suspect she has carpal tunnel syndrome.

Which nerve is most likely to be affected to cause these symptoms?

A. Radial nerve

B. Median nerve

C. Ulnar nerve

D. Musculocutaneous nerve

E. Axillary nerve

Correct Answer:Median nerve

Explanation:

The median nerve is formed from the C8/T1 nerve roots and from the lateral and medial cords of the brachial plexus. It provides sensation to the lateral two-thirds of the palm as well as the index, middle and lateral half of the ring finger. Carpal tunnel syndrome occurs when the aspect of the median nerve passing through the carpal tunnel is compressed, commonly causing a sensory disturbance, pain or weakness the distribution of the median nerve.

The radial nerve innervates the triceps, extensor digitorum and abductor pollicis longus, facilitating extension at the elbow and fingers and abduction at the thumb.

The axillary nerve comes from the posterior cord of the brachial plexus and innervates the deltoid, providing abduction of the arm. It also facilitates sensation to the 'regimental badge patch' on the lateral aspect of the upper limb.

The musculocutaneous nerve provides sensation to the lateral forearm and innervates the biceps, allowing flexion at the elbow.

The ulnar nerve innervates flexor carpi ulnaris, the first dorsal and second palmar interosseous, adductor pollicis and the ulnar aspect of flexor digitorum profundus. It facilitates abduction of the pinky finger and index finger, adduction of the index finger and adduction of the thumb. It also flexes the distal phalanx of the ring and pinky fingers.

Further reading:

https://patient.info/doctor/carpal-tunnel-syndrome-and-median-nerve-lesions

Question:

A 70-year-old man is admitted to the acute medical unit (AMU) following an unwitnessed fall at home. He is confused and cannot provide a history. On examination, he is clinically dehydrated with dry mucous membranes and reduced skin turgor. A catheter is inserted to monitor urine output and intravenous fluids are started.

Below are the patient's urea and electrolyte (U&E) levels on admission:

Urea and electrolytes Result Normal range

Sodium 142 mmol/L 135 - 145

Potassium 7.2 mmol/L 3.5 - 5.0

Urea 34.0 mmol/L 2.5 - 8.0

Creatinine 400 μmol/L (baseline 80 μmol/L) 60 - 110

Estimated GFR 12.9 ml/min/1.73m2 > 60

What is the most appropriate next step in the management of this patient?

A. Repeat U&Es and wait for result

B. Start intravenous insulin-glucose infusion

C. Give nebulised salbutamol

D. Refer patient for urgent haemodialysis

E. Give 10% calcium gluconate intravenously

Correct Answer:Give 10% calcium gluconate intravenously

Explanation:

This patient has a stage 3 acute kidney injury (AKI) with a creatinine > 3 times its baseline value. Acute kidney injury is an acute decline in glomerular filtration rate, which may have pre-renal, renal and post-renal causes. This question does not include enough detail to determine the cause, but plausible options include dehydration (pre-renal), rhabdomyolysis secondary to a long lie (renal) or acute urine retention (post-renal).

A possible complication of acute kidney injury is hyperkalaemia which must be identified and treated urgently to prevent, amongst other symptoms, cardiac arrhythmias, which can progress to cardiac arrest. This patient is hyperkalaemic and should have an urgent ECG to check for loss of P waves and tall tented T waves. In severe hyperkalaemia, the patient's ECG may resemble a sine wave which is pre-terminal and heralds cardiac arrest.

The first step in management should be to stabilise the myocardium with 10% calcium gluconate IV. This is given in 10 ml doses, with the patient's heart rhythm being checked in between each dose.

Hyperkalaemia on a blood test may be artefactual (e.g. abnormally high values such as 10 mmol/L or more), and it would be sensible to repeat the sample to check for this. However, this is not the most appropriate first step here as the patient is potentially at risk of cardiac arrhythmias if calcium gluconate is not given urgently.

Starting an insulin-glucose infusion and nebulised salbutamol are both methods of drawing potassium ions back into cells and will reduce the patient's serum potassium levels. They are sensible steps in managing hyperkalemia, but calcium gluconate should always be given first to stabilise the myocardium. When moderate/severe hyperkalaemia is identified, senior help should always be called for as hyperkalaemia which is refractory to medical treatment, may require urgent haemodialysis.

Further reading:

https://geekymedics.com/hyperkalaemia/

Question:

A 12-year-old boy presents to his GP with a 3-day history of multiple golden-crusted lesions around his mouth and his cheeks, which are mildly itchy. Before crusting, the lesions appeared as thin-walled vesicles. This is his third presentation in the last six months, with the same complaint. On examination, satellite lesions are seen around his chin and neck. His temperature is 37.3°C.

What is the most appropriate investigation?

A. Blood cultures

B. Full blood count

C. Microscopy of skin scrapings

D. No investigation required as diagnosis is purely clinical

E. Swab for culture and sensitivity

Correct Answer:Swab for culture and sensitivity

Explanation:

Impetigo can start as tiny pustules or vesicles that rapidly become honey-coloured crusted plaques (or golden-coloured like in this stem). They are mostly present around the mouth and nose. Non-bullous impetigo is caused by Staphylococcus aureus, Streptococcus pyogenes or a combination of both. Impetigo is usually a clinical diagnosis and investigations are not needed. Swabs (of exudate from a moist lesion or de-roofed blister) for culture and sensitivities should be considered in cases which are persistent despite treatment, recurrent, or widespread. The possibility of methicillin-resistant Staphylococcus aureus (MRSA) should be also considered. As this is the boy's third presentation with impetigo within the last 6 months, the most appropriate investigation is to take a swab for culture and sensitivity.

Whilst a full blood count may demonstrate raised inflammatory markers, it would not reveal the causative organism or aid in the management of the infection.

Blood cultures are carried out where systemic disease is suspected i.e. sepsis. As there are no systemic symptoms given in this question and the patient is afebrile, there are no need for blood cultures.

Microscopy of skin scrapings is most often used to diagnose fungal skin infections, such as tinea corporis (ringworm). Scrapings are mounted in potassium hydroxide, and examined under a light microscope for hyphae and spores.

Further reading:

https://cks.nice.org.uk/topics/impetigo/diagnosis/diagnosis/

Question:

A 5-day-old baby on the special care baby unit has stopped tolerating feeds over the last two days, after initial successful bottle feeding. Today there have been two episodes of bile-stained vomiting and blood-stained stool present in her nappy.

On examination, she is irritable and floppy, with global tenderness on abdominal palpation, notable abdominal distension and a palpable abdominal mass. Bowel sounds are reduced. Her basic observations demonstrate a heart rate of 100bpm, blood pressure of 70/40mmHg and temperature 36.8⁰C.

She was born at 35 weeks by spontaneous vaginal delivery with a birth weight of 2.4kg and 5-minute APGAR score of 7. She is being bottle-fed. She passed meconium within 12 hours of birth.

What is the most likely diagnosis?

A. Sepsis

B. Hirschprung's disease

C. Intussusception

D. Necrotising enterocolitis

E. Meconium ileus

Correct Answer:Necrotising enterocolitis

Explanation:

The most likely diagnosis is necrotising enterocolitis, in which newborn infants (particularly if they are pre-term and have a low birth-weight) have a poor blood supply to the bowel that leads to ischaemia, necrosis and potentially perforation. Classically the infant will develop signs of obstruction (as described in this case), such as vomiting (that may be bile-stained), abdominal distension and resistance to feeding. Necrosis of the bowel can also lead to the appearance of bloody mucoid stool in the nappy. It is a surgical emergency, and urgent management is required to prevent any bleeding from bowel perforation resulting in haemorrhagic shock. If identified, infants should receive an NG tube, IV fluids and antibiotics; 20-40% will require surgery, either due to a failure to respond to medical management or if perforation is suspected.

Hirschsprung's disease is incorrect. Although it typically presents in the first year of life with abdominal distension and bile-stained vomiting, there is usually a failure to pass meconium in the first 24 hours due to the absence of ganglion cells in the myenteric plexus of the large bowel causing a functional obstruction. This is usually followed by an ‘explosive’ passage of stool. In this case, there is no history of delayed meconium passage and blood-stained stool is more typical of necrotising enterocolitis.

Intussusception involves ‘telescoping’ of proximal bowel into a distal segment and is also a cause of bowel obstruction in infants. It usually peaks at around 6-9 months and is much more common in male infants. Although it can produce a similar picture to necrotising enterocolitis it is less likely to occur in newborns and typically produces a characteristic ‘sausage-shaped mass’ in the right upper quadrant with ‘red-currant jelly’ like stool. This can be difficult to distinguish from the blood-stained stool of necrotising enterocolitis but usually occurs later in the course of clinical symptoms with a preceding passage of mucus.

Sepsis is important to consider in this baby given the risk of perforation associated with necrotising enterocolitis. However, it is a general diagnosis and necrotising enterocolitis is a more specific explanation for her condition that will guide appropriate investigation and management.

Meconium ileus is unlikely given that she passed meconium within the first 12 hours of life. Meconium is the first passage of stool, and delay in the passage may be the result of neurological issues with the bowel, or in conditions such as cystic fibrosis, the meconium can fail to pass due to the thick consistency causing a functional obstruction.

Further reading:

https://patient.info/doctor/necrotising-enterocolitis

Question:

A 56-year-old man with a previous medical history of known bowel cancer attends the Emergency Department with a cough productive of green sputum and associated shortness of breath. The cough has been worsening over the past three days, during which time he has described episodes of shaking at night-time. He is perfectly lucid and shows no evidence of confusion. He has no chest pain.

He has no known drug allergies. He currently takes amlodipine for hypertension and atorvastatin for high cholesterol. He has had 3 cycles of chemotherapy, the last one being 10-days ago.

On examination, he is cool to the wrists and has right basal crepitations on auscultation. His abdomen is soft and non-tender. Observations show: Heart rate 100 bpm, regular; BP 100/80 mmHg; RR 24; Sats 95% on room air; Temp 38.3 oC.

Bloods show: WCC 2.3; Neuts 0.48; Hb 95; Plts 78; Ur 8.0; Creat 115.

Bearing in mind the likely diagnosis, what is the most appropriate initial antibiotic choice for this patient?

A. IV Piperacillin / tazobactam 4.5 g QDS

B. IV Co-amoxiclav 1.2 g TDS and IV Clarithromycin 500 mg BD

C. IV Co-amoxiclav 1.2 g TDS

D. PO Amoxicillin 500 mg TDS

E. IV Amoxicillin 1 g TDS

Correct Answer:IV Piperacillin / tazobactam 4.5 g QDS

Explanation:

The important thing to recognise here is that the patient has neutropenic sepsis. The CURB indicators are provided as a distractor and all that is required for you to know to answer the question is that the blood results is that the patient is neutropenic and has evidence of infection.

The fact that he has a RR < 30, normal saturations and a BP that doesn’t score on the CURB-65 criteria will not alter your answer here. Patients with neutropenic sepsis can become unwell very quickly and as such are given high strength and broad-spectrum antibiotics from the moment the diagnosis is suspected.

Tazocin (piperacillin and tazobactam) is a broad-spectrum antibiotic that should be issued for neutropenic sepsis.

Further reading:

https://www.nice.org.uk/Guidance/CG151

Question:

A 22-year-old student presents to the GP, concerned about a rash that he has developed. The lesions first appeared on his hands and the bottoms of his feet, but have now spread to cover his trunk. He has now noticed wart-like lesions around his genitals which are painless, but are making him feel self-conscious; he is concerned that he may have a sexually transmitted infection.

He has felt unwell for a few days, with non-specific symptoms including fever and headache, and is hoping for some form of treatment to relieve his symptoms. Upon further questioning, he reveals that he has had casual unprotected sexual intercourse with numerous partners in the last few months, most being individuals met on nights out. He has been treated for a chlamydia infection 6 months previously and reveals that he also believes he had a more recent STI; he developed a painless ulcerated lesion on his penis, which forced him to abstain from sex due to the embarrassment. He did not seek medical advice for this and was relieved that it simply resolved on its own.

The GP, like the patient, is concerned about the presence of a sexually transmitted infection. He counsels the patient about the practice of protected sex and attempts to refer him to the nearby sexual health clinic. The patient does not seem keen to attend, as he is worried about the prospect of his previous partners being contact traced.

Considering the likely diagnosis, which of the following complications may arise if the patient does not seek treatment for the condition?

A. Loss of rod cells within the retina

B. Renal cyst development

C. Demyelination of the dorsal columns

D. Chronic arthralgia

E. Development of nasal polyps

Correct Answer:Demyelination of the dorsal columns

Explanation:

This patient is exhibiting signs of secondary syphilis; a sexually transmitted infection caused by the spirochaete Treponema pallidum. Syphilis can present with a wide range of symptoms, with the presentation described in stages; different symptoms develop depending on the length of the time the disease has gone untreated.

The main feature of primary syphilis is the development of a chancre; a solitary painless ulcer on the genitals; the patient's description of this makes the diagnosis very likely. If untreated, secondary syphilis can develop, most commonly 4-12 weeks after the initial chancre. Symptoms of this stage are largely systemic flu-like symptoms and dermatological features. A widespread maculopapular rash is common, and condyloma lata are wart-like lesions that can also be present.

If this patient was to refuse treatment, he would be at risk of developing tertiary syphilis. Whilst this can take many years to develop, distant organs can become involved, and the disease can be severe. Granulomatous lesions known as 'gummas' can develop within a number of organs, and the condition can affect the cardiovascular system, causing pathologies such as aortic root inflammation and possibly mycotic aneurysms. Neurosyphilis refers to the involvement of the nervous system; classic features include demyelination of the dorsal columns (referred to as 'tabes dorsalis') and the Argyll-Robertson pupil (bilaterally small pupils that do not constrict to light but will accommodate).

Nasal polyps most commonly arise due to chronic inflammation within the lining of the nasal passageway; they are more common in those with chronic sinus disease, those with adult-onset asthma, or diseases such as cystic fibrosis. They are not a known complication of syphilis.

The development of chronic arthralgia is more commonly associated with the tertiary stage of Lyme's disease; another condition caused by a spirochaete (Borellia burgdorferi).

Tertiary syphilis is not known to cause renal cyst development; the kidneys can be involved, but this will likely be in the form of gumma formation within the organs.

Retinitis pigmentosa is a disease that can cause the loss of rod cells within the retina; patients often develop problems with night vision and eventually progress to chronic visual loss.

Further reading:

https://cks.nice.org.uk/topics/syphilis/

Question:

A 66-year-old man presents to the emergency department with severe shortness of breath. For the past year, he has been experiencing dyspnoea when walking up the stairs, as well as wheezing and coughing. On questioning, he has been sleeping in a chair due to shortness of breath when lying flat in bed. He has not seen his GP in the last year.

On examination, there are bibasal crackles in the lungs and bilateral pitting oedema up to the knee.

His observations are:

Oxygen saturation: 92% on room air

Respiratory rate: 22 breaths per minute

Heart rate: 75 beats per minute

Blood pressure: 145/95 mmHg

Temperature: 37.5 °C

What is the most appropriate initial treatment?

A. Oxygen and nebulised salbutamol

B. Oral furosemide

C. Oxygen and IV furosemide

D. Oxygen and oral prednisolone

E. Nebulised mucolytic

Correct Answer:Oxygen and IV furosemide

Explanation:

This patient presents with heart failure features, including shortness of breath, bibasal crackles, pitting oedema and cardiac asthma. Patients with heart failure may also report sleeping with several pillows at night or sleeping in an upright position due to orthopnoea. Given the acute presentation of shortness of breath and low oxygen saturations, the most appropriate initial management for this patient is oxygen and IV furosemide.

Oral furosemide may be used in the treatment of heart failure, however, it is not the most appropriate treatment in the acute setting. Furthermore, this patient has low oxygen saturations and, therefore, also requires oxygen.

Oxygen and nebulised salbutamol are used in the treatment of asthma attacks – salbutamol does not play a role in the management of heart failure.

Oxygen and oral prednisolone are used in the treatment of exacerbations of chronic obstructive pulmonary disease (COPD) – prednisolone does not play a role in the management of heart failure.

Nebulised mucolytics are used to break down mucus in conditions such as COPD, pneumonia, cystic fibrosis and bronchiectasis. The cough in heart failure is caused by fluid rather than mucus build-up in the lungs and therefore is not treated with mucolytics.

Further reading:

https://geekymedics.com/acute-heart-failure/

Question:

A 5-year-old child is brought to the GP by his mother, as he has developed a fever and an itchy rash over the last four days.

On examination, there is a wide-spread erythematous rash on the chest, back, and face with fluid-filled blisters and some scabbed-over lesions. On questioning, some children at school have had a similar rash.

Given the most likely diagnosis, how is the causative pathogen spread?

A. Direct contact, indirect contact via contaminated objects, and respiratory droplets

B. Direct contact and indirect contact via contaminated objects

C. Direct contact only

D. Toxins present in food

E. Faeco-oral spread

Correct Answer:Direct contact, indirect contact via contaminated objects, and respiratory droplets

Explanation:

The description of the rash and age of the patient are highly suggestive of chicken pox, which is caused by the varicella zoster virus (VZV). Chickenpox is spread through direct contact, indirect contact via contaminated objects, and respiratory droplets. Therefore, direct contact only and direct contact and indirect contact via contaminated objects are incorrect. Transmission of VZV does not occur through faeco-oral spread or toxins present in food.

Further reading:

https://geekymedics.com/chickenpox/#:~:text=Chickenpox%20is%20an%20acute%20disease,associated%20with%20fever%20and%20malaise.&text=The%20incubation%20period%20is%20typically,be%20up%20to%2021%20days.&

Question:

A 72-year-old patient is brought to A&E by her daughter after she began complaining of a variety of symptoms. Around an hour ago, she complained of a sudden onset of abnormal sensation affecting her left side and her face. The patient has also developed uncontrollable hiccups, which she is finding quite distressing. The patient is known to have hypertension and hyperlipidaemia, both of which are currently being managed via medical therapy.

The admitting doctor carries out a full neurological examination, which reveals abnormal pain and temperature sensation on the right-hand side of the body and also of the left-hand side of the face. The patient exhibits past-pointing when asked to perform the finger-nose test with her left hand, but not her right. The patient has left-sided ptosis and her pupils appear different sizes. Nystagmus is detected when eye movements are tested.

Given the patient's presentation, there is significant concern amongst the medical team and further investigations are ordered.

Which of the following investigations would be the most appropriate to carry out first?

A. Lumbar puncture

B. MRI head

C. Echocardiogram

D. Contrast head CT

E. Non-contrast head CT

Correct Answer:Non-contrast head CT

Explanation:

The most likely diagnosis, in this case, is the lateral medullary syndrome; a clinical entity arising from the infarction of a portion of the medulla oblongata. The most common cause is an occlusion of the posterior inferior cerebellar artery (PICA) which supplies this part of the brain, although other rarer causes of stroke (carotid artery dissection, vasculitis etc...) are also possible. The condition can result in a complex neurological presentation due to the many functions of the medulla.

Classical features include:

Abnormal pain and thermal sensation of trunk and limbs contralaterally

Impairment of pain and thermal sensation over the ipsilateral face

Ipsilateral Horner syndrome (likely to be present in this patient as identified by the ptosis and probable miosis)

Ipsilateral limb ataxia

Dysphagia

Nystagmus

Hiccups are another relatively common manifestation of the condition, although these can also arise due to other pathologies, such as abdominal disease, causing diaphragmatic irritation.

As with any form of ischaemic stroke, the most important initial investigation is a non-contrast head CT in order to rule out haemorrhage; this is more appropriate than a contrast CT scan, as blood will appear hyperdense on the scan if present.

Once confirmed, assuming the condition has arisen due to an occlusion of the PICA, management is as per any case of ischaemic stroke; the possibility of thrombolysis should be considered, with antiplatelet therapy and management of vascular risk factors being important parts of longer-term management.

An MRI head would be more appropriate in a less acute scenario; whilst it allows for more detailed imaging of the brain, including any tissue damage, delays in carrying out the scan mean that in most centres, CT remains the first priority in suspected stroke.

A lumbar puncture would not be appropriate in this setting; the patient has signs of likely stroke and may have raised intracranial pressure. Carrying out the procedure in this scenario may cause brain stem herniation.

An echocardiogram can sometimes be used in the setting of a stroke to screen for a mural thrombus that may have resulted in an embolism affecting the brain. It is not the first priority in this scenario, however.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK551670/

Question:

A 45-year-old woman is brought to A&E with a 2-day history of cough, fevers and shortness of breath. She is otherwise fit and well. On examination, she is tachypnoeic, tachycardic, hypoxic and hypotensive. On auscultation, she has coarse crepitations at the base of her right lung. Despite treatment with 2000ml of normal saline and IV antibiotics, she remains hypotensive with a blood pressure of 75/40 mmHg and a heart rate of 130.

What would be the most appropriate treatment for her hypotension?

A. Blood transfusion

B. Inotropes

C. Fluids

D. Vasopressors

E. Thrombolysis

Correct Answer:Vasopressors

Explanation:

This lady has distributive shock due to chest sepsis. Her blood pressure hasn’t improved despite antibiotics and fluids. She requires vasopressors to maintain her blood pressure.

Further fluids are likely to cause harm. There is nothing to suggest bleeding so she doesn’t require blood as volume replacement.

Inotropes are used in the treatment of cardiogenic shock.

Thrombolysis would be the treatment of choice for a pulmonary embolism, however, she has another explanation (pneumonia and sepsis) for her symptoms.

Further reading:

https://lifeinthefastlane.com/ccc/shock-ddx/

Question:

You are the paediatric SHO on-call. You are called to assess a baby delivered 5 minutes ago with increased work of breathing. When you arrive, the obstetric SHO informs you that the mother was 42 weeks gestation at delivery. She states that dark green staining of the amniotic fluid was present, as well as instances of fetal bradycardia (evident from fetal monitoring) in the third stage of labour. The doctor also tells you that the mother has suffered from maternal hypertension throughout her pregnancy and has admitted to using cocaine and smoking tobacco despite the advice of her Obstetrician. On examination of the neonate, you note green staining of the skin, intercostal and subcostal recession, an APGAR score of 4 (mainly for laboured breathing and limpness) as well as peeling of the skin. You perform a range of investigations, including an umbilical arterial blood gas (that highlights an acidaemic picture, hypoxia and increased pCO2) and a chest x-ray (which shows patchy infiltrates bilaterally and diaphragmatic flattening).

What is the MOST LIKELY diagnosis?

A. Surfactant deficient lung disease

B. Neonatal sepsis

C. Meconium aspiration syndrome

D. Transient tachypnoea of the newborn

E. Congenital diaphragmatic hernia

Correct Answer:Meconium aspiration syndrome

Explanation:

The most likely diagnosis, in this case, is meconium aspiration syndrome. The greatest risk factor for this condition is post-term delivery. Other risk factors for meconium aspiration syndrome is varied, including maternal hypertension, oligohydramnios and maternal drug abuse (e.g. tobacco, cocaine). Clinical features for this condition include meconium-stained amniotic fluid, green-blue colouring of the baby’s skin at birth, limpness with an associated low APGAR score, respiratory distress, features of post-maturity (e.g. peeling of the skin) and bradycardia on fetal monitoring. Chest x-ray typically shows bilateral patchy infiltrates representing aspirated material. Arterial blood gas analysis may highlight a low pH, high pCO2 as well as hypoxia.

Surfactant deficient lung disease is associated with pre-term babies, not post-term as in this case.

Transient tachypnoea of the newborn is associated with caesarean section.

Congenital diaphragmatic hernia is associated with pulmonary hypoplasia and abdominal contents visible in the chest cavity on chest x-ray. Clinically, this condition presents with respiratory distress plus a scaphoid abdomen.

Neonatal sepsis would more likely present with a fever, tachycardia, cool peripheries, amongst others features.

Further reading:

https://patient.info/doctor/meconium-aspiration

Question:

A 56-year-old woman presents to the A&E department with an acutely painful right eye. She was sat watching TV at home when she experienced sudden onset eye pain and blurred vision. The episode began 3 hours ago, and she has since developed a headache and vomited twice.

She has a past medical history of hypertension managed with amlodipine 5mg and losartan 25mg. She also reports that she wears glasses for reading.

On examination, her right eye is red with an oedematous cornea and mid-dilated pupil that is unresponsive to light.

What is the most likely diagnosis?I

A. Cluster headache

B. Acute angle-closure glaucoma

C. Chronic open angle glaucoma

D. Anterior uveitis

E. Scleritis

Correct Answer:Acute angle-closure glaucoma

Explanation:

The most likely diagnosis is acute angle-closure glaucoma (AACG) - a sight-threatening condition that requires an emergency referral to ophthalmology for further assessment and management. The key features of AACG are headache, nausea ± vomiting and periocular pain. On examination, patients have a red eye, reduced visual acuity, corneal oedema and a fixed, dilated pupil.

Patients with cluster headaches typically present with a unilateral headache lasting 15-180 minutes. Whilst it may be associated with autonomic symptoms such as red-eye and lacrimation; there are typically other features including rhinorrhoea, eyelid swelling and aural fullness. This is also a less likely diagnosis as a cluster headache would not manifest with corneal oedema and pupil changes.

Anterior uveitis characteristically presents with progressive pain, red-eye and photophobia. Examination typically reveals a small, irregular pupil and conjunctival injection around the corneal limbus.

In scleritis, there is transmural inflammation of the sclera resulting in focal eye pain with tenderness to palpation of the eye. Patients describe the pain as boring and made worse by eye movement. Typically it is associated with an underlying systemic disorder.

Patients with chronic open-angle glaucoma do not typically experience symptoms until the disease is very advanced. Chronic open-angle glaucoma presents with painless, progressive peripheral visual loss.

Further reading:

https://cks.nice.org.uk/topics/glaucoma/diagnosis/ocular-hypertension-primary-open-angle-glaucoma/

Question:

A 51-year-old woman presents to her GP with palpitations. She has noticed that her periods have become less frequent and irregular, and she has had some hot sweats, which her partner has commented on. She has lost 2 kg in the past 2 months.

She has a past medical history of hypertension, for which she takes ramipril once daily. She has no known drug allergies and there is no family history of note.

She has a 30-pack-year smoking history. She currently works as a solicitor and notes that she has recently had difficulties at work due to irritability.

On examination, an irregularly irregular pulse and palmar erythema are noted. The neck examination is normal.

What is the most likely diagnosis?

A. De Quervains Thyroiditis

B. Grave's disease

C. Hashimoto's thyroiditis

D. Menopause

E. Drug-induced thyrotoxicosis

Correct Answer:Grave's disease

Explanation:

This patient is presenting with features of thyrotoxicosis. These include diarrhoea, weight loss, palpitations, heat intolerance, menstrual disturbance, and anxiety. On examination, you may find tachycardia (+/- irregular pulse), tremor, palmar erythema, sweating and eye features specific to grave's disease (ophthalmoplegia, exophthalmos).

Grave's disease is the most likely diagnosis in this patient. Her sex, tobacco use and age are all risk factors for the development of grave's disease, which is the most common cause of thyrotoxicosis. While the presence of diffuse goitre would almost certainly confirm the diagnosis, a normal neck exam does not preclude this diagnosis.

Menopause is a reasonable differential diagnosis for this patient's symptoms given her sex and age. However, the presence of likely AF and weight loss mean that a thyroid cause of her symptoms is more likely.

De Quervain's thyroiditis would initially present with features of thyrotoxicosis accompanied by fever, and thyroid pain and tenderness. It follows a natural history of hyperthyroidism followed by transient hypothyroidism.

Hashimoto's thyroiditis is a cause of hypothyroidism, which would present in the opposite way to this patient's symptoms.

Causes of drug-induced thyrotoxicosis include lithium and amiodarone. Ramipril is not a recognised cause.

In this patient, Grave's disease could be confirmed by thyroid function tests which would find:

Raised T4

Low TSH

Positive thyroid receptor antibodies (TRAb)

See further reading link for NICE summary of the management of hyperthyroidism.

Further reading:

https://www.nice.org.uk/guidance/ng145/resources/visual-summary-pdf-6965793901

Question:

A 58-year-old retired farmer presents with episodes of bloody urine. He describes passing dark red urine and occasional clots on a few occasions over the last 2 weeks. He denies dysuria, frequency, fevers, abdominal pain or bleeding from other sites. He has a past medical history of hypertension and takes ramipril for this.

Abdominal examination is unremarkable and rectal examination reveals a smooth, non-tender prostate of normal size. Vital signs and U&Es are normal.

Which of the following is the most likely diagnosis?

A. Prostatitis

B. Prostate cancer

C. Bladder cancer

D. Nephritic syndrome

E. Urethritis

Correct Answer:Bladder cancer

Explanation:

The most likely diagnosis is bladder cancer, specifically transitional cell carcinoma (which makes up 90% of all bladder cancers).

Bladder cancer typically presents with painless gross haematuria alone, with no abnormalities noted on clinical examination. All patients aged over 45 with unexplained visible haematuria need an urgent referral for urological assessment (cystoscopy, biopsy and urine cytology). Risk factors for bladder cancer include increasing age, smoking and occupational exposure to certain compounds (i.e. aromatic amines) which are commonly found in industrial plants processing paint, dye, metal and petroleum.

Prostate cancer is less likely to present with painless haematuria and more likely to present with urinary storage and voiding symptoms (i.e. poor urinary flow, terminal dribbling). The normal rectal examination also makes the diagnosis less likely.

Prostatitis typically presents with pelvic pain and haematospermia. Haematuria can also occur, although, given the absence of pelvic pain and a normal prostate on examination, this diagnosis is less likely.

Urethritis usually presents with dysuria, urinary frequency and urethral discharge. None of these symptoms are present, making the diagnosis unlikely.

Nephritic syndrome is a clinical syndrome characterised by haematuria (micro- or macroscopic), proteinuria and hypertension, with associated renal impairment. This patient has normal renal function and normal blood pressure, making this diagnosis unlikely. The most common causes of nephritic syndrome include post-streptococcal glomerulonephritis, IgA nephropathy and systemic inflammatory disorders (Goodpasture’s syndrome and granulomatosis with polyangiitis).

Further reading:

https://patient.info/doctor/bladder-cancer-pro

Question:

A 24-year-old man presents to general practice with fatigue, arthralgia and headache. He mentions that his symptoms started a few days after he went camping outdoors with his friends. On examination, he is noted to have a painless red circular lesion on his right arm, which measures roughly 6 centimetres in diameter.

Given the most likely diagnosis, what is the most likely causative microorganism?

A. Listeria monocytogenes

B. Borrelia burgdorferi

C. Staphylococcus aureus

D. Streptococcus pyogenes

E. Neisseria meningitidis

Correct Answer:Borrelia burgdorferi

Explanation:

This patient presents with signs and symptoms characteristic of Lyme disease, especially given the recent camping history and the presence of a red target lesion on the skin. The main causative microorganism in Lyme disease is Borrelia burgdorferi, a highly motile gram-negative bacterium, which is spread through the bite of infected ticks. Patients typically present with erythema migrans (a target lesion at the site of the tick bite), but there may occasionally be systemic features such as headache, fatigue, arthralgia, and fever as well.

Listeria monocytogenes is a gram-positive bacterium which can be found in contaminated food. It usually only affects pregnant women, older adults, or immunocompromised individuals. Symptoms of listeriosis may include fever, muscle aches, and neck stiffness.

Neisseria meningitidis is a gram-negative bacterium, the main causative microorganism for meningitis in young adults. Meningitis would typically present with headache, fever and neck stiffness.

Staphylococcus aureus is a gram-positive bacterium which is responsible for different types of infections, such as cellulitis. Cellulitis typically presents a swollen red area on the skin that is painful to touch, as opposed to a painless target lesion.

Streptococcus pyogenes (group A streptococcus) is a gram-positive bacterium which can potentially lead to strep throat infections or impetigo.

Further reading:

https://patient.info/doctor/lyme-disease-pro

Question:

A 25-year-old female presents to her GP with a generalised headache that has been present constantly for the past 2 months. On further questioning, the GP discovers that the headache is associated with blurred vision. The GP also notes that the patient is overweight and is currently prescribed the combined oral contraceptive pill. Fundoscopic examination reveals papilloedema. Neurological examination is otherwise unremarkable. Blood pressure is 130/74 and she is apyrexial. There is no significant family history.

What is the MOST LIKELY diagnosis?

A. Meningitis

B. Tension headache

C. Migraine

D. Benign intracranial hypertension

E. Subarachnoid haemorrhage

Correct Answer:Benign intracranial hypertension

Explanation:

The most likely diagnosis is benign intracranial hypertension (a.k.a. idiopathic intracranial hypertension). The patient is presenting with typical features, including headache and blurred vision associated with papilloedema. Other less typical presenting features may include an enlarged blind spot and sixth nerve palsy. Major risk factors for the condition include being a young female, being overweight, pregnancy and certain drugs (including the combined oral contraceptive pill, steroids, tetracyclines, Lithium and vitamin A).

Subarachnoid haemorrhage is less likely in this clinical scenario, particularly given the duration of symptoms. A patient would be more likely to present with a sudden onset, severe headache similar to being ‘hit with a baseball bat on the back of the head’.

Meningitis is unlikely in this case given the duration of symptoms and the fact the patient is apyrexial, with no complaints of photophobia or neck stiffness.

Tension headache would be more likely to be described as a ‘tight band across the forehead’.

Migraine is more likely to be described as unilateral and pulsatile, often associated with photophobia or phonophobia and often associated with an aura. Migraine is not associated with papilloedema.

Further reading:

https://patient.info/doctor/idiopathic-intracranial-hypertension-pro

Question:

A 17-year-old female is brought to the emergency department by her mother after she has taken 20 tablets of paracetamol. These were taken one hour ago, all within a 5-minute period. She has a history of self-harm and suicidal ideation and recently split from her boyfriend. The patient is emotionally distressed but examination is otherwise unremarkable. She weighs 54kg.

How long after ingestion should plasma paracetamol levels be measured?

A. Start IV N-acetylcysteine and do not measure paracetamol levels

B. Immediately

C. 2 hours

D. 4 hours

E. 6 hours

Correct Answer:4 hours

Explanation:

Paracetamol levels should be taken 4 hours post-ingestion, for any patient who has ingested >75 mg/kg within a 24-hour period. Before this time, plasma paracetamol concentration cannot be interpreted.

IV N-acetylcysteine (NAC) is the antidote for paracetamol overdose and is most effective if given within 8 hours of ingestion. IV NAC is generally administered if:

paracetamol levels fall on or above the nomogram line

or immediately in a staggered overdose

or if there are clinical features of hepatic injury (e.g. jaundice or hepatic tenderness)

Further reading:

https://patient.info/doctor/paracetamol-poisoning

Question:

A 65-year-old man is referred to the local hospital having not passed urine for 48 hours. He describes a single episode of low volume, brown-tinged urine two days ago but no urge to pass urine since then. He currently feels well. Past medical history includes untreated hypertension, mild hearing loss and osteoarthritis. He takes no regular medications.

Clinical examination reveals a trace of pedal oedema, however, no other abnormalities are noted. A bedside bladder scan fails to detect any urine in the bladder, and the patient is unable to produce a sample for urinalysis.

Urgent blood tests are performed, revealing:

Blood test Result Reference range

Haemoglobin (Hb) 76 g/L 130 – 180

Platelet count 200 x 109/L 140 – 400

White cell count (WCC) 15.6 x 109/L 3.6 – 11.0

Neutrophils 14.8 x 109/L 1.8 – 7.5

CRP 109 mg/L < 5

Prothrombin time (PT) 14 seconds 10 - 14

Activated partial thromboplastin time (APTT) 60 seconds 24 - 37

K+ 5.9 mmol/L 3.5–5.3

Urea 28.7 mmol/L 2.5 - 7.8

Creatinine 1200 μmol/L 59–104

Albumin 39 g/L 35 – 50

The man exits for a cigarette but returns escorted to his cubicle breathless, whereupon he suffers a cardiopulmonary arrest.

What is the most likely cause of this patient's presentation?

A. ANCA glomerulonephritis

B. Glomerular basement membrane disease

C. Acute interstitial nephritis

D. Lupus

E. IgA nephropathy

Correct Answer:Glomerular basement membrane disease

Explanation:

This man is presenting with pulmonary-renal syndrome, in this case, secondary to circulating glomerular basement membrane (GBM) antibodies. These antibodies are usually directed towards the alpha-3 chain of type 4 collagen, present in the glomerular and alveolar basement membranes. When alveolar haemorrhage is present, this is referred to as Goodpasture's syndrome. In this case, the discriminating feature pointing towards the diagnosis of GBM disease is the abrupt onset anuria. In many patients this is the only symptom, with most patients lacking any extra-renal manifestations of the disease.

Whilst lupus, IgA vasculitis and ANCA vasculitis can present with pulmonary-renal syndrome they would not be expected to cause abrupt onset anuria, but perhaps oliguria. Cigarette smoke can exacerbate or provoke significant alveolar haemorrhage in GBM disease, which in this case caused the low haemoglobin and precipitated the cardiopulmonary arrest.

Acute interstitial nephritis would not present with anuric acute kidney injury or pulmonary-renal syndrome.

Further reading:

https://www.msdmanuals.com/en-gb/professional/pulmonary-disorders/diffuse-alveolar-hemorrhage-and-pulmonary-renal-syndrome/pulmonary-renal-syndrome

Question:

A 75-year-old man presents with left-sided weakness and cognitive decline which have been progressing over the last 6 weeks. You also find he has left homonymous hemianopia on examination. An MRI head shows a lesion which raises suspicion of a primary brain tumour.

Which of the following is the most common type of malignant primary brain tumour, and also the most aggressive?

A. Craniopharyngioma

B. Glioblastoma multiforme

C. Meningioma

D. Schwannoma

E. Pilocytic astrocytoma

Correct Answer:Glioblastoma multiforme

Explanation:

Glioblastoma multiforme is the most common and aggressive malignant primary brain tumour. It is more common in older men and median survival is 15 months.

Meningioma is a common benign brain tumour. Despite being a "benign" tumour, it can still be very problematic if it grows and invades important local structures. In some cases, meningiomas can become malignant tumours.

Pilocytic astrocytoma is a slow-growing brain tumour that occurs mostly in children and teenagers.

Craniopharyngioma also tends to be a low-grade brain tumour.

Schwannomas are benign tumours of the cells which wrap around nerves to produce the myelin sheath. They can arise intracranially or around peripheral nerves.

Further reading:

https://radiopaedia.org/articles/glioblastoma

Question:

A 63-year-old male presents to her GP with a four-month history of an erythematous rash on his nose and cheeks (shown below). He states that the rash started off with intermittent flushing and is worse following alcohol ingestion. He has no past medical history of note, takes no regular medication and has no allergies.

What would be the most appropriate first-line treatment for this patient?

Source: M. Sand, D. Sand, C. Thrandorf, V. Paech, P. Altmeyer, F. G. Bechara [CC BY 2.0]

A. Prescribe oral doxycycline

B. Prescribe topical metronidazole

C. Prescribe a topical retinoid

D. Refer for phototherapy

E. Prescribe topical benzoyl peroxide

Correct Answer:Prescribe topical metronidazole

Explanation:

The condition described in this case and in the image is acne rosacea. This is a condition that typically affects fair-skinned people and is characterised by erythema, telangiectasia, papules and pustules on the forehead, nose, cheeks and often chin. It typically begins with flushing and is often worse after alcohol ingestion, as in this case.

The first-line treatment for acne rosacea is topical metronidazole. Topical azelaic acid can be used if topical metronidazole is not tolerated or fails to improve the condition.

Phototherapy is not used in the treatment of acne rosacea since ultraviolet radiation often worsens the rash.

Topical and oral retinoids can be used as second-line treatment in the management of acne rosacea but they have to be used off-licence

Oral tetracyclines can be used in the treatment of acne rosacea however they are also a second-line treatment which is usually only given if topical treatments have failed.

Topical benzoyl peroxide can be used to treat acne rosacea but topical metronidazole is preferred as a first-line treatment.

Further reading:

https://patient.info/doctor/rosacea-and-rhinophyma

Question:

A 74-year-old woman presents to the emergency department with wrist pain following a fall, earlier today. A plain radiograph series of the wrist is requested and is seen below.

What is the diagnosis?

Case courtesy of Assoc Prof Frank Gaillard, Radiopaedia.org, rID: 12382

A. Transverse extra-articular distal radius fracture with dorsal angulation

B. Transverse extra-articular distal radius fracture with volar angulation

C. Transverse intra-articular distal radius fracture with volar angulation

D. Intra-articular fracture of radial styloid

E. Transverse intra-articular distal radius fracture with dorsal angulation

Correct Answer:Transverse extra-articular distal radius fracture with dorsal angulation

Explanation:

This case demonstrates a transverse extra-articular distal radius fracture with dorsal angulation, otherwise known as a Colles' fracture. It most commonly occurs from a fall onto an outstretched hand (FOOSH). These fractures are typically seen in older women with osteoporotic bones. The angulation of the fracture is described by the position of the distal bone in relation to the proximal bone.

Transverse extra-articular distal radius fracture with volar angulation is otherwise known as a Smith's fracture.

Transverse intra-articular distal radius fracture with dorsal angulation is otherwise known as a Dorsal Barton's fracture.

Transverse intra-articular distal radius fracture with volar angulation is otherwise known as a Volar Barton's fracture.

Intra-articular fracture of radial styloid is otherwise known as a Chauffer's fracture.

Further reading:

https://geekymedics.com/fractures-of-the-distal-radius-wrist-fractures/

Question:

A 52-year-old man presents to the GP with gradually progressive shortness of breath that has progressed over the past few months; this has been accompanied by a persistent dry cough. He has had numerous swabs for COVID-19; all have been negative and he has received both vaccinations against the virus. He has also noticed several purplish lesions developing on his cheeks and nose; he wonders if these may be related.

The patient denies chest pain, haemoptysis or wheeze; he has never smoked and works as an accountant. There are no pets in his household. He has previously been well, his only other medical condition on record is chondromalacia patellae, which is being managed by regular NSAID therapy. The patient mentions that he developed joint pain and swollen, 'lumpy' shins a few years previously; his previous GP thought this may be due to a new NSAID being started, and changed the medication. The shin lesions eventually resolved without further management.

Respiratory examination reveals no stigmata of chronic lung disease, with no abnormal findings on inspection. The patient's oxygen saturations, respiratory rate and pulse rate are all within the normal range. On auscultation, there are quiet, fine crepitations, heard best at the lung bases, with no other added sounds.

The GP is concerned about the possibility of a systemic disease causing lung involvement and refers the patient for a chest X-ray.

Which of the following is the most likely diagnosis in this case?

A. Chronic sarcoidosis

B. Berylliosis

C. Behcet's disease

D. Idiopathic pulmonary fibrosis

E. Hypersensitivity pneumonitis

Correct Answer:Chronic sarcoidosis

Explanation:

Whilst not a classical presentation, the most likely diagnosis, in this case, is chronic sarcoidosis. This is a multi-system inflammatory disorder of unknown origin that can result in the involvement of a number of organs, the lungs being by far the most commonly affected. The patient's past history of what is likely to be erythema nodosum points towards a previous diagnosis of acute sarcoidosis; this form of the condition most commonly presents with these lesions, along with arthralgia and anterior uveitis.

Whilst the majority of cases of acute sarcoidosis do not progress to chronic disease, some individuals can develop long-term complications after an acute episode. This most frequently causes gradually increasing shortness of breath and cough. The disease can eventually cause a degree of interstitial lung fibrosis, which explains the fine crepitations on auscultation.

The patient's facial rash adds further weight to the suggestion of likely sarcoidosis; the description is that of lupus pernio, violaceous skin plaques affecting the face that is pathognomonic of the disease.

Sarcoidosis is usually investigated using a chest X-ray; this may show bi-hilar lymphadenopathy, although in late-stage disease this may disappear and be replaced by signs of fibrotic lung changes. A lung biopsy may be used to clinch the diagnosis; this will show the presence of non-caseating granulomas.

Hypersensitivity pneumonitis is a form of interstitial lung disease that occurs due to an exaggerated response to a specific antigen; avian serum and Micropolyspora faeni are two commonly implicated antigens. There are no exposures in the history that would point towards this as the likely diagnosis.

Idiopathic pulmonary fibrosis (IPF) is the most common cause of interstitial lung disease and can present with very similar symptoms as those described by the patient. A biopsy may be required to confirm that this is not the cause in this scenario, although the facial rash and symptoms of acute sarcoidosis make chronic sarcoidosis more likely than IPF.

Behcet's disease is a rare form of vasculitis that classically presents with oral and genital ulceration, alongside other systemic features such as anterior uveitis. Whilst the condition can cause erythema nodosum, it would not explain the other symptoms in this scenario.

Berylliosis can present identically to chronic sarcoidosis both in terms of lung involvement and with non-caseating granulomas on biopsy. However, it would not account for the other systemic features of the condition, and there is no history of beryllium exposure in the history.

Further reading:

https://patient.info/doctor/sarcoidosis-pro

Question:

A 32-year-old man attends his local hospital for routine diabetic eye screening. He reports progressive blurring of his vision since his last visit to the department two years ago. He denies any flashes or floaters, diplopia, eye discomfort or pain.

He has a past medical history of type 1 diabetes mellitus, diagnosed aged 6. He describes poor glycaemic control over the previous year due to poor mental health and stresses of the Covid-pandemic. He reports that he was admitted to hospital four months ago for diabetic ketoacidosis (DKA).

Visual acuity is reduced to 20/40 bilaterally. Intraocular pressure and the anterior segment are normal bilaterally. On dilated fundus examination, there are multiple microaneurysms, hard exudates, and neovascularisation of ~30% of the optic disc noted in both eyes. There is no macula oedema.

What is the most appropriate initial management in this patient?

A. Focal photocoagulation

B. Vitrectomy

C. Pan-retinal photocoagulation

D. Intravitreal aflibercept

E. Intravitreal dexamethasone

Correct Answer:Pan-retinal photocoagulation

Explanation:

The most likely diagnosis in this patient is proliferative diabetic retinopathy (DR) - an advanced form of DR that occurs when abnormal new vessels grow on the optic disc (NVD) or elsewhere (NVE). Neovascularisation occurs in proliferative DR due to chronic hypoxia. Pan-retinal photocoagulation (PRP) is a technique that uses a laser to cause thermal burns to the retina, reducing areas of ischaemic tissue. PRP aims to reduce the global oxygen demand of the retina and subsequently decrease total vascular endothelial growth factor (VEGF) production. PRP is considered the mainstay treatment in proliferative DR; therefore, this would be the most appropriate initial treatment for this patient. It is important to note that PRP should be paired with other interventions such as improving glycaemic control and managing existing co-morbidities.

In focal photocoagulation (FP) a specific point of leakage is identified and targeted with a laser. As FP is used to target a small number of specific vessels, it is typically only recommended in non-proliferative DR.

A potential complication of proliferative DR is bleeding into the vitreous humour, which further increases the risk of retinal detachment. Patients with a persistent haemorrhage may be offered a vitrectomy, however it is not the first line management of proliferative DR. This patient did not have any evidence of haemorrhage on examination; therefore, this would not be the most appropriate initial management.

Clinically significant macular oedema may be managed with intravitreal anti-VEGF therapy, such as aflibercept, as these agents help to minimise neovascularisation. Corticosteroids, such as dexamethasone, may be used as an adjunct to anti-VEGF therapy or primary therapy in the management of macular oedema. This patient did not have any evidence of macula oedema on examination; therefore, anti-VEGF and corticosteroids would not be recommended at this time.

Further reading:

https://geekymedics.com/diabetic-retinopathy/

Question:

A 47-year-old male presents to the emergency department with right upper quadrant pain, fever, and chills for the last 18 hours. He has a past medical history of biliary colic for which he has never sought any medical attention. He does not drink alcohol or use tobacco products.

The patient is alert and orientated. Physical examination reveals jaundice with scleral icterus as well as marked right upper quadrant pain. Observations are normal except for an elevated temperature. Laboratory studies are significant for an elevated white cell count.

His clinical presentation is consistent with a diagnosis of ascending cholangitis. He has been commenced on appropriate antibiotics and intravenous fluids.

Which of the following is the best next step in management?

A. Endoscopic retrograde cholangiopancreatography (ERCP)

B. Gastroscopy

C. Chest radiograph

D. Abdominal radiograph

E. Colonoscopy

Correct Answer:Endoscopic retrograde cholangiopancreatography (ERCP)

Explanation:

The clinical presentation of right upper quadrant pain, fever and jaundice (Charcot’s triad) are concerning for ascending cholangitis (AC) – an infection of the biliary tree. The pentad of Charcot’s triad + hypotension + altered mental status is referred to as Reynold’s pentad and carries a high mortality rate. Stasis in the biliary tree secondary to obstruction or stricturing are the main causes of this life-threatening condition that requires prompt drainage via endoscopic retrograde cholangiopancreatography (ERCP). Patients should also be prescribed broad-spectrum intravenous antibiotics to provide coverage for both gram-negative and anaerobic pathogens.

Gastroscopy is indicated in patients who have upper gastrointestinal bleeding secondary to varices or peptic ulcer disease. It would not be a required investigation in a patient with AC.

Colonoscopy has multiple roles including use in lower gastrointestinal bleeds, bowel cancer screening and polyp removal. However, it is not indicated in the management of AC.

Abdominal radiographs are important in the consideration of small bowel obstruction which typically presents with nausea, vomiting and lack of bowel motions.

Chest radiographs in the setting of abdominal disease can be used to identify air under the diaphragm which can be indicative of bowel perforation. It is not required in the management of AC. The patient does not have features consistent with a bowel perforation such as guarding or rigidity.

Further reading:

https://patient.info/doctor/cholangitis

Question:

A 78-year-old care home resident attends the emergency department with sudden onset abdominal pain and bloating. He has not opened his bowels or passed flatus for 5 days. There is no history of nausea or vomiting. He was admitted 3 years ago with a sigmoid volvulus, managed by decompression with sigmoidoscopy. On examination, the abdomen is non-tender and distended, with tinkling bowel sounds heard on auscultation.

Based on the likely diagnosis, what is the diagnostic investigation?

A. Serum lactate

B. Urinalysis

C. Contrast CT abdomen

D. Erect chest x-ray

E. Abdominal x-ray

Correct Answer:Contrast CT abdomen

Explanation:

This case demonstrates bowel obstruction secondary to sigmoid volvulus. Absolute constipation with abdominal distention and tinkling bowel sounds are common findings. Vomiting typically does not occur or occurs later in large bowel obstruction, compared to small bowel obstruction. The risk of recurrence of sigmoid volvulus is up to 90%. Contrast CT abdomen is the gold standard investigation in suspected bowel obstruction as it can identify the aetiology of the obstruction and aid in surgical planning.

An abdominal x-ray may demonstrate the classical coffee bean sign in a sigmoid volvulus with dilated bowel loops, if there is an incompetent ileocaecal valve. However, it is not diagnostic.

An erect chest x-ray may suggest bowel perforation if air is visible below the diaphragm (pneumoperitoneum). However, it is not diagnostic of sigmoid volvulus.

Whilst the serum lactate may be raised in a volvulus due to poor tissue perfusion and ischaemia, it would not be diagnostic in this case.

Urinalysis would play no role in the diagnosis of a large bowel obstruction.

Further reading:

https://patient.info/doctor/sigmoid-volvulus

Question:

A 65-year-old man presents to his GP after experiencing episodes of chest pain lasting around ten minutes. These episodes are induced by exercise and relieved by rest. His father died of a myocardial infarction at the age of 72.

Given the most likely diagnosis, which of the following medications will reduce his mortality risk?

A. Aspirin

B. Atenolol

C. Glyceryl trinitrate

D. Nicorandil

E. Amlodipine

Correct Answer:Aspirin

Explanation:

This patient is suffering from angina. Angina typically presents with chest pain that is brought on by exertion and relieved by rest.

Though all of the listed drugs are used in the management of angina, only aspirin is actually used for secondary prevention of cardiovascular disease. Aspirin has been demonstrated to reduce death from cardiac causes and non-fatal myocardial infarcts by almost half. The mechanism of action of aspirin is as an anti-platelet and an anti-inflammatory agent. It causes inhibition of cyclo-oxygenase, thus inhibiting the formation of thromboxane A2, which is a promoter of platelet aggregation. Statins have also been shown to have a prognostic benefit in patients with angina.

The other options listed above are all important for preventing episodes of angina and relieving symptoms, but they are not used for secondary prevention of cardiovascular disease.

Atenolol is a beta-blocker, which reduces heart rate and contractility.

Amlodipine is a calcium channel blocker of the dihydropyridine class; it relaxes vascular smooth muscle and dilates coronary arteries.

Nicorandil is a potassium channel activator with a vasodilatory action on the coronary vasculature.

Glyceryl trinitrate also has a vasodilatory effect.

Further reading:

https://www.nice.org.uk/guidance/cg126

Question:

You are an SHO on placement in a GP practice. A 40-year-old male patient attends with low mood. He mentions that his mood has been deteriorating over the past month. He cannot sleep, has lost the desire to eat and has isolated himself from friends and family. The patient also expresses that he has been contemplating ways of taking his own life. On review of the patient’s electronic record, you discover that he presented 6 months previously with deliberate self-harm and has suffered from depression since the age of 26 years. On further questioning, you establish that the patient has recently lost his job and drinks excessive amounts of alcohol.

From the information given, what is the GREATEST risk factor for suicide?

A. Depression

B. Unemployment

C. Male gender

D. Alcohol abuse

E. History of self-harm

Correct Answer:History of self-harm

Explanation:

The greatest risk factors for suicide include a history of self-harm or a previous suicide attempt. Suicide is most common in males aged over 40 years. The most common methods of suicide are hanging, strangulation and suffocation. Other than the risk factors mentioned in the scenario, risk factors for suicide include homelessness, drug abuse, suffering from a chronic illness that is activity limiting, social deprivation, specific professions (doctors, farmers, vets, dentists) and bullying.

Male gender is indeed a risk factor for suicide but is not the single greatest predictor mentioned in the scenario.

Mental illness, such as depression, is indeed a risk factor for suicide but is not the single greatest predictor mentioned in the scenario.

Unemployment is indeed a risk factor for suicide but is not the single greatest predictor mentioned in the scenario.

Alcohol abuse is indeed a risk factor for suicide but is not the single greatest predictor mentioned in the scenario.

Further reading:

https://patient.info/doctor/suicide-risk-assessment-and-threats-of-suicide

Question:

A 45-year-old man attends his GP with sore eyes. He mentions that his eyes have been sore for the last couple of months and are associated with a ‘gritty’ sensation. The patient also reports that his eyes feel ‘stuck’ together and ‘itchy’ in the morning. The gentleman complains of severe dandruff, very oily skin and intermittent rashes that affect his face. On examination, you notice a reddening of his eyelid margins accompanied by slight scaling.

What is the MOST LIKELY cause of blepharitis in this case?

A. Sjogrens syndrome

B. Rosacea

C. Seborrhoeic dermatitis

D. Meibomian gland dysfunction

E. Staphylococcal blepharitis

Correct Answer:Seborrhoeic dermatitis

Explanation:

The most likely cause of blepharitis, in this case, is seborrhoeic dermatitis. Blepharitis can be defined as inflammation of the eyelids. Blepharitis has many causes, including Sjogren’s syndrome, staphylococcal infection, meibomian gland dysfunction, rosacea, as well as many others. Blepharitis associated with seborrhoeic dermatitis presents with scaling and redness around the eye margins, greasy skin, dandruff and facial rash.

Blepharitis coupled with Sjogren’s syndrome typically presents with red eyelids, dry mouth and a predominantly dry eye sensation.

Staphylococcal blepharitis typically presents with hyperaemia and telangiectasia around the eye, along with crusting at the base of the eyelashes.

Blepharitis associated with meibomian gland dysfunction presents with small droplets of oil around the openings of the meibomian glands. The orifices of the meibomian glands may also be visibly obstructed.

Blepharitis associated with rosacea typically presents with facial flushing and telangiectasia.

Further reading:

https://patient.info/doctor/blepharitis-pro

Question:

A 49-year-old woman presents to the emergency department with a two-hour history of sudden-onset generalised abdominal pain. Her past medical history includes recently diagnosed rheumatoid arthritis, for which she has been started on methotrexate with bridging prednisolone. This was commenced two months ago. She denies any vomiting, haematemesis or weight loss but describes some intermittent abdominal pain during the preceding month. She has had no previous abdominal surgeries.

On examination, her abdomen is tender throughout, with guarding and rebound tenderness in the epigastric region, however, no organomegaly is felt, and there is no obvious distension.

Her observations are:

Oxygen saturation: 99% on room air

Respiratory rate: 22 breaths per minute

Heart rate: 105 beats per minute

Blood pressure: 125/88 mmHg

Temperature: 37.2 °C

A pregnancy test is negative.

What is the most likely diagnosis?

A. Gastric volvulus

B. Felty syndrome

C. Perforated peptic ulcer

D. Gastric cancer

E. Dieulafoy lesion

Correct Answer:Perforated peptic ulcer

Explanation:

This patient most likely has a perforated peptic ulcer. Perforated peptic ulcers typically present with severe sudden-onset epigastric or generalised abdominal pain and a history of intermittent abdominal pain or reflux. There are likely to be signs of peritonism, and there may also be other risk factors for peptic ulcer disease in the history, such as oral non-steroidal anti-inflammatory drug (NSAID), steroid or bisphosphonate use.

Although gastric cancer could perforate and lead to sudden-onset abdominal pain with signs of peritonism, this would usually be preceded by signs suggestive of gastric cancer, such as nausea, vomiting, early satiety or weight loss. The presence of oral steroid use in this patient also points more towards a diagnosis of a perforated peptic ulcer.

A Dieulafoy lesion is an abnormally large and tortuous blood vessel in the gastric mucosa. This is usually asymptomatic but can present with painless haematemesis or melena.

Gastric volvulus typically presents with severe epigastric pain and vomiting. The history of steroid use is also more suggestive of a perforated peptic ulcer in this patient.

Felty syndrome is a rare complication of rheumatoid arthritis, characterised by splenomegaly and low neutrophil count. Although splenomegaly can cause abdominal pain, this patient has no palpable organomegaly and has a risk factor for peptic ulcer disease, making a perforated peptic ulcer more likely.

Further reading:

https://teachmesurgery.com/general/gastric/peptic-ulcer/

Question:

A 67-year-old man presents to A&E with pain in his perianal area. He is clearly in a lot of pain and looks ashen. His past medical history includes type 2 diabetes, advanced COPD, previous transient ischaemic attack and a laparoscopic cholecystectomy 3 years ago. He takes aspirin, clopidogrel, atorvastatin, amlodipine, prednisolone 5mg daily, metformin, gliclazide, and insulin. He has no known allergies.

You, the general surgery doctor, are called see this patient and you find him looking very unwell. He states he has had this pain for almost a week now, and he has had fevers today.

His vital signs are as follows:

HR 110 bpm

BP 85/50 mmHg

RR 28

Sats 92% on 5L

Temp 38.4 oC

His ABG shows a metabolic acidosis with a lactate of 7.

You examine him and find a large area of redness with indurated skin. There are some blistered areas, and he is exquisitely tender in this area. You cannot assess for the presence of deeper fluctuance, as he is too tender to allow you to do so. You commence the sepsis 6 package and call for senior help.

While waiting for a senior review and the blood results, what should you do next?

A. Sedation and re-examination

B. Arrange an USS of the area

C. Book a medical bed for cellulitis management

D. Contact theatres to arrange for immediate debridement

E. Attempt needle aspiration of a possible abscess

Correct Answer:Contact theatres to arrange for immediate debridement

Explanation:

This is necrotizing fasciitis until proven otherwise. For this, the normal workup would be sepsis 6 management (IV antibiotics, blood cultures, serum lactate, IV fluids, oxygen, urine output monitoring), consideration of a CT scan to look for subcutaneous gas, but ultimately this man needs urgent surgical debridement.

Antibiotics alone will not help this man, and if a CT scan is to be performed, it must not slow down his route to theatre. A high lactate, exquisite tenderness, and systemic compromise in an immunosuppressed patient should cause some anxiety among staff. This is an emergency and cannot wait to go to theatre.

A medical ward is no place for this patient, as without aggressive surgical debridement he will not survive.

Needle aspiration of a possible abscess runs the risk of spreading the infection deeper, and will definitely cause undue pain.

USS scan will be of no acute benefit, and sedating this man in order to more thoroughly examine him is not sensible, as you may cause further systemic instability, and will likely gain no more information.

Further reading:

https://patient.info/doctor/necrotising-fasciitis-pro

Question:

A 24-year-old student presents to the GP after being strongly encouraged to do so by his partner, who is extremely concerned about him. He admits to having struggled over the last year; due to the COVID-19 pandemic he has felt isolated at university and admits to having a generally low mood for the past 3 months.

The patient admits to getting little pleasure from his hobbies; he was previously a keen swimmer but has lacked the motivation to train even now this is possible given a recent relaxation in restrictions. He describes an increase in sleepiness; often spending most of the day in bed and that he has very low energy levels. Despite this, his appetite has increased, and he reports having gained around 3kg over the last few months. He has had problems concentrating, and has failed multiple modules of his course, which he is very ashamed about. Whilst the patient has often felt down and considered himself worthless, he has never considered harming himself; he credits this to the support of his girlfriend, for which he is very grateful. He states that his mood improves when he is around others and has the opportunity to distract himself.

The GP makes a diagnosis of atypical depression given the patient's hypersomnia, increased appetite and improvement in mood during positive events. The patient seems unwilling to try CBT, and the GP prescribes antidepressant medication. Unfortunately, 6 months later, the symptoms are still persisting; neither sertraline nor venlafaxine have been of benefit. The GP informs the patient that he will try one more medication before making a specialist referral, and prescribes him phenelzine.

What is the mechanism of action of this third medication?

A. Monamine oxidase inhibitor

B. COM-T inhibitor

C. Noradrenergic and specific serotonergic antidepressant

D. Selective serotonin reuptake inhibitor

E. Serotonin and norepinephrine reuptake inhibitor

Correct Answer:Monamine oxidase inhibitor

Explanation:

Phenelzine is a monoamine oxidase inhibitor (MAOI) that can be used in the setting of depression that is resistant to other therapies. There is also some evidence to suggest that it is an effective option in managing atypical depression; a subtype characterised by an upturn in mood in response to positive events, and symptoms such as weight gain and increased sleep.

Monoamine oxidase inhibitors function by inhibiting the family of enzymes responsible for the oxidation and breakdown of a number of neurotransmitters; including both serotonin and noradrenaline; both strongly implicated in the pathophysiology of depression. Whilst the medications are an efficacious option for managing depression, the medications have a number of side effects and cautions that patients must be made aware of. Postural hypotension can be troubling in elderly patients, and there are a number of dietary restrictions necessary for those taking the drugs; inhibition of monoamine oxidases can interfere with the metabolism of tyramine. Therefore, patients must avoid consuming large amounts of dietary tyramine, and abstain from eating excessive amounts of cheese or fermented alcoholic drinks. Failure to do so can trigger the 'cheese reaction' - a hypertensive crisis triggered by high levels of noradrenaline, a breakdown product of tyramine.

Those on MAOI's must also be made aware of drug interactions that can arise; in particular, they must not be co-prescribed with any other medication that increases serotonin levels, as there is a risk of causing serotonin syndrome.

The patient has already been prescribed a selective serotonin reuptake inhibitor in the form of sertraline, and a serotonin and norepinephrine reuptake inhibitor (venlafaxine). Phenelzine does not work by either of these mechanisms.

Mirtazapine is an example of a noradrenergic and specific serotonergic antidepressant; this is another option for those with depression resistant to traditional treatment.

COM-T inhibitors are normally indicated in the setting of Parkinson's disease (MAOI's can also be used for the condition); they function by inhibiting the breakdown of dopamine.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK539848/

Question:

A 25-year-old woman attends her first cervical screening programme appointment. On speculum examination, the cervix appears normal. A smear test is obtained and sent for cytological testing.

She is sexually active and has a regular sexual partner. She takes the combined oral contraceptive pill (COCP) and her last menstrual period was 2 weeks ago. She experiences regular periods every 28 days and usually bleeds for 4 days. She has not experienced any inter-menstrual or post-coital bleeding, pain, or per-vaginal discharge. Her last STI screen was 1 year ago and was negative. She had a medical termination of pregnancy 1 year ago.

One week later she receives a letter explaining that some abnormalities were detected on her smear test and she should attend the colposcopy clinic for further follow-up.

At the colposcopy clinic, the cervix appears white when acetic acid is applied and yellow when iodine is applied. There is evidence of new vessel formation on the cervix. A biopsy is obtained demonstrating dysplasia in the basal one-third of the cervical epithelium.

What is the most likely histological diagnosis?

A. Cervical adenocarcinoma

B. Cervical squamous cell carcinoma

C. Cervical intraepithelial neoplasia (CIN) 2

D. Cervical intraepithelial neoplasia (CIN) 3

E. Cervical intraepithelial neoplasia (CIN) 1

Correct Answer:Cervical intraepithelial neoplasia (CIN) 1

Explanation:

The presence of dysplastic cells confined to the basal one-third of the cervical epithelium indicates that the histological diagnosis is cervical intraepithelial neoplasia 1 (CIN1). CIN is a pre-malignant condition to cervical squamous cell carcinoma, in which there is the detection of cells undergoing abnormal growth and differentiation (dysplasia). The key distinction between CIN and cervical squamous cell carcinoma is that in CIN the abnormal cells are confined by the basement membrane; as soon as abnormal cells are found beyond the basement membrane, it becomes a carcinoma. At colposcopy, acetic acid is applied to temporarily coagulate nucleoprotein and areas of CIN will show up as white due to the high cell turnover. Iodine is also applied, which stains normal epithelium brown whilst CIN will stain yellow due to a lack of glycogen. CIN is also pro-angiogenic so new vessel formation may be visible.

CIN types are defined by the location of abnormal cells on biopsy. As previously mentioned, CIN1 is present when the abnormal cells are confined to the basal one-third of the epithelium. If abnormal cells are present in one-third to two-thirds of the epithelial layer this is CIN2, and if present in two-thirds to the whole of the epithelial layer this is CIN3. Hence both CIN2 and CIN3 are incorrect answers, as although the dysplasia has not invaded the basement membrane (indicating that this is CIN), it is only present in the basal one-third of the cervical epithelium.

CIN is a pre-malignant condition for cervical squamous cell carcinoma. Low-grade CIN (i.e. CIN1) will spontaneously resolve in 60% of cases, whereas high-grade CIN (i.e. CIN2 and CIN3) are less likely to regress and 20% will develop into carcinoma. As CIN is frequently asymptomatic, the cervical cancer screening programme is essential for picking up cases early on to reduce the chances of progression.

CIN and squamous cell carcinoma involve dysplasia (abnormal growth and differentiation) of squamous cells. Cervical adenocarcinoma, on the other hand, involves dysplasia of columnar cells. Cervical adenocarcinomas are much rarer than squamous cell carcinomas. There is also a pre-malignant state for these cancers, which is known as ‘cervical glandular intraepithelial neoplasia (cGIN)’.

Further reading:

https://pathways.nice.org.uk/pathways/cervical-cancer

Question:

You are a junior doctor working in the emergency department. You are examining a young patient who has sustained a significant injury to their right elbow. You find that they are unable to extend the fingers on their right hand.

Which nerve is most likely to have been damaged?

A. Radial nerve

B. Musculocutaneous nerve

C. Median nerve

D. Axillary nerve

E. Ulnar nerve

Correct Answer:Radial nerve

Explanation:

The radial nerve, root C6/C7, is formed from the posterior cord of the brachial plexus. The key muscles it innervates are the triceps, extensor digitorum and abductor pollicis longus, facilitating extension at the elbow and fingers and abduction at the thumb. Elbow injury, particularly humeral shaft fracture, is a common cause of radial nerve injury.

The axillary nerve comes from the posterior cord of the brachial plexus and innervates the deltoid, providing abduction of the arm. It also facilitates sensation to the 'regimental badge patch' on the lateral aspect of the upper limb.

The musculocutaneous nerve provides sensation to the lateral forearm and innervates the biceps, allowing flexion at the elbow. The median nerve allows flexion and abduction of the wrist, flexion of the distal phalanx of the thumb, flexion of the distal phalanx of the index and middle fingers, pronation of the forearm and opposition of the thumb.

The ulnar nerve innervates flexor carpi ulnaris, the first dorsal and second palmar interosseous, adductor pollicis and the ulnar aspect of flexor digitorum profundus. It facilitates abduction of the pinky finger and index finger, adduction of the index finger and adduction of the thumb. It also flexes the distal phalanx of the ring and pinky fingers.

Further reading:

https://patient.info/doctor/neurological-examination-of-the-upper-limbs

Question:

A 64-year-old man is having a medication review due to his resistant hypertension. Despite taking ramipril, amlodipine, and indapamide, his blood pressure remains elevated. He is non-diabetic.

The man's medications were reviewed to ensure he was taking the optimal tolerated doses, and he was found to be fully compliant with treatment. Persistently elevated blood pressure measurements were confirmed both by clinic readings and home blood pressure recordings.

Before deciding what medication to use next, his blood potassium level was checked, where it was found to be 4.1 mmol/L.

What is the most appropriate medication to prescribe alongside his current regime?

A. Verapamil

B. Candesartan

C. Spironolactone

D. Bisoprolol

E. Doxazosin

Correct Answer:Spironolactone

Explanation:

Spironolactone is a potassium-sparing diuretic used in step 4 of hypertension management when blood potassium levels are ≤ 4.5mmol/L.

Candesartan is an angiotensin-2 receptor blocker (ARB), which can be used in hypertension treatment in place of an ACE inhibitor.

Bisoprolol is a beta-blocker, used in step 4 of hypertension management when blood potassium levels are > 4.5mmol/L.

Doxazosin is an alpha-blocker, used in step 4 of hypertension management when blood potassium levels are > 4.5mmol/L.

Verapamil is a calcium channel blocker - in this case, the gentleman is already taking amlodipine, so it is not an appropriate medication to prescribe.

Further reading:

https://cks.nice.org.uk/topics/hypertension/management/management/

Question:

A 74-year-old lady presents to the GP with a two-month history of episodes of dizziness and loss of consciousness. She says that she becomes dizzy when exerting herself but sometimes also has symptoms at rest. She describes a feeling of light-headedness however she denies any experience of the room spinning during these episodes.

On each occasion, the loss of consciousness came out of the blue and she woke to find herself on the floor, thankfully unhurt. She noticed no other symptoms before the collapse and quickly felt back to normal afterwards. Her only past medical history is a previous myocardial infarction. Clinical examination is unremarkable.

An ECG is recorded and shown below.

What is the most appropriate course of action in this case?

Source: Public Domain

A. Prescribe a beta blocker for rate control

B. Refer immediately for continuous cardiac monitoring

C. Refer immediately for percutaneous coronary intervention (PCI)

D. Refer routinely to cardiology for fitting of a pacemaker

E. Prescribe warfarin to prevent stroke

Correct Answer:Refer immediately for continuous cardiac monitoring

Explanation:

This patient needs to be referred immediately to hospital for continuous cardiac monitoring; there is a risk of severe bradycardia and sudden cardiac death due to complete heart block. Eventual treatment is with a pacemaker, but a routine referral would be dangerous due to the high risk of mortality in this patient.

Referral for PCI would be appropriate if the ECG showed an ST-elevation myocardial infarction but this is not the case and the patient has no chest pain.

Prescribing a beta-blocker could be appropriate if the patient had angina or atrial fibrillation. The ECG does not show atrial fibrillation. A beta-blocker would be potentially life-threatening to administer in this context, given the patient's current bradycardia. The patient may already be taking a beta-blocker following her myocardial infarction and if this is the case, it should be stopped immediately pending further review.

Prescribing warfarin would be appropriate if the patient were in atrial fibrillation but this is not the case here. A CHADS2VASC score would ideally be calculated if this were the case to ensure that anticoagulation was necessary. The patient should be involved in a discussion to make an informed choice between warfarin and a NOAC.

Further reading:

https://patient.info/doctor/stokes-adams-attacks

Question:

A 64-year-old female presents to her GP with a 4-month history of post-menopausal bleeding. She is otherwise asymptomatic. Her first period was at 12-years-old and her last period was at 49-years-old. She has no children and is up-to-date with cervical smear screening. Her only medication is continuous combined hormone replacement therapy (HRT). She was treated for gonorrhoea 25 years ago. She has smoked 10 cigarettes daily for the past 20 years and does not drink alcohol.

What represents the greatest risk factor for endometrial cancer in this patient?

A. Nulliparity

B. Hormonal replacement therapy

C. Smoking

D. Previous sexually transmitted infection

E. Age of menarche

Correct Answer:Nulliparity

Explanation:

The correct answer is nulliparity. Many of the risk factors for endometrial cancer are due to unopposed oestrogen exposure. Pregnancy is a protective factor for endometrial cancer as it reduces the number of ovulatory cycles that a woman has. Breastfeeding is also recognised to reduce the risk of endometrial cancer as lactation also suppresses ovulation. Therefore, women who have had several pregnancies are at lower risk of endometrial cancer, than those who have never been pregnant.

The age of menarche is normal; typical age of menarche is between 11 and 15 years. The typical age of menopause is between 45 and 55-years-old. Early menarche and late menopause increase the number of ovulatory cycles and the overall oestrogen exposure for an individual, increasing the risk of endometrial cancer.

HRT is incorrect as the patient is taking a combined preparation with both oestrogen and progesterone, with progesterone being protective against endometrial cancer. Oestrogen-only preparations of HRT are associated with an increased risk of endometrial cancer, in those with a uterus. Any form of HRT does come with risks, including risk of VTE and stroke. Combined HRT preparations have also been demonstrated to cause a small increased risk of breast cancer.

Smoking is incorrect. Whilst increasing the risk of most malignancies, it has actually been well demonstrated that smoking reduces the risk of endometrial cancer. The mechanism for this is unclear.

No studies have demonstrated a link between sexually transmitted infections and an increased risk of endometrial cancer.

Further reading:

https://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/uterine-cancer/risk-factors

Question:

A new medication is developed for generalised anxiety disorder (GAD). A researcher conducts a study involving 500 patients with GAD to test the efficacy of this new medication. The patients are randomised to either the treatment arm, which receives the new medication, or the control arm, which receives a sugar pill.

What is the main purpose of randomisation in this study?

A. To reduce selection bias

B. To reduce the placebo effect

C. To reduce observer bias

D. To reduce recall bias

E. To reduce measurement bias

Correct Answer:To reduce selection bias

Explanation:

The main purpose of randomisation in a clinical trial is to reduce selection bias. Selection bias is the bias that arises when the way in which participants are selected for a study, or selected for either the treatment or control arm of a study, results in a sample population that is very different to the general population they are intended to represent.

The placebo effect is the phenomenon where a patient’s belief in their treatment, rather than the treatment itself, results in a beneficial effect. This effect can be reduced by blinding.

Observer bias is the bias that arises due to a researcher’s expectations or preconceptions affecting the way they perceive and record a variable. This is the main form of bias that is eliminated through double-blinding.

Recall bias, also known as reporting bias or responder bias, is the bias that arises from participants inaccurately recalling past events or omitting details. It is a particularly big problem in retrospective studies that rely on participants providing information.

Measurement bias is the bias that arises from an inaccuracy in the way in which the variable is being measured, for example using an inaccurate measuring tool.

Further reading:

https://guides.himmelfarb.gwu.edu/prevention\_and\_community\_health/types-of-studies

Question:

A 40-year-old man is admitted to hospital following a protracted flare of his Crohn’s disease, resulting in >20kg weight loss over the past 6 months. He has undergone numerous bowel resections in the past and now has short bowel syndrome. During admission, his peripherally inserted central catheter (PICC) becomes blocked, and due to a delay in the process of re-siting this, he is without parenteral nutrition for several days. One day after restarting the feed, he becomes unwell with breathlessness and palpitations.

Blood results on restarting feeding are as follows:

Result Reference range

Magnesium 0.45 mmol/L (0.7-1.0)

Phosphate 0.39 mmol/L (0.74-1.4)

Potassium 2.4 mmol/L (3.5-5.3)

What complication most likely explains these electrolyte abnormalities?

A. Conn’s syndrome

B. Refeeding syndrome

C. Cholestasis

D. Primary hyperparathyroidism

E. Vitamin D deficiency

Correct Answer:Refeeding syndrome

Explanation:

This patient has refeeding syndrome, an important cause of biochemical derangement which arises from a period of malnutrition. This typically occurs when feeding is reinstated after a prolonged period of fasting. During fasting, metabolism switches from carbohydrates to fats/ketones for energy utilisation in an attempt to prevent protein and muscle breakdown. When feeding is restarted, the glucose load stimulates insulin secretion and upregulation of carbohydrate, fat and protein synthesis. This anabolic stimulus promotes rapid intracellular uptake of phosphate, potassium, magnesium and thiamine, and consequently, plasma levels of these electrolytes begin to fall rapidly. The most concerning acute complication is cardiac dysrhythmia secondary to hypokalaemia (as evidenced by this patient's breathlessness and palpitations), but other complications can include respiratory muscle weakness, seizures and fluid shifting.

The key to preventing refeeding is to identify those at high risk, which include: chronic malnutrition (anorexia nervosa, chronic alcoholism, cachexia), post-operative patients, the elderly, little/no nutritional intake for >5 days, unintentional weight loss >10% in the last 3-6 months, and oncology patients receiving chemotherapy. Nutritional support for at-risk patients can be delivered through various means, depending on the setting, but typically includes oral, enteral (nasogastric (NG), nasojejunal (NJ), percutaneous endoscopic gastrostomy (PEG)) or intravenous (total parenteral nutrition (TPN)) feeding. If refeeding syndrome is a risk, or is suspected, plasma phosphate, potassium, magnesium, calcium and sodium should be checked, and if deranged, replaced prior to feeding. Management thereafter involves thiamine replacement (IV Pabrinex) if indicated, commencing feeding slowly, and careful rehydration with ongoing electrolyte monitoring. Other complications of TPN include problems linked to the central line (incorrect position, blockage, infection), electrolyte abnormalities and hyperglycaemia (especially if diabetic), abnormal liver function tests, and hyperlipidaemia.

Although primary hyperparathyroidism and vitamin D deficiency are other causes of hypophosphataemia, they do not explain the other electrolyte abnormalities (hypomagnesaemia or hypokalaemia) or clinical features of breathlessness and palpitations.

Conn’s syndrome (also known as primary hyperaldosteronism) classically presents with hypertension and hypokalaemia resulting from aldosterone excess, which although could account for the symptoms of breathlessness and palpitations, would not explain the hypomagnesaemia and hypophosphataemia.

Cholestasis is a potential complication of long-term parenteral nutrition, so is less likely here, given this patient has started his TPN feed within the last 24 hours.

Further reading:

https://patient.info/doctor/malnutrition

Question:

A 35-year-old woman presents to the emergency department with a history of sudden onset confusion. A collateral history reveals she recently resolved to stop drinking, as she has been struggling with alcoholism for years.

Blood tests reveal she has a thiamine level of 25 nmol/L (50 – 220 nmol/L).

What organ is most likely to be affected by this deficiency?

A. Liver

B. Heart

C. Spleen

D. Kidneys

E. Lungs

Correct Answer:Heart

Explanation:

Thiamine is the precursor for the cofactor of two enzymes key to the Krebs cycle: pyruvate dehydrogenase and alpha-ketoglutarate dehydrogenase. Therefore, a deficiency of thiamine (vitamin B1) is associated with pathologies in organs highly dependent on aerobic respiration: the heart and the brain. Thiamine deficiency is associated with wet beriberi, which is a form of dilatational cardiomyopathy, meaning the heart is correct. Patients with this condition may present with tachycardia, shortness of breath, and leg swelling. In this case, this patient is likely in delirium tremens, a potentially fatal state caused by acute alcohol withdrawal on a background of alcoholism. Alcoholics are at an increased risk of thiamine deficiency due to their poor diet and absorption, so cases of wet beriberi and Wernicke-Korsakoff syndrome are higher in alcoholics.

Thiamine deficiency is not classically associated with kidney dysfunction, although renal failure can be a complication of wet beriberi.

Multiple organ failure can be present as a result of wet beriberi as a result of heart failure; the dilation of the heart ventricles eventually leads to decompensation, leading to end-organ damage, potentially including the liver. However, the heart is affected first, so any liver pathology from hypoxia is a complication of the initial heart pathology from B1 deficiency.

Wet beriberi is more commonly associated with heart and brain pathology than lung disease.

Vitamin B1 deficiency is not as heavily associated with spleen pathology as it is heart and brain pathology, as these are much more aerobically dependent organs.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK537204/

Question:

A 59-year-old woman attends her GP with a red right eye. The patient reports that she was first aware of her red-eye when her husband noticed it the previous day. The eye is not particularly painful, but it does feel mildly irritated. There is no history of trauma. There is no significant past medical history.

Clinical examination reveals a bright red, flat patch with sharply defined edges located in the inferior conjunctiva surrounded by normal conjunctiva.

What is the most appropriate investigation to perform, given the likely diagnosis?

A. Blood pressure measurement

B. Chest x-ray

C. C-reactive protein and white blood cell count

D. Intraocular pressure measurement

E. Full blood count

Correct Answer:Blood pressure measurement

Explanation:

The most likely diagnosis, in this case, is subconjunctival haemorrhage. This condition can be defined as bleeding of conjunctival or episcleral blood vessels into the subconjunctival space. Risk factors for this condition include increasing age and female gender. The aetiology of subconjunctival haemorrhage is usually idiopathic. Causal factors may include trauma, hypertension, wearing contact lenses and bleeding disorders. In the absence of an obvious causal factor (e.g. trauma), blood pressure should always be checked. Blood tests are not indicated for an isolated episode of subconjunctival haemorrhage. If trauma is reported, the patient may need further investigation to rule out more extensive eye injury. This condition does not usually require active management unless an underlying systemic illness is identified.

A full blood count is not indicated in this scenario. This investigation, along with coagulation studies, would be appropriate in recurrent subconjunctival haemorrhage if a bleeding disorder was suspected.

Inflammatory markers would be appropriate if a systemic illness were suspected, not in the case of an isolated episode of subconjunctival haemorrhage.

Intraocular pressure measurement would be appropriate if acute angle-closure glaucoma were suspected. This condition would more likely present with ocular pain, red eye, reduced visual acuity and haloes seen around lights.

Chest x-ray would not be appropriate in this case.

Further reading:

https://patient.info/doctor/subconjunctival-haemorrhage-pro

Question:

A 21-month-old developmentally normal boy is brought to a paediatric ENT clinic by his father for “trouble hearing”. Around one month ago, he presented to his GP with bilateral ear pain and fever. The GP prescribed amoxicillin for 10 days, which his father reports he completed. At your clinic today, the boy keeps on tugging at his ears.

On physical examination, his temperature is 36.8°C, blood pressure is 89/53 mm Hg, pulse is 83/min, and respiratory rate is 29/min. On otoscopy, his tympanic membranes appear non-erythematous bilaterally, but air/fluid levels can be seen in both middle ear spaces.

What is the most appropriate course of action?

A. Observe for 2 months

B. Conduct a hearing test

C. Refer him for a tympanostomy

D. Prescribe another course of amoxicillin

E. Prescribe a course of ceftriaxone

Correct Answer:Observe for 2 months

Explanation:

Otitis media with effusion (OME) or serous otitis media can often occur after acute otitis media (AOM). When fluid is present in the middle ear it leads to a conductive hearing loss, which is quite often accompanied by the feeling that you cannot “pop” your ears. Most cases of OME resolve spontaneously – around half will have resolved by 3 months, and nearly all cases will have resolved by 9 months. As this patient is newly diagnosed and is developmentally normal, the best course of action would be watchful waiting. If after 3 months (total) the OME persists he may require more active management with a hearing evaluation and further interventions based on that. The best course of action, in this case, is to observe for another 2 months.

Another course of antibiotics is not appropriate for newly diagnosed OME. Another course of amoxicillin could be considered if the patient had signs of infection (i.e. erythematous, bulging tympanic membrane).

Tympanostomy is not an appropriate course of action for newly diagnosed OME in a developmentally normal child. Tympanostomy should be considered in children who are at risk for speech and language problems or who have persistent OME.

Conducting a hearing test is not an appropriate course of action for newly diagnosed OME in a developmentally normal child. It should be considered if the OME persists for 3 months or if there are any concerns regarding speech and language development.

Further reading:

https://cks.nice.org.uk/topics/otitis-media-with-effusion/management/management/

Question:

A 65-year-old man presents to the emergency department with acute onset fever and abdominal pain. He has a past medical history of alcoholic liver cirrhosis.

On examination, he appears unwell but is orientated to time and place. His abdomen is grossly distended and diffusely tender. Shifting dullness is present. His temperature is 38.3ºC, heart rate 115 bpm, blood pressure 103/85 mmHg, respiratory rate 23 /min, and oxygen saturation 96% on room air.

An ascitic tap is performed and demonstrates the following:

Factor Result Reference range

Appearance Cloudy

Protein 6g/dL (<4)

Neutrophil count 530 cells/µL (<250)

Red blood cell count 270 cells/µL (0)

He is subsequently treated and recovers.

What is the most appropriate prophylactic treatment for this patient?

A. Rifaximin

B. Cefotaxime

C. Spironolactone

D. Ciprofloxacin

E. Lactulose

Correct Answer:Ciprofloxacin

Explanation:

Ciprofloxacin is correct. This patient has abdominal distention on a background of alcoholic liver cirrhosis, suggesting the presence of ascites, a known complication. The presence of fever, abdominal pain and tenderness suggest an element of infection. Such a presentation should raise suspicion of spontaneous bacterial peritonitis (SBP), which is thought to be caused by haematogenous bacterial spread and colonisation of ascitic fluid. The cloudy ascitic fluid with raised protein, blood, and neutrophil count all support the diagnosis of SBP. SBP is commonly treated with IV cefotaxime. Following treatment and recovery, the British Society of Gastroenterologists guidelines recommends that patients should be offered ciprofloxacin antibiotic prophylaxis.

Lactulose and rifaximin are used for the prophylaxis of hepatic encephalopathy, by promoting ammonia metabolism and excretion, thus reducing the serum concentration. These patients typically present with altered mental state and asterixis. Rifaximin is used if lactulose itself alone is insufficient, as it is thought to help with altering gut flora to reduce ammonia production.

Cefotaxime is used in the acute management of SBP, not as prophylaxis.

Spironolactone is offered to patients with ascites secondary to liver cirrhosis. Although ascites can predispose a patient to SBP, spironolactone does not directly protect against it, as it does not prevent bacterial colonisation of the ascitic fluid.

Further reading:

https://www.bsg.org.uk/clinical-resource/guidelines-on-the-management-of-ascites-in-cirrhosis/

Question:

A researcher conducts a prospective cohort study to determine whether sexually transmitted infections (STIs) increase the risk of urinary tract infections (UTIs). A group of 100 patients who have just been diagnosed with an STI and a group of 100 individuals matched by age, sex, level of sexual activity and comorbidities who have never been diagnosed with an STI are recruited and followed up over time to monitor for UTIs.

What is the main purpose of matching the characteristics of those in the control group to those in the treatment group?

A. To reduce the placebo effect

B. To reduce recall bias

C. To reduce measurement bias

D. To reduce confounding bias

E. To reduce observer bias

Correct Answer:To reduce confounding bias

Explanation:

The main purpose of matching the characteristics of those in the control group to those in the treatment group is to reduce confounding bias. This is the bias that arises when an additional factor is independently associated with both the exposure and the outcome, leading to an apparent correlation between the exposure and outcome. For example, if the exposure group contained more older participants, females, participants who were more sexually active and many people with benign prostatic hyperplasia, this could lead to the exposure group having higher levels of UTIs independent of a previous STI diagnosis.

The placebo effect is the phenomenon where a patient’s belief in their treatment, rather than the treatment itself, results in a beneficial effect. This effect can be reduced by blinding.

Observer bias is the bias that arises due to a researcher’s expectations or preconceptions affecting the way they perceive and record a variable. This is the main form of bias that is eliminated through double-blinding.

Recall bias, also known as reporting bias or responder bias, is the bias that arises from participants inaccurately recalling past events or omitting details. It is a particularly big problem in retrospective studies that rely on participants providing information.

Measurement bias is the bias that arises from an inaccuracy in the way in which the variable is being measured, for example using an inaccurate measuring tool.

Further reading:

https://guides.himmelfarb.gwu.edu/prevention\_and\_community\_health/types-of-studies

Question:

A 44-year-old gentleman presents to the GP with a persistent itching feeling. He states this affects his whole body and is becoming increasingly hard to deal with. He denies any rashes and is bemused and frustrated about the origin of his symptoms. He informs the doctor that he has also experienced an uncomfortable burning sensation in his hands and feet, accompanied by an increased redness of these areas; this seems to be sporadic in nature.

His past medical history is limited, other than two recent admissions for deep vein thromboses; these seemed to occur without a trigger, and as a result, he is currently taking apixaban. The only other medication he takes is paracetamol, which he reports using frequently to deal with a chronic headache.

On examination, the patient is of normal height and weight, and a thorough examination reveals no rashes, nor any other abnormalities. Nevertheless, the GP is concerned about the patient's symptoms and orders a set of blood tests. TFT's, U&E's and a blood film are all normal, but a full blood count reveals the following:

Haemoglobin - 189g/L

MCV - 64

Haematocrit - 0.6L/L

WBC - 12x109/L

Platelets - 450x109/L

Given the likely diagnosis, which of the following investigations would be most appropriate?

A. Chest X-ray

B. Bone marrow biopsy

C. Genetic testing via PCR

D. Abdominal ultrasound

E. Immunophenotyping

Correct Answer:Genetic testing via PCR

Explanation:

This patient is describing symptoms of polycythaemia vera; a form of haematological malignancy involving the abnormal proliferation of erythrocytes. The full blood count of this patient reveals a raised haemoglobin level, as well as a slightly raised WBC and platelet level, all of which are in keeping with the condition. The MCV is low, as is often the case in the disease, as there are insufficient iron stores to accommodate for the increased level of red blood cell production, and the haematocrit is raised, as the increase in red blood cells increase the erythrocyte: plasma ratio.

The first-line test for patients with suspected polycythaemia vera is genetic testing via PCR to screen for the presence of a JAK2 mutation, a genetic alteration that is present in many myeloproliferative disorders but is strongly associated with polycythaemia vera. If this is present, the diagnosis is very likely, and treatment can be initiated, usually via venesection to reduce the patient's erythrocyte level. Given this patient's significant thrombotic history, he is likely to receive both aspirin and hydroxycarbamide, as both of these therapies can reduce the risk of venous thromboembolism.

A bone marrow biopsy may be used in the work-up for polycythaemia vera, but given the invasive nature of the procedure, this is reserved for patients who are negative for a JAK2 mutation, but for whom there is still a strong clinical suspicion of the disease. This is therefore not the most appropriate first-line investigation.

Immunophenotyping involves detecting certain proteins on the surface of cells in order to classify them. This is often used in the setting of leukaemia to determine the exact subtype that is present; it is not required in polycythaemia vera.

A chest X-ray is unlikely to be of diagnostic benefit in polycythaemia vera.

Abdominal ultrasound may rarely be indicated in patients with polycythaemia vera if there is suspicion that the condition has caused Budd-Chiari syndrome, a rare complication resulting from hepatic vein thrombosis. There is no evidence of this in the patient's history, and it is unlikely to be warranted in this case.

Further reading:

https://patient.info/doctor/polycythaemia-vera-pro

Question:

A 25-year-old pregnant woman attends a routine antenatal appointment with vomiting. She is 11 weeks pregnant and has never before had a child. The patient reports intractable vomiting, often occurring 6-8 times per day for the last 3 weeks. She mentions that she has unintentionally lost 3kg in weight over the last 3 weeks. Over the last few days, she has been feeling quite dizzy when she moves from sitting to standing and she is struggling to maintain adequate oral intake of fluid. On examination, she has a dry mouth, appears pale, has a blood pressure of 80/60mmHg and heart rate of 100bpm. Urine dipstick discovers the presence of ketones (++).

What is the MOST APPROPRIATE management plan?

A. Adopt a watch and wait approach

B. Admit for insulin and IV fluids

C. Treat with omeprazole, amoxicillin and metronidazole

D. Admit for early delivery

E. Admit for IV fluids and anti-emetics

Correct Answer:Admit for IV fluids and anti-emetics

Explanation:

The most likely diagnosis is hyperemesis gravidarum (HG). This condition can be defined as intractable vomiting occurring in the first trimester of pregnancy. Risk factors for HG include carrying a female fetus, multiple male fetuses, the presence of comorbidities (hyperthyroidism, psychiatric illness, pre-existing diabetes mellitus and gastrointestinal disorders) and history of molar pregnancy. Protective factors for this condition include consistent water intake during pregnancy and maternal age older than 30 years.

Clinical features for HG include persistent vomiting, associated weight loss and features of hypovolaemia (e.g. dizziness, dehydration, low blood pressure, high heart rate etc). The most appropriate management option for this patient is admission to hospital for the administration of intravenous fluids and anti-emetics.

Insulin and fluid replacement would not be appropriate, as there is no convincing evidence the patient has diabetes (the ketones present in the urine are due to reduced oral intake secondary to vomiting, rather than a lack of insulin).

Triple therapy (omeprazole, amoxicillin and metronidazole) would be appropriate if peptic ulcer disease (PUD) was suspected. PUD typically presents with epigastric pain and reflux.

A watch and wait approach would be detrimental in this case. The patient is developing hypovolaemic shock (i.e. increased heart rate and low blood pressure) and will likely continue to deteriorate unless given IV fluid replacement.

Early delivery would not be appropriate in this case as a pregnancy delivered at 11 weeks would not be viable.

Further reading:

https://patient.info/doctor/nausea-and-vomiting-in-pregnancy-including-hyperemesis-gravidarum

Question:

A 20-year-old student presents to A&E with severe abdominal pain and the passage of numerous watery stools. The pain is reported to be 'crampy' in nature and appears to come and go in waves. The stool is not bloody and the patient has not noticed any mucus contained within it. A full history reveals that he is was concerned about some leftover Chinese takeaway that he reheated 12 hours ago; he was warned by his girlfriend at the time that this was unwise, and that the food should be discarded. The takeaway is described to have been a mixture of rice and vegetables.

The patient's observations are within the expected ranges, although the pulse is towards the top end of the normal range at 97. Clinical examination reveals no signs of dehydration, with a normal capillary refill time and skin turgor, moist mucous membranes and warm peripheries. The doctor in A&E prescribes some Dioralyte oral rehydration solution and explains to the patient that whilst he is likely suffering from inflammation within his intestines due to an infection from the contaminated food, the likely organism responsible does not warrant antibiotic treatment.

Which of the following organisms is most likely to account for the patient's presentation?

A. Salmonella typhi

B. Bacillus cereus

C. Giardia lamblia

D. Campylobacter jejuni

E. Clostridium difficile

Correct Answer:Bacillus cereus

Explanation:

The patient has presented with signs of infective colitis, with the classical presentation of colicky abdominal pain and diarrhoea. The likely source of infection is the Chinese takeaway; given the fact that this was eaten only 12 hours previously, and symptoms have already developed, a toxin-producing bacteria is the most likely culprit. Enterotoxins can affect the absorption of water and electrolytes, causing a rapid onset of secretory diarrhoea. Pathogens producing such toxins to consider in this case would include Staphylococcus aureus, and, if a travel history was described, Vibrio cholerae. However, given the description of rice consumption, the most likely organism in this particular scenario is Bacillus cereus, a gram-positive, spore-forming bacteria that can cause infection in those consuming rice that has not been thoroughly reheated. Whilst the symptom-onset can be rapid, the infection will usually resolve without therapy, with prevention of dehydration the main consideration for management.

Salmonella typhi is the organism most frequently responsible for causing typhoid, a common consideration for fever in a returning traveller. Unlike disease due to other non-typhoidal salmonella species, gastrointestinal involvement is not necessarily a feature of typhoid, and the lack of fever and recent travel makes the diagnosis less likely.

Clostridium difficile is a gram-positive bacillus that can cause colitis, most frequently in patients admitted to hospital. The usual trigger for infection is the provision of antibiotics; the drugs alter the intestinal flora, allowing for colonisation with the bacteria. There is no history of antibiotic use or a hospital stay in this case.

Campylobacter jejuni is the most common causative organism implicated in bacterial gastroenteritis; it can be acquired through the consumption of contaminated meats. It can often present with bloody diarrhoea, rather than the secretory diarrhoea frequently seen in infections with toxin-producing organisms. It is less likely to be the diagnosis in this scenario, as the incubation period is around 2-4 days, and therefore is not in keeping with the history of likely exposure.

Giardia lamblia is a parasitic infection that can be acquired through the consumption of contaminated water sources, often in those travelling to less-developed countries. There is no history of travel in this case, and the infection most commonly presents with loose, fatty stools, rather than the profuse watery diarrhoea described by the patient.

Further reading:

https://patient.info/doctor/gastroenteritis-in-adults-and-older-children

Question:

An 85-year-old female with a background of hypertension presents to the emergency department complaining of a headache which began 3 hours ago. The headache is localised to the right side of the forehead and radiates to the back of the head. It is associated with dizziness. The patient describes the headache as being the worst headache she has ever experienced, which began suddenly and reached maximal intensity within a few seconds. She was seen by her GP who recorded her blood pressure as 225/100 at that time. A repeat blood pressure is 180/85, and the patient states the headache has now resolved.

On examination, the patient has no neurology of note and fundoscopic exam is normal. A CT head is performed and shows no abnormalities.

What is the next most appropriate step in the management of this patient?

A. Admit for nitroprusside and BP monitoring

B. Admit for a lumbar puncture

C. Arrange an MRI head

D. Discharge home with simple analgesia

E. Discharge with prescription for triptans

Correct Answer:Admit for a lumbar puncture

Explanation:

This patient has presented with a classic thunderclap headache and a diagnosis of subarachnoid haemorrhage (SAH) needs to be ruled out. CT head typically identifies most cases of SAH (95-98%), however, a normal CT head does not completely rule out the diagnosis. The most appropriate next step is to perform a lumbar puncture (ideally this should be done at least 12 hours after symptom onset). Spectrophotometry should be performed on the cerebrospinal fluid to identify xanthochromia (yellow discolouration of the spinal fluid caused by the red blood cell lysis).

It is not appropriate to discharge the patient with simple analgesia or triptans, without first ruling out a subarachnoid haemorrhage. Whilst there may be a role for nitroprusside (hypertensive urgency), a SAH must first be ruled out.

There is no role for an MRI head in this patient at this stage.

Further reading:

https://patient.info/doctor/subarachnoid-haemorrhage-pro

Question:

A 14-year-old female presents to the emergency department with a headache and neck stiffness. Her eyes are tightly closed, and bright lights appear to be causing her considerable pain. She has not received her childhood vaccines. On examination, heart rate 113bpm, temperature 38.2oC, blood pressure 102/74mmHg and oxygen saturation 98% on room air. There is a widespread non-blanching rash.

Based on the likely diagnosis, what is the most likely causative organism?

A. Group B Streptococcus

B. Listeria monocytogenes

C. Haemophilus influenzae

D. Neisseria meningitidis

E. Streptococcus pneumoniae

Correct Answer:Neisseria meningitidis

Explanation:

The history of a headache, neck stiffness, photophobia, and a non-blanching rash all point towards meningococcal meningitis. Whilst meningitis has a variety of bacterial and viral causes, meningococcal meningitis is caused by Neisseria meningitidis. It presents with the classical non-blanching petechial/purpuric rash. The other organisms do not typically cause a non-blanching rash. The best way to prevent against infection is vaccination, and multiple vaccines are available for Neisseria meningitidis.

Streptococcus pneumonia is a common cause of bacterial meningitis in those >60 years old. A vaccine is available.

Listeria monocytogenes is a common cause of bacterial meningitis in immunocompromised patients. There is no vaccine available.

Group B Streptococcus is a common cause of bacterial meningitis in infants aged 0-3 months. There is no vaccine available.

Haemophilus influenzae is a common cause of bacterial meningitis in infants and children from birth to 6 years old. A vaccine is available.

Further reading:

https://cks.nice.org.uk/topics/meningitis-bacterial-meningitis-meningococcal-disease/

Question:

A 21-year-old man presents with shortness of breath and a chronic productive cough. His past medical history includes type 2 diabetes mellitus and recurrent upper respiratory tract infections during childhood. On examination, he has nasal polyps, finger clubbing, and bilateral coarse crepitations on inspiration and expiration.

His temperature is 37.1°C, blood pressure 117/75 mmHg, HR is 64bpm, and SpO2 is 96%.

What is the most likely cause of his shortness of breath?

A. Bronchiectasis

B. Chronic obstructive pulmonary disease

C. Community acquired pneumonia

D. Viral upper respiratory tract infection

E. Asthma

Correct Answer:Bronchiectasis

Explanation:

The answer to this question is bronchiectasis, in this case, as a complication of cystic fibrosis. Bronchiectasis can present with shortness of breath, coarse crepitations, clubbing, and a chronic productive cough. It is typically caused by recurrent respiratory tract infections, which result in permanent and irreversible bronchial dilation. As such, conditions predisposing to recurrent respiratory infections such as asthma, chronic obstructive pulmonary disease (COPD), and cystic fibrosis can all result in bronchiectasis. The past medical history of the patient points towards cystic fibrosis being the underlying cause in this case. A mutation in the CTFR gene results in the production of thick mucus, impairing the mucociliary escalator and predisposing to infection. Cystic fibrosis can also affect other areas of the body, such as the pancreas (resulting in type 2 diabetes), the fingers (causing clubbing), and may present with nasal polyps on examination.

Community acquired pneumonia (CAP) typically presents with shortness of breath, crepitations, and an increased temperature. This patient has no signs of fever or sepsis. Whilst that does not entirely exclude CAP, the presence of clubbing and the patient’s past medical history of diabetes are better explained by bronchiectasis secondary to cystic fibrosis.

Asthma typically presents with a high-pitched wheeze and non-productive cough. There is also usually a history of atopy. The patient also has normal observations and a normal SpO2, making it unlikely he is having an acute asthma attack.

Chronic obstructive pulmonary disease (COPD) may present with clubbing and coarse crepitations; however, it typically presents later in life and with a non-productive cough. This patient also has a normal SpO2 making it unlikely he has COPD.

Viral upper respiratory tract infection also typically presents with a fever, as well as other symptoms such as a runny nose. Shortness of breath is not a common symptom though it can occur in more severe cases.

Further reading:

https://www.nice.org.uk/guidance/ng78

Question:

A 52-year-old woman presents to the GP, complaining of persistent fatigue. She is now struggling in her job as a maths teacher and feels exhausted by the end of the day. The patient explains that they have also experienced frequent urinary tract infections, and often gets pains in a number of her joints after a long day at work. She stopped menstruating 3 months previously, and wonders if her symptoms are simply due to menopause; she denies any issues with her mood or sleep, and has no other past medical history of note. She reports drinking roughly 4 units of alcohol per week.

There are no abnormalities on examination; the patient has no evidence of pallor, rather she appears relatively tanned. Abdominal examination is unremarkable.

The GP informs the patient that menopause could account for a number of her symptoms, but orders a number of investigations to rule out other possibilities. FBC and U&E are both normal, however, LFT's demonstrate a mildly elevated ALP and ALT. A HBA1c measurement returns a result of 54, which the GP tells the patient is above the threshold for a diagnosis of diabetes mellitus. This comes as a great surprise to the patient, as she maintains a healthy diet and exercise routine.

The GP is not certain of the cause of the patient's wide array of symptoms and therefore arranges a hospital referral for a second opinion and further investigations. These reveal a genetic cause for the patient's symptoms.

Given the likely diagnosis, which of the following genes is most likely to be implicated in the pathophysiology of the disease?

A. CARD15

B. HFE

C. NOD2

D. ATP7B

E. n-MYC

Correct Answer:HFE

Explanation:

The most likely diagnosis, in this case, is hereditary haemochromatosis; a disorder of iron metabolism in which patients have issues with the excretion of the metal, leading to accumulation and deposition within organs. The disease most frequently arises due to a mutation in the HFE gene, which can result in ineffective transferrin binding and decreased hepcidin levels, both of which cause greater iron absorption and eventually iron overload.

his can go unnoticed for many years; in women, it commonly presents post-menopause, as prior to this, iron is naturally removed from the body via menstruation. However, over time, excessively high iron levels can damage a number of internal organs; the liver is frequently infected, with low-level hepatitis developing, with possible progression to cirrhosis. Pancreatic inflammation can result in secondary diabetes mellitus; this explains the abnormal HBA1c result in this patient. Other features can include:

Arthralgia

Pituitary gland dysfunction

Restrictive cardiomyopathy

Skin hyperpigmentation

The ATP7B gene is mutated in Wilson's disease; another possible cause of liver disease in younger patients. This arises due to issues with copper metabolism rather than problems with iron overload.

CARD15 and NOD2 are two genes implicated in Crohn's disease; they do not have a role in the pathophysiology of hereditary haemochromatosis.

n-MYC is an oncogene that has a role in the development of many cases of neuroblastoma, a relatively common malignancy of sympathetic nervous system tissue that most commonly affects children.

Further reading:

https://patient.info/doctor/hereditary-haemochromatosis

Question:

A 35-year-old male presents to his GP with fatigue and pruritus developing over the past month. He states his appetite hasn’t changed, his bowel motions are normal for him and otherwise he feels well in himself. He has a past medical history of mild depression, asthma and ulcerative colitis. He does not drink alcohol or smoke.

On examination, he has mild hepatomegaly and icterus of the sclera. There are no signs of anaemia, bruising or bleeding. A range of blood tests are requested by the GP.

What is the most appropriate initial imaging modality?

A. CT abdomen

B. Hepatobiliary scintigraphy

C. Abdominal ultrasound

D. Endoscopic retrograde cholangiopancreatography (ERCP)

E. Magnetic resonance cholangiopancreatography (MRCP)

Correct Answer:Abdominal ultrasound

Explanation:

Any patient presenting with jaundice and hepatomegaly should have an initial abdominal ultrasound to assess the liver for cirrhosis (i.e. cirrhosis and malignancy) and the biliary tree for evidence of obstruction (i.e. gallstones, strictures or malignancy). In this scenario, the patient most likely has a diagnosis of primary sclerosing cholangitis (PSC), given the clinical presentation and history of ulcerative colitis (70-80% of patients with PSC also have ulcerative colitis).

PSC is an inflammatory condition affecting the intra-hepatic and extra-hepatic biliary ducts, causing cholestasis secondary to multifocal biliary strictures. PSC typically presents with jaundice, pruritis, right upper quadrant pain, fatigue, weight loss and fevers. Findings on clinical examination can include hepatomegaly, splenomegaly and signs of liver cirrhosis in late-stage disease.

MRCP is currently the gold standard investigation to make the definitive diagnosis, as this allows detailed imaging of the biliary tree and associated strictures. The use of ERCP has largely been replaced by MRCP due to the reduced risk of complications (i.e. ascending cholangitis). However, an abdominal ultrasound is a more appropriate initial investigation to exclude alternative diagnoses.

A standard CT abdomen is not a particularly useful investigation for diagnosing PSC, however it might be useful if there is a suspicion of associated malignancy.

Hepatobiliary scintigraphy involves the use of radiotracers (e.g. Tecnetium99) to visualise the function of the liver and bile ducts via the movement of the radiotracers through it. This investigation is sometimes used to assess bile production and drainage, however, it is not used routinely in the investigation of PSC.

Further reading:

https://patient.info/doctor/primary-sclerosing-cholangitis-pro

Question:

A 70-year-old male attends the Accident and Emergency department with unilateral visual loss affecting his right eye. He reports that he awoke in the morning with right-sided blurred vision that has now progressed to total loss of vision in his right eye. He denies any associated pain. He has a past medical history of hypertension and myeloma.

Clinical examination reveals the following:

visual acuity of 6/48

right-sided ipsilateral relative afferent pupillary defect

retinal haemorrhages in all four quadrants with dilated veins giving a "blood and thunder" appearance

What is the MOST LIKELY diagnosis in this case?

A. Vitreous haemorrhage

B. Retinal detachment

C. Central retinal vein occlusion

D. Branch retinal vein occlusion

E. Central retinal artery occlusion

Correct Answer:Central retinal vein occlusion

Explanation:

The most likely diagnosis, in this case, is central retinal vein occlusion (CRVO). This condition can be defined as occlusion of the central retinal vein. Retinal venous occlusion is the second most common form of retinal disease (behind diabetic retinopathy). Risk factors for CRVO include advancing age (especially above the age of 65 years), hypertension, diabetes, smoking, obesity, raised intraocular pressure, inflammatory diseases (e.g. Behcet’s syndrome), myeloma and other prothrombotic states.

There are two main forms of CRVO (that often overlap):

non-ischaemic

ischaemic

Non-ischaemic CRVO usually has a better long-term outcome, however, it can progress to the ischaemic form. Ischaemic CRVO typically leads to long-term, severe visual impairment with the development of neovascular glaucoma. Clinical features for CRVO include sudden, painless monocular visual loss, dense central scotoma, ipsilateral relative afferent pupillary defect (RAPD), retinal haemorrhage, oedema and dilated veins creating a "blood and thunder" fundoscopic appearance.

Branch retinal vein occlusion is less likely in this case. This condition typically presents with a unilateral, painless blurring of vision, image distortion, and sometimes a field defect (most commonly altitudinal). Fundoscopic examination usually reveals vascular dilatation and tortuosity associated with haemorrhages in an arc distribution.

Retinal detachment typically presents with a sudden increase in floaters and photopsia (flashing lights) and a progressive visual field defect affecting peripheral vision followed by central vision. Retinal detachment can be identified during fundoscopy, visible as an elevation of the retina, giving the retina a grey and out of focus appearance.

Central retinal artery occlusion presents in a similar fashion to central retinal vein occlusion, with painless monocular visual loss. Fundoscopy typically reveals a ‘cherry-red’ spot and surrounding ‘ground-glass’ appearance.

Vitreous haemorrhage typically occurs on a background of diabetic retinopathy. Presentation of this condition varies according to the degree of haemorrhage, including reduced visual acuity, floaters, decreased light perception and a red hue affecting the patient’s vision.

Further reading:

https://patient.info/doctor/retinal-vein-occlusions

Question:

A 45-year-old male presents to the emergency department complaining of left upper quadrant abdominal pain that radiates to his lower posterior thoracic area. The pain is constant but has now plateaued after beginning suddenly 3 hours ago. He is nauseous and has vomited three times since the onset. He has a significant history of alcohol use, having consumed seven standard drinks per day for the past 20 years, but no other past medical history.

On examination, his blood pressure is 100/60 mmHg, but other vitals are within normal limits, dry mucous membranes, and abdominal examination reveals a distended, tender abdomen with voluntary guarding in the left upper quadrant. Intravenous fluid are given rapidly.

What are the most appropriate next early management steps?

A. High-potency opioid (e.g. morphine), anti-emetic (e.g. ondansetron), and paraenteral feeds

B. Non-steroidal anti-inflammatory drug (e.g. ibuprofen), anti-emetic (e.g. ondansetron), and keep nil-by-mouth

C. Non-steroidal anti-inflammatory drug (e.g. ibuprofen), anti-emetic (e.g. ondansetron), and repeated trials of oral diet as tolerated

D. High-potency opioid (e.g. morphine), anti-emetic (e.g. ondansetron), prophylactic empiric IV antibiotics (e.g. ciprofloxacin), and repeated trials of oral diet as tolerated

E. Non-steroidal anti-inflammatory drug (e.g. ibuprofen), anti-emetic (e.g. ondansetron), prophylactic empiric IV antibiotics (e.g. ciprofloxacin), and keep nil-by-mouth until an oral diet is tolerated

Correct Answer:Non-steroidal anti-inflammatory drug (e.g. ibuprofen), anti-emetic (e.g. ondansetron), and repeated trials of oral diet as tolerated

Explanation:

The most likely diaagnosis in this patient is acute pancreatitis. This typically presents with sudden onset abdominal pain, radiating through to the back. With a history of excess alcohol, this is the most likely aetiology. The patient’s initial management steps should include a non-steroidal anti-inflammatory drug (e.g. ibuprofen), anti-emetic (e.g. ondansetron), and repeated trials of oral diet as tolerated. The patient has vomited three times since the pain onset and continues to feel nauseous, so an anti-emetic (e.g. ondansetron) is appropriate to prevent dehydration, electrolyte abnormalities and patient discomfort. As included in the question stem, early and adequate fluid resuscitation is the most important initial management step for all patients to reduce morbidity and mortality related to organ failure.

Pain relief should be provided for all patients according to the severity of pain. As this patient was complaining of mild pain, it would be most appropriate to start on an NSAID (e.g. ibuprofen) then adjust to a high-potency opioid (e.g. morphine) if pain control is inadequate or the patient's pain score increases. Morphine is considered safe in clinical practice as there is no good evidence to support the theoretical risk of exacerbating pancreatic inflammation.

A normal oral diet should be started as soon as tolerated (preferably within 24 hours). This is best achieved through repeated trials of oral diet as tolerated as opposed to keeping the patient nil-by-mouth until an oral diet is tolerated or prescribing paraenteral feeds.

There is no evidence to support the use of prophylactic empiric antibiotics in the absence of proven or highly suspected infection, regardless of disease severity, hence it would not be an appropriate initial management step in this clinical vignette. If an infection is suspected based on signs and symptoms such as fever, leukocytosis, or signs of organ dysfunction, ciprofloxacin would be an appropriate empiric antibiotic as it has good pancreatic penetration.

Further reading:

https://www.nice.org.uk/guidance/ng104

Question:

A 27-year-old female presents to the emergency department because of gradually worsening lower abdominal pain over the past 3 days. Paracetamol has not helped the pain. The patient was able to move her bowels this morning and she denies dysuria or urinary frequency. She has no nausea or vomiting. Her last menstrual period was 3 days ago and she has had multiple sexual partners over the past 3 months without using contraception. She has no other medical problems.

Her observations are as follows:

Temperature: 38.9 degrees Celsius

Heart rate: 94 beats/minute

Respiratory rate: 20 breaths/minute

SpO2: 99% on room air

Blood pressure: 129/88 mmHg

Physical examination demonstrates cervical exudate and cervical motion tenderness. Her urine pregnancy test is negative and her urine dipstick is negative for leucocytes and nitrites.

What is the most appropriate antibiotic treatment for this patient?

A. Clindamycin

B. Trimethoprim

C. Ceftriaxone and doxycycline

D. Ceftriaxone, doxycycline and metronidazole

E. Moxifloxacin

Correct Answer:Ceftriaxone, doxycycline and metronidazole

Explanation:

This question focuses on the treatment of a young female patient who has presented with the signs and symptoms of pelvic inflammatory disease (PID) – an infection of the upper genital tract of women that is typically secondary to sexually transmitted organisms. Prompt treatment with an appropriate antibiotic regimen is indicated to prevent complications such as infertility, tubo-ovarian abscess and peri-hepatitis. Antibiotic regimens need to provide coverage for commonly implicated pathogens such as Chlamydia trachomatis and Neisseria gonorrhoeae, in addition to Trichomonas vaginalis. As such, treatment with ceftriaxone, doxycycline and metronidazole would be an appropriate regimen and is first-line. While ceftriaxone is administered through a one-off intramuscular injection, doxycycline and metronidazole are given as a two-week oral course. Most patients can be treated as outpatients. Indications for hospitalisation include unstable vital signs, tubo-ovarian abscess formation, pregnancy and lack of response to oral medications.

Ceftriaxone and doxycycline alone would not be appropriate for a patient with suspected PID as it would not provide coverage for Trichomonas vaginalis.

Clindamycin can be used in conjunction with gentamicin but would not be appropriate on its own. Clindamycin is particularly useful when a pelvic abscess is suspected.

Moxifloxacin can be used in the treatment for PID but is expensive and provides less coverage of Neisseria gonorrhoea.

Trimethoprim is a first-line treatment for women with a urinary tract infection. The patient has a negative urine dipstick and no lower urinary tract symptoms.

Further reading:

https://patient.info/doctor/pelvic-inflammatory-disease-pro#nav-4

Question:

A patient is currently being treated in the intensive care unit whilst recovering from severe sepsis and is incidentally found to have deranged thyroid function tests. She has been an inpatient for 1 week and is recovering well. She is still receiving IV antibiotics and fluids and is awaiting transfer to a medical ward for ongoing care.

Her thyroid function tests demonstrate a low T3 and T4. Two days ago her TSH level was high, but it is now low. It was also noted that her cortisol levels are raised. Pituitary hormone testing revealed no further abnormalities. She has no goitre, her temperature is 37.5⁰C and she is alert. She does not have any other symptoms.

She has not previously had any problems with her thyroid. She has no significant past medical history, her only regular medication prior to admission was atorvastatin 10mg and she has no allergies.

What is the most likely diagnosis?

A. Hashimoto's thyroiditis

B. Subclinical hypothyroidism

C. Graves' disease

D. De Quervain's thyroiditis

E. Sick euthyroid syndrome

Correct Answer:Sick euthyroid syndrome

Explanation:

The correct answer is sick euthyroid syndrome. Sick euthyroid syndrome is diagnosed when a patient’s thyroid hormone (T3/T4) levels are low but they have no thyroid symptoms in the presence of severe systemic illness, such as sepsis (as in this case), starvation and diabetic ketoacidosis. TSH levels vary depending on the phase of the illness, usually rising initially and decreasing over time. Cortisol increases in response to stressful physiological events, including systemic infection, which would explain the other blood results. There is typically no past history of thyroid disease in these patients, as the syndrome is associated with a temporary change in thyroid function and there is usually no underlying structural abnormality.

Hashimoto’s thyroiditis occurs due to autoimmune destruction of the thyroid gland and is one of the most common causes of hypothyroidism, and hence you would not expect the patient to be clinically euthyroid. Hashimoto’s also typically results in a painless goitre, and you would expect the TSH to be high given the lack of negative feedback on the pituitary as a result of the low thyroid hormones. Thyroid function tests would also reveal raised autoantibodies against thyroglobulin and thyroid peroxidase in Hashimoto’s.

Subclinical hypothyroidism is not the most likely diagnosis. Subclinical hypothyroidism typically involves slightly raised TSH and a T3/T4 within the normal range with no associated clinical features. In these patients, it is useful to measure anti-thyroid peroxidase autoantibodies, as their presence is predictive of progression to more severe hypothyroidism.

This patient does not have Graves’ disease, as Graves’ is a hyperthyroid state in which the T3 and T4 levels would be raised. It occurs as a result of auto-immune stimulation of the TSH receptors. This patient has low levels of T3 and T4 and is clinically euthyroid.

De Quervain’s thyroiditis is also incorrect. These patients will initially present with hyperthyroid symptoms before becoming hypothyroid. Patients typically present with a painful goitre. It is usually triggered by a viral infection.

Further reading:

https://www.msdmanuals.com/en-sg/professional/endocrine-and-metabolic-disorders/thyroid-disorders/euthyroid-sick-syndrome

Question:

A 12-year-old boy attends the emergency department with his mother complaining of severe sudden onset of pain from his stomach. He reports it starting 1 hour ago and describes it as going from his right side down to below his belly button. He has had 2 episodes of vomiting in the past hour but does not feel feverish and is able to hold down fluids. He is able to pass urine and has not experienced any blood or lower urinary tract symptoms (LUTS). There has been no recent change in his bowel habit. This is the first time he has experienced this type of pain before. He reports being generally fit and well, with no past medical history. The mother informs you there is a family history of kidney stones and that she has experienced similar symptoms many years ago for which she had “multiple scans”.

Routine observations shows: RR 18, BP 121/75, HR 96, Temperature 37.3°c and SpO2 97%.

He looks visibly distressed, fidgeting, and unable to find a comfortable position. Clinically he is tender on palpation of the right flank, right iliac fossa, and suprapubic abdominal areas. There are no obvious palpable masses or organomegaly and bowel sounds are present. The testicular examination was normal.

You prescribe analgesia, do a urine dipstick, and take bloods for FBC, U&Es and CRP.

What would be the next most appropriate investigation for this patient’s symptoms?

A. Renal ultrasound

B. Magnetic resonance urography

C. Non contrast enhanced CT KUB

D. Intravenous urography

E. Kidney, ureter, and bladder (KUB) x-ray

Correct Answer:Renal ultrasound

Explanation:

The patient has presented with classical symptoms of ureteric colic (loin to groin pain, vomiting, family history of nephrolithiasis). Nephrolithiasis refers to the presence of calculi (crystalline stones) within the urinary system (kidneys and ureter). 80% of stones are calcium-based, with calcium oxalate stones being the most common type. Calculi formed in the kidneys can become dislodged and subsequently impacted within the lumen of the ureter, leading to the above condition. When suspected, the first-line imaging technique in children is a renal ultrasound, due to a lack of radiation exposure and a reduced need for anaesthesia to perform the scan. However, studies have demonstrated reduced sensitivity compared to CT KUB in identifying calculi, in particular, those <3 mm.

In adults, non-contrast enhanced CT KUB is considered the gold standard investigation due to its superior sensitivity for detecting calculi. It can also determine the stone diameter and density, skin to stone distance, and surrounding anatomy, helping guide treatment. However, the main drawback of non-contrast enhanced CT is the higher radiation dose, a major concern in children. NICE guidance recommends the use of low-dose non-contrast CT in children and younger people if there is uncertainty about the diagnosis of renal colic post ultrasound.

KUB x-ray can be helpful in identifying large radiopaque calculi and follow up for evidence of resolution post-treatment. However smaller calculi or radiolucent stones may not be picked up on initial imaging and there is no ability to assess for acute renal tract changes (e.g. hydronephrosis).

Intravenous urography is a radiographic study of the urinary system carried out by IV contrast and performing serial radiographic exposures. However, due to radiation exposure, need to gain IV access and the potential risk of contrast allergy, this modality is largely avoided in children.

Magnetic resonance urography has been shown to provide detailed anatomical information about the urinary system and does not expose patients to ionising radiation. However, it is more sensitive for detecting non-calculus obstructive uropathy (e.g. malignancy, cysts, etc).

Further reading:

https://uroweb.org/guideline/urolithiasis/#note\_94

Question:

A 45-year-old man is brought to A&E by ambulance after he collapsed at home, holding his head. He now has a reduced level of consciousness; his GCS is recorded as 6, and the paramedics have secured the airway via intubation. His partner is incredibly distressed but is able to inform you that he has never had an episode like this before, and has been otherwise well, although he is currently under investigation for suspected Ehler's Danlos syndrome. There was no history of trauma before the event, with the collapse being reported as 'coming out of the blue'.

Examination carried out as part of the initial assessment reveals bradycardia and hypertension; there is an immediate concern about the possibility of raised intracranial pressure. Hyperreflexia and increased tone are noted on further neurological assessment, with significant neck stiffness. Kernig's sign is positive. The patient is booked in for an emergency CT head, and given his current level of consciousness, contact is made with a specialist tertiary care centre.

What is the most likely cause of this patient's symptoms?

A. Subarachnoid haemorrhage

B. Pituitary apoplexy

C. Streptococcal meningitis

D. Extradural haemorrhage

E. Central venous sinus thrombosis

Correct Answer:Subarachnoid haemorrhage

Explanation:

Whilst it is difficult to determine the exact cause of this patient's symptoms given the sudden onset with limited history and no investigation results, of the answers available, subarachnoid haemorrhage (SAH) is the most likely. This can arise due to trauma, or (as is most probable in this scenario) due to the rupture of an aneurysm within the brain, allowing for blood to enter the subarachnoid space. The patient's history of Ehler's Danlos syndrome puts him at an increased risk of this condition, as the vascular form can correspond with an increased chance of aneurysm formation. The meningism displayed on examination (neck stiffness and positive Kernig's) also support the diagnosis; the blood can irritate the meninges, resulting in these findings.

This patient will need an urgent CT scan and potentially angiography to confirm the diagnosis, and a neurosurgical referral is likely to be required. The management of a subarachnoid haemorrhage usually involves identification of the source of the bleeding, and the use of clips or coiling to close the defect.

Both pituitary apoplexy and central venous sinus thrombosis are important differentials for subarachnoid haemorrhage; these can result in a 'thunderclap headache' (a classical presentation of SAH; although not present in this scenario) and a sudden onset of symptoms. However, the patient's risk factors and signs of meningism make a subarachnoid haemorrhage more likely; there are no features of the history such as an underlying cerebral tumour or an inherited thrombophilia that would suggest that one of these alternative diagnoses needs to be considered.

Meningitis is a classic cause of neck stiffness and a positive Kernig's sign, due to the meningeal inflammation that occurs in the condition. However, this condition would be unlikely to present as suddenly as in this scenario, and the patient is described as having been previously well.

An extradural haemorrhage usually arises as a result of a traumatic head injury; whilst this could have been suffered due to this patient's fall, it would not explain the initial collapse, and there is no previous history of trauma to suggest that this is a likely diagnosis.

Further reading:

https://cks.nice.org.uk/topics/headache-assessment/

Question:

A 5-year-old girl is being investigated for a 5-month history of joint pain. She has been experiencing gradually worsening pain in her joints, which is worst in her right knee. The pain and stiffness are worst in the early mornings and are better when she returns from school and after swimming. There is no history of night pain or trauma. She has no significant prior medical history, was born via normal vaginal delivery with no perinatal complications, is developing normally, and is up-to-date with her immunisations. Her maternal aunt has Hashimoto's thyroiditis.

On examination, she is alert, afebrile and hemodynamically stable. She has an antalgic gait. On the assessment of her joints, there is mild swelling, warmth, and tenderness in her left elbow, right knee, and right ankle with associated restriction in active and passive joint movement.

Based on this history, what is the most likely diagnosis?

A. Transient synovitis

B. Growing pains

C. Juvenile idiopathic arthritis

D. Septic arthritis

E. Osteochondritis dessicans

Correct Answer:Juvenile idiopathic arthritis

Explanation:

Juvenile idiopathic arthritis (JIA) is the correct answer. The patient in the scenario has presented with chronic (lasting more than six weeks), asymmetrical, inflammatory (pain has a diurnal variation being worst in the morning and improves with exercise), oligoarthritis (affecting less than four joints), and has a family history of autoimmunity (maternal aunt has Hashimoto's). On examination, she is not acutely unwell and has an antalgic gait (limp) with associated inflammatory joint activity (swelling, tenderness, stiffness). These features are most consistent with a diagnosis of JIA.

JIA describes a group of chronic paediatric inflammatory arthritides and is a clinical diagnosis characterised by:

Onset before the age of 16

Presence of objective arthritis (in one or more joints) for at least six weeks.

The most common subtype is oligoarticular (more than 50% of cases), which typically affects young female children.

The main risk factors for JIA are:

Female sex

Age under six years

HLA polymorphism

Family history of autoimmunity

Although JIA is a clinical diagnosis, it requires evaluation by a paediatric rheumatologist to confirm the diagnosis and its subtype.

Growing pains (also known as idiopathic nocturnal pains of childhood) typically occur in school-aged children and are characterised by chronic, symmetrical, generalised lower limb pains that wake children up at night. Furthermore, this condition is never associated with morning pain, limitation of activity, or limp. Although the patient in the scenario has chronic pain, it is inflammatory (diurnal variation, which improves with exercise), is associated with a limp, and there is no evidence of night-time pain.

Osteochondritis dessicans is an idiopathic lesion of subchondral bone which may or may not be associated with trauma, is worsened by activity, and typically affects either the knee or elbow joint. Although the patient in the scenario has joint pain in her elbow and knee associated with swelling, her joint pain is of an inflammatory nature (diurnal variation, which improves with exercise), there is no history of trauma, and multiple joints are affected. Osteochondritis dessicans is not a form of inflammatory arthritis and is thought to be the result of biomechanical forces, which results in subchondral damage, and subsequent monoarthritis worsened by activity.

Septic arthritis is an important differential to consider and rule out in any child with sudden onset joint pain. Although the patient in the scenario has a painful, swollen knee joint, her joint pain is most consistent with a gradual-onset progressive inflammatory oligoarthritis. Furthermore, on examination, she is systemically well (alert, afebrile, and hemodynamically stable). Patients with septic arthritis typically have acute-onset (present for less than one week) monoarthritis (affecting a single joint), which is severe, and have a septic presentation (febrile, drowsy, with/without shock).

Transient synovitis is a form of reactive arthritis which occurs following a viral illness and typically results in acute-onset, self-limiting hip pain and limp. Although the patient in the scenario has joint pain with an associated limp, there is no history of recent viral illness, her pain is primarily in her knee and elbow (with no evidence of hip involvement), and her presentation is more consistent with a gradual-onset progressive inflammatory oligoarthritis.

Further reading:

https://www.niams.nih.gov/health-topics/juvenile-arthritis

Question:

A 43-year-old man presents to the GP with heartburn. He describes a 3-month history of a bitter taste in his mouth after eating, followed by a burning sensation in his chest.

He reports that the heartburn is worse after eating a big meal, especially when he stoops forward or lies down afterwards. He does not experience this pain on exertion.

There is no history of weight loss, dysphagia, vomiting, abdominal pain or alteration to stools.

He has no past medical history. He has recently started using antacids which help to alleviate his symptoms.

What is the most likely diagnosis?

A. Peptic ulcer disease

B. Cholecystitis

C. Gastro-oesophageal reflux disease

D. Stable angina

E. Achalasia

Correct Answer:Gastro-oesophageal reflux disease

Explanation:

The most likely diagnosis in this patient is gastro-oesophageal reflux disease (GORD). GORD is defined as the symptoms that result from the reflux of gastric contents into the oesophagus and other structures (oral cavity, larynx, lungs). This patient has presented with the classical symptoms associated with GORD, including heartburn and acid regurgitation. Additional findings that strengthen this diagnosis are aggravating factors, including positional changes, such as leaning forward to lying down, especially when performed shortly after meals, and the alleviation of symptoms with antacids.

Classically, patients with peptic ulcer disease (PUD) present with burning or gnawing pain in the epigastric region that occurs a few hours after a meal or with hunger. Other key features of PUD include the 'pointing sign' (the ability to indicate the exact point of pain with one finger) and frequent nocturnal pain.

Patients with achalasia typically present with a prominent symptom of dysphagia. Whilst patients with achalasia may also report heartburn and regurgitation, the absence of dysphagia to solids and liquids makes this diagnosis less likely.

Whilst it is essential to exclude a cardiac aetiology to any chest pain, typically stable angina presents with substernal chest pain precipitated by exertion and relieved by rest. This patient does not report any exertional chest pain or have any obvious risk factors for cardiovascular disease.

Patients with cholecystitis typically present with pain isolated to the epigastric or right upper quadrant. Cholecystitis presents acutely and is often associated with nausea, fever, and pain that develops over a few hours.

Further reading:

https://www.nice.org.uk/guidance/cg184

Question:

A 76-year-old lady presents with a two-month history of increased shortness of breath. She now gets breathless on the walk to the shop at the end of her road, having previously only gotten breathless when walking the half-hour walk into the city centre. She has also developed a cough, bringing up clear sputum, which she says has sometimes contained specks of blood. She has a past medical history of poorly-controlled hypertension, rheumatoid arthritis, and mild COPD. She has a 40 pack-year smoking history.

On examination, there is mild scattered wheeze bilaterally with reduced chest expansion on the right side. The right lower base is stony dull to percussion, and there are reduced breath sounds over the same area. A chest X-ray suggests a pleural effusion.

The pleural fluid is aspirated:

Blood: LDH 320 IU/L

Pleural fluid: LDH 140 IU/L

What is the most likely cause of this lady’s pleural effusion?

A. Rheumatoid arthritis

B. COPD

C. Lung cancer

D. Liver cirrhosis

E. Heart failure

Correct Answer:Heart failure

Explanation:

Heart failure is the most likely cause of this patient’s pleural effusion. The results can be interpreted using Light’s criteria. Light’s criteria are used to determine whether a pleural effusion is a transudate or an exudate. The pleural fluid is likely to be an exudate if the ratio of pleural fluid LDH to blood LDH is greater than 0.6, or if the pleural fluid LDH is greater than two-thirds of the upper limit of normal blood LDH. If the pleural fluid protein to blood protein ratio is greater than 0.5, this also suggests that the pleural fluid is exudate.

The results in this question suggest that the pleural fluid is transudate. The most common causes of a transudate are heart failure, liver cirrhosis, hypoalbuminaemia, and peritoneal dialysis. This patient has no signs of liver disease and has a history of poorly-controlled hypertension (the most common cause of heart failure), this is the most likely underlying diagnosis. The patient would not necessarily have peripheral oedema if this was left-sided heart failure.

Pleural effusions in heart failure are often bilateral, but if unilateral, the most common side is the right side.

Although lung cancer is an important diagnosis to rule out in a patient with such a significant smoking history, it is less likely based on the results of the pleural tap. The symptoms, however, could be suggestive of an underlying malignancy, so further investigation would be warranted.

An effusion associated with this patient’s rheumatoid arthritis would usually be an exudate, so, again, the results of the pleural tap suggest that this is unlikely.

COPD alone is not a known cause of the pleural effusion.

Further reading:

https://patient.info/doctor/pleural-effusion-pro

Question:

A 26-year-old female patient attends a sexual health clinic complaining of a new vaginal discharge and some mild lower abdominal pain for the past two months. She has a regular 30-day menstrual cycle and has not noticed any intermenstrual bleeding or menorrhagia.

The patient is sexually active with many partners and does not use any barrier contraception. She has a 10-pack-year smoking history and does not drink alcohol.

On examination, mucopurulent vaginal discharge is noted in addition to adnexal and cervical motion tenderness. The patient’s temperature is recorded at 38.3°C. A cervical swab is positive for Chlamydia trachomatis.

Which of the following is a complication of the likely diagnosis?

A. Postpartum haemorrhage

B. Pre-eclampsia

C. Gestational trophoblastic disease

D. Ectopic pregnancy

E. Twin pregnancy

Correct Answer:Ectopic pregnancy

Explanation:

This patient is presenting with pelvic inflammatory disease (PID), which describes a spectrum of inflammatory conditions that affect the upper genital tract. In patients with PID, damage to the Fallopian tubes may disrupt the movement of the fertilised ovum to the uterine cavity, leading to an ectopic pregnancy. Patients with PID are also at a significant risk of developing infertility as well as chronic pelvic pain.

PID is not associated with an increased risk of developing gestational trophoblastic disease, which refers to chromosomally abnormal pregnancies that are malignantly transformed. The strongest risk factor for developing gestational trophoblastic disease is older maternal age.

A postpartum haemorrhage is not a complication of PID. There are many risk factors for developing a postpartum haemorrhage, including placenta praevia, multiple pregnancy and a prolonged labour.

Pre-eclampsia describes the presence of new-onset hypertension accompanied by proteinuria after the 20th week of gestation. Risk factors for developing pre-eclampsia include an increased BMI, older maternal age and primiparity.

A twin pregnancy is not a recognised complication of PID. Patients who are using ovulation-stimulating drugs or assisted reproductive technology are at an increased risk of developing a twin pregnancy.

Further reading:

https://patient.info/doctor/pelvic-inflammatory-disease-pro#nav-7

Question:

A 32-year-old woman is brought to the emergency department by ambulance following an assault. A collateral history is gained from a partner, who reports that the patient received a punch at the side of their head around 40-minutes ago. He goes on to explain that the patient was ambulatory following the injury, and only reported pain at the site of their head.

However, the patient later suddenly collapsed around 30 minutes following the injury and appeared to lose consciousness.

On examination, the doctor records a GCS of 10/15 (E3, V3, M4).

A CT scan demonstrates the presence of a hyperdense biconvex mass at the lateral side of the cranium associated with some midline shift.

Bleeding from what structure is associated with the most likely diagnosis?

A. Middle meningeal vein

B. Anterior communicating artery

C. Bridging vein

D. Middle meningeal artery

E. Berry aneurysm

Correct Answer:Middle meningeal artery

Explanation:

This patient is presenting with an extradural haemorrhage (EDH), a type of intracranial haemorrhage that most commonly arises from an injury to the middle meningeal artery. The course of this vessel goes underneath the pterion, which describes the site of the fusion of a number of cranial bones. The pterion is a comparatively weaker area of the skull and so the middle meningeal artery is particularly vulnerable to damage during trauma. Bleeding in the extradural space is associated with a latency period, during which the patient may appear well before a rapid neurological deterioration occurs. On a CT scan, an EDH typically presents with a biconvex region of hyperdensity.

A subarachnoid haemorrhage (SAH) is associated with a sudden-onset, severe headache and a rapid decline in neurological status. Spontaneous SAHs are often caused by the rupture of a berry aneurysm, which refers to a type of intracranial aneurysm that is usually located within the Circle of Willis. An SAH is associated with the presence of blood in the subarachnoid cisterns on a CT scan.

Bleeding from the middle meningeal vein is also associated with the development of an extradural haematoma (EDH). However, bleeding from this vessel is a less common cause of an EDH in comparison to the middle meningeal artery, and so is not the correct answer in this case.

A subdural haemorrhage is a type of intracranial haemorrhage associated with damage to the bridging veins. Patients with a subdural haemorrhage typically present with an impaired neurological function depending on the extent of the bleed as well as a crescentic shaped lesion on a CT scan that may cross the suture lines.

A rupture of the anterior communicating artery would cause an intraparenchymal haemorrhage and is a type of haemorrhagic stroke. Patients with this type of bleed would generally present with sudden-onset symptoms typically associated with a stroke such as hemiparesis, hemianopia and higher cortical dysfunction. In the acute phase of a haemorrhagic stroke, a CT scan may show an irregularly shaped hyperdense lesion within the brain tissue.

Further reading:

https://geekymedics.com/extradural-haematoma-overview/

Question:

A 40-year-old woman presents to A&E with several weeks of abdominal pain. Initially, the pain began shortly after eating and self-resolved after three-quarters of an hour. The pain progressively worsened and has become constant over the past day. She has experienced associated nausea and three episodes of non-bloody, non-bilious vomiting. On abdominal examination, she has tenderness to palpation in the right upper quadrant without rebound tenderness or guarding. The patient’s temperature is 39°C, blood pressure is 130/80 mmHg, pulse is 85/min, respirations are 20/min and oxygen saturation is 95% on room air. Laboratory studies demonstrate a leukocyte count of 15 × 109/ L.

What is the next best step in management?

A. Endoscopic retrograde cholangiopancreatography (ERCP)

B. IV antibiotics

C. Percutaneous cholecystostomy

D. Laparoscopic cholecystectomy

E. Close observation

Correct Answer:IV antibiotics

Explanation:

This patient most likely has a diagnosis of acute cholecystitis, which is caused by distension and inflammation of the gallbladder from blockage of the cystic duct by a gallstone. Patients typically present with nausea, vomiting, right upper quadrant (RUQ) pain/tenderness and fever. An ultrasound can show an occluding stone, thickening of the gallbladder wall or pericholecystic fluid. If an ultrasound is inconclusive, an MRCP or HIDA scan can be used. Treatment consists of intravenous (IV) fluids and broad-spectrum IV antibiotics followed by laparoscopic cholecystectomy. Patients that are extremely ill or poor surgical candidates may require emergency bile duct decompression with a percutaneous cholecystostomy instead of a laparoscopic cholecystectomy.

Observation would be inappropriate in this scenario given the patient has ongoing abdominal pain, fever and leucocytosis.

Endoscopic retrograde cholangiopancreatography (ERCP) is used to treat patients with gallstones obstructing the common bile duct and pancreatic duct (which can result in pancreatitis and cholangitis). It is not used routinely for patient's presenting with acute cholecystitis.

Further reading:

https://patient.info/doctor/gallstones-and-cholecystitis

Question:

An 18-year-old woman presents to the GP with a two-day history of an intensely painful and red left eye. She describes severe pain when looking at light and a progressive loss of vision.

She usually wears contact lenses but has been unable to put them in since the pain started.

She also reports she recently fell asleep in her contact lenses after a night out.

What is the most likely diagnosis?

A. Infective keratitis

B. Photokeratitis

C. Blepharitis

D. Optic neuritis

E. Conjunctivitis

Correct Answer:Infective keratitis

Explanation:

The most likely diagnosis is infective keratitis. Keratitis is inflammation of the cornea, a clear and transparent layer covering the iris and pupil. Infective keratitis may be bacterial, viral, fungal or amoebae in aetiology. Infective keratitis is a severe and potentially sight-threatening condition. NICE guidelines suggest that the presence of reduced visual acuity, deep/severe pain within the eye, and photophobia should all prompt urgent investigation. Additionally, contact lens-related red eye should always prompt further investigation and consideration for infective keratitis.

Conjunctivitis often presents with a red eye, discomfort and discharge from the eye. The presence of severe pain, photophobia and progressive loss of vision make a diagnosis of conjunctivitis less likely. Ultimately, a serious cause of red-eye must be excluded.

Whilst optic neuritis can present with subacute loss of vision, it typically does not cause red-eye or photophobia. Other key distinguishing features for optic neuritis include loss of colour vision and painful eye movements;

A form of non-infective keratitis called photokeratitis sometimes called 'arc eye', is inflammation of the cornea secondary to exposure to ultraviolet radiation. In this patient, there is no history of UV exposure, which makes this less likely.

Patients with blepharitis may present with crusting of the eyelids and a sensation of persistent dry eye. Whilst there may be exacerbations, blepharitis would never present with this extent of pain, progressive visual loss or photophobia.

Further reading:

https://geekymedics.com/keratitis

Question:

An 82-year-old man is referred to audiology by his GP for progressively worsening hearing loss. The patient has been complaining of steadily worsening hearing loss over the last 2 years and says that it is worst in noisy environments. An audiogram performed by the audiologist reveals bilateral high-frequency hearing loss.

What is the most likely cause of this presentation?

A. Otosclerosis

B. Meniere's disease

C. Presbycusis

D. Acoustic neuroma

E. Noise induced hearing loss

Correct Answer:Presbycusis

Explanation:

The correct answer is presbycusis. This patient has presented with worsening hearing loss that is most noticeable in noisy environments. An audiogram also showed that it is a bilateral high-frequency loss. The most likely cause of this presentation is presbycusis - a sensorineural hearing loss that typically affects elderly individuals.

An acoustic neuroma would cause a sensorineural hearing loss, however, the symptoms would be unilateral.

Meniere's disease would cause sensorineural hearing loss but would present with other symptoms such as vertigo, tinnitus and a sensation of aural fullness.

Noise-induced hearing loss would also often present with high-frequency hearing loss. However, it would normally be associated with an acute event with a sudden deterioration in hearing loss that then does not change. Or it may be progressive if associated with a patient's occupation, however, this is unlikely in this case as this patient is in his 80s and has only been having issues with his hearing for the last two years.

Otosclerosis is an autosomal dominant condition in which normal bone in the ear is replaced by vascular spongy bone. It causes a conductive hearing loss and typically presents in patients aged 20-40.

Further reading:

https://patient.info/doctor/presbyacusis

Question:

A 28-year-old man presents to the A&E department with a 2-day history of a painful, hot and swollen right knee. He generally feels unwell and is now finding it difficult to walk.

The patient received treatment with single-dose azithromycin for chlamydia approximately 6-weeks ago following an episode of dysuria. He has no other past medical history.

On examination, the knee has a limited range of movement and appears red and swollen. The patient does not have a fever.

What is the most appropriate initial investigation?

A. MRI

B. Inflammatory markers

C. Plain film X-ray

D. Arthrocentesis with synovial fluid analysis

E. Antinuclear antibodies

Correct Answer:Arthrocentesis with synovial fluid analysis

Explanation:

NICE guidelines state that any patient presenting with an acutely painful, hot and swollen joint should be regarded as having septic arthritis until proven otherwise, even in the absence of systemic symptoms such as fever. Therefore, the most appropriate initial step in this patient is arthrocentesis with synovial fluid analysis to exclude the presence of septic arthritis. Given this patient's recent history of infection with C. trachomatis and subsequent monoarthritis, reactive arthritis (ReA) is a likely diagnosis. However, as septic arthritis has a high fatality rate without prompt intervention, this serious diagnosis must be excluded first. Analysis of the synovial fluid should include Gram-stain and culture. If the patient has ReA, the synovial fluid will have a negative Gram-stain and culture.

Imaging modalities such as X-ray or MRI are of little benefit in the acute stages of ReA. Furthermore, X-ray and MRI are of limited utility in the diagnosis of septic arthritis; therefore, both modalities are unlikely to form part of the initial investigations.

Inflammatory markers such as erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) are not considered specific or sensitive and cannot be used for diagnostic purposes in the presentation of acute monoarthritis. Therefore, they would not be the most appropriate initial investigation to arrange in this patient.

Antinuclear antibodies (ANAs) are typically elevated in autoimmune diseases. In the context of acute monoarthritis, they would not be considered diagnostic and would likely be negative in both ReA and septic arthritis.

Further reading:

https://www.bashhguidelines.org/media/1064/1772.pdf

Question:

A 56-year-old lady presents to her GP reporting a burning sensation just below her breastbone after meals and a sour taste in her mouth. She has also noticed a dry cough develop since these symptoms began. This has been ongoing for the last 8 weeks, happens several times per week and symptoms are worse when lying flat or bending over. She has tried over the counter antacids which help slightly.

History reveals no symptoms of dysphagia, vomiting, exertional symptoms, change in bowel habit or recent changes in weight (BMI 22). Past medical history is unremarkable and there is no relevant family history. The patient does not drink alcohol and is a non-smoker. Her examination is unremarkable and observations are all within normal parameters.

The GP refers her for endoscopy due to her age and symptoms. This reveals no evidence of suspicious lesions but does show some mild inflammation of the lower oesophagus.

What would be the most appropriate initial treatment of this patient’s symptoms?

A. Trialling an alginate of another 2 months (e.g. Gaviscon)

B. Prescribe ranitidine 150mg twice daily for one month

C. Arrange for a carbon-13 urea breath test

D. Prescribe omeprazole 20mg once a day for one month

E. Prescribe omeprazole 20mg for 2 months

Correct Answer:Prescribe omeprazole 20mg once a day for one month

Explanation:

The most appropriate initial management would be to trial omeprazole 20mg once a day for one month as this patient has proven GORD based on her symptoms and the endoscopy findings. GORD may also be associated with symptoms affecting the oral cavity and respiratory tract such as hoarseness, dry cough and, in chronic regurgitation, dental erosion. Risk factors include positive family history, obesity, older age and hiatus hernia. Diagnosis is predominantly clinical and supported by testing (endoscopy) as needed.

Trialling an alginate for another 2 months would not be appropriate given the patient has already tried this management option and found it ineffective.

Carbon-13 urea breath would be an important investigation in patients being treated for uninvestigated dyspepsia, either before or after a trial with a full dose PPI for 1 month.

Ranitidine is not currently available in the UK or globally. It has been discontinued as a precaution because it may contain a small amount of an impurity that has been linked to an increased risk of cancer in animals. It's not yet known whether it will be available again in future.

Omeprazole 20mg for 2 months would be appropriate if there were evidence of severe oesophagitis on the endoscopy (it was described as mild in this scenario).

Further reading:

https://cks.nice.org.uk/topics/dyspepsia-proven-gord/management/dyspepsia-proven-gord/

Question:

A 30-year-old male presents to his GP with an ulcerated area on the posterior lower leg, which he noticed developed from a small blister after catching it on his bike. He has a past medical history of ulcerative colitis, which is currently stable. He is otherwise well.

On examination, the ulcer has a purplish border and visible slough.

What is the most likely diagnosis?

A. Martorell's ulcer

B. Psoriasis

C. Pyoderma gangrenosum

D. Venous ulcer

E. Squamous cell carcinoma

Correct Answer:Pyoderma gangrenosum

Explanation:

The most likely diagnosis is pyoderma gangrenosum (PG). The presence of an ulcerated lesion, with a purple base that has developed from a small blister or pustule, is strongly suggestive of PG. PG is commonly associated with inflammatory bowel disease. The association of trauma and then development of an ulcerated area further support a diagnosis of PG.

An isolated lesion, on the posterior aspect of the leg and the younger age of the patient, make a venous ulcer unlikely.

Psoriasis does not present with ulcerated lesions, but instead with scaly plaques with a predilection for the extensor surfaces.

A squamous cell carcinoma (SCC) would also be unlikely in this location and the initial blister is not typical of an SCC.

Martorell's ulcer presents as a painful ulceration of the lower leg associated with diastolic arterial hypertension. There is no history of hypertension in this scenario, making this rare diagnosis very unlikely.

Further reading:

https://www.dermnetnz.org/topics/pyoderma-gangrenosum/

Question:

A 26-year-old male is brought in to A&E with difficulty breathing. He tells you he has been to a wedding and became breathless after eating shellfish. During the assessment, he becomes very wheezy and is struggling to talk. On examination his lips are swollen and he has a widespread urticarial rash. A repeat set of observations show oxygen saturations are 92% on room air, heart rate is 110 bpm and blood pressure is 90/60 mmHg.

What is the MOST important initial management step?

A. 10mg IV chlorphenamine

B. 500 micrograms IM adrenaline

C. 500ml fluid bolus

D. High-flow oxygen

E. Call anaesthetics for airway support

Correct Answer:500 micrograms IM adrenaline

Explanation:

This gentleman’s history and clinical signs indicate a diagnosis of anaphylaxis with (distributive) shock. IM adrenaline is the most important initial management step in the treatment of anaphylaxis.

He is hypoxic with signs of airway compromise so high-flow oxygen should be administered and anaesthetics should be involved in order to establish an airway. It will take time for anaesthetics to arrive, therefore adrenaline should be given first. Adrenaline will slow the anaphylactic reaction through vasoconstriction and bronchodilatation, which allows time for anaesthetics to arrive. He is hypotensive so will require a fluid challenge but A and B come before C.

For any patient presenting with anaphylaxis, you should assess them using an ABCDE approach, call for help, administer adrenaline, involve anaesthetics and establish an airway (A), administer high flow oxygen (B), give an IV fluid challenge (C) followed by 10mg IV chlorphenamine and 200mg IV hydrocortisone.

Further reading:

https://www.resus.org.uk/anaphylaxis/emergency-treatment-of-anaphylactic-reactions/

Question:

A 21-year-old female presents to her GP complaining of thick white discharge for the past 3 days. The discharge does not smell but she describes her genital area as being itchy, sore and inflamed. She has recently become sexually active with a single sexual partner. Her past medical history includes a diagnosis of type 1 diabetes mellitus.

What is the most appropriate initial management step?

A. Topical hydrocortisone

B. Topical mupirocin cream

C. Clotrimazole pessary

D. Oral azithromycin

E. Oral flucloxacillin

Correct Answer:Clotrimazole pessary

Explanation:

The most likely diagnosis is vulvovaginal candidiasis, also known as vaginal thrush. This is a fungal infection caused by an overgrowth of the yeast known as candida. Vaginal thrush can be treated with local (e.g. cream, pessary) or oral imidazoles. A clotrimazole pessary is the most appropriate treatment of the options presented (alternatively, a topical clotrimazole cream could also be used). It can be transmitted sexually, hence why sexual partners should also be treated and the couple should abstain from sex until candidiasis has resolved. The most common symptom is a thick white "cottage cheese" discharge and an inflamed vulval area that can be itchy. Patients may also complain of dysuria and dyspareunia. Risk factors for its development include pregnancy, diabetes, antibiotic use and immunosuppressive medication.

Oral flucloxacillin is an oral antibiotic and therefore not an appropriate treatment for a fungal infection. Oral flucloxacillin is most commonly used to treat staphylococcal skin infections.

Topical hydrocortisone will not treat vaginal thrush as an anti-fungal is needed to treat this infection. Topical hydrocortisone is commonly used in the management of balanitis.

Oral azithromycin is an oral antibiotic most commonly used to treat chlamydia trachomatis infections.

Topical mupirocin is a topical antibiotic most commonly used to treat staphylococcus aureus skin infections (e.g. impetigo) including methicillin-resistant strains.

Further reading:

https://patient.info/doctor/vaginal-and-vulval-candidiasis

Question:

A 29-year-old woman presents to her GP with a 2-day history of redness, swelling and pain in her left leg. She recalls that 3-days ago, she was bitten by an insect while sitting outdoors in the garden.

She has no significant medical history. Her medications include the contraceptive pill (Mercilon - Ethinylestradiol 20 micrograms, Desogestrel 150 micrograms) and a daily multivitamin tablet. She does not have any allergies.

All her vital signs are recorded as normal in the clinic. On examination, there is a 5cm erythematous lesion with poorly demarcated borders on her left leg; the area is warm and tender but non-fluctuant.

What is the most appropriate initial management in this patient?

A. Oral clarithromycin

B. Oral flucloxacillin

C. Oral co-amoxiclav

D. No treatment required; review in 5 days

E. Topical fusidic acid

Correct Answer:Oral flucloxacillin

Explanation:

The most likely diagnosis in this patient is cellulitis - an acute, spreading infection of the deep dermis and subcutaneous tissue. NICE guidelines suggest that adults with Eron class I cellulitis (no signs of systemic toxicity and no uncontrolled comorbidities) should be managed with flucloxacillin 500–1000 mg four times daily for 5–7 days. It is important to note that NICE guidelines stress the importance of considering several different factors when prescribing antibiotics in the management of cellulitis, including the severity of symptoms, site of infection, the risk for uncommon pathogens or resistant bacteria. However, in this patient, as she is systematically well with a mild infection, flucloxacillin is the most appropriate initial management.

Patients with evidence of cellulitis near the eyes or mouth should be prescribed oral co-amoxiclav 500/125 mg three times a day for 7-days (if they are suitable for management in the community).

Patients with an allergy to penicillins should be prescribed an alternative such as oral clarithromycin 500 mg twice daily for 5–7 days. This patient does not have a penicillin allergy or any other apparent contraindication; therefore, flucloxacillin is the preferred antibiotic.

Topical antibiotics, such as fusidic acid (2%), are only recommended for superficial/limited infections, especially when staphylococcal species are suspected. Patients with evidence of cellulitis should never be managed with topical preparations alone; therefore, fusidic acid would not be an appropriate monotherapy.

Patients should always be started on oral antibiotics if cellulitis is suspected. Patients with cellulitis should be reviewed 2-3 days after the initial consultation, depending on clinical judgement and if symptoms worsen, to review the suitability of the chosen antibiotic regime. Therefore, it would not be appropriate to delay treatment and review this patient in 5 days.

Further reading:

https://cks.nice.org.uk/topics/cellulitis-acute/

Question:

John Anderson, a 78-year-old gentleman, who was admitted with community-acquired pneumonia the day before has become acutely drowsy and is only intermittently responding to voice. His past medical history includes COPD.

Vital signs are as follows:

HR is 78

BP 112/76

RR 24

SaO2 91% on 28% O2 via venturi mask

On examination, he has widespread wheezing with right basal crepitations. He is on appropriate intravenous antibiotics already and his bedside capillary blood glucose is 6.4. The nurse has already given back to back salbutamol and ipratropium nebulisers in addition to prednisolone in the last hour. You decide to perform an arterial blood gas.

Which of the following arterial blood gas patterns would suggest the need for non-invasive ventilation?

A. pH 7.52, Po2 12.5, PCO2 3.1, HCO3 25, Lact 1.0, Base Excess +0.8

B. pH 7.15, Po2 12.5, PCO2 4.5, HCO3 11, Lact 6.4, Base Excess -4.7

C. pH 7.38, Po2 7.9, Pco2 6.7, HCO 39, Lact 1.2, Base Excess +1.1

D. pH 7.22, Po2 10.6, Pco2 5.5, HCO3 15, Lact 5.2, Base Excess -3.5

E. pH 7.28, pO2 7.6, pCO2 9.7, HCO3 36, Lact 1.9, Base Excess -2.0

Correct Answer:pH 7.28, pO2 7.6, pCO2 9.7, HCO3 36, Lact 1.9, Base Excess -2.0

Explanation:

This patient has signs of decompensated type 2 respiratory failure, which can be a complication of advanced COPD. Non-invasive ventilation (NIV) is often used in this context, to reduce CO2 levels and assist in the correction of acidosis.

Type 2 respiratory failure occurs as a result of alveolar hypoventilation, which prevents the patient from being able to adequately oxygenate and eliminate enough CO2 from their blood. Type 2 respiratory failure involves hypoxaemia (PaO2 is <8 kPa) with hypercapnia (PaCO2 >6.0 kPa).

The following arterial blood gas demonstrates type 2 respiratory failure with associated acidosis, which would warrant the use of NIV:

pH 7.28

pO2 7.6

pCO2 9.7

HCO3 36

Lactate 1.9

Base Excess -2.0

A senior doctor should be involved in making the decision to commence non-invasive ventilation, as resuscitation status and ITU referral need to be considered. It is also important to note that non-invasive ventilation is advised after one hour of optimal medical treatment with controlled oxygen therapy, nebulisers, steroids and antibiotics (if indicated) as per NICE guidelines (see further reading below).

Further reading:

https://www.nice.org.uk/guidance/qs10/chapter/quality-statement-7-noninvasive-ventilation

Question:

A 42-year-old lady (P5+0), presents upon GP referral for an incidental finding of a painless cervical lump on pelvic speculum examination performed for routine pap smear testing. The patient is asymptomatic and denies pelvic discharge, fever, itching, genital lesions, postcoital bleeding, weight loss or urinary symptoms. Her last menstrual period was 1 week back.

What is the most likely diagnosis?

A. Bartholin cyst

B. Cervical cancer

C. Nabothian cyst

D. Cervicitis

E. Foreign body

Correct Answer:Nabothian cyst

Explanation:

Nabothian cysts are retention cysts formed due to the occlusion of glands in the mucosa of the uterine cervix, causing them to be distended with retained secretions. It is a very common finding, especially in multiparous middle-aged women. It is a benign condition and does not need treatment.

The Bartholin glands are paired glands approximately 0.5 cm in diameter, found in the labia minora in the 4- and 8-o’clock positions.

A foreign body would usually present with a history of the inability to retrieve a foreign body or symptoms and signs of infection secondary to the retention of a foreign body (i.e. retained tampon).

Cervical cancer usually presents with abnormal vaginal bleeding, most commonly postcoital. It can also present as intermenstrual bleeding. With the introduction of the cervical screening program, the majority of cervical cancer cases are identified prior to the development of any symptoms.

Cervicitis typically presents with a history of abnormal vaginal discharge, itching, fever and dyspareunia. Speculum examination would normally reveal an inflamed cervix with purulent discharge.

Further reading:

https://patient.info/doctor/uterine-cervix-and-common-cervical-abnormalities

Question:

A 60-year old man presents with a 2-month history of a non-healing ulcer 2 cm in diameter over his left shin 5 cm superior to his ankle joint. He has a past medical history of type 2 diabetes and hypertension and a 20 pack-year smoking history.

The ulcer is well-defined with sharp edges, and its pale centre contains some necrotic tissue. It is moderately painful.

Once investigations confirm the most likely diagnosis, what is the best treatment?

A. Venous sclerotherapy

B. Compression bandaging

C. Supervised exercise program

D. Referral for revascularization

E. Pentoxifylline

Correct Answer:Referral for revascularization

Explanation:

This man most likely has an arterial leg ulcer. Arterial ulcers are typically small, well-defined, punched out, painful, located in areas of poor circulation such as the pre-tibial region, and contain necrotic tissue. The persistence of this ulcer means this man is probably suffering from critical leg ischemia. This would be confirmed by asking about a history of claudication on walking, clinical examination, and via ABPI measurements and arterial duplex ultrasound scans. The treatment of critical ischemia is revascularization via angioplasty or bypass.

If this man were suffering from a milder case of peripheral arterial disease, then the first-line treatment would be a supervised exercise program to increase leg blood supply, in addition to clopidogrel. However, the presence of tissue death and resulting diagnosis of critical ischemia means immediate measures are needed.

Compression bandaging and venous sclerotherapy are both treatments for venous insufficiency, however, there is no evidence of this type of pathology in this scenario. Venous ulcers are usually poorly defined, red, have sloped edges, and contain granulation tissue at their centres. They are often found near the medial malleolus.

Pentoxifylline is an oral vasodilator used as a second-line treatment of peripheral arterial disease that is not amenable to surgery.

Further reading:

https://patient.info/doctor/leg-ulcers-pro

Question:

A 12-month-old boy is brought to the GP by his father after the health visitor voiced some concerns about his son's development. The boy is still struggling to support himself in a seated position without assistance and crawls very infrequently. When pulled to a standing position, the child seems to lack any strength to support his torso, and his legs remain in an abnormal position; the child makes no attempt to take steps. There were no previous concerns about the boy's development, and he had been otherwise well, although a birth history elicits that he was born 7 weeks prematurely.

The GP examines the boy; the child is happy to interact, and smiles and laughs at the doctor. He is able to demonstrate a partial pincer grip and has a monosyllabic babble. However, the boy holds his legs in a stiff abnormal position; the doctor notes increased tone in the lower limbs compared to the upper limbs and hyperreflexia when testing knee and ankle jerks.

A referral to the paediatrics unit at the local hospital is made, where further assessment is carried out. The paediatric consultant who assesses the patient suspects a diagnosis of cerebral palsy, and books an MRI. The results of this scan indicate an abnormality that confirms this suspicion, and the parents are informed of the diagnosis and its implications.

Given the likely type of cerebral palsy present in this child, which of the following is most likely to have been seen on MRI?

A. Periventricular leukomalacia

B. Chiari malformation

C. Loss of grey-white matter differentiation in the internal capsule

D. Absence of basal ganglia

E. Lesion within cerebellar vermis

Correct Answer:Periventricular leukomalacia

Explanation:

Cerebral palsy is defined as a group of permanent disorders of the development of movement and posture occurring due to non-progressive disturbances in the developing fetal or infant brain. For the condition to develop, the insult usually occurs before the age of 2, although the vast majority of cases of cerebral palsy occur due to issues arising before birth. The most common causative factor for cerebral palsy is prematurity; this is the likely cause in this case. Other possibilities include birth asphyxia, neonatal infection, and hypoxia due to seizures.

There are a number of subtypes of the condition; depending on the area of the brain that is affected. The most common subtype is spastic cerebral palsy, which arises due to pathology affecting the cerebral cortex. Children with spastic cerebral palsy will often have issues with motor development and may have delayed gross motor milestones. Upper motor neuron signs may be present on examination, and neonatal reflexes may persist beyond their usual duration.

Spastic cerebral palsy can be further divided into 3 main subtypes, depending on the areas of the body affected. Hemiplegic cerebral palsy mainly affects one half of the body, whilst quadriplegic cerebral palsy affects all four limbs. In the boy in this scenario, the lower limbs are affected more than the upper limbs, which is likely indicative of diplegic cerebral palsy, which classically has this distribution. This form of the disease is most commonly associated with periventricular leukomalacia, an abnormal softening of the white matter around the ventricles within the brain. The cause of the lesion is thought to be reduced blood flow to this area and is a frequent complication of premature birth.

Other less common, non-spastic types of cerebral palsy include dyskinetic, which arises due to issues with the basal ganglia, and ataxic, which is the result of cerebellar pathology. Cerebral palsy requires a multidisciplinary approach to management, with physiotherapy and the use of walking aids and splints frequently used. Medications such as baclofen can reduce spasticity, and surgery may be necessary in more severe cases.

Congenital absence of the basal ganglia is exceptionally rare and would result in a severe form of dyskinetic cerebral palsy, rather than the diplegic pattern present in this case.

A lesion within the cerebellar vermis would result in ataxic cerebral palsy. This would present with coordination issues, and potentially poor fine motor skills. The clinical picture is much more indicative of diplegic cerebral palsy.

A Chiari malformation is a congenital malformation where the cerebellar tonsils develop in an abnormal location, within the foramen magnum. The condition is associated with the development of syringomyelia and can give cerebellar symptoms that frequently develop later in life.

Loss of grey-white matter differentiation in the internal capsule is likely to be seen in the setting of an ischaemic stroke; oedema that occurs due to the infarction results in the loss of the differentiation between the matter types on imaging such as CT or MRI.

Further reading:

https://cks.nice.org.uk/topics/cerebral-palsy/

Question:

A 40-year-old lorry driver is being investigated for excessive tiredness. Three weeks ago he fell asleep whilst driving and drove the lorry off the road. He sustained minimal injuries, and no one else was injured. He says his wife has noticed that he is snoring excessively when he sleeps. He has a past medical history of hypertension, hypercholesterolemia and type II diabetes mellitus.

On examination, he appears alert and has a large body habitus. He is 180cm tall and weighs 136kg.

What is this patient's body mass index (BMI)?

A. 41.97

B. 102.76

C. 27.54

D. 36.85

E. 75.56

Correct Answer:41.97

Explanation:

The patient in the vignette has features that are suspicious of obstructive sleep apnoea (daytime sleepiness, snoring). One of the risk factors for this condition is obesity, which is determined clinically by calculating the patient's BMI. The BMI of an individual = weight (kg) / height (m)2. Therefore the BMI in this scenario = 136kg/1.80m2 = 41.97. This patient's BMI is above 40 which indicates that he is severely obese.

Further reading:

https://www.nice.org.uk/guidance/cg189/ifp/chapter/obesity-and-being-overweight

Question:

A scientist wishes to determine if bladder surgery increases the risk of developing bladder cancer. She recruits 100 patients who have undergone surgery on their bladder and 100 age and sex-matched individuals who have never had bladder surgery. She then follows the two groups up over time, recording those who develop bladder cancer.

What type of study is described?

A. Prospective cohort

B. Retrospective cohort

C. Case series

D. Case-control

E. Ecological

Correct Answer:Prospective cohort

Explanation:

This is a prospective cohort study. A prospective cohort study identifies a group of people with a known exposure and a group without the exposure, then follows them up over time to see if they develop the condition being studied.

A case series identifies a group of people with a known exposure and follows them up to see if they develop the condition being studied. The main difference between a case series and a prospective cohort study is that a case series lacks a control group who were not exposed to the risk factor.

A retrospective cohort study involves looking back into the past to determine if a group of people have been exposed to the risk factor. The exposure status was measured in the past, and some people may have already been diagnosed with the disease of interest.

An ecological study compares different populations that have different rates of cases and different rates of risk factor exposure.

Case-control studies involve comparing a group of cases with a group of controls and seeing if there are different rates of risk factor exposure between the two groups.

Further reading:

https://guides.himmelfarb.gwu.edu/prevention\_and\_community\_health/types-of-studies

Question:

A 62-year-old woman attends the Emergency Department with a 2-day history of facial swelling. She reports a headache, involving her head feeling "tight" and she also feels dizzy when mobilising. On further questioning, she feels slightly short of breath and has had a cough for the last 8 weeks which she presumed to be due to a viral infection. She came to seek medical attention this morning because whilst lifting her arms up to reach a high cupboard her symptoms got much worse and she nearly fainted.

She has no significant past medical history. She smokes 25 cigarettes per day and has done for the past 40 years.

On examination, she has facial and neck oedema as well as distended neck veins. Her chest examination reveals abnormal breath sounds on the right side and her observations are within the normal range.

Chest x-ray reveals a right-sided lung mass. Initial blood tests show a normal full blood count, urea and electrolytes, liver function tests and thyroid function tests.

What is the most likely diagnosis?

A. Dermatomyositis

B. Superior vena cava (SVC) obstruction

C. Angioedema

D. Cellulitis

E. Hypothyroidism

Correct Answer:Superior vena cava (SVC) obstruction

Explanation:

The most likely diagnosis is superior vena cava (SVC) obstruction, likely due to underlying lung carcinoma. This is an oncological emergency and symptoms include facial and neck swelling, arm swelling, dizziness and headache, shortness of breath, chest pain and cough. Signs on examination include oedema in the arm, neck and face, distended neck and arm veins, respiratory distress and cyanosis. Duration and progression of symptoms vary depending on the degree and speed of obstruction as well as collateral flow available. Classically, signs and symptoms can be exacerbated by lifting the arms above the head.

Angioedema is a differential diagnosis for unexplained oedema usually due to allergy. However, the additional examination findings of engorged veins in this patient as well as likely underlying lung cancer make SVC obstruction more likely and more important to investigate for and manage initially.

Hypothyroidism can also cause oedema as well as dizziness, breathlessness. However, this patient's thyroid function tests are normal.

Cellulitis would be an unusual cause of entire face and neck swelling without further signs or symptoms of infection and normal blood tests.

Dermatomyositis is a rare autoimmune disorder characterised by a heliotrope rash which can cause periorbital and generalised oedema. It is also sometimes a paraneoplastic condition associated with an underlying tumour. This is less likely in this scenario, however, given the neck venous distension and the classical sign of symptom exacerbation on arm elevation.

Further reading:

https://patient.info/doctor/superior-vena-cava-obstruction

Question:

A 69-year-old man presents to the emergency department with a painful right leg. The pain started suddenly an hour and a half ago when he got up from the sofa after binge-watching TV. He has no significant past medical history.

On examination, he is very anxious and has a heart rate of 92/min with an irregular rhythm. His right lower limb is colder and paler than the left. He has no palpable dorsalis pedis or popliteal pulse, but there is a weak pulse at the femoral artery below the inguinal ligament.

What is the most appropriate next step in the management of this patient?

A. Fasciotomy

B. Mechanical embolectomy

C. Systemic thrombolysis

D. Electrical cardioversion

E. Doppler ultrasound of the lower limb

Correct Answer:Doppler ultrasound of the lower limb

Explanation:

This patient is suffering from acute limb ischemia (arterial occlusive disease) as a result of a presumed embolism from a thrombus related to atrial fibrillation (AF). It is not known whether the arterial embolus is occlusive or not, as manual palpation is not accurate enough to determine this. Doppler ultrasound will tell us about the degree of stenosis and will be able to guide decisions for intervention.

Endovascular catheter-directed therapy, systemic thrombolysis, or mechanical embolectomy can be used to restore perfusion.

Concurrent fasciotomy may be considered if an extended period of time has passed with complete occlusion, due to increased ischaemic burden and potential for reperfusion injury and oedema. A Doppler ultrasound would be performed prior to any of these interventions.

Further reading:

https://patient.info/doctor/limb-embolism-and-ischaemia

Question:

A 74-year-old retired architect presents with a 6-month history of progressive exertional dyspnoea and a dry cough. He denies weight loss, fevers, skin changes or arthralgia. Past medical history includes hypertension, for which he takes amlodipine. On further questioning, he has never smoked and drinks minimal alcohol. On examination, finger clubbing is present and bibasal fine end-inspiratory crepitations are audible on chest auscultation.

A high-resolution CT thorax is requested, and the patient is subsequently diagnosed with idiopathic pulmonary fibrosis.

What medication can improve the prognosis in this patient?

A. Pirfenidone

B. Azathioprine

C. Prednisolone

D. Sildenafil

E. Mycophenolate mofetil

Correct Answer:Pirfenidone

Explanation:

This case demonstrates idiopathic pulmonary fibrosis (IPF). It is characterised by progressive exertional dyspnoea, a dry cough and bibasal fine end-inspiratory crepitations. Finger clubbing is commonly seen on examination. With no particular causes elicited from the history, this may be idiopathic in origin. A high-resolution CT scan thorax is the gold-standard investigation and is diagnostic for pulmonary fibrosis. Pirfenidone and nintedanib are the only antifibrotic medications recommended by NICE in the UK, to reduce the rate of progression of IPF. Despite this, their evidence base is still limited, and restrictions on their use exist.

Prednisolone is typically used in acute exacerbations of IPF, however, the evidence base is poor. Once commonly recommended for managing the condition, international guidelines now strongly advise against the use of corticosteroids, either as monotherapy or in combination with other medications, in the ongoing treatment of IPF.

NICE guidelines also advise that the following medications should not be routinely used in the ongoing management of IPF; ambrisentan, azathioprine, bosentan, co-trimoxazole, mycophenolate mofetil, prednisolone, sildenafil and warfarin.

Further reading:

https://patient.info/doctor/pulmonary-fibrosis

Question:

A 40-year-old woman presents with a 3-week history of fatigue, joint pain and stiffness, and recurrent mouth ulcers. The joint pain and stiffness worsen in the morning and improve throughout the day. During this time, she has also had recurrent sunburns.

She is currently being treated for tuberculosis and takes rifampicin, isoniazid, ethambutol, pyridoxine, and pyrazinamide. She also has epilepsy, for which she takes levetiracetam.

On examination, there is mild tenderness of the metacarpophalangeal joints of both hands and metatarsophalangeal joints of both feet, and she has an erythematous papular rash on both cheeks that spares the nasolabial folds.

Blood tests are performed:

Test Result

Anti-nuclear antibodies positive

Anti-double-stranded DNA antibodies negative

Anti-histone antibodies positive

What is the most likely underlying cause of her presentation?

A. Drug-induced lupus due to isoniazid

B. Drug-induced lupus due to levetiracetam

C. Drug-induced lupus due to pyrazinamide

D. Non-drug-induced systemic lupus erythematosus

E. Drug-induced lupus due to pyridoxine

Correct Answer:Drug-induced lupus due to isoniazid

Explanation:

Drug-induced lupus due to isoniazid is correct. This patient has signs and symptoms of lupus, characterised by inflammatory arthritis (joint pain and stiffness that is worse in the morning and improves throughout the day), recurrent mouth ulcers, and a malar rash. The autoantibodies help to determine whether this is systemic lupus erythematosus (SLE) or drug-induced lupus. In both SLE and drug-induced lupus, anti-nuclear antibodies are present. Anti-double-stranded DNA antibodies are specific for SLE and are not frequently seen in drug-induced lupus. In drug-induced lupus, anti-histone antibodies are commonly seen and are not frequently seen in SLE. Other drugs that may cause drug-induced lupus are procainamide, hydralazine, minocycline, terbinafine, phenytoin, sulfasalazine, and carbamazepine.

Drug-induced lupus due to levetiracetam, pyrazinamide and pyridoxine is incorrect. These drugs are not associated with drug-induced lupus. Levetiracetam is an antiepileptic drug, pyrazinamide is an anti-tuberculosis drug, and pyridoxine is vitamin B6, and is co-prescribed with isoniazid to reduce the likelihood of peripheral neuropathy.

Non-drug-induced systemic lupus erythematosus is incorrect. Anti-histone bodies are not commonly seen in non-drug-induced SLE, and the absence of anti-double-stranded DNA antibodies makes non-drug-induced SLE less likely.

Further reading:

https://geekymedics.com/systemic-lupus-erythematosus-sle/

Question:

A doctor wishes to study the effects of chronic illness on mood. To assess the participants’ mood, a questionnaire using a 5-point Likert scale is administered. The scale allows patients to select whether they strongly disagree, disagree, are neutral, agree or strongly agree with each statement about their mood.

What form of bias is most likely to be present in this study?

A. Measurement bias

B. Misclassification bias

C. Central tendency bias

D. Procedure bias

E. Observer bias

Correct Answer:Central tendency bias

Explanation:

The use of Likert scales is associated with a risk of central tendency bias. This is the bias that arises from people’s tendency to rate items towards the middle of a scale, rather than the extremes.

Measurement bias is the bias that arises from an inaccuracy in the way in which the variable is being measured, for example using an inaccurate measuring tool.

Observer bias is the bias that arises due to a researcher’s expectations or preconceptions affecting the way they perceive and record a variable.

Procedure bias is the bias that arises from the conditions in which a study is undertaken, for example not giving participants enough time to complete a questionnaire or interviewing participants in a non-private room.

Misclassification bias is the bias that arises from incorrectly classifying a study participant.

Further reading:

https://geekymedics.com/statistics-for-medical-students/

Question:

A 64-year-old man is admitted to the acute medical unit. He complains of mild abdominal pain and a feeling as though he had gained weight in his abdomen. He is currently being investigated as an outpatient for alcoholic liver disease.

On examination, he is deeply jaundiced and has palmar erythema. He also has a distended abdomen and shifting dullness is elicited.

Which complication of alcoholic liver disease is demonstrated by the presence of shifting dullness?

A. Ascites

B. Portosystemic varices

C. Gynecomastia

D. Hepatic encephalopathy

E. Hepatopulmonary syndrome

Correct Answer:Ascites

Explanation:

Ascites is a build-up of fluid in the peritoneal cavity. Shifting dullness is an examination finding suggestive of the presence of ascites, and occurs due to fluid shifting through the space with gravity causing a variable difference in abdominal percussion. Ascites should be considered a possibility in any patient, especially one with known liver disease, complaining of abdominal distension.

Portosystemic varices manifest as oesophageal or retroperitoneal varices, haemorrhoids or caput medusae. Bleeding from oesophageal varices is a medical emergency and usually presents with marked haematemesis.

Gynecomastia is the presence of breast tissue enlargement in males and occurs in patients with chronic liver disease due to dysregulation of serum levels of sex hormones such as oestrogen and testosterone.

Hepatic encephalopathy is a state of altered consciousness in patients with liver disease. This ranges from altered mood and anxious state to stupor and coma. The classical clinical findings are encephalopathic wrist flap (asterixis), apraxia, fetor hepaticus and in the later stages reduced consciousness. The precipitant must be sought and treated.

Hepatopulmonary syndrome refers to vasodilation of pulmonary vasculature leading to breathlessness and hypoxaemia.

Jaundice and palmar erythema are non-specific markers of chronic liver disease.

Further reading:

https://patient.info/doctor/cirrhosis-pro

Question:

A 35-year-old woman presents to the clinic with double vision and dysphagia persistent for the last three months. Her symptoms worsen towards the end of the day, and she feels extreme fatigue and weakness in her legs. She has a past medical history of hypothyroidism, for which she takes levothyroxine. She has never smoked but drinks 12 units of alcohol a week.

On examination, she is unable to maintain a sustained upwards gaze for more than 1 minute and bilateral ptosis is noted. Reflexes are normal and sensation is intact in all modalities, bilaterally. As the consultation proceeds, her voice quietens.

Given the likely diagnosis, what autoantibody is most likely to be present?

A. Anti-Jo-1 antibodies

B. Anti-ganglioside antibodies

C. Anti-Mi-2 antibodies

D. Voltage-gated calcium-channel antibodies

E. Acetylcholine receptor antibodies

Correct Answer:Acetylcholine receptor antibodies

Explanation:

Acetylcholine receptor antibodies are correct. This patient has signs and symptoms consistent with myasthenia gravis due to the presence of muscle fatiguability (the muscles become weaker during periods of activity), as demonstrated by her diplopia and dysphagia towards the end of the day and her voice reduction in volume during the consultation. A common special test performed in cases of suspected myasthenia gravis is an upwards gaze test, where the examiner holds their finger up in front of the patient to fix their eyes onto. Due to muscle fatiguability, the patient's eyelid droops and they have difficulty maintaining their gaze (usually within a minute). Around 90% of patients with myasthenia gravis have acetylcholine receptor antibodies. Myasthenia gravis is also associated with other autoimmune diseases such as thyroid disease (which this patient has), systemic lupus erythematosus, and Addison's disease.

Voltage-gated calcium-channel antibodies are incorrect. These antibodies are associated with Lambert-Eaton myasthenic syndrome (LEMS), characterised by proximal muscle weakness and reduced reflexes that improve with exercise. This patient's features worsen with activity. Many patients with LEMS have an associated underlying malignancy (particularly small cell lung cancer). The absence of unexplained weight loss and her smoking history make this option less likely.

Anti-ganglioside antibodies are incorrect. These antibody tests may be considered in Guillain-Barre syndrome (GBS) to confirm the diagnosis if it is still unclear following clinical exam, cerebrospinal fluid testing, and nerve conduction studies. Patients with GBS initially experience back/leg pain before experiencing a progressive, symmetrical weakness of the limbs that is ascending (starting with the legs first). Tendon reflexes are also reduced or absent, and patients may experience mild paraesthesia. These do not apply to this patient. GBS is also classically triggered by an infection, which is not present in this case. Fatiguability is also not present, unlike in myasthenia gravis.

Anti-Jo-1 antibodies and anti-Mi-2 antibodies are incorrect. These are autoantibodies seen in polymyositis and dermatomyositis. Polymyositis is characterised by symmetrical proximal muscle weakness with or without tenderness, Raynaud's phenomenon, and respiratory muscle weakness. It is strongly associated with malignancy. Dermatomyositis has skin manifestations such as extremely dry and cracked skin, Gottron's papules, and a heliotrope rash. Fatiguability is not present (unlike in myasthenia gravis), and muscle strength does not considerably improve with rest.

Further reading:

https://patient.info/doctor/myasthenia-gravis-pro

Question:

Lucy Lantern, an 88-year-old lady, has been admitted to hospital for her hip replacement following a neck of femur fracture. Unfortunately while awaiting the operation she has become very confused, unable to orientate herself in time or place and demanding to leave the ward. Her AMTS is now 3/10 (on arrival it was 10/10). All her observations are normal and her NEWS is 0. Clinical examination and urine dipstick are unremarkable. You decide to conduct a review of her drug chart.

She suffers from osteoarthritis, high cholesterol, Crohn's disease and hypertension. Her current medications include paracetamol, simvastatin, prednisolone, azathioprine and amlodipine.

Which one of the 5 drugs she is taking is the most likely to be responsible for her confusion?

A. Paracetamol

B. Amlodipine

C. Azathioprine

D. Simvastatin

E. Prednisolone

Correct Answer:Prednisolone

Explanation:

The patient has developed delirium – a very common occurrence in elderly patients. Delirium often has a multifactorial cause including infection, change of environment and medications. Clinical assessment does not indicate there is any obvious infective cause for her delirium.

Of the regular medications she is taking, prednisolone is most likely to be contributing to her delirium. Steroids are a well-known cause of delirium in the elderly along with, but not limited to benzodiazepines, opiates, antiparkinsonian or antiepileptic drugs and digoxin. Antihypertensives can also contribute to delirium but given her NEWS is normal, we can assume her blood pressure is normal and that the steroids are more likely to be causing the symptoms.

Further reading:

http://pmj.bmj.com/content/80/945/388

Question:

An obese 42-year-old patient presents to the GP with persistent abdominal pain after eating. He describes a burning sensation under his ribs, with this sometimes travelling up towards his throat; this is particularly severe with large meals. Recently, he has suffered from recurrent bouts of hiccups; these can last a number of minutes and be distressing. The patient reports that he has sought advice for his symptoms previously, with a previous doctor informing him that reflux is the most likely explanation. However, treatment with omeprazole and over-the-counter Gaviscon recommended has not resulted in any improvement.

The patient reports a 3 stone weight loss over the past 6 months, although he has been attending a weight loss class during this time, with the aim of becoming a more healthy weight. He denies changes in appetite, changes in bowel habit or passing blood in his stools. Abdominal examination reveals no tenderness or masses on palpation. There is no lymphadenopathy elicited.

Given the patient's non-response to PPI therapy, the GP makes a hospital referral. The consultant informs the patient that he may require an upper GI endoscopy; however, before this is carried out, he is booked in for a chest X-ray. This is reported as showing a significant degree of retrocardiac air; this allows for a diagnosis to be made without a need for more invasive investigations. The consultant explains the diagnosis to the patient, including the risk factors and the management options.

Considering the likely diagnosis, which of the features of the patient's history is the most likely to have contributed to the development of the condition?

A. ACE inhibitors

B. Obesity

C. Hypertension

D. Rapid weight loss

E. Being middle-aged

Correct Answer:Obesity

Explanation:

The most likely diagnosis, in this case, is a hiatus hernia; a displacement of a portion of the stomach above the diaphragm. This most commonly involves the gastro-oesophageal junction (a sliding hiatus hernia), with the fundus of the stomach implicated in some cases (a rolling hiatus hernia). The condition may remain asymptomatic or can present with persistent reflux symptoms, as the proximal location of the stomach results in an increased chance of acid coming into contact with the oesophagus. Hiccups are another feature that points towards a hiatus hernia as a likely diagnosis; these can arise due to diaphragmatic irritation. The findings of a retrocardiac air bubble on chest X-ray are classical of hiatus hernia; this is a useful first-line investigation for suspected hiatus hernia given its rapid availability.

The condition is far more common in obese patients; the exact reason for this is still debated, although it is thought that the explanation may be as simple as the increased abdominal pressure caused by excessive body weight. Other risk factors for the condition include:

Increased age - the frequency of hiatus hernia gradually increases with age; therefore, being middle-aged is not a risk factor

Male sex

Previous gastrointestinal surgery

Connective tissue diseases - Marfan syndrome, Ehler's-Danlos syndrome

There is no known association between hypertension or its treatment (ACE inhibitors) and hiatus hernia. Rapid weight loss can predispose patients to develop gallstones, but not a hiatus hernia.

Further reading:

https://patient.info/doctor/hiatus-hernia-pro

Question:

A 3-year-old boy is brought to the GP by his mother because of a rash that started on his face three days ago. The mother reports that the boy does not seem bothered by the rash but occasionally scratches it at rest. The boy is otherwise well and has no history of fever, coryzal symptoms or diarrhoea.

He has no significant past medical history and is up-to-date on all childhood vaccinations. He has no known allergies.

On examination, the boy appears well and is playing with some toys. His vital signs are recorded as normal with a temperature of 37.1°C, pulse 90/min and respiratory rate 20/min. Close inspection of the face shows small, clustered lesions with a golden crust along the upper lips and around the nose.

Which of the following investigations would be most appropriate to perform first in this patient?

A. Swab and bacterial culture

B. Skin biopsy

C. No investigations required

D. Blood cultures

E. Urinalysis

Correct Answer:No investigations required

Explanation:

The most likely diagnosis in this patient is non-bullous impetigo - a superficial infection of the skin caused by the bacteria Staphylococcus aureus or Streptococcus pyogenes. Impetigo is a common condition affecting paediatric populations; non-bullous impetigo accounts for most cases (about 70%). NICE guidelines state that impetigo is usually a clinical diagnosis, and investigations are not typically indicated unless the diagnosis is uncertain or there is a high risk of complications in a patient.

A swab and bacterial culture is only indicated in impetigo if the disease is persistent, recurrent or widespread; as in these cases, the possibility of meticillin-resistant Staphylococcus aureus (MRSA) should be considered. As this patient is systemically well and has presented with a three-day history of rash only, investigation with swabs would not be indicated initially.

A skin biopsy is rarely performed in the context of impetigo; however, if indicated, it classically reveals a superficial subcorneal collection of neutrophils and bacteria.

Post-streptococcal glomerulonephritis (PSGN) is a potential complication of impetigo. In these patients, urinalysis and urine microscopy may be indicated to confirm the presence of haematuria, red blood cell casts and proteinuria. However, as PSGN typically occurs 14 days after infection, it would not be recommended to screen the child for this complication unless symptoms indicated the need for investigation.

In general, blood cultures are only required in patients who are systemically unwell, are immunocompromised or are at risk of unusual organisms. This patient is systemically well and most likely has a self-limiting illness; therefore, blood cultures would not be indicated at this time.

Further reading:

https://cks.nice.org.uk/topics/impetigo/

Question:

A 15-year-old girl presents to the GP with a 6-month history of amenorrhea. She states that she is under a lot of pressure preparing for a gymnastics competition, and has started to restrict her calorie intake to feel like she is "in control of something". She underwent menarche at 13 years old, and her menstrual cycle has previously been regular.

She weighs 45kg and measures 160cm tall. Vital signs are recorded as pulse 40/min, blood pressure 95/62mmHg and SpO2 98% on room air. Her skin appears slightly yellow, and there is fine, downy hair on her neck and shoulder blades. She has to use both hands to stand up from the chair.

What is the most appropriate initial management for this patient?

A. Emergency admission

B. Refer to community eating disorder service (CAMHS)

C. Prescribe oral phosphate replacement

D. Review patient in 2-weeks

E. Prescribe the combined oral contraceptive pill

Correct Answer:Emergency admission

Explanation:

The most likely diagnosis in this patient is anorexia nervosa (AN) - an eating disorder characterised by the restriction of caloric intake leading to low body weight. In AN, there are also associated symptoms such as fear of weight gain, body dysmorphia, hormonal disturbance and often personal denial of illness. This patient describes restriction of her caloric intake in response to life stresses and has key clinical findings of secondary amenorrhoea, low body weight, bradycardia, lanugo hair and carotenaemia. NICE guidelines suggest that emergency admission should be considered in any patient at risk of serious physical or psychological complications from an eating disorder. High-risk features in this patient include cardiovascular instability (bradycardia ≤40), rapid weight loss, and reduced muscle power (inability to stand without support).

Anorexia nervosa is associated with various electrolyte abnormalities, such as hypophosphataemia and hypokalaemia. If a patient is suspected of having an electrolyte imbalance, NICE guidelines suggest emergency admission is warranted, as this should be managed in an inpatient setting. Therefore, prescribing oral phosphate replacement would not be an appropriate initial management option.

Patients who do not require emergency medical admission should be referred immediately to an age-appropriate eating disorder service, depending on the locally agreed care pathway guidelines. However, the clinical picture in this patient is concerning and warrants inpatient attention; therefore, community-based child and adolescent services (CAMHS) would not be the most appropriate initial management.

NICE guidelines stress the importance of clinicians maintaining a 'low threshold for concern' in patients with anorexia nervosa, as they may appear deceptively well despite underlying medical instability. Therefore, given this patient's signs of physical compromise, it would not be appropriate to manage this patient in the community or wait for 2-weeks to review her condition.

Patients with secondary amenorrhoea lasting >12 months are considered at a higher risk of developing osteoporosis. In patients with amenorrhoea, the underlying cause should be treated first where possible in an attempt to regain a normal menstrual cycle naturally. If amenorrhea persists, patients should be considered for the combined oral contraceptive pill (COCP). In this patient, the most likely underlying cause of the secondary amenorrhoea is malnutrition and low body weight; this should be managed first before starting the COCP.

Further reading:

https://cks.nice.org.uk/topics/eating-disorders/management/suspected-eating-disorder/#admission

Question:

A 28-year-old man is brought to the emergency department following a motor vehicle collision.

Despite analgesia, he is experiencing significant pain in his left leg.

On examination, he is found to have a pulseless left leg and posterior knee dislocation. The leg is extremely swollen and tight. Passive range of motion of the foot elicits excruciating pain in the calf.

Which of the following investigations would be most useful in reaching a definitive diagnosis?

A. Intra-compartmental pressure monitor

B. Creatinine kinase

C. Doppler ultrasound

D. MRI

E. Duplex ultrasound

Correct Answer:Intra-compartmental pressure monitor

Explanation:

The most likely diagnosis in this patient is compartment syndrome - the critical increase in pressure within a fascial compartment. The diagnosis of compartment syndrome is usually clinical, based on symptoms and risk factors. However, if required, the most reliable diagnostic test is an intra-compartmental pressure monitor.

A Doppler ultrasound may be used to detect a thrombus or demonstrate muscle damage, but it cannot accurately determine pressure within a fascial compartment.

A duplex ultrasound may be used to assess flow rates and vascular structures, but it cannot accurately determine pressure within a fascial compartment.

An MRI scan may show muscle oedema and the loss of typical fascicular architecture. There may also be changes to muscle enhancement, depending on the MRI sequence used, if there is subsequent myonecrosis in the affected compartment. Ultimately, however, MRI should not be used to diagnose suspected compartment syndrome as it would significantly delay the diagnosis and time to initiate surgical management.

Haematological markers like creatinine kinase, both the initial and trending levels, may be used to aid diagnosis; however, it is not specific for compartment syndrome, therefore, cannot be considered diagnostic alone.

Further reading:

https://orthoinfo.aaos.org/en/diseases--conditions/compartment-syndrome/

Question:

A 67-year-old man presents to the emergency department with a 3-day history of a productive cough and lethargy associated with headaches and joint pain.

On examination, he has a GCS of 15/15, a heart rate of 100bpm, a respiratory rate of 26, an SpO2 of 92% on room air, a blood pressure of 95/65 mmHg and a temperature of 38.1ºC. There is also a widespread rash of erythematous target lesions.

Blood results are demonstrated below:

Test Result Reference range

Haemoglobin 150 g/L (130 - 180)

Platelets 320 \* 109 (140 - 400)

WCC 17.4 \* 109/L (3.6 - 11.0)

Na+ 141 mmol/L (133 - 146)

K+ 3.9 mmol/L (3.5 -5.3)

Urea 9.0 mmol/L (2.5 - 7.8)

Creatinine 110 µmol/L (59 - 104)

CRP 88 mg/L (<5)

A chest x-ray shows multiple bilateral interstitial opacities.

What is this patient's CURB-65 score?

A. 4

B. 2

C. 5

D. 1

E. 3

Correct Answer:2

Explanation:

The patient in the vignette has features consistent with atypical pneumonia caused by Mycoplasma pneumoniae (arthralgia, erythema multiforme, and characteristic interstitial infiltrates on the chest radiograph). M. pneumoniae is an atypical community-acquired pneumonia that typically affects young adults and children.

The components of the CURB-65 score are as follows (each scoring 1 point):

C Confusion (abbreviated mental test score ≤ 8/10)

U urea > 7 mmol/L

R Respiration rate ≥ 30/min

B Blood pressure: systolic ≤ 90 mmHg and/or diastolic ≤ 60 mmHg

65 Aged ≥ 65 years

As the patient in the vignette is over the age of 65 years old (67) and has serum urea >7 mmol/L (9.0), his CURB-65 score is 2.

Further reading:

https://www.nice.org.uk/guidance/qs110/chapter/quality-statement-4-mortality-risk-assessment-in-hospital-using-curb65-score

Question:

A 15 month-old boy is brought in by his parents as he has been inconsolable for 4 hours. They describe a 12-hour history of vomiting and abdominal distension. On further questioning, he has not had any dirty nappies for the last 24 hours. They also describe a 3-month history of intermittent groin bulging when he cries, which they have seen their GP about.

On examination, vital signs are within normal parameters for his age. The abdomen is distended and there is an irreducible, non-fluctuant bulge in the right groin that is tender but non-erythematous.

What is the most likely diagnosis?

A. Lymphadenitis

B. Strangulated inguinal hernia

C. Incarcerated inguinal hernia

D. Retractile testes

E. Hydrocele

Correct Answer:Incarcerated inguinal hernia

Explanation:

The most likely diagnosis is an incarcerated inguinal hernia.

An indirect inguinal hernia is a congenital abnormality from the failure of the processus vaginalis to close. The processus vaginalis is an outpouching of peritoneum that, along with the gubernaculum, guides the testes in their descent through the inguinal ring into the scrotum. In females, the canal of Nuck (which is functionally similar to the processus vaginalis) terminates in the labia majora and assists in guiding the ovaries to their final location in the pelvis. The processus vaginalis and canal of Nuck both close between 36-40 weeks of gestation.

The left testis descends before the right and usually closes first, resulting in a higher incidence of right-sided inguinal hernias.

Most inguinal hernias are asymptomatic and are often found during a routine examination or by parents who have noticed an intermittent bulging in the groin, scrotum, or labia, often with straining.

An incarcerated hernia presents as an irreducible non-fluctuant bulge that is tender and may or may not be erythematous. The child is usually inconsolable and may have obstructive symptoms such as nausea and vomiting, constipation, and abdominal distention.

If incarceration progresses to strangulation, the child may have peritonitis, bloody stools, and haemodynamic instability.

Other conditions may be confused for an incarcerated hernia, such as a retractile testis, lymphadenopathy, and hydrocele.

Difference between incarceration and strangulation:

Incarcerated hernias are irreducible hernias that cannot return to the abdominal cavity when pushed in.

Strangulated hernias are incarcerated hernias that lose their arterial blood supply.

Hydrocele

A collection of serous fluid between the layers of the membrane (tunica vaginalis) that surrounds the testis or along the spermatic cord. The main symptom is a painless, swollen scrotum on one or both sides, which feels like a water-filled balloon and would not present with symptoms of obstruction like the case in question. Most paediatric hydroceles are congenital and usually resolve within the first year of life.

Lymphadenitis

Inflamed and enlarged lymph nodes usually secondary to infection. Symptoms include painful lymphadenopathy with erythema. Lymphadenitis would not present with symptoms of obstruction like the case in question.

Retractile testes

In most males, the testicles can move in and out of the scrotum at different times due to changes in temperature etc. Retractile testes do not need any treatment but do need close follow-up until puberty, as they can become ascendant. Retractile testes are usually painless and would not present with symptoms of obstruction like the case in question.

Further reading:

https://geekymedics.com/hernias-explained/

Question:

A 43-year-old female with type 2 diabetes, hypothyroidism and chronic kidney disease presents with 4 months of worsening lethargy and shortness of breath. Clinical examination is unremarkable.

Blood tests reveal the following:

Hb = 78g/L (115-160)

MCV = 124fL (76-96)

WCC = 5.3 x109/L (4.0-11.0)

Neutrophils = 2.1x109/L (1.5-8.0)

Platelets = 210 x109/L (150-400)

Sodium = 138mmol/L (133-145)

Potassium = 4.7mmol/L (3.5-5.0)

Urea = 11.2 (2.5-6.7)

Creatinine = 120 micromol/L (55-90)

eGFR = 47 mL/min/1.73m2

TSH = 8.9mU/L (0.5-5.7)

Total T4 = 86nmol/L (70-140)

HbA1c = 54mmol/mol

Which of the following is the most likely cause of this patient's anaemia?

A. Chronic kidney disease

B. Anaemia of chronic disease

C. Haemolytic anaemia

D. Folate deficiency

E. B12 deficiency

Correct Answer:B12 deficiency

Explanation:

The most likely cause of this patient's anaemia is B12 deficiency, secondary to pernicious anaemia.

Pernicious anaemia is associated with both autoimmune thyroid disease and type 1 diabetes.

Vitamin B12 is present in meat and animal protein foods. Absorption occurs in the terminal ileum and requires intrinsic factor (IF). Intrinsic factor is produced by parietal cells in the gastric mucosa. In pernicious anaemia, autoantibodies target parietal cells and intrinsic factor, eventually resulting in an inability to absorb vitamin B12.

Other causes of macrocytic anaemia include folate deficiency, chronic liver disease, and myelosuppression.

Haemolytic anaemia is not associated with autoimmune thyroid disease or type 1 diabetes and typically presents with normocytic anaemia.

Folate deficiency also causes macrocytic anaemia, however, given the patient's past medical history, pernicious anaemia is a more likely diagnosis.

An eGFR of 47 indicates Stage 3a chronic kidney disease, which is unlikely to cause significant anaemia. Chronic kidney disease is typically associated with normocytic anaemia.

Anaemia of chronic disease usually presents as normocytic or microcytic anaemia (rather than macrocytic anaemia).

Further reading:

https://patient.info/doctor/pernicious-anaemia-and-b12-deficiency

Question:

A 23-year-old Caucasian female presents to the emergency department complaining of vision loss. She woke up this morning unable to see anything out of her left eye, and is experiencing pain with eye movements. The vision in her right eye is unaffected. She has no medical history, and has only once presented to the GP before with left-sided weakness after exercise. This spontaneously resolved after two weeks without treatment, and was attributed to stress.

On examination of the eye, there is no conjunctivitis or evidence of trauma. A central scotoma and relative afferent pupillary defect are noted on cranial nerve examination. Fundoscopy shows a pale disc. No more abnormalities are noted on peripheral neurological examination.

Given the most likely diagnosis, what investigations are most appropriate at this time?

A. ANA, anti-dsDNA, and anti-cardiolipin antibodies

B. MRI of the brain and spine, visual-evoked potentials, and lumbar puncture for matched oligoclonal bands

C. Anti-AQP4 antibodies

D. MRI of the brain and spine, visual-evoked potentials, and lumbar puncture for unmatched oligoclonal bands.

E. CT of the brain, and lumbar puncture for unmatched oligoclonal bands

Correct Answer:MRI of the brain and spine, visual-evoked potentials, and lumbar puncture for unmatched oligoclonal bands.

Explanation:

The correct answer is an MRI of the brain and spine, visual-evoked responses and lumbar puncture for unmatched oligoclonal bands, given the most likely diagnosis of multiple sclerosis (MS). The vignette describes a young Caucasian female presenting with acute monocular visual loss and pain on eye movement. The examination findings of central scotoma, relative afferent pupillary defect and a pale optic disc are consistent with optic neuritis. It is important to consider multiple sclerosis in anyone with optic neuritis, especially in a young female who presents with a previous ‘episode’ of left-sided weakness. The vignette describes Uhthoff’s phenomenon, where the symptoms worsened with heat (such as exercise, weather or a shower). Uhthoff’s phenomenon is highly suggestive of multiple sclerosis.

The MRI of the brain and spine is to identify any plaques in the white matter. The visual-evoked responses could be delayed in someone with MS, due to the demyelination slowing the impulses. The lumbar puncture looks for oligoclonal bands in the CSF which are not present in the serum (unmatched). Matched oligoclonal bands could indicate infection, autoimmune disease or sarcoidosis, but are not associated with MS.

ANA, anti-dsDNA and anti-cardiolipin antibodies are incorrect investigations at this time. Based on the vignette, multiple sclerosis is a more likely diagnosis than Systemic Lupus Erythematous.

Anti-AQP4 antibodies would investigate for neuromyelitis optica. While this is an important differential to consider in this situation, multiple sclerosis is the most likely diagnosis in this case.

CT of the brain and lumbar puncture for unmatched oligoclonal bands is incorrect. MRI of the brain and spine is the neuroimaging of choice for MS.

Further reading:

https://www.nice.org.uk/guidance/cg186/chapter/Recommendations#diagnosing-ms-2

Question:

A scientist is interested in finding out if there is a link between neurosurgery and Alzheimer’s disease. He identifies a group of 20 patients who have undergone neurosurgery and then follows them up over time to identify those who develop Alzheimer’s disease. He also collects data on the age, sex and ethnic origin of the participants.

What type of study is described?

A. Case series

B. Cross-sectional

C. Case-control

D. Retrospective cohort

E. Prospective cohort

Correct Answer:Case series

Explanation:

This is a case series. A case series identifies a group of people with a known exposure and follows them up to see if they develop the condition being studied.

A cross-sectional study collects data at a single point in time and often assesses numerous characteristics at once.

Case-control studies involve comparing a group of cases with a group of controls and seeing if there are different rates of risk factor exposure between the two groups.

A prospective cohort study identifies a group of people with a known exposure and a group without the exposure, then follows them up to see if they develop the condition being studied.

A retrospective cohort study involves looking back into the past to determine if a group of people have been exposed to the risk factor. The exposure status was measured in the past and some people may have already been diagnosed with the disease of interest.

Further reading:

https://guides.himmelfarb.gwu.edu/prevention\_and\_community\_health/types-of-studies

Question:

A 74-year-old man attends a respiratory clinic with shortness of breath. He was diagnosed with chronic obstructive pulmonary disease thirty years ago, he is treated with optimal medical management and he is an ex-smoker. He also has a history of ischaemic heart disease and had a heart attack 5 years ago.

On examination, he has reduced air entry bilaterally, a pan-systolic murmur over the left border of his sternum, and bilateral lower limb oedema. He has had a transthoracic echocardiogram which is reported as showing good left ventricular function but tricuspid regurgitation with raised right ventricular systolic pressure. An arterial blood gas in room air shows a PaO2 of 7.8 kPa and a PaCO2 of 6.2 kPa.

What is the most likely aetiology of his pulmonary hypertension?

A. Type 5 pulmonary hypertension due to sarcoidosis

B. Type 3 pulmonary hypertension due to chronic lung disease

C. Type 2 pulmonary hypertension due to left heart disease

D. Type 1 primary pulmonary arterial hypertension

E. Type 4 pulmonary hypertension due to chronic thromboembolic disease

Correct Answer:Type 3 pulmonary hypertension due to chronic lung disease

Explanation:

The most likely aetiology of this patient's pulmonary hypertension is type 3 pulmonary hypertension due to chronic lung disease. The mechanism of pulmonary hypertension in this group is chronic hypoxic vasoconstriction. The loss of this hypoxic vasoconstriction when these patients are given too much oxygen can contribute to the development of type 2 respiratory failure. When pulmonary hypertension causes right ventricular impairment, as evidenced in this case by his peripheral oedema, it is commonly referred to as cor pulmonale.

His echocardiogram reveals good left ventricular function and no left-sided valvular disease making type 2 pulmonary hypertension due to left heart disease unlikely.

Type 1 primary pulmonary arterial hypertension usually occurs either idiopathically in young patients, or in association with collagen vascular diseases such as systemic sclerosis.

There are no features, such as recurrent pulmonary embolism, in this case, to suggest type 4 pulmonary hypertension due to chronic thromboembolic disease.

Type 5 pulmonary hypertension includes miscellaneous or multifactorial causes of pulmonary hypertension such as sarcoidosis, haematological conditions or metabolic disorders.

Further reading:

https://academic.oup.com/bjaed/article/6/1/17/347000

Question:

A worried mother brings her 6-week-old baby daughter to be reviewed by their GP. The mother reports that her daughter cries inconsolably most evenings for no apparent reason and that this has been occurring for the past 4 weeks. During each episode of crying, the mother describes that her daughter stiffens, draws up her legs towards her chest, becomes facially more flushed and passes flatus. She also reports that her daughter’s cries are more high-pitched and distressed during these episodes. Each episode of crying lasts between 3-4 hours in duration. There is no association with feeding. The child has no significant past medical history. Clinical examination is unremarkable and the child's growth is within normal limits.

What is the most likely diagnosis?

A. Volvulus

B. Non-accidental injury

C. Infantile colic

D. Gastro-oesophageal reflux disease (GORD)

E. Intussusception

Correct Answer:Infantile colic

Explanation:

The most likely diagnosis, in this case, is infantile colic. This condition can be defined as infantile crying which lasts more than 3 hours per day for more than 3 days per week for at least 3 weeks in an otherwise healthy baby. Infantile colic is a benign condition that is self-limiting. The aetiology underlying this condition is unclear. Symptoms typically include inconsolable crying (that is high-pitched, distressed and usually in the evening) accompanied by facial redness, drawing up of the knees and flatus. Further investigation is not typically warranted in cases of suspected infantile colic (unless atypical features are present). Management typically involves parental reassurance only.

Intussusception typically presents with paroxysms of colicky abdominal pain with associated crying (often with a well-looking child in between paroxysms). Other clinical features can include:

bilious vomiting

palpable ‘sausage-shaped’ mass in the right upper quadrant

dehydration,

irritability

‘red-currant jelly’ stool

Volvulus is less likely in this case. This condition usually presents with constipation, bile-stained vomit, abdominal distension and abdominal pain.

Non-accidental injury is not likely in this case.

GORD is less likely in this case, given there is no association with feeding.

Further reading:

https://patient.info/doctor/baby-colic-pro

Question:

A 24-year-old student presents to the GP after being strongly encouraged to do so by his partner, who is extremely concerned about him. He admits to having struggled over the last year; due to the COVID-19 pandemic he has felt isolated at university and admits to having a generally low mood for the past 3 months.

The patient admits to getting little pleasure from his hobbies; he was previously a keen swimmer but has lacked the motivation to train even now this is possible given a recent relaxation in restrictions. He describes an increase in sleepiness; often spending most of the day in bed, and also that he has very low energy levels. Despite this, his appetite has increased, and he reports having gained around 3kg over the last few months. He has had problems concentrating, and has failed multiple modules of his course, which he is very ashamed about. Whilst the patient has often felt down and considered himself worthless, he has never considered harming himself; he credits this to the support of his girlfriend, for which he is very grateful. He states that his mood improves when he is around others and has the opportunity to distract himself.

The GP makes a diagnosis of atypical depression given the patient's hypersomnia, increased appetite and improvement in mood during positive events. The patient seems unwilling to try CBT, and the GP prescribes antidepressant medication. Unfortunately, 6 months later, the symptoms are still persisting; neither sertraline nor venlafaxine have been of benefit. The GP informs the patient that he will try one more medication before making a specialist referral, and prescribes him phenelzine.

Which of the following pieces of advice is the GP most likely to give to the patient regarding this medication?

A. The patient should avoid contact sports when on the medication

B. The patient will need regular blood tests to monitor levels of the drug

C. The patient must avoid consuming grapefruit juice

D. The patient must continue their current antidepressant regime alongside the new medication

E. The patient should avoid consuming excessive amounts of aged cheese

Correct Answer:The patient should avoid consuming excessive amounts of aged cheese

Explanation:

Phenelzine is a monoamine oxidase inhibitor (MAOI) that can be used in the setting of depression that is resistant to other therapies. There is also some evidence to suggest that it is an effective option in managing atypical depression; a subtype characterised by an upturn in mood in response to positive events, and symptoms such as weight gain and increased sleep.

Monoamine oxidase inhibitors function by inhibiting the family of enzymes responsible for the oxidation and breakdown of a number of neurotransmitters; including both serotonin and noradrenaline; both strongly implicated in the pathophysiology of depression. Whilst the medications are an efficacious option for managing depression, the medications have a number of side effects and cautions that patients must be made aware of. Postural hypotension can be troubling in elderly patients, and there are a number of dietary restrictions necessary for those taking the drugs.

Inhibition of monoamine oxidases can interfere with the metabolism of tyramine. Therefore, patients must avoid consuming large amounts of dietary tyramine, and abstain from eating excessive amounts of aged cheese or fermented alcoholic drinks. Failure to do so can trigger the 'cheese reaction' - a hypertensive crisis triggered by high levels of noradrenaline, a breakdown product of tyramine.

Those on MAOI's must also be made aware of drug interactions that can arise; in particular, they must not be co-prescribed with any other medication that increases serotonin levels, as there is a risk of causing serotonin syndrome. Therefore, the previous anti-depressants must be stopped, with a sufficient period left before starting the MAOI. They must not continue their current antidepressant regime alongside the medication.

Drug level monitoring is required for certain medications; usually those with a narrow therapeutic index; lithium, digoxin and gentamicin being examples. Monoamine oxidase inhibitors do not require levels to be measured.

Grapefruit juice can inhibit the CYP450 family of enzymes, which can have a role in the metabolism in a number of medications; MAOIs are not one of these.

Avoiding contact sports would be appropriate advice for drugs that increase the risk of bleeding; this is not a known side effect of monoamine oxidase inhibitors.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK539848/

Question:

A 69-year-old African male presents to the emergency department with severe left eye pain which came on abruptly 2 hours previously. He reports a severe headache and poor vision from the left eye. He has never had these symptoms before.

His observations are normal. Physical examination is significant for a fixed, mid-dilated left pupil. Intraocular pressure (IOP) in the left eye is 39 mmHg.

Which of the following is the best next step in management?

A. Ciprofloxacin eye drops

B. High dose oral steroids

C. Tropicamide eye drops

D. Intravenous acetazolamide

E. Arrange temporal artery biopsy

Correct Answer:Intravenous acetazolamide

Explanation:

This patient has presented with acute onset monocular vision loss of the left eye and has a fixed, mid-dilated pupil with an elevated intraocular pressure (IOP - normal = 10 – 21 mm Hg). This is suggestive of a diagnosis of acute angle-closure glaucoma (AACG) – a vision-threatening emergency that requires prompt treatment and specialist ophthalmology involvement. AACG occurs secondary to blockage of normal outflow of aqueous humour which leads to an acute rise in IOP. Optic nerve axonal death follows. All efforts should be directed at reducing the intraocular pressure and this is achieved with topical anti-glaucoma medication and intravenous acetazolamide.

High dose oral steroids would be indicated in cases of suspected giant-cell arteritis (GCA). GCA typically presents in an elderly female with constitutional symptoms, temporal artery tenderness and jaw claudication.

Temporal artery biopsy is important when considering GCA as a diagnosis, which is unlikely to be the diagnosis in the above case.

Ciprofloxacin eye drops are indicated in contact lens wearers with a corneal abrasion. Corneal abrasion does not lead to an elevated IOP.

Tropicamide eye drops may worsen pupillary block in AACG.

Further reading:

https://patient.info/doctor/angle-closure-glaucoma

Question:

A 22-year-old woman presents to the GP with a 3-month history of worsening fatigue. She notes that her symptoms began shortly after a diagnosis of glandular fever, approximately 4-months ago.

The patient describes activities that were previously well tolerated, such as walking to university, leave her feeling exhausted. She describes difficulty with her studies because of increasing brain fog and unrefreshing sleep.

The patient says she is happy but distressed by the constant fatigue, as she is normally fit and well.

Physical examination is normal. A comprehensive set of blood tests including FBC, ESR, CRP, TFTs, LFTs, ANA, RF and HIV antibodies do not reveal any abnormalities.

Which of the following is the most appropriate initial management in this patient?

A. Counselling and supportive care

B. Fluoxetine

C. Eye movement desensitisation and reprocessing

D. Gabapentin

E. Amitriptyline

Correct Answer:Counselling and supportive care

Explanation:

The most likely diagnosis in this patient is chronic fatigue syndrome (CFS), also known as myalgic encephalomyelitis (ME). CFS/ME is characterised by persistent and disabling fatigue, post-exertional malaise (PEM), unrefreshing sleep, cognitive dysfunction and headaches. The symptoms in CFS/ME are not related to other medical or psychiatric conditions; however, symptoms are often preceded by a viral illness. There are no curative medications or treatments for chronic fatigue; instead, the primary goal of treatment is to manage symptoms and improve functional capacity. Therefore, initial treatment should include counselling and supportive care, helping patients to understand their condition and implement techniques to improve exercise tolerance.

Patients with comorbid depression may be recommended a selective serotonin-reuptake inhibitor (SSRI) such as fluoxetine, or a tricyclic antidepressant (TCA), such as amitriptyline. However, this patient does not express any anhedonia or low mood; therefore, it would not be suitable to commence treatment with an SSRI or TCA in the first instance.

In patients with associated neuropathic pain, medications such as gabapentin may be considered. This patient does not identify pain as a primary symptom; therefore, this would not be the most appropriate initial management.

Eye movement desensitisation and reprocessing (EMDR) is a form of trauma-focused psychological therapy recommended in patients with post-traumatic stress disorder symptoms (PTSD) lasting >3 months. This patient does not have any features suggestive of PTSD; therefore, this would not be an appropriate treatment to initiate.

Further reading:

https://patient.info/doctor/myalgic-encephalomyelitischronic-fatigue-syndrome-mecfs-pro

Question:

A 6-month-old boy attends paediatric emergency department with his mother. Over the past 2-days his mother reports that he has been coughing and has a reduced oral intake. The boy is exhibiting signs of respiratory distress having been referred to the unit by his GP. Physical examination reveals subcostal recessions, nasal flaring and wheezing. The patient has no other significant medical history. He has been achieving his development goals and has been fully vaccinated.

Given the presentation, what is the most likely causative agent for this scenario?

A. Bordetella pertussis

B. Influenza

C. Parainfluenza virus

D. Respiratory syncytial virus

E. Adenovirus

Correct Answer:Respiratory syncytial virus

Explanation:

The correct answer is respiratory syncytial virus (RSV). In a child under 1-years-old with a wheeze, consider broncholitis. Broncholitis is a common a viral induced lower respiratory tract infection which causes inflammation of the bronchioles. Inflammation of the respiratory epithelial cells may lead to airway obstruction causing a characteristic wheeze. Treatment is mainly supportive, monitoring respiratory function with a move for intubation and ventilation in serious cases.

Influenza, parainfluenza and adenovirus are all other potential causes for broncholitis. However, their incidence rates are lower than RSV making them less likely to be the correct answer in this scenario. Rapid diagnostic assays may be appropriate to perform in such cases to have a definitive causative agent identified.

Bordetella pertussis is the cause of whooping cough, very unlikely in this scenario given the clinical picture and the vaccination record.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK519506/

Question:

A 63-year-old gentleman presents to the GP surgery complaining of a chronic dry cough that has been ongoing over the last year. It is now getting worse and he reports having a persistent feeling of irritation in his throat. He is also complaining of a persistent runny nose that he initially attributed to his hayfever but is now present throughout the year. He reports no difficulty swallowing, no weight loss, no haemoptysis, no chest pain and no shortness of breath. He is otherwise fit and well and is able to walk several miles without becoming breathless. He has never smoked and currently works as an accountant.

A respiratory examination is unremarkable and vital signs are normal. There is some mild inflammation of the nasal mucosa noted. A routine panel of blood tests including FBC, U&E, CRP, ESR, LFTs, Coagulation Studies are all unremarkable.

What is the most likely diagnosis?

A. Pulmonary fibrosis

B. Post-nasal drip

C. Asthma

D. Laryngeal cancer

E. Lung cancer

Correct Answer:Post-nasal drip

Explanation:

The most likely diagnosis is post-nasal drip. This occurs when there are excess secretions in the nasal cavity that over time drip down the back of the oropharynx, causing irritation and provoking the patient to cough.

Post-nasal drip is a common cause of chronic cough, along with asthma and gastro-oesophageal reflux disease. Post-nasal drip has several potential underlying causes including viral infections (present during the infection), hayfever (seasonal), and other allergies (may be present all year round, depending on the allergen). In this scenario, it seems likely this patient has an allergy, resulting in continuous post-nasal drip symptoms.

Before a diagnosis of post-nasal drip can be made, other more sinister diagnoses must be considered (i.e. lung cancer, laryngeal cancer). Malignancy seems unlikely in this patient given the absence of other concerning symptoms (i.e. weight loss, fatigue, haemoptysis, hoarse voice, shortness of breath) and a normal panel of bloods (i.e. no anaemia or evidence of infection).

Pulmonary fibrosis typically presents with progressive shortness of breath, dry cough, finger clubbing and bilateral inspiratory crackles on auscultation of the chest. The absence of any risk factors (i.e. occupational exposure such as coal mining), shortness of breath and pathological findings on clinical examination make this diagnosis unlikely.

Asthma is a common cause of chronic cough, however this is typically nocturnal and would be unusual to present at this age. The absence of any other symptoms of asthma such as shortness of breath or wheeze makes this diagnosis unlikely.

Gastro-oesophageal reflux disease is another common cause of chronic cough, however, there is no mention of any symptoms of reflux (i.e. epigastric pain), making this diagnosis less likely given the rest of the history.

Further reading:

https://www.webmd.com/allergies/postnasal-drip#1

Question:

A 21-year-old male presents to the GP after developing a rash over the past 2 days. On examination, a widespread itchy, maculopapular rash is evident. He is otherwise well but reports he finished a course of antibiotics a week ago for a ‘sore throat’.

What is the most likely cause of his rash?

A. Sepsis

B. Drug reaction

C. Psoriasis

D. Eczema

E. Measles

Correct Answer:Drug reaction

Explanation:

The most likely cause of the maculopapular rash in this scenario is a drug reaction. In the history, the patient notes he has recently completed a course of antibiotics for a sore throat. The use of amoxicillin in infectious mononucleosis can provoke a drug-induced hypersensitivity rash that typically presents 7-10 days after antibiotic use. Given that the patient is systemically well, sepsis and measles are not likely diagnoses.

Eczema and psoriasis are less likely as they classically affect extensor or flexor surfaces.

Further reading:

https://www.dermnetnz.org/topics/infectious-mononucleosis/

Question:

A 7-year-old female is admitted under ENT for a routine tonsillectomy. On examination, she appears well but is slightly pale with marked conjunctival pallor. The rest of her examination is unremarkable other than enlarged non-inflamed tonsils. Her blood test and film reveal a microcytic hypochromic anaemia. Haemoglobin electrophoresis shows increased levels of HbA2 and HbF, but no HbH is seen.

What is the most likely diagnosis?

A. Beta-thalassemia major

B. Beta-thalassemia trait

C. Alpha-thalassemia minor

D. Sickle cell anaemia

E. Iron deficiency anaemia

Correct Answer:Beta-thalassemia trait

Explanation:

The most likely diagnosis in the above scenario is beta-thalassemia trait – an autosomal recessive haemoglobinopathy resulting from impaired synthesis of the beta-globin chain of haemoglobin. This patient presents with clinical signs of anaemia (pallor in appearance and of her conjunctiva) and has an established microcytic anaemia on routine blood biochemistry. The underlying cause of her anaemia, therefore, points towards either a failure or insufficiency of haemoglobin synthesis. A helpful pneumonic for remembering the causes of microcytic anaemia is the acronym “TAILS” (thalassemias, anaemia of chronic disease, iron deficiency anaemia, lead poisoning and sideroblastic anaemia). In this case, the findings on haemoglobin electrophoresis are diagnostic and clearly signify an underlying defect in haemoglobin synthesis, specifically the beta chain of haemoglobin, since haemoglobin variants HbA2 (α2δ2) and HbF (α2γ2) - which both lack the beta subunit of haemoglobin – are disproportionately elevated as part of a compensatory mechanism to maintain haemoglobin production. Patients with beta-thalassemia trait often have a mild hypochromic microcytic anaemia and are usually asymptomatic.

Sickle cell anaemia produces sickled red bloods cells that are routinely observed on blood film, which are detected as HbS on haemoglobin electrophoresis.

Beta-thalassemia major typically presents within the first year of life when the production of fetal haemoglobin - HbF – α2γ2 - begins to fall. Affected children are often symptomatic and present with a combination of failure to thrive, lethargy, hepatosplenomegaly, pallor and jaundice, owing to a severe microcytic anaemia. Increased levels of HbF and HbA2 are observed on haemoglobin electrophoresis.

Alpha-thalassemia minor can resemble mild beta thalassemia trait and presents with a microcytic hypochromic anaemia, but in contrast to patients with beta-thalassemia would not produce an elevated HbA2 on routine blood film.

Iron deficiency anaemia is an important differential for microcytic hypochromic anaemia but does not account for the increased levels of HbA2 and HbF seen on blood film, which are characteristic of beta thalassemias.

Further reading:

https://geekymedics.com/thalassaemia/

Question:

You are a junior doctor working on the general medicine ward. You are reviewing a 68-year-old male who has been an inpatient for the past week. He initially presented cachectic and withdrawing from alcohol, and was noted to have a distended abdomen with right upper quadrant discomfort.

His liver function tests have been statically deranged since admission. His coagulation screen is also abnormal and his albumin is low.

The patient had an ultrasound scan confirming a mild amount of ascites and a cirrhotic liver. His alpha-fetoprotein (AFP) level has been measured and is significantly raised.

What is the most likely diagnosis?

A. Renal cell carcinoma

B. Colorectal cancer

C. Hepatocellular carcinoma

D. Cholangiocarcinoma

E. Pancreatic cancer

Correct Answer:Hepatocellular carcinoma

Explanation:

The history, examination findings and laboratory/radiological abnormalities raise concern for hepatocellular carcinoma. This typically occurs in people with liver cirrhosis secondary to hepatitis or alcohol excess. Alpha-fetoprotein (AFP) is the tumour marker most commonly associated with this condition. Cholangiocarcinoma may produce a similar clinical presentation although does not produce AFP. Pancreatic cancer notoriously presents with non-specific signs and symptoms, although carcinoma of the head of the pancreas classically causes painless jaundice. Colorectal cancer would be less likely than hepatocellular carcinoma in this presentation and there is nothing to suggest that the patient has renal cell carcinoma.

Further reading:

https://patient.info/doctor/primary-liver-cancer-pro

Question:

A 44-year-old woman presents to A&E with sudden onset chest pain and dyspnoea, which came on whilst watching television. She describes a feeling of her heart 'racing' in her chest and feels faint. A COVID-19 swab taken on admission is negative. She has a past medical history of anxiety and depression, for which she takes sertraline. She is also prescribed the combined contraceptive pill.

Examination reveals no abnormalities other than notable tachypnoea and tachycardia; both lungs are clear. Observations reveal the following:

Pulse - 134

Respiratory rate - 29

Oxygen saturations - 93%

Capillary refill time - 3 seconds

An arterial blood gas (ABG) is taken in A&E off oxygen, and gives the following result:

pH - 7.48

PaO2 - 8.3 kPa

PaCO2 - 3.2 kPa

HCO3- - 25 mmHg

Base excess - 0

Given the ABG findings in combination with the history, which of the following would be the most appropriate next step?

A. Calculate a Wells' score

B. Take a peak flow measurement

C. Take blood sample for full blood count and urea and electrolytes

D. Reassure the patient that this is likely to be due to anxiety, and teach them circular breathing techniques

E. Ask the nurse to prepare nebulised salbutamol

Correct Answer:Calculate a Wells' score

Explanation:

The likely diagnosis in this lady is an acute pulmonary embolism (PE); therefore the most appropriate next step would be to calculate a Well's score. The patient has presented with sudden onset shortness of breath and chest pain, which is relatively classical in PE, although a pneumothorax is also a relevant consideration; a CXR should be obtained to exclude this. The arterial blood gas demonstrates type 1 respiratory failure with an uncompensated respiratory alkalosis; likely due to hyperventilation in an attempt to compensate for the hypoxia. The combined oral contraceptive pill increases the probability of venous thromboembolism due to the effect of oestrogen on various clotting factors.

The Well's score is a clinical tool that can be used to determine the likelihood of a pulmonary embolism (or a deep vein thrombosis; a separate checklist is available for this) being present and to guide the next steps. If the score is 5 or above, further investigation in the form of CT pulmonary angiography is warranted, as there is a high likelihood of an embolism being present. If the score is below 5, then a d-dimer is often measured with the aim of excluding PE; this test has a high negative predictive value.

Given the patient's history of anxiety and depression, an acute panic attack is another possibility, as this would produce similar symptoms, and could also cause a respiratory alkalosis secondary to hyperventilation. However, this should not be diagnosed until organic pathology has been ruled out. Additionally, this would not explain the hypoxia and reduction in oxygen saturations. Therefore, reassuring the patient that this is likely to be due to anxiety, and teaching them circular breathing techniques would not be appropriate in this scenario.

Asking the nurse to prepare nebulised salbutamol would be an excellent approach if there was a suspicion of an acute exacerbation of asthma or COPD; however, the onset is exceptionally acute, and there is no trigger mentioned in the history, nor any evidence of these conditions in the past medical history.

Taking a blood sample for full blood count and urea and electrolytes would be useful to exclude infection and a measure of kidney function is necessary before booking a CTPA due to the contrast used in the scan. However, these blood results are unlikely to make the diagnosis on their own, and therefore a Well's score calculation is more appropriate as a first step.

Taking a peak flow measurement can be useful in the routine monitoring of asthma, and also in the classification of the severity of an acute attack. However, carrying this out in an acutely hypoxic patient may worsen their clinical condition, and asthma is not the most likely diagnosis in this case.

Further reading:

https://patient.info/doctor/pulmonary-embolism-pro

Question:

A 26-year-old woman presents to the GP with a 2-day history of pain on urination and increased frequency. She also notes that her urine looks more cloudy than usual. She has no associated vaginal discharge or irritation.

She is sexually active with one partner and has a copper IUD. She has no other significant past medical history.

On examination, the patient appears well. Abdominal examination reveals some suprapubic tenderness. There is no fever or costovertebral angle tenderness.

What is the most likely diagnosis?

A. Pyelonephritis

B. Overactive bladder

C. Lower urinary tract infection

D. Reactive arthritis

E. Vaginitis

Correct Answer:Lower urinary tract infection

Explanation:

The most likely diagnosis in this patient is a lower urinary tract infection (UTI). NICE guidelines outline the typical features of UTI as dysuria, frequency, urgency, changes to appearance ± consistency of urine and suprapubic tenderness. The symptoms in this patient are likely due to a combination of cystitis and urethritis, secondary to an infective aetiology, most likely E. coli.

Patients with pyelonephritis typically present with acute onset flank pain, myalgia, nausea ± vomiting and fever ± rigors. Pyelonephritis commonly occurs in the context of a lower UTI as bacteria can ascend through the urinary tract. This patient does not have any systemic features or flank pain indicating pyelonephritis; therefore, this is a less likely diagnosis. However, it is essential to always consider this potential complication in patients with UTI.

Patients with vaginitis typically present with vaginal discharge, pruritus and dyspareunia. Whilst it is important to consider co-existing infectious vaginitis in patients with UTI, the patient does not have any features to suggest this as the primary diagnosis.

Reactive arthritis (ReA) classically presents with a triad of symptoms, formerly known as Reiter's triad, including post-infectious arthritis, non-gonococcal urethritis, and conjunctivitis. Patients also typically have a recent history of genitourinary or gastrointestinal infection. The absence of recent infection and other symptoms of ReA make this a less likely diagnosis.

Patients with overactive bladder (OAB) classically present with urinary urgency, frequency and incontinence. Whilst the patient does have features consistent with OAB, the acute onset of symptoms are more suggestive of an infective aetiology. NICE guidelines suggest all patients with suspected OAB should be investigated for UTI first before making a diagnosis.

Further reading:

https://cks.nice.org.uk/topics/urinary-tract-infection-lower-women/

Question:

A 10-month-old child is brought to the GP by his mum. He appears malnourished, despite feeding well, and his mum reports a persistent wet cough.

He was born at 39+2 weeks by normal vaginal delivery with no complications. The family recently moved to the UK, and his mother cannot recall any newborn screening tests taking place. He is up to date with vaccinations.

On examination, his weight is below the 2nd percentile for his age. He is unsettled with a raised respiratory rate and increased work of breathing. On auscultation of the chest, crackles are audible.

What would be the most appropriate initial management option in this child?

A. Prescribe daily oral prednisolone

B. Initiate a CFTR modulatory drug (e.g. Ivacaftor)

C. Refer to paediatric outpatient clinic

D. Same day referral to paediatric A&E

E. Prescribe inhaled corticosteroid

Correct Answer:Same day referral to paediatric A&E

Explanation:

This child is clearly unwell with evidence of significant faltering growth and respiratory distress with a likely underlying diagnosis of cystic fibrosis. Given the presence of acute respiratory distress, this child should be referred for review by paediatrics immediately as they are likely to need acute treatment for their chest (e.g. chest physiotherapy, antibiotics, oxygen) as well as further investigations to confirm the diagnosis, both of which are outside the scope of GP.

If the child has presented with isolated faltering growth and was not in respiratory distress, outpatient paediatric referral would be appropriate, but this is not the case in this scenario.

In an attempt to control inflammation in the airways oral corticosteroids such as prednisolone may be considered, however, long-term treatment is associated with adverse effects. Inhaled corticosteroids may be used in patients with concurrent cystic fibrosis and asthma to relieve inflammation, but they are not routinely used. Regardless, prescribing some inhaled corticosteroids is not the most appropriate initial management option.

CFTR modulatory drugs can help to restore function but are a new treatment that would only be commenced in secondary care (i.e. the paediatric outpatient clinic) and would not form part of an initial management strategy.

Further reading:

https://patient.info/doctor/cystic-fibrosis-pro

Question:

A 60-year-old man presents to his GP with neck stiffness. He reports that the neck stiffness has been present for around 6 months, but over the last 2 weeks, he has developed arm pain associated with pins-and-needles, weakness and difficulty in manipulating small objects with his hands. Examination reveals upper limb hyperreflexia and globally reduced sensation of the patient’s arms. An urgent MRI scan is requested which highlights multilevel cervical spondylosis and cervical cord compression due to vertebral disc prolapse.

What is the GOLD-STANDARD management for the condition described?

A. Emergency decompressive surgery

B. Watch and wait approach

C. Pyridostigmine

D. Antibiotics

E. Plasma exchange

Correct Answer:Emergency decompressive surgery

Explanation:

The most likely diagnosis is degenerative cervical myelopathy (DCM) and secondary cervical vertebral disc herniation. The gold-standard management for this condition, especially in patients with obvious disease progression, is emergency decompressive surgery. DCM (a.k.a. cervical spondylosis) can be defined as compression of the cervical spinal cord due to various factors (e.g. disc compression, hypertrophy of ligaments, osteophyte formation). The greatest risk factor for this condition is increasing age. Clinical features for this condition include neck pain, neck stiffness, limb pain, loss of dexterity, numbness, paraesthesia, autonomic dysfunction (erectile dysfunction, bowel or bladder incontinence) and unsteadiness. On examination, typical findings include limb hyperreflexia, spasticity, reduced sensation, weakness and clonus. The first-line investigation for DCM is an MRI scan.

A watch and wait approach may be life-threatening in this case due to the progressive nature of his disease. A small number of patients have DCM identified on MRI as an incidental finding and may not require surgery, but this conservative approach would not be appropriate in this case.

Plasma exchange is not used in the management of DCM. It is instead used in the management of conditions such as Guillain-Barre syndrome.

Pyridostigmine is an acetylcholinesterase inhibitor and is not indicated for DCM. It is instead used in the management of myasthenia gravis.

Antibiotics are not appropriate in this case as there are no features of an active infection. They may be used in the management of Lyme disease, which is a differential diagnosis for DCM.

Further reading:

https://www.bmj.com/content/360/bmj.k186

Question:

A 9-year-old girl attends her GP with her mother. She complains that her left ear hurts and feels “stuffy”. She is an otherwise healthy girl. Both she and her mother deny any fever, nasal congestion, rhinorrhea, or cough. She denies putting any foreign objects into her ear. She tells you that she is spending the Easter holidays learning to swim at the local leisure centre.

On examination, she has tenderness over the tragus and pain during the otoscopic examination of her left ear. The external ear canal is red and swollen. The tympanic membrane is pearly with a cone of light.

What is the most likely pathogen causing this child’s earache?

A. Pseudomonas aeruginosa

B. Streptococcus pneumoniae

C. Varicella zoster virus

D. Candida

E. Moraxella catarrhalis

Correct Answer:Pseudomonas aeruginosa

Explanation:

The most likely diagnosis is otitis externa (also known as "swimmer's ear"). Otitis externa is an infection of the external auditory canal. It most commonly results from contaminated water that enters the outer ear during swimming which provides a nidus for bacterial growth. Causative organisms include pseudomonas aeruginosa, staphylococcus aureus, and occasionally other gram-negative rods. Patients with otitis externa typically present with external, localised ear pain, which is made worse with palpation of the tragus and external ear. This can make examination particularly challenging, especially in children. Ofloxacin otic drops are used first-line in both bacterial cases of otitis externa when the tympanic membrane is intact. If the tympanic membrane is perforated; you must check that the drops are not ototoxic

Streptococcus pneumoniae is one of the most common causes of acute otitis media (AOM). This patient has a normal-appearing tympanic membrane and no evidence of middle-ear effusion.

Otitis externa may also be due to fungal organisms. Candidal otitis externa usually presents with pruritis and white flaky debris in the ear canal. It usually occurs after the normal flora of the ear has been eradicated by the use of topical antibiotics in the canal. As such it can be a complication of treatment of bacterial otitis externa.

Moraxella catarrhalis is a cause of acute otitis media (AOM). This patient has a normal-appearing tympanic membrane and no evidence of middle-ear effusion.

Herpes zoster oticus (Ramsay Hunt syndrome) is an infection of the inner, middle, and external ear caused by the varicella-zoster virus (VZV). It typically presents with pruritus or burning and vesicular lesions in the ear canal. In some cases, pruritus, pain, or paraesthesia may precede the development of the skin lesions. In this case, the patient does have external ear pain, however, lack of vesicular lesions in the ear makes this diagnosis unlikely. This clinical vignette is more fitting of a bacterial otitis externa.

Further reading:

https://patient.info/doctor/otitis-externa-and-painful-discharging-ears

Question:

An 18-year-old woman presents to the general practitioner with a newly developed, intensely itchy rash that spread from the anterior portion of her abdomen to her legs. Initially, she noticed it while drinking beer at a party five weekends ago. She admits to having frequent episodes of diarrhoea for the past 3-months, citing low mood and some abdominal discomfort. Her mother has type 1 diabetes mellitus, but she does not have any family history of dermatological or gastrointestinal disease.

Given the likely diagnosis, which of the following best describes the pathological changes that have taken place?

A. Villous atrophy and crypt hyperplasia

B. Filaggrin gene mutation in the epidermis

C. Hyperproliferation and build up of skin cells

D. Helicobacter mediated breakdown of the gastric and duodenal mucosa

E. Transmural granulomatous inflammation of the gastrointestinal tract

Correct Answer:Villous atrophy and crypt hyperplasia

Explanation:

This patient is presenting with undiagnosed coeliac disease. Presence of risk factors, such as dermatitis herpetiform, diarrhoea, and a family history of autoimmune disease. The onset of the rash following the party (with beer containing gluten), indicates an intolerance. In coeliac disease, anti-TTG and anti-EMA antibodies are responsible for causing villous atrophy and crypt hyperplasia of the intestinal mucosa. This leads to malabsorption and other symptoms.

Eczema is less likely as it would present with a widespread rash. The presence of risk factors for coeliac disease also makes it less likely. In eczema the pathology shows filaggrin gene mutation which impairs the barrier function of the epidermis.

Peptic ulcers are unlikely due to lack of risk factors and symptoms in this presentation, such as dyspepsia. The pathology shows Helicobacter-mediated gastric and duodenal mucosal breakdown.

Psoriasis is unlikely as it would more likely present with family history and potentially some symptoms of psoriatic arthritis (such as nail changes). There is also no mention of bleeding in relation to the potential plaques. The pathology shows hyperproliferation and build-up of skin cells.

Crohn’s disease could be a potential option due to the family history of autoimmune disease and diarrhoea, but the signs suggest that coeliac disease is the more likely diagnosis given the gluten intolerance and presence of dermatitis herpetiform. Crohn's pathology shows transmural granulomatous inflammation of the gastrointestinal tract, in skip lesions.

Further reading:

https://geekymedics.com/coeliac-disease/

Question:

A 78-year-old woman is admitted with a femoral fracture following a fall from standing height. She has a past medical history of hypertension and ischaemic heart disease.

Blood tests are requested, which demonstrate:

Test Result Normal range

Serum calcium 1.8 mmol/L (2.1 - 2.6)

Serum phosphate 1.6 mmol/L (0.8 - 1.4)

Her vitamin D levels are also low.

What is the likely aetiology of these findings?

A. Autoimmune hypoparathyroidism

B. Parathyroid adenoma

C. Osteoporosis

D. Osteopetrosis

E. Chronic kidney disease

Correct Answer:Chronic kidney disease

Explanation:

Chronic kidney disease is the correct answer because the kidneys are responsible for completing vitamin D synthesis, which in turn is needed for dietary calcium absorption. This patient likely has secondary hyperparathyroidism as a result, which is a physiological attempt of the parathyroid glands to compensate for the low calcium patients have as a result of poor renal function. In secondary hyperparathyroidism, the parathyroid glands undergo a negative feedback response to increase parathyroid hormone (PTH) secretion. PTH increases bone reabsorption in an attempt to increase serum calcium. As a result, patients are at risk of fragility fractures (from a force that would not ordinarily result in a fracture), which is in keeping with this woman presenting with a fracture following a fall from standing height, due to low bone density. Hypertension and ischaemic heart disease are risk factors for chronic kidney disease.

Osteoporosis is an important differential, but the history of risk factors for chronic kidney disease in this patient's past medical history and the blood results suggest that a renal cause is at play. Osteoporosis is most commonly seen in post-menopausal women, as their reduction in protective oestrogen impacts bone density, but these blood results point to another cause as calcium and phosphate are usually normal in osteoporosis.

Osteopetrosis is a rare congenital bone condition characterised by bone overgrowth and associated brittleness because of impaired old bone reabsorption, leading to ineffective new bone modelling. A familial history or earlier onset of fractures would usually be expected in patients, and some other classic features such as nerve palsies and back pain, may be expected in the history. As none of these are present and the blood findings suggest a renal cause (which is much more common), chronic kidney disease is a more reasonable differential.

Autoimmune hypoparathyroidism is an unusual cause of primary hypoparathyroidism, another (more common) cause of which is a complication of thyroid/throat surgery. There is no indication of autoimmune disease in this patient's past medical history (which may point to an autoimmune cause as having one autoimmune condition often increases the risk of another developing).

Parathyroid adenoma is the most common cause of primary hyperparathyroidism. Patients classically present with polydipsia, polyuria, renal calculi, abdominal involvement such as ulceration or pancreatitis, and depression ('bones, stones, abdominal groans, and psychic moans'). However, it is important to note these signs and symptoms are a result of hypercalcaemia, and many patients are asymptomatic, with findings being incidental. None of these symptoms are suggested in the stem, and the calcium is low rather than high. Furthermore, the history of fractures should point towards secondary hyperparathyroidism as a compensatory mechanism for low calcium levels causing loss of bone density.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK557822/

Question:

A 5-year-old boy presents to the general practitioner with a maculopapular blanching rash on his face and chest. He had a fever a few days ago prior to the rash appearing. There is visible non-purulent conjunctivitis present in both of his eyes, and he has a runny nose. He has not had any of his childhood vaccinations due to concerns from his mum. Observations are unremarkable, and there are no concerns regarding his feeding. Chest auscultation reveals bilateral air entry with no added sounds.

What is the most appropriate next step for this patient?

A. Supportive measures

B. Admit to hospital

C. Refer to paediatrics outpatient clinic

D. Intravenous antibiotics

E. Immediate intramuscular benzylpenicillin

Correct Answer:Supportive measures

Explanation:

The most appropriate next step for this patient is to implement supportive measures, with the most likely diagnosis being measles. Measles presents with an initial fever which peaks on day five before a maculopapular rash appears on the face and spreads cephalocaudally. The child may also have coryzal symptoms and non-purulent conjunctivitis. The MMR vaccine prevents against infection and/or reduces the likelihood of severe illness and complications if infection does occur. Even though this child has not been vaccinated, he is otherwise well in himself with normal observations. There are also no concerns from the parent regarding his normal feeding habits. Therefore a suitable management plan would be to offer supportive management such as maintaining good hydration and paracetamol for the fever. The parents should also be given information about when to seek further medical help if needed.

Admitting this child to the hospital is not a suitable option as he is otherwise well. He does not require intravenous fluids or support with feeding. His observations are unremarkable; therefore, there are no immediate concerns on examination. Hospital admission is generally needed for patients with complications of measles such as pneumonia and croup.

Immediate intramuscular benzylpenicillin is not a suitable next step for this patient. This injection is given to patients with suspected meningitis who present to the general practitioner before the hospital. The diagnosis here, however, is measles, as explained above. Meningitis presents with a non-blanching rash and may not present with other features such as conjunctivitis. Patients with meningitis may also present with photophobia and neck stiffness.

In this case, a referral to the paediatrics outpatient clinic would not be necessary. This child is presenting with measles which does not require a paediatrician review if mild, as in this patient. The GP may suggest a follow-up with themselves later on in the disease course to ensure the child is recovering well.

Intravenous antibiotics are not a treatment option for measles. Measles is a viral illness, so antibiotics would not help in managing this. Intravenous antibiotics can, however, be used for complications of measles infection such as pneumonia. This child has normal observations and nothing to suggest a chest infection on auscultation. The parents should be informed about the complications of measles and what action to take if the child’s condition changes.

Further reading:

https://geekymedics.com/measles/

Question:

A 60-year-old male patient attends a Dermatology appointment with a pigmented lesion on his back. He has been aware of the lesion for 6 months, during which time, he reports that the lesion has slightly increased in size. On examination, the patient is fair-skinned and has a raised, warty lesion located on the centre of his upper back. The lesion is 2cm in diameter, well-demarcated, yellow to brown in colour, has a ‘stuck on’ appearance and has multiple ‘plugged’ follicles on inspection with a dermatoscope.

What is the MOST LIKELY diagnosis?

A. Actinic keratosis

B. Acrochordon

C. Stucco keratosis

D. Seborrhoeic keratosis

E. Cutaneous horn

Correct Answer:Seborrhoeic keratosis

Explanation:

The most likely diagnosis, in this case, is seborrhoeic keratosis (SK). SK may also be referred to as a basal cell papilloma, brown wart, barnacle, or senile wart. This condition is the most common form of benign, cutaneous tumour that affects the elderly population. Major risk factors for SK development include increasing age (the most important risk factor) and fair skin. The precise pathophysiology underlying SK remains undefined. These lesions may appear anywhere on the body except on the palms and soles.

Clinical features of these lesions include:

a raised lesion with a ‘stuck on’ appearance

1mm to several centimetres in diameter

variation in colour (e.g. yellow, light brown, grey, dark brown)

a warty/greasy/waxy appearance and typical dermatoscopy findings (i.e. ‘clods’ of keratin, ridges and furrows creating a cerebriform appearance)

These lesions do not require removal, however, patients may wish them to be excised for several reasons (e.g. cosmetic, associated itch, may catch on clothes). Methods used to remove SK include cryotherapy, curettage, laser surgery and shave biopsy.

Cutaneous horns more commonly occur on sun-exposed skin (i.e. pinna, face, forearms). They are hard, keratinised lesions which are typically longer than they are wide.

Actinic keratosis typically occurs on the scalp of fair-skinned, elderly individuals. They are initially small, rough-textured lesions that later enlarge and become red and more scaly in appearance.

Acrochordons are skin-coloured lesions that typically occur in the skin folds of overweight individuals.

Stucco keratosis are a subtype of seborrhoeic keratosis that are white in appearance, more commonly affect males and tend to appear on the lower extremities.

Further reading:

https://www.dermnetnz.org/topics/seborrhoeic-keratosis/

Question:

A 32-year-old woman with a history of acne vulgaris is reviewed by her General Practitioner. She has a long history of acne and has been using topical benzoyl peroxide for several years having had intolerable side effects from topical retinoids. Unfortunately, she has found recently that her acne control has been worsening and has required multiple courses of topical antibiotics.

She has no other medical problems and takes no other medications, and has no other known drug allergies. She is not pregnant or breastfeeding and uses contraception with her long-term partner.

What is the most appropriate next step in management for this patient?

A. Continue topical benzoyl peroxide and add in oral lymecycline

B. Stop topical benzoyl peroxide and start oral lymecycline

C. Stop topical benzoyl peroxide and start topical azelaic acid 20%

D. Stop topical benzoyl peroxide and start oral erythromycin

E. Continue topical benzoyl peroxide and add in oral erythromycin

Correct Answer:Continue topical benzoyl peroxide and add in oral lymecycline

Explanation:

This patient has trialled topical medications only with limited success and has worsening acne. An oral treatment such as oral lymecycline is an appropriate next step in management and should be continued alongside topical benzoyl peroxide to prevent antibiotic resistance.

Continuing benzoyl peroxide and adding oral erythromycin would be associated with a higher incidence of antibiotic resistance and so should be avoided unless there are contraindications to tetracyclines, such as pregnancy or breastfeeding.

Stopping the benzoyl peroxide and starting azelaic acid is not likely to be helpful - alternatives such as topical retinoids have been trialled and treatment should be escalated. Similarly, stopping the benzoyl peroxide and starting antibiotics is inappropriate due to the increased risk of antibiotic resistance.

Further reading:

https://cks.nice.org.uk/acne-vulgaris#!scenarioRecommendation

Question:

A 40-year-old female attends her GP with darkened patches of skin in her armpits and groin. She reports that the patches have developed over the previous couple of months. The patient has no significant family history. The patient has poorly controlled type 2 diabetes mellitus and has a BMI of 35. On examination, hyperpigmented patches are present on both axillae and groin creases. The patches are brown and thickened with a velvety texture.

What is the most appropriate management plan?

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A. Weight loss and optimisation of diabetic control

B. Do nothing as the darkened patches will likely regress spontaneously

C. Refer to a weight management programme

D. Commence a new anti-diabetic medication to optimise diabetic control

E. Excise the darkened patches of skin

Correct Answer:Weight loss and optimisation of diabetic control

Explanation:

The patient is most likely to have developed Acanthosis Nigricans. Acanthosis Nigricans is a skin disorder that is associated with patches of hyperpigmentation and hyperkeratosis most commonly located in skin creases (i.e. axillae, groin and back of the neck). Common risk factors include obesity and hyperinsulinaemia induced by diabetes, polycystic ovarian syndrome and Cushing’s syndrome. Therefore, the most appropriate management is to encourage weight loss and gain better control of her diabetes.

Whilst referral to a weight management programme and the consequent weight loss aids the resolution of acanthosis nigricans, the patients’ poor diabetic control needs to be improved in order to address all risk factors for the disease.

Similarly, whilst the patients’ poor diabetic control needs to be improved, which medication may support, weight loss must be instigated in order to address all risk factors for the disease.

Leaving the patches of acanthosis nigricans to regress spontaneously is not in the best interest of the patient as it is a cutaneous indicator of poor internal health.

Excision of darkened skin in acanthosis nigricans is not first-line therapy and not the most appropriate management option available.

Further reading:

https://www.dermnetnz.org/topics/acanthosis-nigricans/

Question:

A 29-year-old female presents to her general practitioner with complaints of dysuria, urinary urgency and haematuria for the last three days. She has no other medical problems and takes no medications on a regular basis. She is not sexually active.

Physical examination reveals mild suprapubic tenderness. Urine dipstick is positive for blood and white blood cells.

The patient is prescribed trimethoprim.

Which of the following laboratory abnormalities is most likely to be seen in patients taking this medication?

A. Hypernatraemia

B. Hyperkalaemia

C. Hypokalaemia

D. Hyperprolactinaemia

E. Hypomagnesaemia

Correct Answer:Hyperkalaemia

Explanation:

Trimethoprim is a commonly used medication for the management of urinary tract infections (UTI) in non-pregnant women. A three-day course is typically prescribed for an uncomplicated UTI. Notable side effects of trimethoprim include hyperkalaemia, nausea/ vomiting and skin rashes. Other medications that cause hyperkalaemia include potassium-sparing diuretics (e.g. spironolactone, eplerenone, triamterene and amiloride), angiotensin-converting enzyme inhibitors, angiotensin II receptor blockers and heparin derivatives.

Medications with anti-dopaminergic properties such as antipsychotics, bowel motility agents (metoclopramide) and histamine-2 receptor blockers can cause hyperprolactinaemia. Hyperprolactinaemia is unlikely to be caused by trimethoprim.

Hypokalaemia is a common electrolyte abnormality seen in patients using salbutamol, insulin or polystyrene sulfonate.

Low magnesium levels are associated with chronic proton pump inhibitor use and loop diuretic use. Hypomagnesaemia is unlikely to be seen in patients taking trimethoprim.

Loop diuretics (e.g. furosemide) can cause hypovolaemiac hypernatraemia.

Further reading:

https://bnf.nice.org.uk/drug/trimethoprim.html

Question:

A 57-year-old woman presents with a 5-month history of nervousness and tremors. During this time, she has had intermittent episodes of palpitations, sweating, and heat intolerance, and has also lost 15 kg. On examination, she has a fine resting tremor and a large goitre with an irregular texture.

What is the most likely nuclear scintigraphy finding?

A. Trace uptake

B. Reduced uptake

C. Diffuse uptake

D. Patchy uptake

E. Solitary focal area of uptake

Correct Answer:Patchy uptake

Explanation:

Patchy uptake is correct. This patient has signs and symptoms consistent with hyperthyroidism, characterised by her heat intolerance, sweating, anxiety, palpitations, weight loss, and a resting tremor. She also has a goitre which requires further investigation to identify what the underlying cause is. A rough and irregular goitre suggests a toxic multinodular goitre. Nuclear scintigraphy involves the use of small amounts of radioactive material to provide information about the structure and function of the thyroid gland. The uptake of this radioactive material is patchy in toxic multinodular goitre as there are a lot of 'hot spots' of thyroid nodules.

Reduced uptake is incorrect. This is seen in thyroiditis leading to the inflammation and destruction of thyroid tissue such as autoimmune (Hashimoto's thyroiditis). Abnormally low areas of uptake can also suggest thyroid cancer.

Diffuse and trace uptake are incorrect. This is seen in Graves' disease, as the entirety of the thyroid gland is smoothly enlarged. The examination would also demonstrate a smoothly enlarged goitre.

Solitary focal area of uptake is incorrect. This is seen in a single toxic thyroid nodule.

Further reading:

https://patient.info/doctor/thyroid-function-tests-pro

Question:

A 43-year-old Caucasian patient presents to the GP after noticing increasing ankle swelling that has been worsening over the past few days. He had assumed that it was due to the hot weather and sitting down for prolonged periods at his office job, but the swelling appears to be worsening. He denies shortness of breath, fatigue, chest pain or orthopnoea, and has been previously well, with his only past medical history being amblyopia that was treated as a child. He takes no regular medication.

Examination reveals pitting oedema up to the mid-calf bilaterally. Cardiac and respiratory examinations are both normal, and the patient's pulse, respiratory rate and blood pressure are all within normal limits. The GP asks the patient to provide a urine sample and performs dipstick testing, this shows +++ protein, with no blood, leucocytes or nitrites.

The GP orders a set of routine blood tests and refers the patient to hospital, informing him that he may require several medications and some dietary changes to help to control his symptoms.

Which of the following is most likely to form part of the management plan in this patient?

A. Midodrine

B. Amlodipine

C. Fludrocortisone

D. Atorvastatin

E. Propranolol

Correct Answer:Atorvastatin

Explanation:

This patient has presented with significant pitting oedema, for which there are a number of causes. Heart, renal and liver failure can all result in physiological imbalances that can allow for the accumulation of fluid within areas of the body; given the patient's lack of past medical history, these are unlikely in this case. The proteinuria on dipstick without blood or hypertension is indicative of a likely diagnosis of nephrotic syndrome. This is a term that encompasses a number of conditions affecting the glomerulus, that can leading to proteinuria, hypoalbuminaemia and oedema; the classical triad seen in nephrotic syndrome.

Given the patient's age and race, the most likely diagnosis is of membranous glomerulonephritis; this is the most common cause of nephrotic syndrome in those of European descent. However, the initial management of nephrotic syndrome is very similar, regardless of the underlying pathology. Patients are encouraged to adopt a low-salt, low-protein diet, to attempt to reduce fluid reabsorption and manage oedema, with loop diuretics such as furosemide often given as an adjunct for this purpose. ACE inhibitors may be used to reduce the degree of proteinuria, especially if hypertension is present. Statins are often prescribed to patients with nephrotic syndrome; the loss of albumin can cause reactive hyperactivity within the liver to attempt to compensate. This process can lead to hyperlipidemia; statins will address this.

Immunosuppressive therapy in nephrotic syndrome in adults has variable success; steroids are very effective in treating minimal change disease in children but are often of limited benefit in the causes of nephrotic syndrome commonly affecting adults.

Amlodipine is a calcium channel blocker that can be used to manage hypertension. Patients with nephrotic syndrome can develop hypertension in some cases, but ACE inhibitors will be the treatment option of choice, given their ability to reduce the level of proteinuria.

Propranolol is a non-cardioselective beta-blocker that can be used for a number of indications, including tremor, migraine prophylaxis and to manage symptoms of thyrotoxicosis. It is not used in the management of nephrotic syndrome.

Midodrine and fludrocortisone can both be prescribed in the setting of postural hypotension; they can help to increase fluid reabsorption to manage the condition. Given that this patient has signs of fluid overload, they would be a poor choice in this scenario.

Further reading:

https://patient.info/doctor/nephrotic-syndrome-pro

Question:

An 11-year-old girl is brought to the GP by her mother with a painful right eye. Her mother describes that the eye became red about three days ago. This morning there was a sticky yellow discharge that stuck her eyelids together when she woke up. The girl says her eye feels gritty and irritated but not itchy. She has no other associated symptoms.

She has no significant medical history.

On examination, the eye is red, but pupils are equal and responsive to light. A thick, yellow discharge is noted in the corner of the eye. There are no tender pre-auricular lymph nodes, and visual acuity is normal.

What is the most likely diagnosis?

A. Allergic conjunctivitis

B. Viral conjunctivitis

C. Episcleritis

D. Keratitis

E. Bacterial conjunctivitis

Correct Answer:Bacterial conjunctivitis

Explanation:

The most likely diagnosis is bacterial conjunctivitis - inflammation of the conjunctiva due to infection. According to NICE guidance, bacterial conjunctivitis should be suspected when there is mucopurulent discharge, pain and mild or absent pruritus. The clinical features of all conjunctivitis subtypes include acute onset conjunctival erythema, pain described as 'grittiness' or 'burning' and variable consistency discharge.

While sometimes difficult to distinguish clinically, viral conjunctivitis typically presents with moderate pruritus, watery discharge, and a recent history of upper respiratory tract infection. The absence of itch and the presence of mucopurulent discharge, in this case, make a bacterial aetiology more likely.

Allergic conjunctivitis generally presents with severe pruritus, watery discharge, eyelid oedema, and other atopic conditions such as rhinitis.

An important cause of red-eye to exclude is keratitis. Keratitis typically presents with progressive pain, decreased visual acuity, purulent discharge, and corneal infiltrates ± ulcer. As there is no history of corneal trauma or contact lens wear and the pain is not severe or progressive, in this case, it makes keratitis a less likely diagnosis.

Episcleritis typically presents with segmental injection and is not associated with discharge or eyelid matting.

Further reading:

https://cks.nice.org.uk/topics/conjunctivitis-infective/

Question:

A 65-year-old man presents to the emergency department with palpitations and dyspnoea. He was previously fit and well, and does not take any regular medications.

Examination reveals oxygen saturations of 95% on air, respiratory rate of 26/min, heart rate of 132 bpm, blood pressure of 68/34 mmHg and temperature of 36.4°C.

A 12-lead-ECG is recorded:

Source: Ewingdo. Licence: [CC BY-SA 4.0] via Wikimedia Commons.

Given the likely diagnosis, what is the most appropriate initial management option?

A. Synchronised DC cardioversion

B. Oral bisoprolol

C. Defibrillation

D. Oral digoxin

E. IV metoprolol

Correct Answer:Synchronised DC cardioversion

Explanation:

The ECG shows atrial fibrillation (AF) with a rapid ventricular response (sometimes referred to as 'fast AF'). Given that the patient is in shock, the advanced life support (ALS) tachycardia guidelines recommend that patients undergo synchronised DC cardioversion, due to the presence of adverse features. These adverse features include shock, syncope, myocardial ischaemia and acute heart failure.

Defibrillation would be the most appropriate initial management option for patients with ventricular fibrillation or pulseless ventricular tachycardia as part of the shockable cardiac arrest algorithm.

IV metoprolol and oral bisoprolol are cardioselective beta-adrenoceptor blockers that can be used in the management of fast AF without adverse features. They are selective beta1-receptor antagonists and therefore have both negative chronotropic and inotropic effects.

Oral digoxin is a cardiac glycoside that exerts its action through the inhibition of sodium-potassium ATPase activity in the myocardium. It may be used for rate control of fast AF in patients with associated chronic heart failure, without the presence of adverse features.

Further reading:

https://www.resus.org.uk/library/2021-resuscitation-guidelines/adult-advanced-life-support-guidelines

Question:

A 72-year-old male presents to the emergency department with a severe headache that started suddenly 3 hours ago. The patient states that it feels like he was ‘hit in the back of the head’. The pain is localised to the occipital area with no radiation. He has vomited twice since being in the emergency department. He denies any weakness, double vision, photophobia or neck stiffness. He has no previous history of headaches but does have a past medical history of poorly controlled hypertension.

Physical examination is normal.

What is the most appropriate next step in management?

A. Lumbar puncture (LP)

B. Cerebral angiogram

C. Non-contrast computed tomography (CT) scan of the brain

D. Thrombolytic therapy

E. Sumatriptan

Correct Answer:Non-contrast computed tomography (CT) scan of the brain

Explanation:

This elderly male with a past medical history of poorly controlled hypertension has presented with an acute onset, severe headache in the occipital region and has also had two episodes of vomiting. This clinical presentation is highly concerning for a subarachnoid haemorrhage (SAH). SAH is a life-threatening condition that is most commonly caused by ruptured ‘berry’ aneurysms, arteriovenous malformations or trauma. A non-contrast CT scan of the brain is urgently required for these patients as the initial diagnostic step.

A cerebral angiogram is an invasive technique carried out by the interventional radiology team to visualise cerebral aneurysms and should be conducted once the diagnosis of SAH has been confirmed with a lumbar puncture or non-contrast head CT scan. It would not be appropriate as the next best step in management in the above case.

Lumbar puncture would be indicated if the initial non-contrast CT scan of the brain was negative and the clinical suspicion for SAH remained high. The initial CT scan can be normal in about 5-10% of patients with SAH, therefore a follow-up LP is required for these cases (usually more than 12 hours after symptom onset). Presence of blood or xanthochromia in the CSF confirms SAH. Xanthochromia indicates red blood cell lysis and that the blood has been present in the CSF for several hours and is not present due to a traumatic tap.

Thrombolytic therapy would be contraindicated in this patient as it is likely to worsen any potential haemorrhage. Thrombolytic therapy is indicated in certain patients who have an ischemic stroke and should not be prescribed to those suffering from SAH.

Sumatriptan is used in the acute management of cluster headaches and migraines. They should be avoided in patients with poorly controlled hypertension. Additionally, this patient’s clinical presentation is more consistent with SAH.

Further reading:

https://patient.info/doctor/subarachnoid-haemorrhage-pro

Question:

Thomas Benedict, a 45-year-old gentleman, comes to see his GP. He has been complaining of a runny nose and strange deformity of his nose that has come on over several months. Other symptoms include several episodes of haemoptysis and some abdominal pain that radiates to his back. On examination, he appears otherwise fit and well and has a ‘saddle’ nose. You suspect a diagnosis of granulomatosis with polyangiitis (Wegener’s granulomatosis).

Given this, which antibody is most specific for this condition?

A. Anti-double stranded DNA antibody

B. Anti-centromere antibody

C. P-ANCA

D. C-ANCA

E. Anti-SCL-70 antibody

Correct Answer:C-ANCA

Explanation:

Wegener’s granulomatosis is a vasculitis that affects both small and medium-sized vessels and therefore the presenting symptoms can vary hugely depending on the organ affected. In this example, the patient has complained of nose bleeds and a saddle nose. This is secondary to nasal septum perforation. C-ANCA is specific for Wegener’s granulomatosis as it is present in over 80% of patients. Wegener’s granulomatosis can also be associated with P-ANCA in rare cases.

P-ANCA is most strongly associated with microscopic polyangiitis and ulcerative colitis.

Anti-DS DNA most strongly associated with systemic lupus erythematosus (SLE).

Anti-SCL-70 is most strongly associated with diffuse systemic sclerosis.

Anti-centromere antibody most strongly associated with limited systemic sclerosis.

Further reading:

https://patient.info/doctor/granulomatosis-with-polyangiitis-wegeners-granulomatosis-pro

Question:

The emergency alarm is sounded on the neurosurgical ward you are working on. On arrival, the patient, who was recently admitted following a head injury, appears to be having a tonic-clonic seizure. The nurses report this started around 10 minutes ago.

Following an initial airway, breathing, circulation assessment which is the most appropriate management step?

A. Administration of a propofol infusion

B. Administration of IV Lorazepam 4mg

C. Administration of 1mg adrenaline IV

D. Administration of 1g phenytoin IV

E. Administration of Levetiracetam 500mg IV

Correct Answer:Administration of IV Lorazepam 4mg

Explanation:

Status epilepticus is classified as a seizure lasting over 5 minutes or persistent seizure activity despite first/second line antiepileptic medications.

Management is as follows:

ABCDE assessment and administration of high flow oxygen (15L via non-rebreather mask)

1st line - Benzodiazepine (i.e Lorazepam 1- 4mg)

2nd line - Phenytoin 15mg/kg (1g in 70Kg patient)

3rd line - Levetiracetam may be used but it has a low rate of seizure termination. Ideally ICU involvement for intubation and ventilation, and continuous infusion of propofol, midazolam or phenobarbital.

Adrenaline is not used in the management of status epileptics.

Further reading:

https://patient.info/doctor/status-epilepticus-management

Question:

A prison inmate presents to the prison doctor requesting blood-borne virus screening. He is asymptomatic but worried about Hepatitis B as a previous acquaintance has been recently diagnosed with the condition. The patient has no past medical history but before incarceration was an intravenous drug user.

Which hepatitis B serology test is positive in both patients who have been vaccinated and in those who have been exposed to hepatitis B?

A. Anti-HBe (hepatitis B envelope antibody)

B. Anti-HBs (hepatitis B surface antibody)

C. HBsAg (hepatitis B surface antigen)

D. HBeAg (hepatitis B envelope antigen)

E. Anti-HBc (hepatitis B core antibody)

Correct Answer:Anti-HBs (hepatitis B surface antibody)

Explanation:

Anti-HBs (hepatitis B surface antibody) indicates immunity. It can be present if the patient has been previously exposed to the virus or if they have been vaccinated against the virus.

Anti-HBc (hepatitis B core antibody) indicates past or current infection.

HBeAg (hepatitis B envelope antigen) indicates ongoing active infection.

Anti-HBe (hepatitis B envelope antibody):

An anti-HBe test that is reactive (positive) while HBeAg levels have dropped below the detection threshold indicates the onset of recovery in an individual with hepatitis B.

An anti-HBe test that is non-reactive (negative) may mean the infection is very recent and viral replication has not yet peaked.

HBsAg (hepatitis B surface antigen) indicates current hepatitis B infection.

Further reading:

https://patient.info/doctor/hepatitis-b-pro

Question:

A 30-year-old comes to the GP surgery to discuss contraception following the birth of her first child 2.5 weeks ago. She is breastfeeding for 50% of feeds and is currently amenorrhoeic. She has a history of migraine without aura and is on no other medications. On assessment today she has a blood pressure of 120/90 mmHg and a BMI of 29.

The patient states that they would like to go with the option that would provide them with effective contraceptive cover in the shortest amount of time.

Which of the following options would be most appropriate?

A. Lactational amenorrhoea

B. Combined oral contraceptive pill

C. Mirena coil

D. Copper coil

E. Progesterone only pill

Correct Answer:Progesterone only pill

Explanation:

The most appropriate contraceptive option that would provide this patient with effective contraception in the shortest amount of time would be the progesterone-only pill (POP). Contraception is not required for the first 21 days post-partum, however, the POP can be commenced at any point during the post-partum period. If the POP is commenced before day 21, the patient would be covered with effective contraception once the first 21 days have passed. If the POP is commenced after day 21, additional contraceptive methods (i.e. barrier) should be used for the first two days of taking the POP.

Both the Mirena and Copper coil can be fitted within 48 hours of giving birth or at 4-weeks post-partum. This patient would need to wait another 1.5 weeks before they could use one of these options, making them less appropriate given her request.

The combined oral contraceptive pill is contraindicated in women who are less than 6 weeks postpartum and breastfeeding, making it an inappropriate choice in this scenario.

Lactational amenorrhoea is 98% effective if the patient is exclusively breastfeeding, amenorrhoeic and less than 6 months postpartum. Given this patient is only breastfeeding 50% of the time, this method is likely to be ineffective.

Further reading:

https://www.fpa.org.uk/sites/default/files/contraception-after-having-baby-your-guide.pdf

Question:

A 38-year-old male with a history of type 1 diabetes mellitus presents to his general practitioner (GP) with early satiety. He reports abdominal discomfort shortly after eating and occasional vomiting. This has been present for several months. On further questioning, he also reports that he has had several episodes of hypoglycaemia without experiencing his usual symptoms.

What complication of diabetes is this patient most likely to be suffering from?

A. Chronic kidney disease

B. Autonomic neuropathy

C. Peripheral neuropathy

D. Diabetic ketoacidosis

E. Retinopathy

Correct Answer:Autonomic neuropathy

Explanation:

This patient is likely to have gastroparesis, a recognised complication of diabetes mellitus. In addition, he has lost awareness of hypoglycaemic episodes. These two features are strongly suggestive of autonomic neuropathy, a complication of diabetes characterised by dysfunction of the autonomic nervous system. There is no specific treatment for autonomic neuropathy; management focuses on symptoms experienced by the individual patient.

Peripheral neuropathy is also associated with diabetes mellitus. Common presenting features include tingling or pins in needles in the extremities, trouble with balance and loss of pain or sensation awareness, particularly in the feet. This patient does not have any of these symptoms at present, but the presence of autonomic neuropathy suggests that he is at risk of peripheral neuropathy too.

Chronic kidney disease and diabetic retinopathy are two other microvascular complications of diabetes. They may both be asymptomatic in the early stages, and it is therefore recommended that patients undergo annual screening for each. Diabetic ketoacidosis is an acute, life-threatening complication characterised by hyperglycaemia, ketosis and acidosis. It may be precipitated by an intercurrent illness such as infection, or missing insulin doses, and is a medical emergency. The patient above has a chronic problem and no suggestion of diabetic ketoacidosis.

Further reading:

https://patient.info/doctor/diabetic-neuropathy-pro

Question:

A 76-year-old gentleman is seen by his GP after having two episodes of visual loss in the last 48 hours. On both occasions, he describes the left-hand side of the vision in his left eye ‘turning black’ for 5-10 minutes. He doesn’t think his right eye was affected.

His regular medications include amlodipine 5mg and atorvastatin 40mg, for hypertension and hypercholesterolaemia. He has also been taking paracetamol 1g QDS and codeine 30mg QDS for the last two weeks for severe intermittent headaches affecting the left side of his head.

What is the most appropriate initial management step?

A. Arrange admission to hospital for urgent CT head

B. 60mg oral prednisolone STAT

C. Routine referral to ophthalmology for review

D. Aspirin 300mg stat dose

E. Optimise analgesia for headache

Correct Answer:60mg oral prednisolone STAT

Explanation:

There should be a high clinical suspicion here of giant cell arteritis, suggested by the history of unilateral headache and subsequent transient visual loss known as amaurosis fugax. NICE recommend a one-off dose of 60mg oral prednisolone and urgent referral to ophthalmology to be seen the same day.

Aspirin 75mg once daily is recommended providing there are no contraindications, whereas a 300mg stat dose of aspirin is used for stroke once haemorrhage is ruled out by CT head.

Appropriate analgesia for his headache is sensible but treating the underlying cause and preventing the complications is more urgently important.

An urgent CT head would be indicated in cases of suspected stroke, however, giant cell arteritis is the more likely diagnosis here. Additionally, a CT would not be available in general practice, whereas prednisolone is readily available.

Further reading:

https://patient.info/doctor/giant-cell-arteritis-pro

Question:

A 45-year-old male builder presents to his GP with an abdominal mass. He says that he has been aware of this for the last 2 years. He reports that he is able to apply pressure to the mass and "put it back inside". He denies any pain, nausea, vomiting or constipation. He has a past medical history of type 2 diabetes and a BMI of 34.

On examination, a mass becomes visible in the umbilical region when the patient coughs. On palpation, the mass is soft, non-tender and easily reducible. The mass does not transilluminate and is not pulsatile. Bowel sounds are normal and no other abnormalities are noted.

What is the most likely diagnosis?

A. Reactive lymph node

B. Rectus diastasis

C. Omental metastasis

D. Umbilical hernia

E. Lipoma

Correct Answer:Umbilical hernia

Explanation:

The most likely diagnosis is an umbilical hernia. Patients typically present with a mass in the umbilical region that enlarges with coughing or straining. Patients may also experience an aching or dragging sensation, particularly with larger hernias. Umbilical hernias are associated with obesity and multiple pregnancies. The hernia typically contains omentum and sometimes loops of bowel. Umbilical hernias are usually reducible, however, they can become irreducible due to strangulation, requiring immediate surgical intervention. Strangulated hernias typically present as painful, irreducible abdominal masses with associated nausea, vomiting and constipation. Reducible hernias are typically repaired as an elective surgical procedure.

A lipoma is unlikely in this case. Lipomas are benign tumours made up of fat tissue. On palpation, they are typically soft to the touch, mobile and painless. They are typically located just under the skin, but can sometimes be deeper. In this scenario, the location of the mass and the description of it being reducible make a diagnosis of umbilical hernia much more likely.

A reactive lymph node would typically be located in the groin, armpit or neck and rubbery in texture, with a small degree of mobility. Reactive lymph nodes are also not reducible. As a result, the diagnosis of a reactive lymph node does not fit the clinical scenario.

Omental metastases are generally not palpable unless there is very severe omental caking. A patient with this degree of malignancy would also have other systemic features present, such as weight loss and fatigue (which is not the case in this scenario).

A rectus diastasis involves a gap developing between the rectus abdominis muscles. This results in a bulge developing between the rectus abdominal muscles, typically during straining or coughing (due to increasing intraabdominal pressure). The condition most commonly affects women during and after pregnancy, however, obese adults can also be affected.

Further reading:

https://patient.info/doctor/abdominal-wall-hernias

Question:

An 80-year-old female presents with a painless deterioration of her vision. She describes a slowly progressive, reduced visual acuity which she mainly notices when relying on her near vision. On further questioning, you discover that the patient also has reduced contrast sensitivity and difficulty in adapting to the dark. On fundoscopic examination, you notice drusen in the macular area. You refer the patient to Ophthalmology and a diagnosis of dry age-related macular degeneration is confirmed.

Which of the following is the gold-standard management for dry age-related macular degeneration?

A. Photodynamic therapy

B. Lifestyle adjustment and visual rehabilitation

C. Intra-vitreal injections of anti-vascular endothelial growth factor agents

D. Macular translocation

E. Laser photocoagulation

Correct Answer:Lifestyle adjustment and visual rehabilitation

Explanation:

Dry age-related macular degeneration (AMD) refers to progressive atrophy of the macula resulting in visual decline. In the wet form of AMD there is neovascularisation, oedema and scarring of the macula which results in a faster progression of visual loss. The most appropriate management for dry AMD, in this case, is lifestyle adjustment and visual rehabilitation. Lifestyle advice for dry age-related macular degeneration (AMD) mainly comprises of smoking cessation, multivitamin supplementation (as per the AREDS2 trial), and visual rehabilitation aimed towards optimising any remaining visual function. No curative treatment exists for dry, as opposed to wet AMD.

Intra-vitreal injections of anti-vascular endothelial growth factor agents are the gold-standard management of wet AMD to prevent or slow the progression of neovascularisation.

Laser photocoagulation may be used in the management of wet AMD but is not appropriate for use in dry AMD.

Macular translocation may be used in the management of wet AMD but is not appropriate for use in dry AMD.

Photodynamic therapy may be used in the management of wet AMD but is not appropriate for use in dry AMD.

Further reading:

https://patient.info/doctor/age-related-macular-degeneration-pro

Question:

Which of the following is a notifiable disease?

A. Ophthalmia neonatorum

B. Croup

C. Dysentery

D. Leptospirosis

E. Mumps

Correct Answer:Mumps

Explanation:

Mumps is a notifiable disease, and the proper officer at the local council or local health protection team should be notified within 3 days of identifying a suspected case.

Dysentery, ophthalmia neonatorum, and leptospirosis were removed from the notifiable disease list in 2010.

Croup is not a notifiable disease.

Further reading:

https://www.gov.uk/guidance/notifiable-diseases-and-causative-organisms-how-to-report

Question:

A 65-year-old man presents to the emergency department with a 2-hour history of sudden-onset severe chest pain which he describes as a heavy weight on the centre of his chest. The pain radiates to his left jaw, and he complains of nausea but has not vomited.

On examination, he appears pale and diaphoretic. Both heart sounds are present with no added sounds.

An ECG shows ST elevation in leads I, aVL, V5 and V6, and ST depression in leads III and aVF.

His troponin level is 0.26 µg/L (normal range <0.01 µg/L)

Given the likely diagnosis, what is the most likely underlying mechanism for this man’s symptoms?

A. Full-thickness infarction of the lateral heart wall

B. Full-thickness infarction of the inferolateral heart wall

C. Ischaemia without infarction of the myocardial wall

D. Partial-thickness infarction of the anterolateral heart wall

E. Partial-thickness infarction of the inferior heart wall

Correct Answer:Full-thickness infarction of the lateral heart wall

Explanation:

This man is presenting with central crushing chest pain radiating to the left jaw, which is classic for the presentation of acute coronary syndrome. The raised troponin level shows that this is a myocardial infarction. The ECG shows ST elevation in the lateral leads (I, aVL, V5 and V6) and reciprocal ST depression in the inferior leads (III and aVF), therefore, this man is having an ST elevation myocardial infarction (STEMI). STEMIs are caused by full-thickness infarction of the myocardial wall, therefore, the most likely underlying mechanism for this man’s symptoms is full-thickness infarction of the lateral heart wall.

Full-thickness infarction of the inferolateral heart wall is incorrect, as the changes in the inferior leads represent reciprocal change rather than infarction of the inferior myocardium.

Partial-thickness infarction of the anterolateral heart wall and partial thickness of the inferior heart wall are incorrect, as partial-thickness infarcts result in NSTEMIs rather than STEMIs.

Ischaemia without infarction of the myocardial wall is incorrect – this is the mechanism behind unstable angina, in which a normal troponin level would be expected.

Further reading:

https://geekymedics.com/acute-coronary-syndrome/

Question:

A 51-year-old gentleman is admitted to the neurology ward after presenting with bilateral leg paraesthesia and weakness 2 weeks after a bout of gastroenteritis. He is diagnosed clinically with Guillain-Barre syndrome.

Which of the following investigations is most useful in monitoring for a life-threatening complication of this disease?

A. Nerve conduction studies

B. Lumbar puncture

C. Spirometry (SVC) / Peak expiratory flow rate (PEFR)

D. MRI head

E. Serum inflammatory markers

Correct Answer:Spirometry (SVC) / Peak expiratory flow rate (PEFR)

Explanation:

Guillain-Barre syndrome is a disorder of suspected autoimmune aetiology which often, but not always, follows infections such as gastroenteritis (especially Campylobacter jejuni infections). It is a monophasic illness commonly featuring ‘ascending’ neuropathy (often paraesthesia) and weakness with lower motor neuron lesion features. Importantly, this weakness may involve both arms and legs as well as the muscles of respiration. In such cases, respiratory failure can occur quickly and with serious consequences. As such, measurement of respiratory function is vital and spirometry (specifically FVC) or peak expiratory flow rate (PEFR) would, therefore, be most useful in monitoring for this complication. Spirometry provides more information but is technically more difficult and often harder to access in acute settings. PEFR is far less challenging for the patient, reproducible and can be kept at the bedside so may be preferred.

A lumbar puncture may be useful in diagnosis as it may show a raised protein and nerve conduction studies show a multi-site demyelinating neuropathy.

MRI head is not inherently useful unless there is suspicion of a central disorder and serum inflammatory markers will not highlight the presence of respiratory compromise.

Further reading:

https://patient.info/doctor/guillain-barre-syndrome-pro

Question:

A 75-year-old man has had increasing fatigue and pain in his long bones over the last year. During this time, he has had associated tingling around his mouth and paraesthesia in his fingers and toes.

He has a past medical history of alcohol misuse and is housebound. He has no significant family history.

On examination, there is generalised tenderness of the long bones and proximal muscle weakness. He has difficulty with walking and has a waddling gait.

Blood tests are requested:

Test Result Reference range

Calcium 1.9 mmol/L (2.1 - 2.6)

Phosphate 0.6 mmol/L (0.8 - 1.4)

Urea 5.9 mmol/L (2.0 - 7.0)

Creatinine 78 μmol/L (55 - 120)

25-hydroxycholecalciferol 83 nmol/L (> 500)

eGFR 78 ml/min (>90)

What is the most likely diagnosis?

A. Primary hyperparathyroidism

B. Tertiary hyperparathyroidism

C. Osteoporosis

D. Secondary hyperparathyroidism due to osteomalacia

E. Secondary hyperparathyroidism due to chronic kidney disease

Correct Answer:Secondary hyperparathyroidism due to osteomalacia

Explanation:

Secondary hyperparathyroidism due to osteomalacia is correct. Prolonged muscular bone pain in a patient with reduced sunlight exposure should raise suspicion of osteomalacia, which is characterised by the softening of bones due to vitamin D deficiency. The blood tests demonstrating low calcium and low vitamin D confirm this. Vitamin D is necessary for the intestinal absorption of calcium. One of the complications of vitamin D deficiency is the development of secondary hyperparathyroidism. Increased levels of parathyroid hormone (PTH) are secreted, which has two main effects: it increases bone resorption and hence, calcium, and reduces phosphate reabsorption from the renal proximal tubules, leading to increased excretion and hence, lower phosphate levels.

Secondary hyperparathyroidism can occur as a result of chronic kidney disease (CKD), however, the blood tests would reveal increased phosphate levels. Patients with CKD excrete less phosphate due to kidney dysfunction. The kidneys are responsible for converting vitamin D into its active form, therefore, patients with CKD may be vitamin D deficient and subsequently may be at risk of hypocalcaemia. As well as this, the increased phosphate leads to calcium deposition as calcium phosphate salts, further reducing calcium levels. A compensatory secondary hyperparathyroidism develops in response to the hypocalcaemia. This patient's blood tests show a low phosphate level and normal renal function, with an eGFR not in keeping with CKD (>60 ml/min).

Blood tests in primary hyperparathyroidism would show increased calcium and decreased phosphate levels, leading to signs and symptoms of hypercalcaemia which can be remembered as "bones (bone pain), stones (renal stones), abdominal groans (nausea and constipation), and psychiatric moans (depression/confusion)" which do not apply to this patient.

Tertiary hyperparathyroidism can occur after prolonged secondary hyperparathyroidism, as the parathyroid glands hypertrophy to secrete more PTH. Blood tests would show normal or raised calcium, decreased or normal phosphate, and normal vitamin D.

Bone disorders leading to osteoporosis may have derangements in blood tests such as calcium, phosphate, and ALP, but osteoporosis itself, in the absence of an underlying pathological condition, does not present with an abnormal bone profile and is asymptomatic until a fragility fracture occurs.

Further reading:

https://patient.info/doctor/hyperparathyroidism-pro

Question:

A 22-year-old man presents to the emergency department with shortness of breath, which started suddenly 2 hours ago. He has a background of asthma and hay fever. His observations are as follows:

SpO2 93% on room air

Heart rate 115 bpm

Respiratory rate 24 breaths/min

Temperature 37.1°C

Blood pressure 87/54 mmHg

On examination, he has a widespread wheeze and is struggling to complete sentences. His peak expiratory flow (PEF) is 35% predicted.

Which feature is suggestive of a life-threatening asthma exacerbation?

A. Peak expiratory flow

B. Respiratory rate

C. Blood pressure

D. Heart rate

E. SpO2

Correct Answer:Blood pressure

Explanation:

The BTS/SIGN Guideline for the Management of Asthma 2019 classifies assessment findings into moderate, acute severe and life-threatening. Hypotension in the context of an asthma exacerbation is classified as a life-threatening feature, therefore blood pressure 87/54 mmHg is the correct answer. This would prompt urgent discussion with the critical care team and escalation of the patient's care.

The BTS/SIGN Guideline classifies a respiratory rate <25 breaths/min as a feature of a moderate exacerbation, which would be in keeping with this patient's respiratory rate of 24 breaths/min. The BTS/SIGN Guideline classifies a heart rate ≥110 bpm, SpO2 ≥92% and PEF 33-50% best or predicted as features of an acute severe exacerbation. These are in keeping with this patient's heart rate of 115 bpm, SpO2 of 93% on room air and PEF 35% predicted.

Further reading:

https://www.brit-thoracic.org.uk/quality-improvement/guidelines/asthma/

Question:

A 41-year-old female patient is brought to the emergency department after collapsing at home. A family member provides a collateral history explaining that the patient had been complaining of gradually worsening fatigue, nausea and vomiting for the past 2 weeks. They add that the patient appears to have lost weight since her symptoms began.

The patient’s past medical history is significant for hypothyroidism and type two diabetes mellitus.

On examination, the doctor notes the presence of hyperpigmented skin.

A set of vital signs shows a blood pressure reading of 84/58mmHg, but is otherwise normal. A blood glucose level is recorded at 5.5mmol/L, and a set of urea and electrolytes is performed with the following results:

Na+ 131 mmol/L

K+ 6.8 mmol/L

Bicarbonate 23 mmol/L

Urea 6.5 mmol/L

Creatinine 70 µmol/L

What is the most appropriate initial management?

A. IV propranolol and oral carbimazole

B. Oral prednisolone

C. IV fluids with an insulin infusion and potassium chloride

D. IV levothyroxine

E. IV hydrocortisone

Correct Answer:IV hydrocortisone

Explanation:

This patient is presenting with an adrenal crisis, which describes a complication of Addison’s disease. Addison’s disease often develops through an autoimmune process, and a past medical history of other autoimmune diseases is a significant risk factor for developing the condition. During the onset of Addison’s disease, patients may present with vague symptoms such as fatigue, nausea and vomiting as well as hyperpigmented skin and weight loss. If untreated, an adrenal crisis can develop. This is characterised by severe hypotension alongside hyperkalemia and hyponatraemia. IV hydrocortisone should immediately be given where an adrenal crisis is suspected.

A regimen of IV fluids with an insulin infusion and potassium chloride may be appropriate for patients presenting with a hyperosmolar hyperglycaemic state (HHS), which refers to a complication of type two diabetes mellitus. The presence of a normal blood glucose level suggests that this is not the correct diagnosis.

Some stable patients with Addison’s disease may be prescribed oral prednisolone as an ongoing glucocorticoid replacement, although hydrocortisone is used more often. If patients also have a mineralocorticoid deficiency, regular fludrocortisone should be additionally prescribed.

IV levothyroxine is the appropriate management for a patient presenting with severe hypothyroidism, or myxoedema. This is a diagnosis that could be considered in this case, however, the presence of hyperpigmented skin, weight loss and the absence of hypothermia suggest an adrenal crisis is a more likely explanation of the patient’s symptoms.

IV propranolol and oral carbimazole should be given to patients presenting with a thyroid storm. This describes a complication of hyperthyroidism and is associated with severe tachycardia, hyperthermia and an altered mental state.

Further reading:

https://patient.info/doctor/adrenal-insufficiency-and-addisons-disease

Question:

A three-year-old girl presents to the GP with itchy yellow-straw coloured lesions around her mouth. Another child at school had a similar problem a couple of days ago. Clinical examination reveals several superficial straw colour lesions with a yellow crust on her face. There are no skin lesions elsewhere. Vital signs are normal.

What is the most likely causative pathogen?

A. Human herpes simplex virus 6 (HHV6)

B. Coxsackie virus

C. Staphylococcus aureus

D. Measles virus

E. Parvovirus B19

Correct Answer:Staphylococcus aureus

Explanation:

The most likely diagnosis is impetigo. Impetigo is commonly caused by staphylococcus aureus or beta-haemolytic streptococcus.

Impetigo presents as superficial clear blisters that rapidly develop into straw-coloured lesions with yellow crusting, typically on the face. It can be treated with topical antibiotics (e.g. fusidic acid) or oral antibiotics (flucloxacillin).

Measles can also present with rash, in addition to fever and other systemic features. The rash associated with measles is typically first seen on the forehead and neck, then spreading to involve the trunk and finally the limbs, over 3-4 days.

Parvovirus typically presents with the typical 'slapped cheek' rash, which involves erythema on the cheeks, sparing the nose, perioral and periorbital regions

Coxsackievirus infection presents with a mild prodromal illness followed by tender oral ulcerative lesions and then usually maculopapular lesions on the hands and feet.

HHV6 causes roseola infantum which typically presents as a rose-pink macular rash spreading from the trunk to involve the face an extremities.

Further reading:

https://patient.info/doctor/impetigo-pro

Question:

A 14-year-old girl presents to the dermatologist with greasy skin with a mixture of comedones, papules and pustules, which started just after puberty. On physical examination, the lesions are distributed mainly on her face; however, a few are present on the chest and back too. This is her third visit, and she has not responded to oral isotretinoin therapy. Moreover, she has also developed multiple painful cysts and nodules in her chest over the last couple of weeks. Her past medical history is significant for major depressive and body dysmorphic disorder. She has been taking escitalopram and sertraline for the last 6-months.

What is the most appropriate initial investigation in this condition?

A. Pelvic ultrasound

B. Dexamethasone suppression test.

C. Skin lesion culture

D. CT-scan abdomen and pelvis

E. Simple visual inspection

Correct Answer:Skin lesion culture

Explanation:

The most appropriate investigation in such situations is skin lesion culture. The above clinical scenario demonstrates acne vulgaris, and a simple visual inspection is usually enough to make the diagnosis. However, skin lesion culture may be warranted in patients who do not respond to escalating treatment, to exclude Gram-negative folliculitis.

A pelvic ultrasound is usually carried out to exclude polycystic ovarian syndrome (PCOS) and is very good at excluding ovarian and adrenal tumours. However, this is not used as an initial investigation in such cases. Instead, free testosterone would be the typical initial investigation, which is the most sensitive test to establish the presence of hyperandrogenism.

A dexamethasone suppression test is done to exclude Cushing syndrome. Facial acne and hirsutism are attributed to increased adrenal androgen and/or cortisol secretion. Women and prepubertal children with Cushing syndrome typically have fine downy facial lanugo hair and, in addition to acne and hirsutism, may also have temporal scalp hair regression. The stem does not provide any evidence apart from acne to support this answer.

CT-scan abdomen and pelvis can be done to exclude virilising tumours, which can be the cause of severe acne. But this is not used as an initial investigation in such cases.

Further reading:

https://dermnetnz.org/topics/investigations-in-acne

Question:

A 75-year-old female presents with sudden painless loss of vision in her right eye with associated new floaters. She describes a curtain descending over her field of vision and flashes of light prior to the loss of vision, occurring over 30-60 minutes. The patient has a history of myopia and wears glasses to correct this. Otherwise, they have no significant past medical history and take no regular medication.

On examination, pupils are equal and reactive to light and there is a significant visual field defect isolated to the right eye. Vital signs are unremarkable.

What is the most likely diagnosis?

A. Dry age-related macular degeneration

B. Posterior circulation syndrome (POCS)

C. Central retinal artery occlusion

D. Transient ischaemic attack

E. Retinal detachment

Correct Answer:Retinal detachment

Explanation:

The most likely diagnosis is retinal detachment, given the classical history of a myopic patient developing sudden-onset painless progressive visual loss.

Retinal detachment involves the separation of the retina from the underlying retinal pigment epithelium. It is more likely in patients who are myopic because of the longer shape of the eyeball which stretches the retina, increasing the likelihood of a tear. Typical presenting symptoms include new-onset floaters, brief flashes of light and sudden-onset painless progressive loss of vision. Patients often describe a dark curtain starting in the peripheral of the visual field and progressing towards the centre. Clinical examination can reveal a visual field defect in the affected eye. If the macula has also detached, visual acuity will be significantly reduced. Fundoscopy may reveal a floating sheet of a partially detached retina and associated vitreous haemorrhage.

A posterior circulation syndrome (POCS) involves damage to the area of the brain supplied by the posterior circulation (e.g. cerebellum and brainstem).

One of the following need to be present for a diagnosis of POCS:

Cranial nerve palsy and a contralateral motor/sensory deficit

Bilateral motor/sensory deficit

Conjugate eye movement disorder (e.g. horizontal gaze palsy)

Cerebellar dysfunction (e.g. vertigo, nystagmus, ataxia)

Isolated homonymous hemianopia

This patient has a visual field defect restricted to one eye, ruling out this diagnosis.

A transient ischaemic attack (TIA) is a temporary inadequacy of the circulation in part of the brain resulting in temporary neurological symptoms. This diagnosis is highly unlikely given the patient's symptoms are persistent and the symptoms are isolated to one eye (whereas in a TIA any visual field defect would involve both eyes due to the cortical nature of the disease).

Central retinal artery occlusion (CRAO) results in unilateral acute painless loss of vision. The condition typically presents with very sudden unilateral visual loss (over seconds). The visual loss is usually severe and fundoscopy typically reveals a pale retina with attenuated retinal vessels. Clinical examination will often reveal a relative afferent pupillary defect in the affected eye, due to damage to the afferent branch of this reflex arc.

Dry age-related macular degeneration involves the progressive painless loss of central vision. The visual loss occurs over months to years, rather than minutes, making the diagnosis unlikely. Typical findings on clinical assessment include drusen in the area of the macula on fundoscopy and reduced central visual acuity.

Further reading:

https://patient.info/doctor/retinal-detachment-pro

Question:

A 62-year-old man with a history of ischaemic heart disease and type 2 diabetes mellitus has been prescribed sildenafil for erectile dysfunction.

Which class of medications would be contraindicated in this patient?

A. Nitrates

B. Beta-blockers

C. Non-dihydropyridine calcium channel blockers

D. Fluoroquinolones

E. Selective serotonin reuptake inhibitors (SSRI)

Correct Answer:Nitrates

Explanation:

The patient has been prescribed sildenafil, a phosphodiesterase (type 5) inhibitor, to treat his erectile dysfunction. Sildenafil leads to increased penile blood flow and erection quality due to its vasodilatory properties, but it is important to note that sildenafil will not cause an erection without sexual stimulation. It should be taken one hour prior to sexual activity. Sildenafil is also used in the management of primary pulmonary hypertension – a rare form of pulmonary hypertension that mainly affects young women. Given its vasodilatory functions, sildenafil use should be avoided with other vasodilators such as nitrates or nicorandil as combined use can lead to profound hypotension. Other notable side effects of sildenafil include flushing, headache, tachycardia and palpitations.

Fluoroquinolones are not contraindicated with the use of sildenafil. Notable side effects of fluoroquinolones include QT interval prolongation, tendonitis and gastrointestinal problems.

The use of SSRIs is not contraindicated in patients who are also using sildenafil. SSRI use should be avoided with other serotonergic medications such as serotonin/norepinephrine reuptake inhibitors.

Medications to be avoided with beta-blockers include non-dihydropyridine calcium channel blockers (cardio-selective calcium channel blockers) like verapamil and diltiazem as this can lead to bradycardia and heart block.

Non-dihydropyridine calcium channel blockers such as verapamil and diltiazem use should be avoided with other AV-nodal blocking drugs like beta-blockers, digoxin and adenosine as this can lead to cardiac arrest. Nitrate use is not contraindicated with calcium channel blockers.

Further reading:

https://bnf.nice.org.uk/drug/sildenafil.html

Question:

A 25-year-old patient presents to the hospital after feeling unwell for several days. He has recently returned from a 3-month placement in Trinidad and Tobago, where he was helping to construct housing. Over the last week, he has experienced a persistent low-grade fever and has recently developed a rash over his torso. He has also experienced fatigue and complains of aching in many of his joints.

The clerking doctor asks for more details about the patient's travel history. The patient reports that he received all the vaccines that he was recommended before his trip and is up to date with his regular vaccinations, but did notice a number of mosquito bites during his stay. He completed COVID-19 swabs before and after leaving Trinidad, both of which were negative, and has not experienced a cough or any change in his taste or smell.

On examination, the patient has a generalised maculopapular rash with some areas of sparing, this blanches under pressure. There are no signs of jaundice, and other than a fever of 38.6, the remainder of the patient's observations are normal. Considering the history and examination, a blood film and rapid diagnostic test for malaria, alongside a COVID test are ordered; these do not reveal any abnormal findings.

Considering the patient's history, the examination findings and investigations carried out, what is the most likely diagnosis in this scenario?

A. Measles

B. Dengue

C. Yellow fever

D. Scarlet fever

E. Typhoid

Correct Answer:Dengue

Explanation:

Dengue is a tropical virus spread via the Aedes mosquito; it is endemic in areas including Asia, the Americas and the Caribbean. It most commonly presents with the 'FAR' syndrome, a combination of fever, arthralgia and rash; a number of tropical infections can give a very similar presentation to this. In rare cases, the virus can give a more severe presentation, progressing to viral haemorrhagic fever (VHF), a clinical picture that is more frequently seen in infections such as Ebola and Lassa virus. VHF involves a massive increase in vascular permeability due to the infection, which can result in a petechial rash, gastrointestinal bleeding and distributive shock. The diagnosis will be made via rapid forms of PCR, investigating the presence of the dengue virus within the blood. There are no acute therapies for dengue, management is conservative.

Yellow fever can present with the 'FAR' symptoms similarly to dengue; it can also cause hepatitis and jaundice (thus the name 'yellow fever'). However, unlike dengue, there is a vaccine available for yellow fever prophylaxis. The patient states that they received all of their required vaccinations before travelling, and therefore the presentation is less likely to be due to yellow fever.

Typhoid is frequently caused by the bacteria salmonella typhi; this can be acquired by travellers to areas of poor sanitation. The condition can cause a rash (so-called 'rose spots') as well as a prolonged fever, but arthralgia is less commonly seen. It is not spread via mosquitos; as the patient reports mosquito bites during their stay, dengue is a more likely diagnosis.

Scarlet fever can lead to the development of a widespread maculopapular rash as this patient has presented with. However, this arises most frequently due to infection with group A streptococcus species, with a sore throat often being a prominent early sign. Given the patient's travel history, this is not the most likely diagnosis.

Measles can cause a generalised maculopapular rash as described in this case, alongside fever and characteristic white spots in the buccal mucosa referred to as 'Koplik spots'. This is less likely to be the diagnosis in this particular scenario, as the patient is up-to-date with his regular vaccinations, and will therefore have received both doses of the MMR vaccine.

Further reading:

https://patient.info/doctor/dengue-2

Question:

A 62-year-old man presents to his GP with an 8-week history of cough. The cough is not productive of sputum or blood, and it has not improved with the use of over-the-counter cough medicine. A systemic enquiry reveals unintentional weight loss, intermittent episodes of low-grade fever, and he states that on several occasions he has awoken from sleep drenched in sweat. He is otherwise fit and well, is a lifelong non-smoker, takes no regular medications, and has no family history of note.

What is the most likely diagnosis?

A. Sarcoidosis

B. Pulmonary embolism

C. Tuberculosis

D. Community-acquired pneumonia

E. Congestive cardiac failure

Correct Answer:Tuberculosis

Explanation:

This patient is most likely suffering from pulmonary tuberculosis. Tuberculosis is an infection associated with the acid-alcohol fast bacillus Mycobacterium Tuberculosis. Presentation is commonly with a prolonged cough (> 3 weeks), and systemic features including low-grade fever, weight loss, loss of appetite, fatigue, night sweats, and erythema nodosum. Chest X-ray will commonly demonstrate upper lobe opacities, and diagnosis is by demonstration of acid-fast bacilli on sputum smear or culture, or in biopsy/tissue culture in the case of disseminated disease, or by identification of bacterial DNA/RNA on nucleic acid amplification testing. It is important to be aware that tuberculosis can disseminate to a multitude of other organs, and multi-system involvement (e.g. cardiac, gastrointestinal, spine, brain).

Congestive cardiac failure is commonly associated with other cardiac risk factors such as previous MI, and is more likely to be associated with weight gain due to fluid retention. Cardiac failure is also associated with symptoms such as orthopnoea/paroxysmal nocturnal dyspnoea and exertional dyspnoea, which are not noted in this case. Fevers and night sweats would not commonly be associated with cardiac failure in the absence of an infective cause such as endocarditis or pericarditis.

Pulmonary embolism is most commonly associated with dyspnoea, tachypnoea, acute onset of localised chest pain and features of concomitant venous thrombosis. It is also associated with risk factors such as malignancy, smoking, prolonged immobility, pregnancy, and combined oral contraceptive use.

Sarcoidosis is a multi-system disease associated with extrapulmonary manifestations and may present acutely with Löfgren syndrome, consisting of erythema nodosum, arthralgia, fever, and bilateral hilar lymphadenopathy. It is found incidentally in a significant proportion of patients (up to 40%), on discovery of bilateral hilar lymphadenopathy on chest X-ray. In addition, sarcoidosis usually presents age 20-40, significantly younger than the patient in this case, and may be associated with a positive family history.

Community-acquired pneumonia would most commonly present with features of dyspnoea, worsening productive cough, pleuritic chest pain and high-grade fever. The duration of this patient’s symptoms, the presence of weight loss, and the non-productive nature of the cough make CAP a less likely diagnosis in this case.

Further reading:

https://bestpractice.bmj.com/topics/en-gb/165

Question:

A 55-year old man presents complaining of a sudden-onset headache that came on this morning whilst he was eating his breakfast. He then collapsed and fell to the floor from his chair. His wife reports that he was unconscious on the floor for around 30 seconds, before standing up again. He also reports a stiff neck.

He has a past medical history of hypertension which has been difficult to control – he is currently prescribed three different BP medications including ramipril, amlodipine and furosemide. He is a smoker with a 30 pack-year history and drinks around 15 units of alcohol per week.

On examination his observations are normal. He is confused, with demonstrable neck stiffness. There is no focal neurological deficit.

CT examination reveals hyperdensity in the basal cisterns.

What is the most likely diagnosis in this patient?

A. Haemorrhagic stroke

B. Ischaemic stroke

C. Subarachnoid haemorrhage

D. Extradural haemorrhage

E. Subdural haemorrhage

Correct Answer:Subarachnoid haemorrhage

Explanation:

The most likely diagnosis in this patient is a subarachnoid haemorrhage. The sudden onset headache with collapse is a typical presenting feature of a subarachnoid haemorrhage, with many patients describing the sensation as feeling like they have been hit in the back of the head. Meningism can also occur due to the presence of blood in the subarachnoid space irritating the meninges. Hypertension is a key risk factor for subarachnoid haemorrhage, alongside a smoking and alcohol history. The CT finding of hyperdensity in the basal cisterns (also known as the subarachnoid cisterns) is indicative of blood in the subarachnoid space.

Subdural haemorrhage symptoms would typically develop much more slowly following trauma to the head. CT would not indicate subarachnoid hyperdensity but subdural crescentic hyperdensity.

Extradural haemorrhage is usually associated with trauma to the temporal bone. CT would indicate extradural lens-shaped hyperdensity.

Haemorrhagic stroke and ischaemic stroke can result in variable presentations, but this is not a typical intra-cerebral pathology presentation, and the CT findings are indicative of extra-cerebral (specifically subarachnoid) pathology.

Further reading:

https://patient.info/doctor/subarachnoid-haemorrhage-pro

Question:

You are a junior doctor working in the Emergency Department. You are reviewing a 68-year-old man who complains of feeling hot and feverish for the last 48 hours. He has a painful abdomen and is nauseous with a decreased appetite. He is known to the gastroenterology team with liver cirrhosis and ascites.

On examination, he has a mildly tender abdomen throughout. His abdomen is grossly distended and shifting dullness is demonstrable. His temperature is 38.9 degrees Celsius.

What is the most likely diagnosis?

A. Appendicitis

B. Variceal haemorrhage

C. Spontaneous bacterial peritonitis (SBP)

D. Urosepsis

E. Cholecystitis

Correct Answer:Spontaneous bacterial peritonitis (SBP)

Explanation:

Ascites and generalised abdominal pain in a patient with known liver cirrhosis should raise the suspicion of spontaneous bacterial peritonitis (SBP). This should be promptly investigated with an ascitic tap, amongst other routine lab tests, and treated swiftly especially if the patient presents with signs of sepsis.

Cholecystitis usually presents with right upper quadrant pain. Urosepsis would not typically cause abdominal pain but may cause nausea and anorexia and could trigger decompensation in a patient with known liver disease. Appendicitis classically causes abdominal pain which is felt initially in the umbilical region before localising to the right iliac fossa. All three of these conditions may cause decompensation of chronic liver disease and should be borne in mind, but SBP is the most likely diagnosis with the clinical information given here and is a particular concern in this patient group.

Variceal haemorrhage typically presents with significant haematemesis.

Further reading:

https://patient.info/doctor/intra-abdominal-sepsis-and-abscesses

Question:

A 72-year-old female presents to her GP for a routine health check. She has a past medical history of well-controlled hypertension, for which she takes ramipril, and a mastectomy for breast cancer 10 years ago. She also reports a family history of multiple strokes.

On examination, she is found to have an irregularly irregular radial pulse. A 12-lead ECG is recorded which confirms atrial fibrillation.

What is the CHA2DS2-VASc score for this patient?

A. 1

B. 3

C. 4

D. 2

E. 5

Correct Answer:3

Explanation:

The CHA2DS2-VASc scoring tool is used to assess the risk of thromboembolic events in patients with atrial fibrillation (AF). NICE recommends that all patients with AF (including paroxysmal AF) have their CHA2DS2-VASc score calculated to assess the need for anticoagulation. Anticoagulation should be offered, following assessment of bleeding risk, to female patients with a score of 2 or more and male patients with a score of 1 or more.

This patient has a CHA2DS2-VASc score of 3:

1 point for age 65-74 years old

1 point for female

1 point for hypertension

The CHA2DS2-VASc score is comprised of:

Component Score

Congestive heart failure 1

Hypertension 1

Age (years)

<65 = 0

65-74 = 1

≥75 = 2

Diabetes mellitus 1

Sex

Male = 0

Female = 1

Previous stroke or transient ischaemic attack (TIA) 2

Vascular disease (prior myocardial infarction, peripheral arterial disease or aortic plaque) 1

Further reading:

https://cks.nice.org.uk/topics/atrial-fibrillation/management/management-of-af/#the-cha2ds2vasc-score-tool

Question:

A 30-year-old woman who moved from India last month brings in her 9-month-old son, who she says is less interactive than her previous child, who is completely healthy, as are the mother and father. On examination, he has non-tender left and right abdominal masses and a yellow sclera. Blood tests show:

WCC: 6 x 109 (3.6-11)

Hb: 85 g/L (115-165)

MCV: 60 fL (80 – 100)

What is the most appropriate diagnostic investigation for the probable diagnosis?

A. Blood film

B. Direct Coombs Test

C. Genetic testing

D. EMA binding test

E. Haemoglobin electrophoresis

Correct Answer:Haemoglobin electrophoresis

Explanation:

The correct answer is haemoglobin electrophoresis. This child has beta-thalassaemia major: the absence of beta globulin chains on chromosome 11. This is an autosomal recessive condition, hence why the rest of the family are well. It is more common in South East Asia. The condition is screened for in pregnant women in the UK, but not in all countries. Children with beta thalassaemia major will present before one year old, with failure to thrive, hepatosplenomegaly, and jaundice. The blood results show microcytic anaemia. The main differentials for this are thalassaemia or iron deficiency anaemia. Iron deficiency would not produce the hepatosplenomegaly and jaundice referenced in the stem. The best diagnostic test is haemoglobin electrophoresis: it will show no HbA and raised HbA2 and HbF.

A blood film would show nucleated red blood cells – these are immature red blood cells or reticulocytes, which are raised in conditions causing haemolysis, where the rapid turnover of red blood cells leads to increased immature red blood cells being released into the circulation before they have time to mature. This would not distinguish between alpha and beta thalassaemia and other causes of reticulocytosis.

Direct Coombs testing is for autoimmune haemolytic anaemia. Warm autoimmune haemolytic anaemia is caused by IgG antibodies against red blood cells, which cause haemolysis best at body temperature leading to mostly extravascular haemolysis, which would cause splenomegaly. However, it is associated with autoimmune conditions such as systemic lupus erythematosus and neoplasia, including chronic lymphocytic leukaemia. Cold autoimmune haemolytic anaemia is caused by IgM antibodies and causes complement-mediated intravascular haemolysis at 4°C - this can cause symptoms such as Raynaud's and acrocyanosis, which are not described here. Both of these are unlikely in a child.

Genetic testing could diagnose beta thalassaemia major but is not the NICE-approved diagnostic test, as haemoglobin electrophoresis can diagnose the condition with similar accuracy but with reduced time and expense. Genetic testing is needed to diagnose alpha thalassaemia, as this has normal electrophoresis findings.

EMA binding test is a flow cytometry test that can diagnose hereditary spherocytosis. This condition may also present with failure to thrive, jaundice, and splenomegaly, as this child has. However, it is more common in the Northern European population and is an autosomal dominant condition, meaning it is likely one of the parents would have been unwell if the child had the condition.

Further reading:

https://oxfordmedicaleducation.com/haematology/anaemia/

Question:

A 21-year-old student presents to the GP in a visibly distraught state. A week previously she had unprotected sexual intercourse with a partner she met in a bar; she describes that this is very out of character for her and that the incident only occurred due to excessive alcohol intake. She has been in a relationship for the past four years and is terrified that her partner will find out, as she has now developed symptoms of what she assumes is a sexually transmitted infection.

The patient reports pain on urination that has developed over the last few days, as well as some foul-smelling vaginal discharge. She describes this as green in colour and is notably frothy. She has been so worried about these symptoms that she is struggling to sleep, and has been unable to attend work for the past few days.

A speculum examination is carried out by the GP, which allows the visualisation of the discharge; its appearance is very similar to what the patient described. The cervix is notably erythematous with a punctate appearance. The GP refers the patient to the nearby genito-urinary medicine clinic; he explains that they will confirm the diagnosis and treatment required, and will discuss her concerns about how to go about notifying her partner.

Given the most likely diagnosis, which of the following is most likely to be seen on further investigations?

A. Treponema pallidum identified on dark-field microscopy

B. Clue cells visualised on wet-mount microscopy

C. Flagellated protozoan seen on wet-mount microscopy

D. Gram-negative diplococcus identified on a swab

E. Gram-negative rod identified on urinalysis

Correct Answer:Flagellated protozoan seen on wet-mount microscopy

Explanation:

This patient has presented with symptoms most likely indicating the presence of trichomoniasis; a sexually transmitted infection caused by Trichomonas vaginalis. Infection most commonly presents with malodorous, green discharge, as well as classic features of any sexually transmitted disease such as dysuria and vulval discomfort. Speculum examination may reveal, as in this case, a 'strawberry cervix'; a term used to describe an erythematous, punctiform appearance of the cervix, which is classically associated with this specific infection.

The diagnosis can be made using vaginal swabs, or wet-mount microscopy - Trichomonas is a flagellated protozoan, which makes it very distinctive. Given the fact that the disease is caused by a parasite, oral metronidazole is the usual first-line treatment option.

A gram-negative diplococcus identified on a swab would be in keeping with a diagnosis of Neisseria gonorrhoeae infection; this is one of the only organisms with this characteristic appearance. The disease may be asymptomatic in women or may present with discharge, which is often mucopurulent. The green, frothy discharge and strawberry cervix described in this scenario point more strongly towards a diagnosis of Trichomonas vaginalis infection.

Clue cells visualised on wet-mount microscopy are a characteristic feature of bacterial vaginosis; these are included in the Amsel criteria sometimes used in diagnosing the condition (the other criteria are a thin, white, yellow, homogeneous discharge, a vaginal fluid pH of over 4.5 when placing the discharge on litmus paper and the release of fishy odour when potassium hydroxide is added - the 'whiff test'). This is less likely to be the diagnosis in this case, given the history of unprotected sexual intercourse; bacterial vaginosis is not a sexually transmitted condition.

A gram-negative rod identified on urinalysis would be in keeping with a urinary tract infection caused by bacteria such as E-coli. Whilst this can cause dysuria, the vaginal discharge points more towards a sexually transmitted infection.

Treponema pallidum identified on dark-field microscopy would indicate a diagnosis of syphilis infection; whilst this is most frequently transmitted sexually, it does not usually present in the primary stage with vaginal discharge, rather with a solitary painless ulcer referred to as a chancre.

Further reading:

https://cks.nice.org.uk/topics/trichomoniasis/

Question:

A new medication is developed for motor neurone disease and is tested in a single-blind randomised controlled trial involving 2000 patients with motor neurone disease. 1000 of the study participants are given the new drug, while the other half receive a sugar pill. The patients do not know if they are taking the new drug or the sugar pill, however the researchers are aware.

What is the main purpose of blinding in this study?

A. To prevent recall bias

B. To prevent the placebo effect

C. To prevent observer bias

D. To prevent selection bias

E. To prevent measurement bias

Correct Answer:To prevent the placebo effect

Explanation:

The purpose of blinding in a single-blind trial is to prevent the placebo effect. This is the phenomenon where a patient’s belief in their treatment, rather than the treatment itself, results in a beneficial effect.

Observer bias is the bias that arises due to a researcher’s expectations or preconceptions affecting the way they perceive and record a variable. This is the main form of bias that is eliminated through double-blinding.

Recall bias, also known as reporting bias or responder bias, is the bias that arises from participants inaccurately recalling past events or omitting details. It is a particularly big problem in retrospective studies that rely on participants providing information.

Measurement bias is the bias that arises from an inaccuracy in the way in which the variable is being measured, for example using an inaccurate measuring tool.

Selection bias is the bias that arises when the way in which participants are selected for a study results in a sample population that is very different to the general population which they are intended to represent.

Further reading:

https://guides.himmelfarb.gwu.edu/prevention\_and\_community\_health/types-of-studies

Question:

A 77-year-old male presents to the GP with an 8-week history of dry cough and 6kg unintentional weight loss. He is an ex-smoker with a 50 pack-year history. Past medical history includes hypertension, type 2 diabetes and chronic obstructive pulmonary disease (COPD). The GP orders a chest x-ray. This is later reported to show a large lesion in the mid-zone of the right lung.

What is the MOST likely diagnosis?

A. Adenocarcinoma

B. Lymphoma

C. Squamous cell carcinoma

D. Tuberculosis

E. Small cell lung cancer

Correct Answer:Squamous cell carcinoma

Explanation:

The most likely diagnosis is lung cancer. Non-small-cell lung cancers (NSCLC) account for around 85% of lung cancers and squamous cell carcinoma (a subtype of NSCLC) is the most strongly associated with a history of smoking.

Adenocarcinoma is the most common subtype of non-small-cell lung cancer, but it is less associated with a history of smoking, making it less likely in this scenario. It is typically associated with asbestos exposure,

There is nothing pertinent in the history to suggest this gentleman is at increased risk of tuberculosis, for example, a relevant travel history, contact history, fevers or haemoptysis. Although TB is a cause of coughing, weight loss and cavitation it is less likely than lung cancer.

Lymphoma can present as nodal or extra-nodal disease (i.e. pulmonary lymphoma). There is nothing in the history to suggest this gentleman is at increased risk of lymphoma, such as chronic immunosuppression. Lymphoma often presents with B symptoms (systemic symptoms), which include fever, night sweats and weight loss; this patient only suffers from the latter. Lung cancer is more common and more probable than lymphoma.

Further reading:

https://geekymedics.com/lung-cancer/

Question:

A 32-year-old man presents to his GP with a two-week history of a progressive dry cough and low-grade fever. On examination, he has erythema multiforme.

After a course of amoxicillin, his symptoms haven't resolved. He is referred for a chest X-ray, which shows reticulonodular shadowing. The patient is diagnosed with atypical pneumonia and treated empirically.

Following the resolution of this man's pneumonia, what should be organised for a follow-up?

A. Chest X-ray in 4 weeks

B. Sputum and cultures in 1 week

C. Chest X-ray in 6 weeks

D. Sputum and cultures in 4 weeks

E. No follow up required given the patient's age

Correct Answer:Chest X-ray in 6 weeks

Explanation:

Chest X-ray in 6 weeks. This is correct, as all cases of pneumonia should have a repeat chest X-ray 6 weeks after clinical resolution (no exception is made for atypical cases). This is to check for resolution of consolidation and to assess for persistent abnormalities of the lung parenchyma. Sputum and cultures are not done after pneumonia cases have resolved clinically unless there is some indication the infection is ongoing despite treatment.

Sputum cultures are not typically done to test a resolution of pneumonia, which makes sense as a clinically resolved pneumonia should mean the patient isn't bringing up sputum unless they have an associated condition such as COPD.

As a clinical aside, this case is likely due to Mycoplasma pneumoniae, a bacterium that causes atypical pneumonia that tends to affect younger patients, as in this stem. It tends to present with a gradual onset of vague symptoms (malaise, headache, etc.) accompanied by a persistent dry cough. It can also cause erythema multiforme. Severe complications include haemolytic anaemia, thrombocytopenia, and bullous myringitis.

Further reading:

https://bestpractice.bmj.com/topics/en-gb/605?q=Mycoplasma%20infection&c=suggested

Question:

You are a junior doctor working in the emergency department. You are examining a patient who has sustained a penetrating forearm injury. You find that they lack sensation in the dorsal web-space between the thumb and first finger of their right hand.

Which peripheral nerve is most likely to have been damaged?

A. Radial nerve

B. Ulnar nerve

C. Axillary nerve

D. Median nerve

E. Musculocutaneous nerve

Correct Answer:Radial nerve

Explanation:

The radial nerve, root C6/C7, is formed from the posterior cord of the brachial plexus. It supplies sensation to the dorsolateral arm and forearm and is most reliably tested at the first dorsal web-space (between the thumb and first finger on the dorsum of the hand). It is, therefore, most likely that this patient has sustained an injury to the radial nerve or one of its branches.

The axillary nerve comes from the posterior cord of the brachial plexus and innervates the deltoid, providing abduction of the arm. It also facilitates sensation to the 'regimental badge patch' on the lateral aspect of the upper limb.

The musculocutaneous nerve provides sensation to the lateral forearm and innervates the biceps, allowing flexion at the elbow. The median nerve allows flexion and abduction of the wrist, flexion of the distal phalanx of the thumb, flexion of the distal phalanx of the index and middle fingers, pronation of the forearm and opposition of the thumb.

The ulnar nerve innervates flexor carpi ulnaris, the first dorsal and second palmar interosseous, adductor pollicis and the ulnar aspect of flexor digitorum profundus. It facilitates abduction of the pinky finger and index finger, adduction of the index finger and adduction of the thumb. It also flexes the distal phalanx of the ring and pinky fingers.

Further reading:

https://patient.info/doctor/neurological-examination-of-the-upper-limbs

Question:

A 32-year-old woman with a past medical history of schizophrenia comes to her GP reporting fatigue. On further questioning, her mental state is stable, however, she is not sleeping well, and is having to get up frequently in the night to urinate, which has been worsening over the past few months, and is increasingly thirsty.

She has no nausea, vomiting, change in bowel habit, no shortness of breath, chest pain, or palpitations.

The GP decides to order some blood tests to investigate the cause of the fatigue

Which of the following tests is most likely to explain her symptoms?

A. Full blood count

B. Liver function tests

C. Thyroid function tests

D. HBA1c

E. Bone Profile

Correct Answer:HBA1c

Explanation:

HBA1c is the correct answer. This woman is presenting with osmotic symptoms relating to impaired glucose control. Antipsychotic medication is a key risk factor for the development of insulin resistance, due to weight gain and by direct adverse effects on insulin sensitivity and secretion. Other drugs which have diabetogenic potential include corticosteroids, thiazide diuretics, and beta-blockers, and patients should be counselled as such, and their blood sugars regularly monitored while on treatment.

Hypercalcemia, detected on a bone profile, can cause fatigue, along with more frequent urination and thirst. However, this would likely present with a range of additional symptoms: “painful bones, renal stones, abdominal groans (GI upset including nausea, vomiting, constipation) and psychic moans” (depression/irritability) as well as musculoskeletal symptoms including cramps and twitches. Hypercalcemia is most commonly due to overactive parathyroid glands or malignancy, with other causes including dehydration, Addison’s disease, thyrotoxicosis, and sarcoidosis.

Anaemia is an important differential for fatigue, with low Hb diagnostic on a full blood count. Other symptoms of anaemia include lightheadedness, shortness of breath, chest pain, and palpitations, which make it a less likely diagnosis in this case. Whilst on antipsychotics, patients will be already receiving regular FBC monitoring due to the risk of developing leukopenia and agranulocytosis (dangerously low levels of white blood cells which increase susceptibility to infection).

Thyroid function tests can detect hyper or hypothyroidism, which can both cause fatigue. However, they are not associated with the osmotic symptoms included in this vignette. Hyperthyroidism is classically associated with palpitations, tachycardia, anxiety and irritability, diarrhoea, heat intolerance, sweating, and weight loss. Hypothyroidism is commonly associated with weight gain, cold intolerance, hair loss, constipation, and menorrhagia.

Patients with liver disease can present with deranged liver function tests and fatigue, along with other classical symptoms such as right upper quadrant pain, jaundice, fever, or pale urine, and dark stools in cholestasis. This patient is not presenting with any of these. While antipsychotic medication can be associated with derangement in LFTs, these are normally mild and transient.

Further reading:

https://patient.info/diabetes/diabetes-mellitus-leaflet

Question:

A 42-year-old is called to see the GP after some abnormalities were detected in blood tests taken before departure on a 6-month business trip to Africa. He has previously been well, with no past medical history of note; he takes no regular medication. He has never smoked and drinks approximately 8 units of alcohol per week.

Liver function tests reveal the following:

ALP - 145 U/L

ALT - 63 U/L

Bilirubin - 24 μmol/L

GGT - 60 U/L

Albumin - 36 g/L

Iron studies are normal, and a liver screen shows no abnormalities with the exception of elevated serum copper levels. On examination, there is a palpable mass measuring approximately 4 finger-widths under the right costal margin. When the patient is distracted, the GP notices a fine resting tremor in the patient's left hand.

Which of the following is the most likely to account for the patient's symptoms and investigation results?

A. Hereditary haemochromatosis

B. Alcoholic liver disease

C. Wilson's disease

D. Alpha-1-antitrypsin deficiency

E. Progressive supranuclear palsy

Correct Answer:Wilson's disease

Explanation:

Wilson's disease is an autosomal recessive condition that is characterised by copper accumulation, principally within the liver, but possibly within other body organs - the basal ganglia being another common site. The disease arises due to an ATP7B mutation that results in low ceruloplasmin levels being present. Ceruloplasmin is the transport protein for copper, and therefore, those with the disease have difficulties excreting the metal, allowing for levels to rise.

The most common manifestation of the condition is chronic hepatitis that may progress to cirrhotic disease; this may, as in this scenario, go undetected for a number of years, until complications begin to arise. This patient's LFTs show a chronic hepatitic picture, with low-level abnormalities in both ALT and ALP; hepatomegaly on examination also makes Wilson's more likely. If cerebral involvement is present, patients may present with tremors, Parkinsonism, or possibly behavioural changes. Kayser-Fleischer rings are a pathognomonic ophthalmological sign associated with the condition.

Progressive supranuclear palsy (PSP) is one of the Parkinson-plus syndromes that can mimic idiopathic Parkinsonism. A resting tremor can be seen in those with the condition, however, this is frequently bilateral, and will usually be accompanied by a gaze palsy that is characteristic of the disease. PSP does not usually cause liver impairment.

Alpha-1-antitrypsin deficiency is a condition caused by an absence of a key protease inhibitor that usually presents the damage caused by the enzyme neutrophil elastase. Those with an inherited deficiency in alpha-1-antitrypsin have a greatly increased risk of developing COPD, and also of liver cirrhosis. Whilst this patient has presented with LFTs in keeping with chronic hepatitis, A1AT would not explain the elevated copper levels in this scenario.

Hereditary hemochromatosis is another inherited syndrome that can cause chronic hepatitis; rather than copper accumulation causing liver damage, those with the condition fail to regulate iron metabolism. The normal iron studies make the diagnosis far less likely in this case.

Whilst there is a possibility that the patient may not be being entirely truthful about their alcohol intake, for significant abnormalities in LFTs to be present at the age of 42, the actual intake would have to be substantially more than the 8 units reported. Alcohol misuse would not explain the resting tremor, and a greatly elevated GGT would be expected.

Further reading:

https://patient.info/doctor/wilsons-disease-pro

Question:

An 84-year-old woman attends her GP with a rash. She mentions that the rash (affecting her chest, back and arms) appeared 3 weeks previously and has been intensely pruritic. Blisters began to appear over the rash around 1 week ago, some of which have burst and crusted over. The patient also reports that she suffers from Parkinson’s disease and psoriasis.

On examination, the patient has:

hundreds of annular lesions affecting her trunk and upper limbs (worse in her axilla)

small vesicles and large bullae associated with the rash (some of which have burst forming crusted erosions)

unaffected mucous membranes

Which of the following best describes the PATHOLOGY underlying the condition described?

A. IgG antibodies attack desmoglein 3

B. Hemidesmosomal destruction with formation of subepidermal blisters

C. IgA antibodies attack tissue transglutaminases

D. IgG antibodies attack desmoglein 1

E. Keratinocyte necrosis

Correct Answer:Hemidesmosomal destruction with formation of subepidermal blisters

Explanation:

The most likely diagnosis, in this case, is bullous pemphigoid. This condition is a blistering disorder that affects the subepidermis. Risk factors for this condition include old age (usually over 80 years), pregnancy and the presence of other comorbidities (including stroke, Parkinson’s, dementia, and psoriasis).

Bullous pemphigoid is caused by immunoglobulin and T-lymphocyte attack on the basement membrane (specifically towards hemidesmosomes) of the epidermis. This results in hemidesmosomal destruction and the formation of subepidermal blisters. Bullous pemphigoid typically presents with a non-blistering rash for several weeks followed by the onset of tense bullae. The rash is variable and may be eczematous, annular or urticarial in nature. This condition may be localised to one area or be more widespread affecting flexural zones (mainly the axillae), trunk and proximal limbs. Mucous membranes are typically spared. Blisters may be small and vesicular in nature or patients can present with tense, large bullae containing a yellow-blood-stained liquid. Blisters may burst forming crusted erosions and, sometimes, may become secondarily infected.

IgG antibodies attacking desmoglein 3 is associated with pemphigus vulgaris. This condition presents similarly to pemphigoid, but instead involves mucous membranes.

Keratinocyte necrosis is often the earliest pathological finding associated with erythema multiforme.

IgG antibodies attacking desmoglein 1 is associated with pemphigus foliaceous. Pemphigus foliaceous presents similarly to pemphigoid, but instead tends to affect younger persons aged 50-60 years.

IgA antibodies attack tissue transglutaminases in dermatitis herpetiformis (DH). This condition typically presents with blisters presenting on the wrists, extensor aspects of the elbows, knees, sacrum and buttocks. DH is often associated with coeliac disease.

Further reading:

https://www.dermnetnz.org/topics/bullous-pemphigoid/

Question:

An 80-year-old woman attends the accident and emergency department with visual hallucinations. The patient reports that her hallucinations have been present for the past month and involve seeing miniature animals, although she is aware that these are not real.

The patient has a past medical history of age-related macular degeneration. Cognitive assessment reveals no significant impairment. Eye examination reveals findings consistent with her past medical history.

What is the MOST LIKELY diagnosis?

A. Optic neuritis

B. Lewy Body dementia

C. Charles Bonnet syndrome

D. Schizophrenia

E. Alzheimer’s disease

Correct Answer:Charles Bonnet syndrome

Explanation:

The most likely diagnosis is Charles Bonnet syndrome (CBS). This condition can be defined as visual hallucinations as a result of ocular disease. Risk factors of this disease include moderate to severe eye disease and old age. Visual hallucinations associated with this condition are often Lilliputian (small versions of objects), that exist outside of the body and range in duration from seconds to hours. The hallucinations often occur in the context of dim lighting.

Diagnosis is achieved by a process of exclusion (i.e. normal cognitive, psychiatric, laboratory and imaging results).

Lewy body dementia is not likely in this case. This would typically present with features of dementia (e.g. memory loss, behavioural change) and Parkinsonian features (e.g. postural instability, bradykinesia, tremor).

Schizophrenia is not likely in this case. This condition would commonly present with lack of insight, hallucinations (e.g. visual, auditory), delusional perception and thought possession abnormalities.

Optic neuritis is not likely in this case. Acute optic neuritis typically presents with visual impairment, ocular pain and dyschromatopsia.

Alzheimer’s disease would typically present with progressive memory impairment.

Further reading:

https://patient.info/doctor/charles-bonnet-syndrome-pro

Question:

A 26-year-old female with a past medical history of kyphoscoliosis, learning difficulties and recurrent aspiration is brought into hospital with a 2-day history of productive cough and fever. On arrival her observations are as follows: temperature 38.6°C, heart rate 123bpm, blood pressure 109/76mmHg, respiratory rate 25 and SpO2 88% on room air. She is given oxygen via a venturi mask at 4 litres per minute and her SpO2 improves to 90%. A chest X-ray demonstrates patchy consolidation in the right lower lobe.

An arterial blood gas is taken 10 minutes after starting oxygen therapy and the results are as follows:

pH: 7.36 (7.35 - 7.45)

PaO2: 7.1kPa (11 - 13 kPa)

PaCO2: 5.0kPa (4.7 - 6.0 kPa)

HCO3-: 23.4mEq/L (22 - 26 mmol/L)

Lactate: 1.1 (0.5 - 2.2 mmol/L)

Which of the following best fits with the results of the arterial blood gas?

A. Type 1 respiratory failure with partially compensated respiratory acidosis

B. No respiratory failure, with partially compensated respiratory acidosis

C. Type 2 respiratory failure with partially compensated respiratory acidosis

D. Type 1 respiratory failure with no acid base disturbance

E. Type 2 respiratory failure with no acid base disturbance

Correct Answer:Type 1 respiratory failure with no acid base disturbance

Explanation:

The ABG in this scenario suggests type 1 respiratory failure with no acid-base disturbance. Type 1 respiratory failure is defined as hypoxaemia (PaO2 <8 kPa) with normocapnia (PaCO2 <6.0 kPa). The patient's pH and HCO3- are both within the normal range, suggesting there is currently no significant acid-base disturbance. The patient's PaCO2 is also normal, ruling out type 2 respiratory failure which involves hypoxaemia (PaO2 is <8 kPa) associated with hypercapnia (PaCO2 >6.0 kPa).

Type 1 respiratory failure occurs as a result of ventilation/perfusion (V/Q) mismatch; the volume of air flowing in and out of the lungs is not matched with the flow of blood to the lung tissue. As a result of the VQ mismatch, PaO2 falls and PaCO2 rises. The rise in PaCO2 rapidly triggers an increase in a patient’s overall alveolar ventilation, which corrects the PaCO2 but not the PaO2 due to the different shape of the CO2 and O2 dissociation curves. The end result is hypoxaemia (PaO2 < 8 kPa) with normocapnia (PaCO2 < 6.0 kPa).¹

Examples of VQ mismatch include:

Reduced ventilation and normal perfusion (e.g. pulmonary oedema, bronchoconstriction)

Reduced perfusion with normal ventilation (e.g. pulmonary embolism)

The patient in this scenario presented with symptoms and signs of pneumonia (most likely secondary to aspiration), confirmed by the presence of consolidation on chest X-ray. When interpreting the arterial blood gas (ABG) results, it's important to acknowledge that they were obtained whilst the patient was receiving supplemental oxygen. PaO2 should be approximately 10kPa less than the percentage fraction of inspired oxygen (FiO2). The FiO2 of a venturi mask with 6L/minute oxygen is 28%, so the PaO2 would be expected to be approximately 18kPa in a healthy individual. A PaO2 of 7.1kPa is therefore well below what would normally be expected and indicative of type 1 respiratory failure.

Further reading:

https://geekymedics.com/abg-interpretation/

Question:

A 6-month-old girl is admitted to the hospital following a 1-day history of fever and breathing difficulties. Her parents also report she had nasal congestion and a slight cough for 3-days before admission.

She has no significant past medical history. Her parents describe a normal pregnancy and birth. No allergies are known.

Vital signs at admission include temperature 38.2°C, HR 170/min, RR 48/min, SpO2 90% on room air and marked irritability. Examination of the chest reveals moderate chest wall retraction, diffuse bilateral crackles and a bilateral expiratory wheeze. Throughout the examination, the child has a 'wet' sounding cough.

Which of the following is the most likely diagnosis?

A. Cystic fibrosis

B. Croup

C. Bronchiolitis

D. Asthma

E. Bacterial pneumonia

Correct Answer:Bronchiolitis

Explanation:

The most likely diagnosis in this patient is bronchiolitis - an infection of the lower respiratory tract, most commonly caused by the respiratory syncytial virus (RSV). Bronchiolitis is a leading cause of hospital admission in infants under one year of age. The typical clinical manifestations of bronchiolitis include a coryzal prodrome lasting 1-3 days, followed by a persistent cough, tachypnoea, chest recession and wheeze ± crackles on chest auscultation.

The diagnosis of bacterial pneumonia should be considered in children with a high fever (over 39°C) and evidence of persistent focal crackles on examination. It is important to note that bacterial pneumonia is much less common in children under one year of age and does not typically present with a wheeze; therefore, this is a less likely diagnosis.

Cystic fibrosis (CF) is a genetically inherited (autosomal recessive) disease that typically presents in early infancy. CF is a multisystem condition characteristically associated with pancreatic insufficiency (steatorrhoea, failure to thrive, insatiable hunger), progressive respiratory symptoms (breathlessness, chronic cough) and recurrent infections. This patient has no significant past medical history and no associated symptoms indicative of CF. Furthermore, the patient has become acutely unwell, suggesting an infectious aetiology as the most likely diagnosis.

NICE guidelines state that asthma is an unusual diagnosis in children under one year of age however should be considered in children presenting with a persistent wheeze without crackles, recurrent episodic wheeze or a personal ± family history of atopy. The patient has become unwell acutely, has no significant personal past or family medical history and has both diffuse crackles and wheeze present; therefore, asthma is an unlikely diagnosis.

A common cause of respiratory distress in children is croup, also known as laryngotracheobronchitis. Croup characteristically presents with acute onset, seal-like barking cough and may be associated with stridor, voice hoarseness and sternal/intercostal indrawing. Patients with croup typically present with a sudden onset barking cough and rapidly develop respiratory distress. This patient has a cough described as 'wet', has experienced gradual worsening of symptoms and does not have any evidence of stridor; therefore, croup is a less likely diagnosis.

Further reading:

https://www.nice.org.uk/guidance/ng9/chapter/recommendations#assessment-and-diagnosis

Question:

A 68-year-old man is referred to a respiratory clinic with shortness of breath. He has had progressive shortness of breath for the last six months with associated swelling of the ankles. He has a past medical history of ischaemic heart disease, having had a myocardial infarction 3 years ago. A chest x-ray is unremarkable.

What is the definitive investigation for the likely diagnosis?

A. B-type natriuretic peptide

B. CT chest

C. ECG

D. Echocardiogram

E. Spirometry

Correct Answer:Echocardiogram

Explanation:

This man has symptoms of heart failure on the background of a previous myocardial infarction. A definitive diagnosis of heart failure requires a transthoracic echocardiogram.

NICE suggests checking B-type natriuretic peptide prior to echocardiography to help assess how urgently an echocardiogram should be performed:

NT‑proBNP level above 2,000 ng/litre - specialist assessment and transthoracic echocardiography within 2 weeks

NT‑proBNP level between 400 and 2,000 ng/litre - specialist assessment and transthoracic echocardiography within 6 weeks.

Raised B-type natriuretic peptide alone would not provide a definitive diagnosis as it can be raised for other reasons (age over 70, left ventricular hypertrophy, tachycardia, renal failure). As a result, this is not the correct answer to this question which focuses on a definitive diagnosis.

An ECG would be useful, but would be non-diagnostic and would not identify the cause or severity of the heart failure.

Spirometry or a CT chest are unlikely to be useful in this scenario.

Further reading:

https://www.nice.org.uk/guidance/ng106

Question:

A 35-year-old woman is referred to the general surgery clinic. She noticed a bulge on her abdominal wall during a recent pregnancy which has persisted since she gave birth. It tends to be more prominent when she is up and about but is otherwise asymptomatic. She had a forceps delivery but has had no previous abdominal surgery.

On examination, there is a soft reducible swelling in the upper midline 2cm above the umbilical ring.

What is the most likely diagnosis?

A. Spigelian hernia

B. Epigastric hernia

C. Divarication of the recti

D. Incisional hernia

E. Paraumbilical hernia

Correct Answer:Paraumbilical hernia

Explanation:

The most likely diagnosis, in this case, is a paraumbilical hernia. Paraumbilical hernias are the most common type of ventral (or anterior abdominal wall) hernia. They pass through a fascial defect in the linea alba within 3cm of the umbilical ring. They are more likely to occur in women but are more likely to cause problems requiring surgery in men. The majority are small and asymptomatic and can safely be managed conservatively. Symptomatic paraumbilical hernias should be repaired, as they often have small fascial defects and are at a fairly high risk of obstruction or strangulation. Raised intra-abdominal pressure during pregnancy is an important risk factor for all types of ventral hernia.

Epigastric hernias are a less common type of ventral hernia. They pass through the linea alba in the upper midline above the umbilical territory. They are often asymptomatic and have a low risk of obstruction or strangulation as they usually only contain extraperitoneal fat. Epigastric hernias are more likely to occur in men.

Spigelian hernias are a rare type of lateral ventral hernia. They pass through the Spigelian fascia lateral to the rectus sheath. They are usually very small and present with localised pain or a lump immediately lateral to the rectus abdominis muscle.

Incisional hernias are ventral hernias which pass through the site of a previous surgical incision. They occur because the fascial closure of the abdominal wall failed to heal properly. This patient had a forceps delivery, which usually involves an episiotomy incision in the perineum, but has not had any previous abdominal surgery.

Divarication of the recti, also known as rectus diastasis, is an important differential diagnosis for a midline abdominal swelling. It occurs when the rectus abdominis muscles separate, stretching the linea alba to a width of more than 2cm. This causes a prominent midline bulge which can look quite striking on clinical examination. However, it is not a hernia as there is no underlying fascial defect. It is usually treated with physiotherapy and exercise programmes and rarely requires surgery.

Further reading:

https://geekymedics.com/hernias/

Question:

A 35-year-old lady presents to the GP surgery with heavy periods, which have been an issue for several years. She describes flooding through tampons regularly and often uses both pads and tampons. She often passes clots, which can be particularly painful. Her menstrual cycle is regular and she denies any intermenstrual or post-coital bleeding. The patient has no plans of becoming pregnant in the near future. She has no significant past medical history and takes no regular medication.

Abdominal and vaginal examination are unremarkable and vital signs are normal. A routine blood panel including FBC and TFTs is normal.

Which is the most appropriate first line management for menorrhagia according to NICE?

A. Oral progestogen

B. Tranexamic acid

C. Levonorgestrel intrauterine system

D. Copper coil

E. Combined oral contraceptive pill

Correct Answer:Levonorgestrel intrauterine system

Explanation:

This patient has a diagnosis of menorrhagia, given her description of regular heavy periods involving flooding of tampons, the use of tampons in addition to pads and the passage of clots. There are no features to suggest sinister pathology given the normal clinical examination and blood tests.

The most appropriate first-line management option for menorrhagia in this scenario is a levonorgestrel intrauterine system (LNG-IUS). The most commonly used LNG-IUS is the Mirena IUS. This is a long-term treatment and should be left in situ for at least 12 months to provide time for it to work. Studies show that women with menorrhagia reported more improvement in bleeding and quality of life with the LNG-IUS than with other treatments available in primary care. A Cochrane review found the LNG-IUS is more effective than oral treatments, resulting in greater reduction in bleeding, greater improvement in quality of life and is overall more acceptable long term.

If a LNG-IUS is declined or unsuitable, the following treatments can be considered:

Non-hormonal options: Tranexamic acid or an NSAID

Hormonal options: Combined oral contraceptive pill or a cyclical oral progestogen (i.e. oral norethisterone).

The copper coil is not used in the management of menorrhagia and may actually worsen menorrhagia symptoms, including increased blood loss and dysmenorrhoea.

Further reading:

https://patient.info/doctor/menorrhagia

Question:

A 30-year-old woman is seen in general practice with a 6-month history of gradually worsening diplopia and a gritty sensation in her eyes. The patient describes "seeing double", particularly when looking upwards. Tilting her head initially improved symptoms, but this has ceased to be effective. There is no headache, visual loss, vertigo or sensory/motor neurological deficit.

Cranial nerve examination:

The patient has a visible proptosis

CN II - visual acuity 6/12 in both eyes, colour vision intact; no gross visual field defects; pupils equal and reactive to light (PEARL); no gross optic disc or retinal defects on direct ophthalmoscopy

CN III, IV, VI - restricted abduction bilaterally; diplopia provoked by lateral, superior and saccadic eye movements; accommodation reflex intact; no visible horizontal or vertical nystagmus

Which of the following best describes the pathophysiology of this patient's condition?

A. Occlusion of the posterior cerebral artery by ruptured atherosclerotic plaque

B. Production of autoantibodies targeting post-synaptic ACh receptors

C. Age-related loss of macular photoreceptors

D. Production of thyroid-stimulating autoantibodies

E. Occlusion of the retinal artery by ruptured atherosclerotic plaque

Correct Answer:Production of thyroid-stimulating autoantibodies

Explanation:

This patient has a likely diagnosis of thyroid eye disease. This condition is also known as Graves ophthalmopathy, and 90% of cases occur in patients with underlying Graves disease (production of thyroid-stimulating autoantibodies causing hyperthyroidism). The underlying mechanism of disease is autoimmune destruction of the extra-ocular muscles, which causes symptoms relating to eye movement (e.g. diplopia, dizziness, falls), proptosis (bulging of the eyes) and rarely visual loss. Though symptoms of mild thyroid eye disease can be improved by treating the underlying cause i.e. managing thyroid dysfunction and smoking cessation, there is no known cure, and visual symptoms/aesthetics can cause long-term disability for the patient. Management of acute, severe disease is via systemic steroids, radiotherapy or decompression surgery.

Production of post-synaptic ACh receptor autoantibodies describes myasthenia gravis, an autoimmune disease which causes muscle fatiguability. While this can cause diplopia, the double vision would likely be provoked, e.g. the patient describes it occurring at the end of the day or after repeated blinking. The patient's sensation of grittiness is not accounted for by myasthenia gravis.

Occlusion of the retinal artery by ruptured atherosclerotic plaque describes central or partial retinal artery occlusion, which would cause a painless visual loss. It is highly unlikely to occur in both eyes simultaneously and does not present with extraocular muscle weakness as described here.

Occlusion of the posterior cerebral artery by ruptured atherosclerotic plaque describes an ischaemic stroke and is highly unlikely in this age group. The patient would present with a visual field defect and potentially motor/sensory/cerebellar symptoms.

Age-related loss of macular photoreceptors describes dry age-related macular degeneration (dry ARMD), which is highly unlikely in this age group.

Further reading:

https://rarediseases.org/rare-diseases/thyroid-eye-disease/

Question:

A 48-year-old woman presents to the GP following a week of worsening breathlessness, fatigue and yellowing of her eyes. Two weeks ago, she underwent an elective laparoscopic cholecystectomy complicated by postoperative bleeding. One unit of packed red cells was transfused.

On examination, her chest is clear. Her abdomen is soft and mildly tender, and the surgical wound is healing well. She is febrile at 38.0°C, but all other vital signs are stable.

Initial blood results show:

Haemoglobin: 75 g/L (115 – 165 g/ L)

Bilirubin: 55 μmol/L (<21 μmol/L)

Lactate dehydrogenase: 600U/L (240–480 U/L)

A peripheral blood film is requested.

What is the most likely finding of the blood film?

A. Target cells

B. Spherocytes

C. Schistocytes

D. Pencil cells

E. Nucleated red blood cells

Correct Answer:Spherocytes

Explanation:

Jaundice, anaemia, and a low-grade fever following a recent blood transfusion should always trigger consideration of a delayed haemolytic transfusion reaction (DHTR), even if the patient has undergone a cholecystectomy (which may also precipitate postoperative jaundice independently of haemolysis). When investigating suspected DHTR, spherocytes would be the main finding expected on blood film. DHTR results in extravascular haemolysis, where antibodies against the donor blood (often IgG anti-Rhesus D) bind to foreign red blood cells (RBCs). Each time these coated RBCs pass through the spleen, the antibodies are removed along with part of the cell membrane, eventually forcing the cell to spring out from its biconcave disk shape to form a spherocyte. This explains why spherocytes appear smaller than normal RBCs and lack the classical central pallor.

The presence of schistocytes is not specific for haemolysis and is not commonly seen unless RBCs are subject to some mode of major mechanical damage such as a mechanical heart valve or serious microangiopathic pathology like disseminated intravascular coagulation (DIC). Schistocytes are irregularly formed fragments of red blood cells.

Target cells (also known as codocytes) are not specific for haemolysis and may also be found in liver disease, thalassaemia and other haemoglobinopathies. Target cells are red blood cells with a dark centre, surrounded by a white ring and a dark outermost band. Target cells appear in conditions that cause the surface of the red cell to increase disproportionately to its volume. This may result from a decrease in haemoglobin, as in iron deficiency anaemia, or an increase in the cell membrane.

Nucleated red blood cells are immature red blood cells produced in the bone marrow. The presence of these in the peripheral blood indicates a problem with bone marrow function or integrity and may point towards malignant conditions such as leukaemia.

Pencil cells are elongated and hypochromic RBCs that are often considered pathognomonic of iron deficiency. These might point towards additional causes of anaemia in the patient but would not help reach a definitive diagnosis of DHTR.

Further reading:

https://geekymedics.com/blood-transfusion-osce-guide/

Question:

A 23-year-old male presents to the emergency department (ED) with a painful right shoulder after sustaining an injury playing rugby. It is found to be dislocated anteriorly. Before attempting reduction the ED registrar tests the sensation of the area of skin on the lateral aspect of the arm overlying the deltoid.

Which peripheral nerve, examined by the registrar, is most likely to have been damaged by this injury?

A. Long thoracic nerve

B. Axillary nerve

C. Radial nerve

D. Musculocutaneous nerve

E. Ulnar nerve

Correct Answer:Axillary nerve

Explanation:

The axillary nerve, root C5/6, comes from the posterior cord of the brachial plexus and innervates the deltoid, providing abduction of the arm. It also facilitates sensation to the 'regimental badge patch' on the lateral aspect of the upper limb. Shoulder dislocation is a relatively common cause of axillary nerve injury and thus function should be examined before and after attempting reduction.

The radial nerve provides sensation to the dorsolateral arm and forearm. It innervates the triceps, extensor digitorum and abductor pollicis longus muscles allowing extension at the elbow and fingers and abduction at the thumb. The long thoracic nerve innervates the serratus anterior muscle; a deficit in this causes 'winging' of the scapula.

The musculocutaneous nerve provides sensation to the lateral forearm and innervates the biceps, allowing flexion at the elbow. The median nerve allows flexion and abduction of the wrist, flexion of the distal phalanx of the thumb, flexion of the distal phalanx of the index and middle fingers, pronation of the forearm and opposition of the thumb.

Further reading:

https://patient.info/doctor/neurological-examination-of-the-upper-limbs

Question:

An 18-year-old man is brought into the hospital by ambulance after being hit in the side of the head and losing consciousness during a football match. Although he regained consciousness soon after, an ambulance was called as he now appears to be developing progressive confusion.

Basic observations demonstrate a raised blood pressure and low heart rate. His GCS is currently 14/15. He appears to be struggling to breathe, with deep and irregular breathing. He is confused and disorientated. Neurological examination reveals reduced power in all four limbs and hyperreflexia.

An extradural haemorrhage is suspected, and an urgent CT head is requested.

What is the most likely finding on the CT head?

A. Crescentic-shaped hyperdensity between the inner dura mater and arachnoid mater

B. Crescentic-shaped hyperdensity between the outer and inner dura mater

C. Lens-shaped hyperdensity between the cranium and the outer dura mater

D. Crescentic-shaped hyperdensity between the cranium and outer dura mater

E. Lens-shaped hyperdensity between the outer and inner dura mater

Correct Answer:Lens-shaped hyperdensity between the cranium and the outer dura mater

Explanation:

The most likely finding on CT scan is a lens-shaped hyperdensity between the cranium and the outer dura mater. Extradural haemorrhage typically occurs following a rupture of the middle meningeal artery that lies in the temporal region beneath the pterion where the frontal, parietal, sphenoid and temporal bones merge. As the bleed is arterial, blood quickly accumulates in the potential space lying beneath the cranium and can cause ‘mass effect’ – leading to midline shift and possibly brainstem herniation if the bleed is not evacuated urgently.

A crescentic-shaped hyperdensity would not occur as the bleed is limited by the suture lines of the skull. Subdural haemorrhages will appear crescentic-shaped on non-contrast CT scans because they are not limited by the suture lines; however subdural bleeds occur between the inner dura mater and the cerebrum.

Subdural haemorrhage would cause a crescentic shaped hyperdensity between the inner dura mater and arachnoid mater.

Further reading:

https://geekymedics.com/extradural-haematoma-overview/

Question:

A 65-year-old woman attends an appointment at a Gynaecology Outpatient clinic due to a problem with her vulval region. She describes that certain areas of her vulva appear paler and thickened compared to surrounding areas. These areas of thickened skin are also associated with intense itchiness. On further questioning, she also suffers from vitiligo on her forearms and recalls that her mother suffered from a similar set of symptoms. On examination, pale and thickened skin on the patient’s labia minora and clitoral hood are noted, with no vaginal mucosal involvement.

What is the GOLD STANDARD therapy for this condition?

A. Topical calcineurin inhibitors

B. Phototherapy

C. Methotrexate

D. Topical steroids

E. Oral retinoids

Correct Answer:Topical steroids

Explanation:

The most likely diagnosis, in this case, is lichen sclerosis (a.k.a. lichen sclerosus et atrophicus). The gold standard management for this condition is topical steroids. A very potent topical steroid is often prescribed as first-line therapy (e.g. clobetasol propionate). In conjunction with this treatment, other conservative measures are often used, including washing the affected area a couple of times per day with water, avoiding restrictive clothing, prompt management of incontinence if present and the application of emollients to alleviate the itch.

Oral retinoids are not appropriate in this case. They may be used in this condition if all previous topical management has failed, but certainly not as first-line therapy.

Methotrexate is not appropriate in this case. It may be used in this condition if all previous topical management has failed, but certainly not as first-line therapy.

Topical calcineurin inhibitors (e.g. tacrolimus) may be used to treat lichen sclerosis, but not as first-line therapy. This topical therapy may be used after topical steroids have been trialled and failed or in conjunction with them.

Phototherapy is considered an experimental treatment for lichen sclerosis at this time.

Further reading:

https://www.dermnetnz.org/topics/lichen-sclerosus/

Question:

A 62-year-old female cleaner presents to her General Practitioner with a 10-month history of worsening inflammation on the hands. She reports her symptoms are worse during periods of prolonged use of detergents. On examination, the hands are extremely dry with an erythematous rash between the finger webs and on the finger pulps with fissuring evident in the skin.

Which of the following is the most likely diagnosis?

A. Irritant contact dermatitis

B. Gottron’s papules

C. Acrodermatitis continua

D. Allergic contact dermatitis

E. Atopic eczema

Correct Answer:Irritant contact dermatitis

Explanation:

Irritant contact dermatitis and allergic contact dermatitis are difficult to differentiate and therefore patch testing is usually always required to exclude allergic contact dermatitis. Irritant contact dermatitis is more common and can occur in anyone following enough prolonged exposure to an irritating agent such as detergents (cleaners), shampoos (hairdressers) and soap and water (healthcare workers). Allergic contact dermatitis, on the other hand, can occur rapidly after the second exposure to an allergen causing activation of specially sensitised T-cells resulting in local inflammation.

Atopic eczema usually presents in childhood and you would look for clues in the history for other atopic conditions such as hay fever and asthma.

Acrodermatitis continua is a rare form of pustular psoriasis affecting the fingers and nails.

Gottron’s papules are bluish-red papules which erupt on the dorsal aspect of the hands in patients with dermatomyositis.

Further reading:

https://www.dermnetnz.org/topics/irritant-contact-dermatitis/

Question:

A 25-year-old man is admitted to A&E by ambulance after being found in a distressed and semi-conscious state by his mother. He has a history of severe depression and says that he has taken an overdose of something, however, he too confused to tell you what he has taken.

On examination, he appears distressed with a respiratory rate of 35, temperature of 38.5 oC, heart rate of 90 and blood pressure of 128/90 mmHg. He is also complaining of ringing in his ears and has vomited twice since arriving.

You take an arterial blood gas which shows the following:

pH 7.15

PCO2 3.8

pO2 12

HCO3- 14

Cl- 96

Na+ 138

K+ 4.2

Which of the following treatment options is most appropriate for this patient?

A. Desferrioxamine

B. Naloxone

C. Sodium bicarbonate

D. N-acetylcysteine

E. Flumazenil

Correct Answer:Sodium bicarbonate

Explanation:

The arterial blood gas (ABG) shows a raised anion gap metabolic acidosis. His anion gap is 32.2, calculated by: (138 + 4.2) – (14 + 96). Knowing whether the anion gap is raised or normal in metabolic acidosis helps distinguish the cause. If the gap is raised, the causes include ketoacidosis, uraemia, salicylates, methanol, aldehyde, lactic acidosis and ethylene glycol (KUSMALE). Judging from the clinical features and ABG, this patient is most likely to have taken a salicylate overdose, so sodium bicarbonate is the most appropriate management choice (to be commenced by a senior doctor).

Aspirin overdose will first cause respiratory alkalosis due to its stimulatory effect on the respiratory centre, and later metabolic acidosis due to build-up of lactate.

Toxidromes and antidotes commonly appear in finals. Naloxone is the antidote for opiate overdose. Features of opiate overdose include respiratory depression and pinpoint pupils.

N-acetylcysteine is used for paracetamol overdose. There are not many early clinical signs except vague abdominal pain and nausea.

Desferrioxamine is used for iron overdose. Clinical features include nausea, vomiting and black stool, eventually followed by hepatorenal failure.

Flumazenil is used for benzodiazepine overdose. This would present with impaired balance and motor function, respiratory depression and eventually hypoxaemia and reduced GCS.

Further reading:

https://lifeinthefastlane.com/ccc/salicylate-poisoning/

Question:

A 25-year old caucasian woman presents to A+E complaining of a 12-hour history of redness, severe photophobia, and pain in her left eye. On examination, the conjunctiva of the eye is injected and slit-lamp assessment reveals a cloudy anterior chamber. Visual acuity is normal.

Given the likely diagnosis, what is the most likely underlying aetiology?

A. Seronegative arthropathy

B. Systemic lupus erythematosus (SLE)

C. Rheumatoid arthritis (RA)

D. Idiopathic

E. Acute closed-angle glaucoma

Correct Answer:Idiopathic

Explanation:

The history and findings on clinical assessment are typical of anterior uveitis. The cloudy appearance of the anterior chamber is caused by inflamed vessels leaking protein into the normally clear aqueous. White or red blood cells may also sometimes be observed within the anterior chamber. Roughly 40% of cases of anterior uveitis have no known cause (idiopathic), followed by seronegative arthropathies associated with HLA-B27.

Anterior uveitis tends not to be associated with rheumatoid arthritis in adults and seldom occurs in isolation in SLE.

Idiopathic anterior uveitis is treated with topical steroids and mydriatics (e.g. cyclopentolate) after an infection has been ruled out by an ophthalmologist.

Acute closed-angle glaucoma also presents with eye pain, redness, and photophobia however this occurs in a much older age group and there are no examination findings of corneal oedema or increased intraocular pressure. The severe photophobia and normal visual acuity present in this case are more consistent with anterior uveitis.

Further reading:

https://patient.info/doctor/uveitis-pro

Question:

A 24-year-old man presents to the emergency department after a fall from his bicycle. He has vomited three times since the accident and has no memory of what happened. On examination, he appears confused, but his eyes are opening spontaneously, and he can follow commands. He has a past medical history of haemophilia.

What feature would indicate the need for a CT head within 1 hour?

A. GCS <14 on initial assessment in the emergency department

B. Dangerous mechanism of injury (e.g. road traffic accident)

C. More than 1 episode of vomiting

D. More than 30 minutes retrograde amnesia immediately before the head injury

E. History of bleeding or clotting disorder

Correct Answer:More than 1 episode of vomiting

Explanation:

This question is about the NICE guidelines surrounding the imaging post head injury.

Indications for a CT head to be performed within 1 hour:

Initial assessment of GCS <13 in the emergency department

GCS <15 at 2 hours after the initial assessment

More than one episode of vomiting

Any sign of basal skull fracture (Battle’s sign, CSF leakage from ear or nose, panda eyes)

Post-traumatic seizure

Focal neurological deficit

Suspected open or depressed skull fracture

Indications for a CT head to be performed within 8 hours:

Age > 65years

History of bleeding or clotting disorder

Dangerous mechanism of injury

More than 30 minutes retrograde amnesia immediately before the head injury

Further reading:

https://www.nice.org.uk/guidance/cg176/chapter/1-Recommendations#investigating-clinically-important-brain-injuries

Question:

A 75-year old man is admitted with a six-day history of reduced oral intake and urine output on a background of a recent viral illness. His family report that he has fainted several times that day and has not passed any urine in 24 hours. He has a past medical history of hypertension, which is treated with ramipril. The triage nurse reports his heart rate as 30 bpm.

Which electrolyte abnormality is most likely to be responsible for his bradycardia?

A. Hyponatraemia

B. Hyperkalaemia

C. Hypokalaemia

D. Hypernatraemia

E. Hypercalcaemia

Correct Answer:Hyperkalaemia

Explanation:

Hyperkalaemia depresses cardiac conductivity. This can cause bradycardia via reduced sinoatrial node function, or via reduced atrioventricular conduction (i.e. heart block). In severe cases, it can cause asystole. In this case, the patients’ dehydration and ACE inhibitor have most likely resulted in an acute kidney injury and secondary hyperkalaemia.

Hypokalaemia causes cardiac hyperexcitability and is more likely to cause re-entrant tachycardias such as ventricular tachycardia/fibrillation or atrial fibrillation/flutter.

Hypernatraemia/hyponatraemia have little influence on cardiac conduction and tend to present with neurological problems such as lethargy/confusion/coma/seizures.

Hypercalcaemia reduces the QT interval and can progress to ventricular fibrillation when severe. It does not cause bradycardia. It has a finite number of causes, none of which this patient seems to have.

Further reading:

https://geekymedics.com/hyperkalaemia/

Question:

A 62-year-old male is brought to the doctor by his wife due to his increasingly strange behaviour over the last 6 months. His wife states that he has become increasingly apathetic towards her. Additionally, there have been recent complaints by other women that he has been making sexual advances towards them. The wife also states that her husband been getting lost on the way home from work.

The patient has no past medical or family history.

What is the most likely diagnosis?

A. Normal-pressure hydrocephalus

B. Vascular dementia

C. Lewy body dementia

D. Frontotemporal dementia

E. Alzheimer's disease

Correct Answer:Frontotemporal dementia

Explanation:

This patient has presented with apathy, personality changes and disinhibition at a relatively young age – this is consistent with the diagnosis of frontotemporal dementia (FTD). FTD is a form of dementia associated with the above findings and frontotemporal atrophy on neuroimaging. This disease presents in younger patients with marked personality changes and typically has a poor prognosis.

Vascular dementia is more likely to be associated with a stepwise decline in cognitive function in older patients who tend to have vascular risk factors such as hypertension and diabetes mellitus.

Alzheimer's disease typically presents with early memory impairment in older patients with preserved consciousness. Frontal lobe dysfunction is more likely to be seen in patients with FTD.

Lewy body dementia is more likely to present with psychotic symptoms such as delusions, Parkinsonian symptoms and fluctuating levels of consciousness.

Normal-pressure hydrocephalus classically presents with the triad of gait abnormalities, urinary incontinence and dementia. It is unlikely to be the underlying diagnosis in the above question.

Further reading:

https://patient.info/doctor/frontotemporal-dementia

Question:

A 25-year-old man is brought to the emergency department by a friend after collapsing. A collateral history is taken. His friend describes twitching that began in his right hand before moving to the rest of his arm and progressing into jerking movements. The movements worsened until they could no longer be controlled but lasted for a few minutes, and he remained conscious throughout. He has no past medical history

On examination, power is 1/5 in the right arm and 5/5 in the left. Sensation is intact across all upper limb dermatomes

Given the likely diagnosis, where is the most likely site of pathology?

A. Cerebellum

B. Frontal lobe

C. Parietal lobe

D. Occipital lobe

E. Temporal lobe

Correct Answer:Frontal lobe

Explanation:

Frontal lobe is correct. This patient has signs and symptoms of a focal seizure. Seizures can be localised based on their features. The history of clinic (jerking) movements starting a distal extremity before moving proximally is suggestive of a feature known as a Jacksonian march. There is also the presence of post-ictal weakness (known as Todd's paresis). The presence of both of these suggests that the seizure has originated from the frontal lobe.

Cerebellum is incorrect. Seizures are unlikely to emerge from the cerebellum itself. Features seen in cerebellar impairment can be remembered using the mnemonic 'DANISH' - dysdiadochokinesia, ataxia, nystagmus, intention tremor, slurred staccato speech, and hypotonia. These features are not present in this patient.

Occipital lobe is incorrect. Seizures that originate from the occipital lobe would cause visual disturbances such as flashes, floaters, or lines in the vision. This patient does not have any features of visual disturbance.

Parietal lobe is incorrect. Seizures originating in the parietal lobe usually present with sensory symptoms such as paraesthesias, dizziness, or even hallucinations. This patient does not have any of these features.

Temporal lobe is incorrect. Seizures originating in the temporal lobe usually present with hallucinations, deja vu, a rising feeling in the stomach, or automatisms such as lip-smacking, or acting as if they are 'on autopilot'. This patient does not have any of these features.

Further reading:

https://pn.bmj.com/content/21/6/481

Question:

A 70-year-old woman presents to her GP due to persistent issues with frequent urination and feeling bloated. More recently, she has noticed pain during intercourse and a loss of appetite.

She has no relevant medical history of note, except for a family history of breast cancer, which affected both her mother and sister.

The GP performs an abdominal and pelvic examination, which reveal no ascites or masses. Before requesting an ultrasound of the abdomen and pelvis, the GP orders a specific blood test.

Which of the following investigations would be most appropriate to request?

A. CA 125

B. CA 19-9

C. Carcinoembryonic antigen (CEA)

D. Alpha-fetoprotein (AFP)

E. Human chorionic gonadotropin (hCG)

Correct Answer:CA 125

Explanation:

A serum CA 125 level would be the most appropriate to request in this case, as the patient’s clinical presentation is suspicious for ovarian cancer (age, symptoms and family history). Examination of the abdomen and pelvis should be performed, and if the patient has ascites or a mass, an urgent 2-week-wait referral should be made. If the examination is normal, serum CA 125 levels should be measured to determine the need for an ultrasound scan.

CA 125 levels can also be raised in endometriosis, menstruation, pregnancy, and pelvic inflammatory disease.

CA 19-9 is elevated in most patients with advanced pancreatic cancer and can be used to monitor response to treatment.

hCG is produced in pregnancy by the placenta. Its levels are raised in placental cell disorders, ranging from benign molar pregnancies to malignant conditions such as choriocarcinoma. hCG levels can also be elevated in testicular cancer.

CEA is not normally present in the bloodstream but may be elevated in bowel cancer.

AFP is raised in most patients with hepatocellular carcinoma. It can be also be elevated in patients with testicular cancer.

Further reading:

https://cks.nice.org.uk/topics/ovarian-cancer/

Question:

A 76-year-old man presents to his general practitioner with a 3-month history of joint pains affecting his hands. He states that the pain occurs throughout the day and medications like ibuprofen provide minimal relief. He also states that he has had some mild upper quadrant abdominal pain for the last 2 weeks which is not related to activity or eating. He denies trauma. His wife states that she has noticed that he is also more tanned than usual. He has no past medical or surgical history.

Liver function tests are ordered which are significant for a small increase in transaminases.

What is the most likely cause of death in patients with this underlying diagnosis?

A. Congestive heart failure

B. Bladder cancer

C. Non-Hodgkin lymphoma

D. Medullary thyroid carcinoma

E. Hepatocellular carcinoma

Correct Answer:Hepatocellular carcinoma

Explanation:

This patient’s clinical presentation of arthritis, a tanned appearance and elevated liver enzymes is suggestive of haemochromatosis. Haemochromatosis is an autosomal recessive disease characterised by excessive iron absorption. Excess iron accumulates and causes the most commonly affected organs (liver, pancreas, heart, joints and skin) to undergo fibrosis. Most patients have a non-specific presentation. Laboratory markers are usually significant for elevated transaminases, elevated serum iron, ferritin and low total iron-binding capacity. Diagnosis is typically achieved through a liver biopsy. The most common cause of death in these patients is hepatocellular carcinoma.

Although patients with hemochromatosis are at increased risk of congestive heart failure (CHF), it is not the most likely cause of death in these patients. CHF is the most common cause of death in patients with acromegaly.

Smoking, aniline dye exposure and chronic use of cyclophosphamide increase the risk of being diagnosed from transitional cell bladder cancer. Patients classically present with painless haematuria.

Non-Hodkin lymphoma (NHL) is associated with conditions such as Sjogren’s syndrome and Hashimoto thyroiditis. There is no association of NHL with haemochromatosis.

Medullary thyroid carcinoma is more likely to be seen in patients who have a history of multiple endocrine neoplasia 2A or 2B.

Further reading:

https://patient.info/doctor/hereditary-haemochromatosis

Question:

A 60-year-old man presents to the emergency department with a two-day history of severe abdominal pain. The pain began insidiously and has progressively worsened. He also complains of decreased appetite, nausea and one episode of vomiting. He has not had a bowel movement or passed gas since the pain began. Previous medical history is significant for an appendicectomy and cholecystectomy.

Vital signs are as follows:

Temperature: 37.8°C

Blood pressure: 136/83 mmHg

Pulse: 85 bpm

Respiratory rate 19/min

SpO2 96% on air

Abdominal exam is significant for diffuse tenderness, moderate distension and hyperactive bowel sounds. Placement of a nasogastric (NG) tube returns approximately 650ml of bilious gastric contents. Intravenous (IV) access is obtained and fluids are started.

What is the definitive management option?

A. Exploratory laparotomy

B. Colonoscopy

C. IV antibiotics

D. Continued observation

E. Exploratory laparoscopy

Correct Answer:Exploratory laparotomy

Explanation:

This patient has developed a small bowel obstruction (SBO), likely due to adhesions from his prior abdominal surgery. Other common causes of SBO include hernias and neoplasms. Symptoms of SBO include crampy abdominal pain, nausea, vomiting and an inability to pass flatus or stool. Clinical examination typically demonstrates abdominal tenderness, distension and tinkling bowel sounds. If small bowel obstruction is left untreated, secondary bowel perforation can develop, leading to peritonitis and intrabdominal sepsis.

Abdominal X-ray and CT abdomen typically demonstrate dilated loops of bowel, air-fluid levels and sometimes a transition point. Partial SBO can often be managed non-surgically by performing nasogastric (NG) tube decompression, administering IV fluids and keeping the patient nil by mouth (NBM). Patients with a complete SBO (as in this case), perforation or prolonged partial bowel obstruction should undergo exploratory laparotomy for definitive surgical management.

Complete SBO is managed surgically with an exploratory laparotomy, not an exploratory laparoscopy. Some surgeons have investigated the use of laparoscopy to help remove adhesions in patients that have undergone prior abdominal surgery, but the gold-standard treatment is an exploratory laparotomy.

IV antibiotics are not used for the definitive treatment of uncomplicated SBO. However, antibiotics would be indicated alongside laparotomy if there were signs of perforation with peritonitis. These symptoms include diffuse abdominal pain, rebound tenderness, fever, haemodynamic instability and free air visualised on imaging.

Continued observation and conservative management would be indicated for stable patients with partial SBO. This patient likely has complete SBO with secondary perforation and therefore requires active treatment.

A colonoscopy can be used to decompress a sigmoid volvulus, but it is not indicated in the acute management of patients with SBO. This patient also has non-feculent NG output, suggesting a proximal site of obstruction.

Further reading:

https://patient.info/doctor/intestinal-obstruction-and-ileus

Question:

A 58-year-old man with metastatic prostate cancer presents to the emergency department with constipation, vomiting, abdominal pain and excessive urination. His wife says that he has become increasingly confused and has complained of increased thirst.

What investigation will reveal the likely diagnosis?

A. Bone profile

B. Urea and electrolytes

C. Full blood count

D. Chest x-ray

E. Blood cultures

Correct Answer:Bone profile

Explanation:

This case demonstrates hypercalcaemia of malignancy. Hypercalcaemia typically presents with the four features of 'bone, stones, abdominal moans and psychiatric groans.' These are bone pain, renal stones, abdominal pain and confusion/depression. In addition, constipation, polyuria, polydipsia, weight loss and weakness are other common features. A bone profile would provide the corrected calcium, phosphate, albumin and alkaline phosphatase.

The other investigations would not aid in the diagnosis of hypercalcaemia.

Further reading:

https://geekymedics.com/hyperkalaemia/

Question:

A 47-year-old woman presents to her GP with a history of constant abdominal pain, fever and lethargy. On examination, she is tender in the right upper quadrant and elicits a positive Murphy's sign. There is no guarding on examination, and she does not appear to be jaundiced.

What is the most likely diagnosis?

A. Gastro-oesophageal reflux disease

B. Acute pancreatitis

C. Acute cholecystitis

D. Cholangitis

E. Biliary colic

Correct Answer:Acute cholecystitis

Explanation:

Acute cholecystitis is characterised by constant pain in the right upper quadrant (RUQ) alongside signs of inflammation, such as fever or lethargy. On examination, patients will be tender in the RUQ and may elicit a positive Murphy's sign (indicates an inflamed gallbladder). To elicit Murphy's sign, apply pressure in the RUQ whilst asking the patient to inspire. If Murphy's sign is positive, there will be a sudden halt in inspiration due to the pain, and the patient will not be reciprocated on palpation of the LUQ. Patients are usually not jaundiced. The lack of guarding in this patient indicates that the gallbladder is unlikely to be perforated.

Biliary colic is characterised by colicky pain in the RUQ, usually after consuming foods rich in fat. Patients will not present with any signs of inflammation, such as fever or lethargy, and are usually not jaundiced. On examination, patients may often be asymptomatic, especially if they have not eaten recently or if they have taken painkillers.

Cholangitis is characterised by Charcot's triad (RUQ pain, signs of inflammation such as fever, and jaundice). On examination, patients may also be confused or hypotensive. In addition, patients may also have pruritus (itching) due to the accumulation of bile within the biliary tract.

Gastro-oesophageal reflux disease (GORD) is characterised by burning retrosternal chest pain, exacerbated by eating or lying down. Examination of patients with GORD is usually unremarkable. It is important to treat GORD effectively, as it can lead to Barrett's oesophagus if the symptoms are not controlled.

Acute pancreatitis is characterised by severe epigastric pain accompanied by nausea and vomiting. Patients will usually have epigastric tenderness on examination. Clinical signs to be aware of are Cullen's sign (bruising around the umbilicus) and Grey Turner's sign (bruising around the flanks), both indicating retroperitoneal haemorrhage.

Further reading:

https://patient.info/doctor/gallstones-and-cholecystitis

Question:

A 24-year-old female presents to her GP for a routine occupational health check. All of her blood tests are normal, apart from her hepatitis serology which reveals she is positive for HBsAg. She denies any intravenous drug use and has not engaged in any high-risk sexual behaviour. Further testing is negative for IgM anti-HAV, anti-HBc, and anti-HCV. She is advised to have a repeat test in 6 months, which reveals the same result.

What is the most likely explanation for this?

A. She is a Hepatitis B carrier

B. She will develop chronic Hepatitis B

C. She has acute Hepatitis B

D. She has been vaccinated against Hepatitis B

E. She has a high chance of passing on Hepatitis B to others

Correct Answer:She is a Hepatitis B carrier

Explanation:

This patient is a carrier for hepatitis B as she has had HBsAg > 6 months. HBsAg is detected during the first 3-5 weeks after being infected, and persistence of this defines carrier status (occurs in 5-10% of cases).

HBeAg denotes infectivity, and the status of this is not known in this scenario hence it can’t be deduced whether the patient is infective or not. HBeAg is usually present for 1½-3 months after the acute illness.

Antibodies to hepatitis B core antigen (HBcAg) - i.e. anti-HBc - imply past infection and antibodies to HBsAg - i.e. anti-HBs - alone imply previous hepatitis B vaccination.

Further reading:

https://patient.info/doctor/hepatitis-b-pro

Question:

An 80-year-old woman presents to her general practitioner with a 2-day history of dysuria. She has not noticed any haematuria but has noticed bubbles in her urine and that it makes a "strange noise" when she passes water. This is her fourth urinary tract infection in 6-months. She has a past medical history of asthma and diverticular disease and has been admitted with acute diverticulitis three times in the past 2-years.

What is the most likely cause of this lady's frequent urinary tract infections?

A. Colovesicular fistula

B. Vesicoureteral reflux

C. Colovaginal fistula

D. Abscess

E. Anal fissure

Correct Answer:Colovesicular fistula

Explanation:

Colovesicular fistulae is an abnormal connection between the bowel and bladder and can be a complication of diverticular disease. This is commonly seen in patients with frequent flare-ups of diverticular disease or complicated diverticulitis. It often presents with pneumaturia, pyuria, frequent urinary tract infections, and even faecaluria.

Colovaginal fistulae are abnormal connections between the bowel and vagina. While still a complication of diverticular disease, it is less common and would usually present with frequent vaginal infections and copious vaginal discharge that may have some faeces.

Abscesses would cause systemic upset, pain in the affected area, and even sepsis in severe cases.

Anal fissures cause severe pain on defecation but do not cause pneumaturia and frequent urinary tract infections.

Vesicoureteral reflux is usually a condition seen in young children that can also cause frequent urinary tract infections as well as renal impairment due to urine flowing backward from the bladder up the ureters. However, it is unlikely to cause pneumaturia. The age and past medical history of diverticular disease make a colovesicular fistula more likely.

Further reading:

https://patient.info/doctor/diverticular-disease

Question:

You are asked to review an 8-year-old boy who has been brought to the emergency department by his father. He has noticed a rapidly spreading patch of painful eczema on his son's face over the last 5 days and when asked mentions that the child's mother had some cold sores around 2 weeks ago. On examination, you notice an erythematous rash around the child's mouth and the presence of pus-filled blisters.

What is the most likely diagnosis?

A. Drug eruption

B. Eczema herpeticum

C. Cellulitis

D. Atopic eczema

E. Impetigo

Correct Answer:Eczema herpeticum

Explanation:

The correct answer is eczema herpeticum. This patient is likely to have eczema herpeticum given the history of atopic eczema with probable exposure to herpes simplex virus from his mother recently. The rash typically has monomorphic, punched-out blisters. The patient should be admitted to hospital for intravenous (IV) aciclovir.

A flare-up of atopic eczema is possible in this patient given he has a history of it. However, the history given by his father of a rapidly spreading area of painful eczema following exposure to herpes simplex virus makes eczema herpeticum much more likely.

Cellulitis would be more likely to occur in the limbs, particularly the lower limbs. Additionally, it typically presents as an erythematous, swollen area without blisters.

Drug eruptions can present in many different ways and this is an important differential for eczema herpeticum. However, the lack of any new medications in the history makes this unlikely.

Impetigo is another important differential to rule out as it is highly contagious. However, the lesions around the mouth would typically be golden, crusted lesions as opposed to the punched-out blisters seen in this patient.

Further reading:

https://dermnetnz.org/topics/eczema-herpeticum

Question:

A 45-year-old woman comes to see her general practitioner complaining of poor vision, particularly at night. She has also noticed that colours seem less vivid, with the symptoms starting around 3 months ago and gradually worsening. She has no eye pain, photophobia, discharge, or redness. She has a past medical history of Crohn's disease, lupus, and alopecia. She takes azathioprine, hydroxychloroquine, and regular paracetamol.

What is the most likely diagnosis?

A. Episcleritis

B. Azathioprine side effect

C. Retinitis pigmentosa

D. Anterior uveitis

E. Hydroxychloroquine side effect

Correct Answer:Hydroxychloroquine side effect

Explanation:

Hydroxychloroquine side effect - the patient is taking hydroxychloroquine for systemic lupus erythematous. It is first-line for lupus and is generally well-tolerated. However, it can cause retinal toxicity and even blindness. Patients taking hydroxychloroquine require regular monitoring after taking the medication for 5 years or a dose greater than 5mg/kg.

Azathioprine is known to cause photophobia but is not known to cause retinopathy or other visual symptoms.

Anterior uveitis can cause visual symptoms and is associated with autoimmune conditions such as Crohn's and anterior uveitis. However, it usually presents acutely with photophobia, pain, eye redness, tearing and a small irregular pupil which this patient doesn't have.

Episcleritis is often idiopathic but can be associated with autoimmune conditions. However, it does not usually cause visual problems and presents with eye redness and grittiness.

Retinitis pigmentosa is a genetic condition that results in night blindness, peripheral vision loss, and eventually central vision loss. It usually starts in childhood.

Further reading:

https://bnf.nice.org.uk/drug/hydroxychloroquine-sulfate.html

Question:

During a routine GP appointment for vaccinations, a 30-year-old man is noticed to have tall stature, wide arm span and pectus excavatum. He has also been treated in the past for a dislocated lens in his right eye. Similar features seem to be prominent in his family history. His GP is concerned that he may be at risk of certain related complications.

Which of the following investigations is most important to regularly monitor for complications related to likely underlying condition?

A. ECG

B. Echocardiography

C. MRI abdomen

D. Chest X-ray

E. Spirometry

Correct Answer:Echocardiography

Explanation:

Judging from the features in the question, this gentleman is likely to have Marfan’s syndrome. Other features of this connective tissue disorder include high arched palate, arachnodactyly (long slender fingers), scoliosis, pes planus (flat feet), joint hypermobility and others.

The correct answer is echocardiography. Regular echocardiograms are important to monitor the size of the aorta because these patients develop aortic dilation and are at risk of aortic dissection.

ECG monitoring would not be useful because the syndrome does not cause long-term ECG changes (although ECG changes may be seen in acute aortic dissection).

Patients with Marfan’s are at more risk of pneumothorax, so chest X-ray may be useful if pneumothorax is suspected, but has no role in regular monitoring. There is no justification for regular spirometry.

MRI abdomen could be useful because these patients are at more risk of abdominal aortic aneurysm, but there is no recommendation for this to be performed regularly.

Further reading:

https://patient.info/doctor/marfans-syndrome-pro

Question:

An 18-year-old patient presents to the GP, concerned about stretch marks that have developed on his back. He reports having grown significantly over the last year and is now significantly taller than the rest of his family. He puts this down to a 'growth spurt', but is concerned that the presence of striae may indicate that he is growing too fast; having been shown a picture of the skin lesions, he believes them to be unsightly. The patient denies any headache, visual changes or neurological features, and has not noticed any other changes in his appearance.

The patient describes no past medical history other than recurrent lens dislocation which has been managed surgically. There is no family history of sudden growth, nor any other relevant medical conditions. On examination, the patient has a BMI of 18, with a slender frame; the patient exhibits no sign of coarsening facial features. The only other finding on examination of the other organ systems is the presence of a murmur; this is heard in late systole and is accompanied by an opening snap.

The GP makes the decision to refer the patient to secondary care, where genetic testing is used to confirm that the patient's symptoms are due to an underlying inherited syndrome.

Given the likely cause of the patient's symptoms, which of the following tools is most likely to have been used to help make the diagnosis?

A. Dandy criteria

B. Finderstein criteria

C. Amsel criteria

D. Ghent nosology

E. Lukawe criteria

Correct Answer:Ghent nosology

Explanation:

The most likely diagnosis, in this case, is Marfan syndrome; an autosomal dominant condition caused by a mutation in the fibrillin 1 gene; the characteristic presentation is a tall, thin individual, with a low BMI and arachnodactyly. Striae are relatively commonly seen in those with the condition. This is not a completely typical presentation, as there is no family history of the condition; however, approximately 25% of patients with Marfan syndrome develop the disease due to a de novo mutation, which is the likely explanation in this case.

A number of features of the history alongside the patient's physical appearance point toward Marfan as the probable diagnosis; lens dislocation, referred to medically as ectopia lentis is a common complication, as is mitral valve prolapse, which is the murmur most likely to be represented by the auscultation findings. Hypermobility, dural ectasia, kyphoscoliosis and chest wall deformities are all also possible in those with the condition.

The Ghent nosology is a set of criteria that can assist in the diagnosis of Marfan syndrome - this takes into account the aortic root diameter, the presence of ectopia lentis, whether fibrillin 1 gene mutation has been detected, as well as a general systemic feature score to determine whether a diagnosis of the condition can be confirmed.

The Dandy criteria are used to help to make a diagnosis of idiopathic intracranial hypertension, whilst the Amsel criteria can be utilised in the setting of suspected bacterial vaginosis.

Neither the Finderstein nor the Lukawe criteria are recognised diagnostic tools in medicine.

Further reading:

https://patient.info/doctor/marfans-syndrome-pro

Question:

The on-call paediatric consultant is bleeped to see a 1-day-old baby after concerns were raised by the doctor who carried out the infant's newborn physical examination. There were no concerns raised at the birth itself, and the delivery was via a successful Caesarian section. However, on examining the child, the doctor noted a pansystolic murmur, heard loudest in the fourth intercostal space at the left sternal edge. A repeat examination by the consultant elicited the same findings, and the child now appears unwell and slightly cyanosed.

An urgent echocardiogram is performed; this is reported as demonstrating 'atrialisation of the right ventricle', with abnormalities of the tricuspid valve. The consultant informs the mother that the condition can often be treated surgically, although he warns her that there is the potential for complications later in life.

Which of the following complications is most commonly associated with the likely diagnosis?

A. Risk of long-term mitral stenosis

B. Increased risk of Wolff-Parkinson-White syndrome

C. Aortic root dilatation

D. Pulmonary hypertension

E. Increased frequency of rheumatic fever

Correct Answer:Increased risk of Wolff-Parkinson-White syndrome

Explanation:

The most likely diagnosis, in this case, is Ebstein's anomaly; a form of congenital heart defect that involves abnormal displacement of the posterior and septal leaflets of the tricuspid valve. This may result in the murmur of tricuspid regurgitation, as well as possibly a third or fourth heart sound. The classic echocardiography finding is of 'atrialisation of the right ventricle' due to this abnormality. The condition is most commonly linked to lithium exposure in-utero; this is most likely in mothers who are being treated for bipolar disorder, with the drug being used as a mood stabiliser in this condition. Ebstein's anomaly often presents early in life; it may or may not be accompanied by a second defect allowing for right-to-left shunting, which will cause cyanosis. Symptoms may be simply those of heart failure in children, such as sweating when feeding, fatigue, and recurrent infections.

The management of the condition will depend upon the degree of abnormality of the valve, severity of the disease, presence or absence of cyanosis, and severe regurgitation through the valve. Severe disease may require surgical repair. Ebstein's anomaly can often be associated with the presence of accessory electrical conduction pathways within the heart which can result in Wolff-Parkinson-White syndrome in affected patients. As with any congenital heart lesion, there is a risk of other classical complications of so-called 'grown-up congenital heart disease'; these can include:

Congestive heart failure

Polycythaemia

Increased risk of infective endocarditis

Risk of Eisenmenger's syndrome

The mitral valve is not involved in Ebstein's anomaly; therefore, long-term mitral stenosis is not a known complication of the condition.

Rheumatic fever usually arises secondary to a streptococcal infection; the exact pathophysiology is unknown, but it is thought to be related to molecular mimicry, allowing for the damage of heart structures. Those with congenital heart disease are not at greater risk, unlike with infective endocarditis.

Aortic root dilatation is a classic complication of Marfan syndrome; those with the condition often need regular echocardiograms to monitor for any aortic root abnormalities. This is not known to be associated with Ebstein's anomaly.

Pulmonary hypertension can arise in the setting of congenital heart defects that allow for left-to-right shunting, due to the increased flow through the pulmonary arteries. Over time, this may lead to a reversal of the direction of the shunt; referred to as Eisenmenger's syndrome. In this scenario, no other defects appear to have been identified that would allow for shunting to take place, therefore, pulmonary hypertension is less likely.

Further reading:

https://patient.info/doctor/ebsteins-anomaly-pro

Question:

A 70-year-old man attends his GP with profound fatigue, joint pain and a distended upper abdomen. He reports that his fatigue and joint pain (mainly of his knees and elbows) first began around 8 months ago and has become progressively worse. On further questioning, he also mentions that he has unintentionally lost around 12 kg of weight over the past 6 months, suffers from night sweats, has noticed new red blotches on his forearms and feels intermittently feverish.

On examination, you note:

A temperature of 38.1oC

Pallor

Splenomegaly and ascites

A petechial rash on his forearms

Knee and elbow tenderness associated with swelling

Cervical and axillary lymphadenopathy.

You suspect a diagnosis of primary myelofibrosis. Which genetic mutation is associated with this condition?

A. STK11 mutation

B. APC mutation

C. JAK2 mutation

D. BRAF-V600E kinase-activating mutation

E. Philadelphia chromosome

Correct Answer:JAK2 mutation

Explanation:

Primary myelofibrosis belongs to a set of conditions called myeloproliferative disorders. Other myeloproliferative disorders include chronic myeloid leukaemia, polycythemia vera and essential thrombocytosis. The JAK2 mutation is a gain of function mutation of the Janus kinase protein. Key pathological features of this condition include anaemia, bone marrow failure, extramedullary haematopoiesis and splenomegaly. Risk factors for this condition include male gender and age above 50 years. The prognosis of primary myelofibrosis is poor with an average life span of 5 years from diagnosis.

Clinical features include:

Anaemia (e.g. fatigue, pallor)

Lymphadenopathy

Splenomegaly

Hypermetabolic features (e.g. night sweats, weight loss, low-grade fever)

Bleeding (ranging from a petechial rash to life-threatening gastrointestinal tract bleeding)

Features of portal hypertension (e.g. ascites, hepatic encephalopathy)

Osteosclerosis with joint pain and swelling

Investigations include:

Blood film - leukoerythroblastosis with teardrop poikilocytes

Full blood count - anaemia, leukocytosis or leukopenia, and thrombocytosis

Genetic testing

X-rays of affected bones

MRI

Bone marrow aspiration with histological analysis

Abdominal ultrasound and CT to assess solid organs (e.g. splenic enlargement)

The Philadelphia chromosome is associated with chronic myeloid leukaemia.

A mutation of the BRAF-V600E kinase-activating gene is associated with hairy cell leukaemia.

An STK11 gene mutation is associated with Peutz-Jehgers syndrome.

Mutation of the APC gene is associated with familial polyposis.

Further reading:

https://patient.info/doctor/myelofibrosis

Question:

A 75-year-old man is brought to the hospital from his nursing home due to worsening weakness and lethargy. He is unable to give a coherent history but explains he feels "quite nauseous". His carer explains he developed a cough about 5-days ago and has been producing green sputum since. His carer also reports increased urinary frequency, leading to repeated urinary incontinence over the last 3-days.

His past medical history is significant for hypertension, type 2 diabetes mellitus and open-angle glaucoma. His current medications include lisinopril, amlodipine and indapamide, insulin and latanoprost ophthalmic.

On examination, his temperature is 38.5°C, respiratory rate 26/min, pulse 116/min, blood pressure 100/75 mmHg and SpO2 97% on room air. On respiratory examination, crackles are heard in the right lower zone of the lung.

Which of the following investigations should be performed first in this patient?

A. Chest X-ray

B. Fingerstick glucose measurement

C. CT scan of the head

D. Blood cultures

E. Troponin T

Correct Answer:Fingerstick glucose measurement

Explanation:

The most likely diagnosis in this patient is a hyperosmolar hyperglycaemic state (HHS) - a rare but potentially life-threatening condition that most commonly affects older people with type 2 diabetes (T2DM), usually in the context of infection. Highly suggestive clinical features of HHS include an acute cognitive impairment, weakness ± lethargy and signs of infection and dehydration. Whilst there are no specific diagnostic criteria for HHS, a fingerstick glucose measurement is one of the first investigations that should be performed in patients to establish the presence of hyperglycaemia. Patients with HHS typically have marked hyperglycaemia (>30 mmol/L [>540 mg/dL]) without significant hyperketonaemia (<3 mmol/L).

This patient has presented with pyrexia, a five-day history of productive cough and crackles in the right lower zone of the lung; therefore, a chest X-ray may be considered in this patient to exclude pneumonia. However, whilst these respiratory symptoms are concerning for infection, the patient's lethargy, cognitive dysfunction, clinical dehydration and history of polyuria should raise suspicion of a metabolic emergency which should be addressed first before the underlying infection.

It is essential to consider the possibility of stroke in patients presenting with acute cognitive dysfunction and vascular risk factors such as T2DM and hypertension. However, the absence of focal neurological deficits makes this diagnosis unlikely. Therefore, a CT scan of the head would not be indicated at this time.

This patient an active infection, most likely pneumonia; therefore, blood cultures may be required in his work-up to exclude severe concurrent bacteraemia or sepsis. However, the constellation of symptoms in this patient suggests a metabolic emergency that should be excluded first with other bedside investigations (i.e. fingerprick glucose).

Cardiac biomarkers, such as troponin T or I, may be ordered if there is clinical suspicion of myocardial infarction as a precipitant to HHS. This patient has not presented with any cardinal features of an acute coronary syndrome; therefore, this is unlikely a suitable first-line investigation but may be considered in the subsequent work-up of this patient, alongside an ECG.

Further reading:

https://diabetes-resources-production.s3-eu-west-1.amazonaws.com/diabetes-storage/migration/pdf/JBDS-IP-HHS-Adults.pdf

Question:

A researcher wishes to know if smoking during adolescence is associated with developing depression in later life. They gather a group of 1000 adult patients and interview them to ascertain whether they smoked during adolescence and, if so, how many cigarettes they smoked a day. They then check the participants' medical records to see if they have ever had a diagnosis of depression. The researcher then collates and analyses the data to see if there is a correlation between the number of cigarettes smoked per day and the likelihood of developing depression.

What form of bias is most likely to be present here?

A. Procedure bias

B. Attrition bias

C. Measurement bias

D. Recall bias

E. Observer bias

Correct Answer:Recall bias

Explanation:

A major form of bias present in retrospective studies relying on patients to provide information is recall bias, also known as reporting bias or responder bias. This is the bias that arises from participants inaccurately recalling past events or omitting details, for example patients may not be able to accurately recall the exact number of cigarettes they smoked a day. Furthermore, participants who have been diagnosed with depression and suspect there may be a link with smoking may recall smoking a higher number of cigarettes a day.

Attrition bias is the bias that can arise from patients being lost to follow-up.

Measurement bias is the bias that arises from an inaccuracy in the way in which the variable is being measured, for example using an inaccurate measuring tool.

Observer bias is the bias that arises due to a researcher’s expectations or preconceptions affecting the way they perceive and record a variable.

Procedure bias is the bias that arises from the conditions in which a study is undertaken, for example not giving participants enough time to complete a questionnaire or interviewing participants in a non-private room.

Further reading:

https://geekymedics.com/statistics-for-medical-students/

Question:

A 27-year-old woman presents with sudden onset chest pain and shortness of breath. She is 30 weeks pregnant, with an uneventful midwife-led pregnancy. Her heart rate is 116 beats per minute, her blood pressure 95/62 mmHg, respiratory rate 28 breaths per minute with pulse oximetry of 95% in room air, she is apyrexial. On examination she looks unwell, heart sounds are normal, the chest is clear, the abdomen appears distended in keeping with known pregnancy and her calves are soft with a small amount of bilateral ankle oedema.

What is the most appropriate initial investigation?

A. Bilateral lower limb compression duplex ultrasound

B. Chest X-ray

C. Computed tomography pulmonary angiogram

D. Ventilation-perfusion scan

E. D-dimer

Correct Answer:Chest X-ray

Explanation:

The most likely diagnosis is a pulmonary embolism. The initial radiological investigation in women with breathlessness or chest pain is a chest X-ray. Despite its low diagnostic accuracy, a chest radiograph should be performed on every pregnant patient suspected of having a PE. This allows for the accurate interpretation of V/Q scan results as well as the evaluation of alternative diagnoses.

A computed tomography pulmonary angiogram (CTPA) or ventilation-perfusion scan (V/Q scan) are both reasonable investigations for pulmonary embolism in pregnant women. The Royal College of Obstetricians and Gynaecologists recommends patient preference after advising that:

“compared with CTPA, V/Q scanning may carry a slightly increased risk of childhood cancer but is associated with a lower risk of maternal breast cancer; in both situations, the absolute risk is very small”.

In practice, this means most women choose a CTPA scan to minimise radiation to the fetus. The Royal College of Physicians recommends a perfusion scan (only the perfusion component of a V/Q scan) as the investigation of choice for pulmonary embolism because of the lower radiation dose to maternal lung and breast tissue.

D-Dimer measurement in pregnancy is not recommended in most guidelines as D-dimer levels increase during the course of a normal pregnancy and slowly decline postpartum, thus, D-dimer levels have limited utility for the diagnosis of venous thromboembolism (VTE) in pregnancy.

Bilateral lower limb compression duplex ultrasound has previously been recommended as an initial radiation-free investigation, however, without signs of a deep vein thrombosis it has an exceptionally low yield. It is now only recommended if there are clinical signs of deep vein thrombosis.

Further reading:

https://www.rcplondon.ac.uk/guidelines-policy/acute-care-toolkit-15-managing-acute-medical-problems-pregnancy

Question:

A 58-year-old man presents to his GP with a 5-month history of intermittent pain in his left lower abdomen with associated diarrhoea. The pain is triggered by eating but is not affected by defecation or passing wind. He denies any rectal bleeding, fever, weight loss, vomiting, change in appetite or bloating. He has no unwell contacts and no significant past medical history.

On examination, there is tenderness in the left lower quadrant, however, no abdominal masses are felt. A digital rectal exam also reveals no masses.

What is the most likely diagnosis?

A. Irritable bowel syndrome

B. Colorectal cancer

C. Diverticulitis

D. Diverticular disease

E. Ulcerative colitis

Correct Answer:Diverticular disease

Explanation:

This man most likely has diverticular disease. This typically presents with intermittent left lower quadrant pain associated with either diarrhoea or constipation. The symptoms of diverticular disease may overlap with those of irritable bowel syndrome, colorectal cancer or colitis, however, the examination finding of left lower quadrant pain and lack of red flag symptoms such as rectal bleeding and weight loss make diverticular disease more likely.

Colorectal cancer may present with abdominal pain and changes in bowel habit, however, the lack of red flag symptoms like rectal bleeding and weight loss make diverticular disease more likely; according to NICE guidance, changes in bowel habits in the absence of other red flag symptoms for bowel cancer only necessitate a 2-week wait referral if a patient is over the age of 60 years old.

Irritable bowel syndrome typically presents with abdominal pain that is relieved by defecation, as well as a change in bowel habits and bloating. It should be suspected in patients who have had symptoms for more than six months.

Ulcerative colitis typically causes bloody diarrhoea, presents in young adults, and may be associated with weight loss. The absence of these features makes ulcerative colitis less likely.

Diverticulitis typically presents acutely with constant left lower quadrant pain, change in bowel habits and a fever. The long history of this patient makes diverticulitis unlikely.

Further reading:

https://www.nice.org.uk/guidance/ng147/chapter/Recommendations#diverticular-disease

Question:

A 35-year-old woman presents to her general practitioner complaining of joint pain, fatigue, and general malaise. She also says that she had a rash on her cheeks and nose two weeks ago which appeared after spending 10 minutes in the sun. She has a past medical history of asthma and Raynaud's disease for which she takes salbutamol, clenil, and nifedipine. She has no allergies.

Given the most likely diagnosis, what is the most important antibody to help confirm the diagnosis?

A. Anti-La

B. Anti-CCP

C. Anti-centromere

D. Anti-Ro

E. Anti-dsDNA

Correct Answer:Anti-dsDNA

Explanation:

The most likely diagnosis is systemic lupus erythematous. This is because lupus classically presents in young women (aged 20-50) with non-specific symptoms such as fatigue, arthralgia, photosensitivity as well as a butterfly rash on the face. Furthermore, it is associated with other conditions such as Raynaud's, Sjogren's and antiphospholipid syndrome.

Anti-dsDNA is the antibody associated with systemic lupus erythematous. Other antibodies commonly raised are ANA (99% sensitive but not specific), anti-Smith, and anti-Histone (useful for drug-induced lupus). A positive anti-dsDNA along with symptoms such as fatigue, arthralgia, and a butterfly rash strongly suggest lupus.

Anti-CCP is associated with rheumatoid arthritis.

Anti-centromere is associated with systemic scleroderma.

Anti-Ro/anti-La can be positive in around 10% of lupus patients. However, these antibodies are rarely checked in suspected cases of lupus as it is more strongly associated with Sjogren's disease (around 75-90%) which usually presents with dry eyes and dry mouth.

Further reading:

https://geekymedics.com/systemic-lupus-erythematosus-sle/

Question:

A 28-year-old G2P1 woman presents to her midwife for a booking appointment. She is currently 9-weeks gestation.

She has no past medical history. She takes no regular medication and has no known drug allergies. She has not been taking any folic acid supplementation.

Her previous pregnancy was uncomplicated, with her son being born by spontaneous vaginal delivery at 39 weeks gestation weighing 4.7 kg.

She reports that her maternal aunt has type 2 diabetes. She is a non-smoker and has not drunk alcohol since discovering she was pregnant. She has lived in the UK for 3-years, having moved from Germany.

Her BMI is measured at 28.9 kg/m2. Respiratory, cardiovascular and abdominal examinations are normal, with no uterine fundus palpable.

Which aspect of this patient's history and examination would warrant an oral glucose tolerance test (OGTT) at 24-weeks gestation?

A. Lack of folic acid supplementation

B. BMI 28.9 kg/m2

C. European hertigae

D. Family history of diabetes

E. Previous baby with a 4.7 kg birth weight

Correct Answer:Previous baby with a 4.7 kg birth weight

Explanation:

The correct answer is a previous baby with a 4.7 kg birth weight.

An OGTT is used in pregnancy to screen for gestational diabetes. NICE recommends that patients with the following risk factors should be offered an OGTT:

BMI > 30 kg/m2

Previous macrosomic baby (>=4.5 kg)

First-degree relative with diabetes

Previous gestational diabetes

Ethnicity with a higher prevalence of diabetes

European heritage is not associated with an increased risk of gestational diabetes.

A BMI of 28.9 kg/m2 is classified as overweight but does not meet the NICE criteria for offering an OGTT.

Lack of folic acid supplementation is not cited by NICE or the Royal College of Obstetrics and Gynaecology as a risk factor for gestational diabetes. Folic acid supplementation is recommended to reduce the risk of neural tube defects.

While this patient does have a family history of diabetes, this is not a first-degree relative. NICE recommends an OGTT for patients with a first degree relative with diabetes.

Further reading:

https://www.nice.org.uk/guidance/ng3/chapter/Recommendations#gestational-diabetes

Question:

A 31-year-old male presents to the emergency department with fever, abdominal pain and bloody bowel movements for the last 24 hours. He was diagnosed with ulcerative colitis ten months ago and has been non-compliant with his medication regime. He does not smoke or drink alcohol. He has not been travelling overseas recently.

His observations are as follows:

Temperature: 38.2 degrees C

Blood pressure: 102/60 mmHg

Heart rate: 121 beats/minute

Respiratory rate: 18 breaths/minute

SpO2: 99% on room air

Physical exam demonstrates a diffusely tender abdomen with hypoactive bowel sounds. There are no signs of peritonitis.

Plain abdominal radiographs demonstrate loss of haustral markings and a transverse colon diameter of 7 centimetres. There are no signs of bowel perforation. Stool studies are negative for C. difficile toxin.

What is the most appropriate treatment for this patient?

A. Sulfasalazine

B. Metronidazole

C. Loperamide

D. Intravenous corticosteroids

E. Subtotal colectomy and ileostomy

Correct Answer:Intravenous corticosteroids

Explanation:

The above findings of unstable vital signs, bloody bowel movements and a dilated transverse colon on an abdominal plain film are consistent with toxic megacolon (TM). As the patient has no travel history and has a negative C. difficle toxin, his condition is most likely secondary to his underlying ulcerative colitis. Intravenous corticosteroids are indicated as first line pharmacotherapy in patients with TM secondary to IBD. Bowel rest, electrolyte and fluid replacement, nasogastric tube insertion (for gastric decompression) and cessation of anti-motility medications should also be part of the management plan.

Loperamide is an anti-motility, opiate agonist that should be held in patients with TM. It is likely to worsen the patient’s current condition.

Sulfasalazine is not indicated in an acute flare of IBD. It can, however, be used to manage IBD once the exacerbation has resolved.

Metronidazole on its own would be an inappropriate antibiotic choice. As TM can lead to translocation of enteric bacteria into the bloodstream, a broad spectrum antibiotic regimen like metronidazole PLUS a cephalosporin should be considered for these patients.

Medical management should be started prior to considering surgery. Bowel perforation, progressive colonic dilatation and failed medical management are reasons why surgical interventions like a subtotal colectomy could be considered.

Further reading:

https://patient.info/doctor/ulcerative-colitis-pro#nav-8

Question:

A 49-year-old male patient from Ethiopia presents to his primary care physician because of slowly growing nodular lesions on his nose and fingertips. He recently moved from Ethiopia and has not seen a doctor for many years.

Physical examination reveals sensory disturbances along the upper extremities.

What is the most likely diagnosis?

A. Dermatitis herpetiformis

B. Tuberculoid leprosy

C. Lepromatous leprosy

D. Sarcoidosis

E. Erythema nodosum

Correct Answer:Lepromatous leprosy

Explanation:

This patient's skin lesions and physical examination findings are consistent with leprosy (Hansen disease), caused by the bacterium Mycobacterium leprae which is endemic in Ethiopia. Characteristic features of this disease include a predilection for cooler parts of the body (fingers, ears and nose) and peripheral neuropathy in a ‘glove and stocking’ distribution. This patient is likely to have lepromatous leprosy – the lethal form of leprosy that typically presents diffusely over the skin. Treatment typically consists of dapsone and other antimycobacterial drugs.

Erythema nodosum is a relatively common skin disorder characterised by red, raised lesions that are typically present on the anterior shins. It is often associated with sarcoidosis, histoplasmosis and inflammatory bowel disease.

Tuberculoid leprosy is the less severe form of the disease which is classically limited to a few skin plaques over the skin.

Sarcoidosis is a multisystem granulomatous disorder characterised by the presence of noncaseating granulomas. It typically affects young black adults and is not associated with sensory abnormalities.

Dermatitis herpetiformis is a skin disease characterised by grouped vesicles or papules that cause severe pruritus, burning or stinging. Of note, it is strongly associated with coeliac disease.

Further reading:

https://patient.info/doctor/leprosy-pro

Question:

A 28-year-old man is brought to the emergency department following a motor vehicle collision. Despite analgesia, he is experiencing significant pain in his left leg.

On examination, he is found to have a pale and pulseless left leg with posterior knee dislocation. The leg is extremely swollen and tight. Passive range of motion of the foot elicits excruciating pain in the calf.

What is the most likely diagnosis in this patient?

A. Muscle tear

B. Deep vein thrombosis

C. Chronic venous insufficiency

D. Compartment syndrome

E. Peripheral arterial disease

Correct Answer:Compartment syndrome

Explanation:

The most likely diagnosis in this patient is compartment syndrome - the critical increase in pressure within a fascial compartment. There is a history of high-energy trauma and posterior knee dislocation. Key clinical features of compartment syndrome include fast onset, severe pain (out of proportion to findings), worsening of pain with passive stretching of the muscle bellies, and a 'tense' feeling over the affected compartment. Evolving neurology, such as developing paraesthesia, and signs of ischaemia are indicative of progressive compartment syndrome.

Typically deep vein thrombosis (DVT) presents with asymmetrical leg swelling, pain, dilation or distension of superficial veins and erythema. Whilst this patient has been involved in a motor vehicle collision, a DVT is a less likely option due to the absence of relevant findings on examination.

Classically, a muscle tear presents with significant tenderness to palpation over the affected muscle and overlying ecchymosis. In this patient, there is a sign of vascular compromise and increased pressure in the compartment; therefore, a muscle tear is very unlikely as the predominant aetiology.

Chronic venous insufficiency is a long-term condition and typically presents with increasing leg pain over time. It is associated with progressive skin changes, venous stasis dermatitis, lipodermatosclerosis and frank ulceration. This patient has no signs of venous insufficiency, making this an unlikely diagnosis.

Peripheral arterial disease is a long-term condition and typically presents in patients with risk factors for atherosclerosis. Whilst peripheral arterial disease can manifest in acute limb ischaemia, there would be a history of claudication and evolving ischaemia. Importantly, this patient has a history of trauma and signs of increased pressure within the fascial compartment.

Further reading:

https://orthoinfo.aaos.org/en/diseases--conditions/compartment-syndrome/

Question:

A 37-year-old female presents to the sexual health clinic with a 4-day history of green, frothy vaginal discharge and vulvar itchiness. The patient has been in a monogamous relationship with her husband for 5 years. She has no significant past medical history and takes no medications on a regular basis. The patient has no known drug allergies.

Speculum examination shows small punctate areas of haemorrhage on the cervix. Vulvar erythema is also present.

What is the most appropriate form of treatment based on the above clinical findings?

A. Treat the patient only with intramuscular ceftriaxone

B. Treat the patient and her partner with metronidazole

C. Treat the patient only with oral metronidazole

D. Treat the patient only with oral fluconazole

E. Treat the patient with intramuscular penicillin

Correct Answer:Treat the patient and her partner with metronidazole

Explanation:

This patient has presented with a green, frothy vaginal discharge with associated cervicitis which is most consistent with Trichomoniasis. Treatment of this sexually transmitted infection in non-pregnant women involves oral metronidazole for both the patient and their sexual partners. The patient’s sexual partners need to be treated in order to avoid re-infection, even if they are asymptomatic.

Only treating the patient could result in the patient’s sexual partner re-infecting the patient.

Therefore, it is important to gather a thorough sexual history from the patient and to treat all sexual partners.

Oral fluconazole is used for women who have been diagnosed with vulvovaginal candidiasis, which classically presents with vulvar pruritus and a ‘cottage cheese’ like discharge.

Intramuscular ceftriaxone is used in the treatment of N. gonorrhoeae infections. Typically, this presents with a mucopurulent discharge from the cervix.

Intramuscular penicillin is used in the treatment of primary syphilis. Primary syphilis is more likely to present with a chancre (painless genital ulcer) and painless regional lymphadenopathy.

Further reading:

https://patient.info/doctor/trichomonas-vaginalis

Question:

A 54-year-old man presents to A&E with a history of nausea and increasing abdominal swelling. On examination, he has a markedly distended abdomen, with detectable shifting dullness. You suspect ascites and perform an ascitic tap to facilitate diagnosis. One of the tests you request is an ascitic albumin so that you can calculate a serum-ascites albumin gradient.

Which of the following diagnoses would be a cause of a low serum-ascites albumin gradient?

A. Pericarditis

B. Right sided cardiac failure

C. Pancreatitis

D. Cirrhosis

E. Budd-Chiari syndrome

Correct Answer:Pancreatitis

Explanation:

Calculation of SAAG can be a useful step in determining the underlying cause of ascites.

Serum-ascites albumin gradient is calculated by using the formula:

Serum albumin - ascitic fluid albumin

A gradient of > 11g/L is regarded as high (‘transudate’), and < 11g/L regarded as low (‘exudate’).

Causes of low SAAG include malignancy, infection, pancreatitis and nephrotic syndrome

Causes of high SAAG include cirrhosis, liver failure, constrictive pericarditis, cardiac failure, tricuspid regurgitation, and Budd-Chiari syndrome (obstruction of hepatic venous outflow by a blood clot).

Further reading:

https://litfl.com/ascitic-fluid/

Question:

A 28-year-old woman is referred to an outpatient endocrine clinic by her GP who suspects she has Addison’s disease.

Which of the following investigations is used to definitively diagnose Addison’s disease?

A. Plasma renin and aldosterone levels

B. 9am cortisol measurement

C. U&Es

D. Insulin tolerance test

E. ACTH stimulation test

Correct Answer:ACTH stimulation test

Explanation:

The ACTH (Synacthen) test is a confirmatory test for Addison’s disease or primary adrenal insufficiency. Synthetic ACTH is administered, and serum cortisol is subsequently measured. In healthy patients, ACTH stimulates a rise in serum cortisol. This is not the case in those with primary adrenal insufficiency. Therefore, a normal or low circulating cortisol after the administration of ACTH is diagnostic of primary adrenal insufficiency.

U&Es will often demonstrate hyperkalaemia and hyponatraemia due to decreased circulating mineralocorticoid activity. U&Es are not, however, a diagnostic test.

The insulin tolerance test is used to diagnose secondary adrenal insufficiency (i.e. inadequate production of pituitary hormones). Insulin administration causes hypoglycaemia which should stimulate the pituitary gland to produce ACTH, which should in return cause a serum cortisol rise.

Plasma renin and aldosterone levels will be altered in a patient with Addison’s disease due to the reduced production of mineralocorticoids, however, this test cannot differentiate between primary and secondary hypoadrenalism.

A 9 am cortisol measurement will give some indication of adrenal function, but this test cannot differentiate between causes of low cortisol.

Further reading:

https://patient.info/doctor/adrenal-insufficiency-and-addisons-disease#nav-5

Question:

A 13-year-old boy is brought to the general practitioner by his mother who has noticed a skin rash on his lower back. He has also had abdominal pain and joint pains for the last three days, having suffered from an upper respiratory infection three days prior to this. The patient does not have any past medical history. He does not take any medications and has no known drug allergies.

Physical examination reveals a mildly tender abdomen and palpable purpura on the sacral region. Blood tests have been requested.

What is the most likely diagnosis?

A. Scarlet fever

B. Steven-Johnson syndrome

C. Scalded skin syndrome

D. Henoch-Schönlein purpura (HSP)

E. Kawasaki disease

Correct Answer:Henoch-Schönlein purpura (HSP)

Explanation:

Henoch-Schönlein purpura (HSP) is an IgA vasculitis and is the most common form of vasculitis seen in children. The disease is characterised by several clinical manifestations including skin lesions (palpable purpura without thrombocytopenia), arthritis, gastrointestinal complaints (abdominal pain, nausea, vomiting and ileus) and renal disease (IgA nephropathy). There have been several infectious triggers recognised, but the underlying cause of HSP remains unknown.

Kawasaki disease is an acute vasculitis with an unknown aetiology. Clinical manifestations of Kawasaki disease include fever > 5 days, bilateral conjunctival injection, unilateral cervical lymphadenopathy, mucous membrane changes and a polymorphous rash on the trunk.

Scarlet fever typically presents with a sandpaper-like rash and 'strawberry tongue' in the setting of group A streptococcal infection. The patient above has gastrointestinal and joint complaints which are not consistent with scarlet fever.

Scalded skin syndrome is typically caused by Staphylococcus aureus and is primarily seen in neonates or adults with immunosuppression. Patients present severely unwell with sloughing of the skin and fevers.

Steven-Johnson syndrome is a life-threatening condition characterised by fever and skin necrosis with two or more mucous membranes generally being involved. It is typically associated with adverse drug reactions. Most commonly implicated drugs include allopurinol, lamotrigine and other anti-epileptic medications.

Further reading:

https://patient.info/doctor/henoch-schonlein-purpura-pro

Question:

A 40-year-old gentleman attends his GP with eye pain and redness. He reports that his right eye has become progressively more painful and red over the past couple of days. He also complains of increased pain when he looks at light, blurred vision and watering of his right eye. The patient has a past medical history of ankylosing spondylitis.

The GP refers the patient to Ophthalmology for an emergency review. After a review of his right eye, the Ophthalmologist reports the following findings:

Mildly decreased visual acuity

Normal intraocular pressure

Perilimbal injection

Inflammatory cells and flare in the anterior chamber

Posterior synechiae

What is the MOST LIKELY diagnosis?

A. Keratitis

B. Scleritis

C. Acute angle closure glaucoma

D. Posterior uveitis

E. Anterior uveitis

Correct Answer:Anterior uveitis

Explanation:

The most likely diagnosis is anterior uveitis. Uveitis may be divided into anterior, posterior and intermediate forms. Upto 50% of anterior uveitis is idiopathic but common associations include seronegative spondyloarthropathies.

Symptoms of anterior uveitis can include eye pain, photophobia, eye redness, excessive lacrimation and visual blurring. Examination findings can include perilimbal injection on examination of the conjunctiva (limbus = border of the cornea and the sclera), decreased visual acuity, posterior synechiae (pupil margin adheres to the lens distorting the shape of the pupil), normal or slightly decreased intraocular pressure and ‘flare’ on examination with a slit-lamp (i.e. increased protein content in the aqueous humour).

Posterior uveitis is less likely in this case. This condition typically presents with blurred vision and floaters in the absence of eye pain.

Acute angle-closure glaucoma is less likely in this case. This condition usually presents in the elderly suffering from hyperopia. Patients typically complain of headache, blurred vision and seeing haloes around lights. Findings on clinical examination includes corneal oedema, decreased visual acuity, corneal injection and increased intraocular pressure.

Scleritis typically presents with a red eye and pain that is worse during eye movement and at night. There is a violaceous hue to the area of redness on the sclera, exquisitely tender to touch and does not blanch with application of topical phenylephrine.

Keratitis presents with eye pain, photophobia, a foreign body sensation, red-eye, yellow-white corneal infiltrate and a hypopyon (seen as a white fluid level within the eye).

Further reading:

https://patient.info/doctor/uveitis-pro

Question:

A 72-year-old patient is brought to A&E by her daughter after she began complaining of a variety of symptoms. Around an hour ago, she complained of a sudden onset of abnormal sensation affecting her left side and her face. The patient has also developed uncontrollable hiccups, which she is finding quite distressing. The patient is known to have hypertension and hyperlipidaemia, both of which are currently being managed via medical therapy.

The admitting doctor carries out a full neurological examination, which reveals abnormal pain and temperature sensation on the right-hand side of the body and also of the left-hand side of the face. The patient exhibits past-pointing when asked to perform the finger-nose test with her left hand, but not her right. The patient has left-sided ptosis and her pupils appear different sizes. Nystagmus is present when eye movements are tested.

Given the patient's presentation, there is concern amongst the medical team of an ischaemic event, and an urgent CT head is ordered.

Which of the following is most likely to account for the patient's symptoms?

A. Middle cerebral artery occlusion

B. Meningioma

C. Foster-Kennedy syndrome

D. Lateral medullary syndrome

E. Cerebral amyloid angiopathy

Correct Answer:Lateral medullary syndrome

Explanation:

Lateral medullary syndrome is a clinical entity arising from the infarction of a portion of the medulla oblongata; the most common cause is an occlusion of the posterior inferior cerebellar artery, although other rarer causes of stroke (carotid artery dissection, vasculitis etc...) are also possible. The condition can result in a complex neurological presentation due to the many functions of the medulla.

Classical features include:

Abnormal pain and thermal sensation of trunk and limbs contralaterally

Impairment of pain and thermal sensation over the ipsilateral face

Ipsilateral Horner syndrome (likely to be present in this patient as identified by the ptosis and probable miosis)

Ipsilateral limb ataxia

Dysphagia

Nystagmus

Hiccups are another relatively common manifestation of the condition, although these can also arise due to other pathologies, such as abdominal disease, causing diaphragmatic irritation.

The condition is managed as per any case of ischaemic stroke; the possibility of thrombolysis should be considered, with antiplatelet therapy and management of vascular risk factors also playing key parts in long term management.

Foster-Kennedy syndrome is a very rare ophthalmological disease, characterised by unilateral optic atrophy, with/without associated papilloedema. It normally arises due to a compressive lesion affecting one of the optic nerves.

Middle cerebral artery occlusion is a common cause of ischaemic stroke; however, it would not explain the combination of ipsilateral and contralateral symptoms that this patient has presented with.

Cerebral amyloid angiopathy is a condition that typically affects elderly patients and involves the build-up of amyloid protein within the vessels of the brain. It carries an increased risk of haemorrhagic stroke and would be unlikely to result in the presentation described in this scenario.

A meningioma is a benign neoplasm of the meninges within the brain; it is unlikely to cause the complex symptoms experienced by this patient, as the medulla is unlikely to be affected.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK551670/

Question:

A 25-year-old woman presents with a 4-month history of worsening double vision. She states that it is exacerbated by attempts to concentrate, such as reading or watching lectures on her computer. She also describes intermittent weakness of her limbs, which is worse in the evenings and better after she has a good sleep.

On examination, she has obvious ptosis and fatigable weakness of her limbs.

What is the most appropriate first-line management of this patient?

A. Prednisolone

B. IV immunoglobulin

C. Pyridostigmine

D. Rituximab

E. Azathioprine

Correct Answer:Pyridostigmine

Explanation:

This patient is suffering from myasthenia gravis (MG). She has ocular symptoms and mild weakness of her limbs, placing her in class II of severity (mild disease). Pyridostigmine, a cholinesterase inhibitor, should be considered the first-line symptomatic treatment for such patients.

IV immunoglobulin can be used acutely in patients experiencing myasthenic exacerbation or myasthenic crisis and in the perioperative management of patients undergoing thymectomy for their MG. They would not be first-line for a patient with mild MG.

Azathioprine is an immunosuppressant medication, it can be used as an adjunct in patients requiring high dose corticosteroids, to reduce steroid requirements, or in patients for whom high dose steroids would be contraindicated. It wouldn’t be considered first-line in isolation.

Prednisolone, a corticosteroid, can be used as an adjunct in patients for whom anticholinesterases do not provide adequate symptom control, or in patients with more severe generalised disease.

Rituximab is an anti-CD20 monoclonal antibody. It can be considered for patients with MG who demonstrate active disease despite treatment with maximal immunosuppression (or have contraindications to immunosuppression), or patients who have recurrent relapses, or relapses that cannot be treated with rescue therapy.

It is worth noting that thymectomy is a useful treatment for patients with MG who have a confirmed thymoma, but that there is increasing evidence for the utility of thymectomy in patients even without thymoma.

Further reading:

https://bestpractice.bmj.com/topics/en-gb/238/treatment-algorithm

Question:

A 38-year-old man presents to the emergency department with left-sided facial weakness. He explains that 3-weeks ago, he experienced a week-long fever (~38.0°C) and headache.

He does not smoke or drink. He does not report any international travel; however, he went hiking in the Scottish highlands last month. He remembers experiencing several insect bites and nettle stings.

He has no significant past medical history and takes no regular medications. The patient is very concerned by the symptoms as he is usually fit and well.

On examination, the patient's vital signs are within normal limits. Neurological examination reveals drooping of both the upper and lower half of the face on the left side; the remaining neurological examination is normal.

Which of the following initial investigations would be most useful in reaching a definitive diagnosis?

A. CT head

B. Immunoblot test

C. ECG

D. Enzyme-linked immunosorbent assay

E. Skin biopsy culture

Correct Answer:Enzyme-linked immunosorbent assay

Explanation:

Two considerations are required in this patient: the neurological examination has revealed unilateral facial paralysis (Bell's palsy), and the history is concerning for Lyme disease. Whilst this patient has not presented with the pathognomic dermatological sign of erythema migrans, it is estimated that up to one-third of cases of Lyme disease may not present with this rash; instead, suggestive features of infection include fever, headache and focal neurological symptoms. Further suggestive features include the recent history of hiking in the Scottish highlands and uncertainty about tick exposure. In patients with suspected infection without evidence of erythema migrans, NICE guidelines recommend an enzyme-linked immunosorbent assay (ELISA) to confirm the diagnosis. An alternative first-line to ELISA, depending on availability, is an immunofluorescence assay (IFA).

If an ELISA test in patients with suspected Lyme disease is either positive or equivocal, NICE guidelines recommend an immunoblot test as a second-line investigation to confirm the diagnosis.

A non-contrast CT head is only typically indicated in unilateral facial paralysis if there is a history of trauma, middle-ear disease or persistent symptoms. A CT head is the initial test of choice in suspected stroke, an important differential in facial nerve palsy. However, the neurological examination in this patient reveals forehead involvement and no other symptoms suggestive of vascular pathology; therefore, a CT would not be the most appropriate initial investigation and would not identify the likely underlying cause of Lyme disease.

A skin biopsy culture for Borrelia is rarely performed in suspected cases of Lyme disease as it requires an expensive and often unavailable medium (Barbour-Stoenner-Kelly medium) and takes a long time (8 weeks or longer). Furthermore, this patient does not have erythema migrans, which means a positive culture is less likely.

Patients with suspected Lyme disease, presenting with features of cardiac involvement, such as dyspnoea, pedal oedema, angina, palpitations or syncope, should receive an ECG as part of their initial workup. ECG findings in Lyme disease are often non-specific and are not considered diagnostic. Furthermore, this patient has neurological symptoms and normal vital signs, making this a less appropriate initial investigation.

Further reading:

https://cks.nice.org.uk/topics/lyme-disease/

Question:

An 11-year old girl attends the GP with her parents. Since starting secondary school two months ago, she has been complaining of pain in her knees and ankles. Over the past few weeks, she has noticed that her legs also feel very stiff and she struggles to participate in PE lessons. Her mum has noticed the stiffness is particularly bad in the mornings before school.

On examination she is afebrile. The GP examines her gait, demonstrating a slight limp that improves as she walks up and down the room a few times. On examination of the knee and ankle joints there is limited movement in all directions, with slight erythema and swelling in her knees. There are no other systemic symptoms, and she has not had any recent illnesses.

She has no past medical history, takes no medications other than paracetamol for pain relief and has no allergies. She received all vaccinations in childhood, and there is no family history of similar conditions.

What is the most likely diagnosis?

A. Septic arthritis

B. Osgood-Schlatter disease

C. Reactive arthritis

D. Transient synovitis

E. Juvenile idiopathic arthritis (JIA)

Correct Answer:Juvenile idiopathic arthritis (JIA)

Explanation:

The most likely diagnosis is juvenile idiopathic arthritis (JIA), the most common chronic inflammatory disease in children. It is characterised by persistent joint swelling and pain that persists for longer than 6 weeks, in the absence of any infection or other explanation for the symptoms. A significant differential to rule out in cases of joint swelling and pain is septic arthritis – as this patient is afebrile, has no other systemic symptoms and no recent illnesses this is unlikely. JIA typically results in ‘gelling’ in which the joint becomes stiff after periods of rest, with stiffness usually worse in the morning. Later in the course of the condition, the joint can become more obviously swollen and inflamed, and the limb can lengthen as a result. Note that JIA may also be known as ‘Still’s disease’ and be associated with classical systemic symptoms including a fever and salmon pink rash. However, the condition is not always systemic and may just involve arthritic features.

Reactive arthritis would be a more likely diagnosis if the onset of arthritic symptoms was more recent and associated with recent extra-articular infection (classically a gastrointestinal or urinary tract infection). It typically causes transient joint swelling of fewer than 6 weeks duration and there will usually be some signs of systemic infection preceding arthritis (e.g. a low-grade fever). Note that a classical presentation of reactive arthritis is in the context of ‘Reiter’s syndrome’ in which it presents alongside uveitis and urethritis.

This is not a typical presentation of Osgood-Schlatter disease which is inflammation of the cartilage and bone at the point of patella tendon insertion at the knee. This usually presents in adolescent males who undertake sports requiring lots of quadriceps use such as football and basketball. Knee pain is usually worsened by running/jumping, relieved by rest and localised to the tibial tuberosity. It is bilateral in around 25-50% of cases. In this case, the morning stiffness is more indicative of arthritis.

Transient synovitis is a diagnosis of exclusion for hip pain in children rather than knee and ankle pain. There is usually sudden onset hip pain and a limp that may follow a viral illness (and as a result, it is key to rule out septic arthritis with consideration of blood cultures and potentially joint aspiration in unclear cases). Pain is usually relieved by rest and there is a reduced range of movement, particularly internal rotation. The lack of systemic symptoms, location of pain and classic arthritic morning stiffness and gelling, in this case, is more suggestive of JIA.

Septic arthritis is an infection of the synovial joint, presenting with acute pain, swelling and tenderness. It must always be ruled out in any child presenting with a painful joint, as early treatment is essential to prevent bone destruction and sepsis. It should be suspected in any child with a limp, fever, inability to weight bear or painful/restricted movement, and can quickly progress to systemic infection. Although any joint can be affected, the hip joint is commonly involved. The clinical course is typically much more acute (developing over hours) than is described in the case above.

Further reading:

https://cks.nice.org.uk/acute-childhood-limp

Question:

A new screening test is being developed to assist in the early detection of a common cancer.

The following statistics were gathered by a clinical trial of the screening test with longitudinal follow-up. 800 patients were involved in the trial.

n = 800 Follow-up positive Follow-up negative

Screening test positive 45 5

Screening test negative 3 747

What is the sensitivity of the screening test based on this clinical trial?

A. 0.060

B. 0.940

C. 0.064

D. 0.993

E. 0.938

Correct Answer:0.938

Explanation:

This question concerns one of the statistics that can be used to evaluate the validity of a screening test or programme.

Follow-up positive Follow-up negative

Screening test positive a b

Screening test negative c d

Sensitivity is the ability of a test to correctly identify patients who have the target condition. It is calculated using the following equation:

Test positives / True positives or a / (a+c)

In this case, the sensitivity of the screening test = 45 / (45 + 3) = 45 / 48 = 0.938 to 3 significant figures

This means that 93.8% of patients with the cancer will be correctly identified by the screening test.

Further reading:

https://geekymedics.com/sensitivity-specificity-ppv-and-npv/

Question:

A 4-month-old girl attends the GP. Her parents are concerned about the presence of a small lump on her left eyelid. On examination, there is a bright red, dimpled nodule on her left eyelid, which her parents' report has grown over the past 3 months.

What is the next most appropriate step?

A. Surgical excision

B. Topical steroid

C. Reassurance and conservative management

D. Referral to paediatrics

E. Clindamycin

Correct Answer:Referral to paediatrics

Explanation:

This lesion is most likely an infantile haemangioma or ‘strawberry haemangioma’. Strawberry naevi may be present at birth or develop in the first few weeks after birth, they are the most common tumours of infancy. They typically begin as small flat red areas and then develop into raised dimpled lesions. The lesions continue to grow until the child reaches 3-4 years, at which point they begin to regress spontaneously.

When strawberry naevi affect the visual axis, they will likely require a referral to paediatrics for further management. Haemangiomas can be treated with oral propranolol after specialist review. Haemangiomas that are not rapidly growing and are not at risk of causing functional impairment may be monitored.

Further reading:

https://patient.info/doctor/strawberry-naevus

Question:

A 9-year-old boy presents with a painful knee after colliding with another child during a game of football. On examination, his left knee is tender, swollen, and has a limited range of motion. There is a shallow cut above the patella. His past medical history includes recurrent nosebleeds and a cold with a rash four weeks ago.

His temperature is 37.1°C, BP is 100/60 mmHg, HR is 85 bpm, and SpO2 is 96%.

Blood results are shown below:

Test Result Reference Range

Haemoglobin 110 g/L 130 – 180 g/L

Total white cell count 3.8 x 10⁹/L 3.6 – 11.0 x 1 0⁹/L

Platelet count 300 x 10⁹/L 140 – 400 x 10⁹/L

Prothrombin time (PT) 12 secs 10 – 14 seconds

Activated partial thromboplastin time (APTT) 50 secs 24 – 37 seconds

Alkaline phosphatase (ALP) 50 U/L 30 – 130 U/L

Alanine aminotransferase (ALT) 30 U/L < 41 U/L

Bleeding time Normal -

Factor IX Reduced -

What complication is he most at risk of?

A. Compartment syndrome

B. Reactive arthritis

C. Osteomyelitis

D. Liver failure

E. Disseminated intravascular coagulation

Correct Answer:Compartment syndrome

Explanation:

The correct answer is compartment syndrome. The patient’s past medical history and blood test results indicate that he likely has a bleeding disorder, specifically a coagulation disorder such as haemophilia. This is due to the normal prothrombin time (PT) and bleeding time, prolonged activated partial thromboplastin time (APTT), and reduced factor IX levels. This points towards haemophilia B rather than haemophilia A (where there is a deficiency in factor VIII). Haemophilia tends to present with more severe bleeding, such as bleeding into the intramuscular compartments and joints and puts the patient at risk of complications such as compartment syndrome, arthritis, and intracranial bleeds.

It is possible that the patient could have an acquired haemophilia as a result of liver dysfunction, as the liver is responsible for producing clotting factors such as factor VIII and IX. Some causes of liver dysfunction include cytomegalovirus and Epstein Barr virus; however, they are more likely to cause a sudden, acute liver failure rather than with a delay of four weeks. In addition, the normal alkaline phosphatase (ALP), alanine aminotransferase (ALT), and PT all point away from liver dysfunction causing acquired haemophilia, making liver failure an incorrect answer. Similarly, reactive arthritis tends to develop within four weeks of an infection.

Disseminated intravascular coagulation (DIC) and osteomyelitis are both incorrect as the patient has normal paediatric vital signs and a normal PT. Both DIC and osteomyelitis are potential complications of sepsis, however, the patient’s normal vital signs, white cell count, and reduced factor IX levels point towards a bleeding disorder like haemophilia B being the most likely cause of his joint pain rather than septic arthritis.

Further reading:

https://geekymedics.com/haemophilia/

Question:

Elijah is a 4-week old baby boy, sent to the paediatric admissions unit by his GP due to vomiting. Dad reports projectile vomiting immediately after meals, which is milky in colour. This has been going on for a few days now, and he is constantly hungry. Elijah has been previously fit and well, with an uncomplicated pregnancy and birth. Dad thinks that Elijah's uncle may have had some stomach problems when he was small, but is not sure about the details.

On examination, Elijah is unsettled and looks pale. He has dry mucous membranes and reduced skin turgor. The abdomen is soft and does not appear tender. An ultrasound scan reveals a hypertrophic pylorus.

Which of the following metabolic disturbances would an ABG be expected to reveal in this patient?

A. Hypochloraemic, hyperkalaemic alkalosis

B. Normochloraemic, hypokalaemic alkalosis

C. Hyperchloraemic, hypokalaemic acidosis

D. Hypochloraemic, hypokalaemic alkalosis

E. Hyperchloraemic, hyperkalaemic acidosis

Correct Answer:Hypochloraemic, hypokalaemic alkalosis

Explanation:

Pyloric stenosis results from hypertrophy of the pyloric muscle in the antrum of the stomach. This causes a narrow pyloric canal, which can easily become obstructed, preventing milk from being able to pass out of the stomach and into the duodenum. As a result, children typically present with forceful, non-bilious projectile vomiting, dehydration and faltering growth. In addition, parents often describe the child as being constantly hungry, with reduced wet nappies and bowel motions.

Due to the inability of the child to absorb nutrition, they often deteriorate quickly with dehydration and metabolic disturbances.

The typical findings on an arterial blood gas are hypochloraemic, hypokalaemic alkalosis. The hypochloraemia and alkalosis occur due to the loss of hydrochloric acid in the child's vomit. The hypokalaemia occurs due to excessive renal losses of potassium as a result of the kidneys attempting to retain H+ ions at the expense of potassium.

Further reading:

https://patient.info/doctor/infantile-hypertrophic-pyloric-stenosis

Question:

A 77-year-old man presents to his GP with weight loss, lethargy, abdominal pain, and early satiety.

A series of investigations are undertaken, and following endoscopic biopsy, he is diagnosed with gastric adenocarcinoma

Given the diagnosis, what is the most likely confirmatory histological finding on biopsy?

A. Auer rods

B. Crypt abscesses

C. Suprabasal epidermal acantholysis

D. Signet ring cells

E. Target cells (codocytes)

Correct Answer:Signet ring cells

Explanation:

Signet ring cells are a histological sign of gastric adenocarcinoma, which accounts for 90-95% of stomach cancers and is more common in males. The cytoplasm of these cancerous cells compresses the nuclei to the peripheries of the cells, causing the resemblance to a signet ring.

Auer rods are a histological finding seen in acute myeloid leukaemia. They are well-defined crystallised cytoplasmic protrusions seen within cells and are not found in gastric adenocarcinoma.

Crypt abscesses are classically present in ulcerative colitis, but may also be seen in Crohn's colitis and infectious colitis. Crypt abscesses are a histological finding whereby inflammatory cells can be seen in gastrointestinal crypts, hence the association with inflammatory bowel disease.

Suprabasal epidermal acantholysis is histologically seen in the rare dermatological condition pemphigus vulgaris and describes the separation of keratinocytes within the epidermis due to autoimmune damage to desmosomes.

Target cells (codocytes) can be pathological, but can also be present physiologically post-splenectomy (as the spleen plays an important role in selecting out deranged red blood cells, which it can no longer do once removed). This is important to know as patients with asplenia can be misdiagnosed with other causes of target cells. Target cells are red blood cells that have a central 'bullseye', which are the retained nuclei usually removed during red blood cell maturation.

Further reading:

https://www.statpearls.com/articlelibrary/viewarticle/22068/

Question:

A 68-year-old man is reviewed in clinic with increasing tiredness, headaches and sweating. Routine blood tests showed the following:

Hb: 194 g/L

Platelets: 193 × 109/ L

WCC: 7.05 × 109/ L

Neutrophils: 4.19 × 109/ L

After further investigations, he is subsequently diagnosed with polycythaemia rubra vera.

Which of the following medications is used to directly reduce the risk of complications associated with this disease?

A. Aspirin

B. Furosemide

C. Lisinopril

D. Bendroflumethiazide

E. Loratadine

Correct Answer:Aspirin

Explanation:

The major complications of polycythaemia rubra vera are thrombotic (i.e. stroke, myocardial infarction) as well as venous thrombosis. Aspirin is prescribed to reduce this risk as long as there are no contraindications.

NICE recommend thiazide diuretics are switched to other antihypertensives in the case of polycythaemia rubra vera.

Antihistamines may be useful in managing the itch sometimes associated with it but have no effect on thrombosis formation.

Lisinopril may secondarily reduce the risk of arterial ischaemia by lowering blood pressure but would not affect venous thrombosis.

Furosemide would also not lower this risk.

Further reading:

https://cks.nice.org.uk/polycythaemiaerythrocytosis#!scenario

Question:

A 27-year-old female has arrived at her GP to speak about contraception and her heavy periods. She has begun a new relationship but neither she nor her partner like barrier contraception. Whilst she wants to discuss contraception, she makes it clear that she does not wish to start a family in the near future. On discussing her menstrual history she says her periods are often irregular and very heavy which is something she also wants treating. She is normally fit and well and has no significant past medical history or family history. She works in an office, drinks alcohol infrequently and smokes about 10 a day. Her BMI is 23.

What is the most appropriate first-line choice of treatment for this patient?

A. Combined oral contraceptive pill

B. Depo-provera injection

C. Levonorgestrel intrauterine system

D. Implant contraception

E. Progesterone-only pill

Correct Answer:Levonorgestrel intrauterine system

Explanation:

NICE recommends considering the levonorgestrel intrauterine system (LNG-IUS) as the first-line choice for the management of menorrhagia in women where there is no pathology identified. The LNG-IUS is also a highly effective method of contraception that is easily reversible.

The progesterone-only pill (POP) is easily reversible, effective and can be beneficial in managing menorrhagia, so it would be an appropriate option, although not the recommended first-line choice for menorrhagia.

The combined oral contraceptive pill (COCP) is contraindicated in this scenario to the patient's smoking history. Under 15 cigarettes a day is not considered an absolute contraindication but is in the category where risks usually outweigh benefits.

The depot injection can take up to a year for fertility to return to normal once stopped and therefore is not an ideal choice for someone who may decide to start a family in the near future.

The implant is an effective reversible method of contraception, however, it is not typically used first-line in the management of menorrhagia.

Further reading:

https://cks.nice.org.uk/menorrhagia#!scenario

Question:

A 28-year-old woman who is 8 weeks pregnant is referred to the ENT clinic. She noticed a lump in her neck four weeks ago that has slightly increased in size. She denies any other symptoms. Past medical history is unremarkable.

On examination, there is a palpable left-sided 1cm non-tender thyroid nodule which is fixed, firm and smooth in texture. There are no overlying skin changes or associated cervical lymphadenopathy. Vital signs are unremarkable.

Neck ultrasound demonstrates a solid hypoechoic 13 x 12 x 12 mm nodule with markedly increased adjacent doppler blood flow, disrupted peripheral calcification and a lobulated outline.

What is the most appropriate next step?

A. Urgent fine-needle aspiration cytology

B. Perform a left hemithyroidectomy in the second trimester

C. Request serum calcitonin

D. Request MRI neck

E. Postpartum fine-needle aspiration cytology

Correct Answer:Urgent fine-needle aspiration cytology

Explanation:

The prevalence of thyroid nodules in pregnancy is reported to be between 3-21% and increases with maternal age and parity. The British Thyroid Association guidelines recommend that all women presenting with a thyroid nodule during pregnancy should undergo a history and exam, serum TSH and neck ultrasound. Performing fine-needle aspiration cytology (FNAC) is required based on the US neck findings, which show suspicious findings such as hypo-echogenicity, increased vascularity, peripheral calcification, and an irregular outline (grade U4). The use of FNAC does not confer any additional risk to pregnancy at any gestational age.

Postponing the FNAC until postpartum would not be appropriate due to the reasons mentioned previously. This would, however, be considered if the nodules were deemed indeterminate/equivocal on US (U3).

An MRI neck may be helpful in suspected cases of retrosternal extension, fixed tumours with or without vocal cord involvement or evidence of haemoptysis.

Surgery is the treatment of choice and may be indicated in the case of rapidly growing tumours or the presence of lymph node metastases. Performing a left hemithyroidectomy in the second trimester could potentially be a safe option, however further cytology would be needed to confirm the diagnosis and determine whether surgery is necessary.

Generally, the role of performing serum calcitonin is only in suspected medullary thyroid cancer, due to the malignancy developing from parafollicular C-cells. This can present as part of multiple endocrine neoplasia (MEN2), with concomitant parathyroid hyperplasia and phaeochromocytoma.

Further reading:

https://patient.info/doctor/thyroid-cancer-pro

Question:

A 29-year-old woman is brought into her GP practice for review. She has noted general aches and pains for the last 2 months, as well as low mood, constipation and increased urinary frequency. Routine blood tests showed a serum adjusted calcium of 2.81 and no other significant abnormalities. She smokes 30 cigarettes a day and has done for the previous 10 years. She has not noticed any breast lumps, denies any significant weight loss and has no respiratory symptoms.

What is the most appropriate next step in investigating her symptoms?

A. Serum parathyroid hormone (PTH)

B. Serum angiotensin converting enzyme (ACE)

C. Mammogram

D. CT chest/abdomen/pelvis

E. Chest x-ray

Correct Answer:Serum parathyroid hormone (PTH)

Explanation:

Serum parathyroid hormone (PTH) should be the first step in investigating the aetiology of hypercalcaemia, unless there are significant red flags for underlying malignancy in which case urgent referral to the appropriate service for further investigation should be arranged. In any case, serum PTH should still be tested and if it is raised, it suggests a diagnosis of primary hyperparathyroidism. A chest x-ray, mammogram and CT chest/abdomen/pelvis would all be useful in investigating for malignancy-related hypercalcaemia. Likewise a chest x-ray and serum ACE would be helpful in investigating for sarcoidosis, a rarer cause of hypercalcaemia.

Further reading:

https://patient.info/doctor/hypercalcaemia

Question:

A 6-month-old child is brought to the GP having jaundice, pallor, lethargy, growth restriction and general weakness for the last 3-weeks. Her past medical history is significant for pneumococcal infection 2-months prior, General physical examination shows splenomegaly. Both the parents have a positive sickling test together with haemoglobins A and S on electrophoresis and are now worried about their child.

Investigations:

Haemoglobin - 50 g/L (115 – 140)

What is the most appropriate investigation to confirm the diagnosis?

A. Sickle solubility test

B. Haemoglobin electrophoresis

C. Blood smear/film

D. Modified Sodium metabisulphite test

E. Reticulocytes count

Correct Answer:Haemoglobin electrophoresis

Explanation:

The symptoms of sickle cell disease can begin between 3 months and 6 months of age when HbF levels are falling. Increased susceptibility to infections by encapsulated bacteria such as pneumococcus; the risk of overwhelming infection is highest before the age of 3 years. Haemoglobin analysis (eg, by electrophoresis) is always needed to confirm the diagnosis. There is no HbA, 80-95% HbSS, and 2-20% HbF.

Reticulocytes count is a non-specific marker which can be increased in most of the haemolytic anaemias and hyper-active bone marrow.

In the sickle solubility test, a mixture of HbS in a reducing solution such as sodium dithionite gives a turbid appearance because of the precipitation of HbS, whereas normal haemoglobin gives a clear solution. However, this test can also be positive for sickle cell traits.

Modified Sodium metabisulphite reduces the oxygen tension inducing the typical sickle shape of red blood cells. A modified sodium metabisulfite method is used to distinguish sickle cell disease from sickle cell trait for use in underdeveloped countries.

Blood smear/film is an initial test which is highly non-specific for sickle-cell disease. The blood films may show sickled erythrocytes and features of hyposplenism.

Further reading:

https://cks.nice.org.uk/topics/sickle-cell-disease/diagnosis/diagnosis-of-sickle-cell-disease/

Question:

A 68-year-old man presents to the emergency department with abdominal pain. He explains that he has experienced gnawing central abdominal pain for the last two days, which radiates through to the back.

He has a past medical history of hypertension, managed with amlodipine 10mg and candesartan 8mg. He drinks 16 units of alcohol a week and has a 40-pack-year tobacco history.

On examination, there is a palpable pulsatile mass in the midline, below the level of the umbilicus. He is hypertensive at 156/87 mmHg and a regularly regular heartbeat of 110 beats per minute.

Which of the following imaging modalities would be most appropriate to perform first?

A. Computed tomography angiography

B. No imaging required

C. Abdominal ultrasound

D. Plain abdominal X-ray

E. Magnetic resonance angiography

Correct Answer:Abdominal ultrasound

Explanation:

The most likely diagnosis is an abdominal aortic aneurysm (AAA). NICE guidelines recommend that all patients suspected of having symptomatic and/or a ruptured AAA should be offered an immediate bedside abdominal (aortic) ultrasound. Ultrasound is considered a good initial test for identifying an AAA, as it has both high sensitivity and specificity and is quick to perform in an emergency setting.

A computed tomography angiography (CTA) is typically only performed if surgical intervention is required, as it allows 3D reconstruction of the aorta allowing for more accurate surgical planning.

A magnetic resonance angiography (MRA) is typically only performed if surgical intervention is required and if the patient has an iodinated contrast allergy that makes CTA unsuitable.

A plain abdominal X-ray is not recommended in the initial workup of AAA. However, a plain abdominal film is often performed on patients with abdominal pain complaints before the diagnosis of AAA has been considered. In this patient, as we have a high suspicion for a AAA, it would not be appropriate to perform an X-ray first.

NICE guidelines advise that all people with a suspected symptomatic and/or ruptured AAA be offered an immediate bedside ultrasound; therefore, the option of no imaging would not be suitable for this patient. However, if ultrasound is not immediately available and AAA is still suspected, imaging may be bypassed, and it is advisable to discuss the case immediately with the regional vascular service.

Further reading:

https://www.nice.org.uk/guidance/ng156

Question:

An athletic 15-year-old boy complains of 3 weeks of knee pain. It is worst during activity and settles with rest. On examination, he has a normal range of movement of the knee and no evidence of a joint effusion. He reports pain on resisted knee extension. There is localised tenderness over the tibial tuberosity, which appears slightly prominent.

What is the most likely diagnosis?

A. Un-displaced patella fracture

B. Osgood-Schlatters disease

C. Quadriceps tendon rupture

D. Anterior cruciate ligament tear

E. Slipped capital femoral epiphysis

Correct Answer:Osgood-Schlatters disease

Explanation:

The most likely diagnosis is Osgood-Schlatter disease – defined as apophysitis of the tibial tuberosity, caused by multiple microfractures and micro-avulsion as the patella tendon inserts into the tibial tuberosity. It most commonly affects young, athletic boys, particularly after a growth spurt. It presents with insidious onset pain on exertion that is relieved by resting. Resisted extension of the knee increases forces at the insertion and therefore reproduces the pain. Most cases settle with physiotherapy and rest.

If it were an un-displaced patella fracture, there would typically be a history of trauma of a direct blow to the patella. There would be an effusion and tenderness more globally over the anterior knee, worse over the patella. There would be a reduction in the range of movement and absent/weak knee extension.

Slipped capital femoral epiphysis often presents with knee pain in adolescents, it’s more common in obese patients and those with an endocrine disorder. Patients would have a normal range of movement of the knee, and no joint effusion, however, the localised tenderness and prominence of the tibial tuberosity are not associated with this diagnosis.

Quadriceps tendon rupture would not cause localised tenderness and prominence of the tibial tuberosity. There would also be a loss of knee extension, as well as swelling, bruising and tenderness over the superior aspect of the knee.

Anterior cruciate ligament tear would also have a history of trauma, typically a pivoting injury, and there is usually a sensation of a ‘pop,’ a rapid haemarthrosis and generalised knee pain with reluctance to bear weight and a sensation of instability.

Further reading:

https://geekymedics.com/knee-examination/

Question:

A 17-day-old baby is brought into the hospital by his mother, who is concerned that he is jaundiced. This began around day five after birth, but she was reassured that this was likely due to the initiation of breastfeeding and should resolve. However, she believes that her son has become more yellow, and is worried about him.

She describes the birth as being an uncomplicated vaginal delivery, with both her and the baby able to go home very shortly after. Since then, her baby has been feeding and sleeping well, with the heel prick test revealing no abnormalities. She has, however, noticed that recently his urine appears darker than normal; this appears to have coincided with the increase in apparent jaundice. She wonders if he is dehydrated and whether she needs to encourage him to feed more often.

Transcutaneous bilirubin measurement demonstrates levels significantly above the normal range for the baby's age. Serum bilirubin levels show an elevated concentration of conjugated bilirubin.

What is the most likely diagnosis?

A. Cephalohaematoma

B. Cystic fibrosis

C. Congenital hypothyroidism

D. Biliary atresia

E. Sepsis

Correct Answer:Biliary atresia

Explanation:

Biliary atresia is a congenital failure of the biliary tree to develop; this leads to a build-up of bilirubin, as it cannot be excreted into the intestine. The important features in the history that point towards this as a likely diagnosis are the darkening of the urine (pale stools can often accompany this) and increased conjugated bilirubin fraction - these both indicate a post-hepatic origin of the pathology. The liver is still able to conjugate the bilirubin; thus, the problem must lie beyond this, with the biliary system implicated.

Jaundice is extremely common in the neonatal period, it is not usually worrying if it develops more than 24 hours after birth, and does not persist beyond 2 weeks. Most cases that fall within this time frame will simply be physiological and reflect the immaturity of the liver. However, persistent, worsening jaundice as described in this case always warrants further investigation; in the setting of prolonged jaundice beyond 2 weeks, biliary atresia must be excluded given its severe complications.

Liver ultrasound is often used to make a diagnosis of biliary atresia, with HIDA scanning (a form of nuclear medicine imaging) sometimes also used. It is essential to confirm the presence of the disease as quickly as possible, as without early treatment there is a significant risk of progression to liver failure. Surgical intervention is warranted, with Kasai's procedure (hepatoportoenterostomy); this involves directly connecting the liver to the small bowel to allow bile to pass out of the hepatic system.

Sepsis can cause jaundice in neonates and is always a consideration in jaundice arising within the first 24 hours of life. However, it is less likely in this case, as the baby has been otherwise well. It would be unlikely to cause a raised level of conjugated bilirubin.

A cephalohaematoma can arise due to birth trauma, often in the setting of forceps delivery. As the haematoma breaks down, the products released can cause bilirubin levels to rise. However, this would likely have been noted by the parents and would cause a rise in unconjugated bilirubin rather than conjugated hyperbilirubinemia.

Congenital hypothyroidism is a possible cause of prolonged jaundice and may cause a slightly elevated level of conjugated bilirubin. However, this is screened for on the heel prick test carried out at 5-7 days - as this was normal, the diagnosis is far less likely.

Cystic fibrosis does not usually cause neonatal jaundice; the disease can cause liver impairment, but this usually occurs in later life.

Further reading:

https://patient.info/doctor/biliary-atresia

Question:

A 33-year-old man is referred to the emergency department by his GP for painful, symmetrical weakness of his lower limbs. This started a few days beforehand with pain and weakness in his feet, which has progressed to involve the whole of his lower limbs. When taking a history he mentions that he was unwell with a stomach bug and experienced abdominal cramps and diarrhoea around 3 weeks ago but otherwise has been well in himself. He has no past medical history and takes no regular medications.

Given the likely diagnosis, which organism classically triggers this presentation?

A. Cytomegalovirus (CMV)

B. Shigella

C. Campylobacter jejuni

D. Epstein-Barr virus (EBV)

E. Influenza virus

Correct Answer:Campylobacter jejuni

Explanation:

The correct answer is Campylobacter jejuni. This history is classic for Guillain-Barre Syndrome (GBS). The patient had a stomach bug recently, which was likely due to Campylobacter jejuni - it is one of the most common triggers for GBS.

Shigella is another possible cause of the patient's recent illness, which could have then triggered GBS. However, shigella would generally cause bloody diarrhoea and vomiting in addition to abdominal pain.

Cytomegalovirus (CMV) is a common virus that can trigger GBS. However, it is normally only an issue in immunocompromised patients.

EBV can potentially trigger GBS but it is not a common cause. EBV generally presents with fatigue, fever, sore throat and lymphadenopathy.

The influenza virus is also known to trigger GBS. However, this patient has not reported any recent flu-like symptoms.

Further reading:

https://patient.info/doctor/guillain-barre-syndrome-pro

Question:

A 21-year-old male is brought to the emergency department after being found by a friend unconscious in bed. His friend says he has been unwell for a few days with some diarrhoea, and this morning he found him in bed, covered in vomit.

On assessment, he is drowsy; opening his eyes and localising to pain whilst making groaning noises. Small, fatty lumps are noted on the patient’s abdominal wall. No past medical history is available.

His vitals signs are as follows:

Heart rate - 124 beats per minute

Respiratory rate - 32 breaths per minute

Blood pressure - 104/65

SpO2 - 97%

Temperature - 37.0˚C

An arterial blood gas is performed and shows:

pH - 7.26

pCO2 - 3.5kPa

pO2 - 13.5kPa

Na+ - 130mmol/L

K+ - 5.5mmol/L

HCO3- - 13mmol/L

Lactate - 2mmol/L

His blood glucose is 28mmol/L. A urine dipstick is positive for glucose and ketones.

What is the most likely diagnosis?

A. Sepsis

B. Diabetic ketoacidosis (DKA)

C. Aspirin overdose

D. Hyperosmolar hyperglycaemic state (HHS)

E. Addison's disease

Correct Answer:Diabetic ketoacidosis (DKA)

Explanation:

Given the patient’s clinical presentation (reduced GCS, dehydration, metabolic acidosis, hyperglycaemia, ketonuria), the most likely diagnosis is diabetic ketoacidosis (DKA). Typical clinical features of DKA include polydipsia, polyuria, weight loss, fatigue, nausea/vomiting, dehydration, hyperventilation, abdominal pain and reduced GCS.

DKA is an acute, life-threatening complication of diabetes. The mention of fatty lumps on the patient’s abdominal wall refers to lipohypertrophy, a common complication associated with the injection of insulin.

Insulin deficiency precipitates hyperglycaemia, ketosis (due to fatty acid release and metabolism), volume depletion and electrolyte disturbance. Ketonaemia results in metabolic acidosis, which is often partially compensated for by a high respiratory rate. Potassium is typically high on blood gas, but it is important to remember that DKA results in whole-body hypokalaemia. DKA can be precipitated by an acute illness such as viral gastroenteritis in this case.

Addison’s disease can also cause similar symptoms of weight loss, tiredness, nausea and vomiting, hypotension, and drowsiness. A crisis can also be precipitated by intercurrent illness. However, Addison’s disease would not cause ketonuria or acidosis, and would typically cause hypo-, rather than hyperglycaemia.

Sepsis could also explain these symptoms, and some of the signs (hypotension, tachycardia, hyperventilation) and investigation results (metabolic acidosis). However, we would expect the patient to be pyrexial and electrolyte disturbance would be less likely. In addition, the metabolic acidosis in sepsis is due to lactic acidosis, so we would expect a raised lactate.

Hyperosmolar hyperglycaemic state (HHS) is another explanation for these symptoms, although would be more commonly seen in type II diabetes (which, especially in a young patient, would rarely require insulin), and would result in the same electrolyte disturbance, but without acidosis.

Aspirin overdose could also explain the vomiting and drowsiness, but the intercurrent diarrhoea would suggest another cause. In aspirin overdose, hyperventilation initially causes a respiratory alkalosis, followed by a mixed respiratory alkalosis and metabolic acidosis. We would expect the electrolytes to be largely normal (potassium may be low, bicarbonate may be low). Aspirin overdose can cause hypo- or hyperglycaemia, but severe hyperglycaemia with ketonuria would be rare.

Further reading:

https://cks.nice.org.uk/topics/diabetes-type-1/diagnosis/when-to-suspect-diabetic-ketoacidosis/

Question:

A 32-year-old lady presents with cyclical abdominal pain over the past 4-months, requiring opioid analgesia. She describes the pain as colicky and sharp and over the suprapubic area, with no radiation. The pain is associated with nausea and sweating. Past medical history is unremarkable, Past surgical history is significant for cone biopsy of the uterine cervix 7 months back for cervical intraepithelial neoplasia (CIN). The patient reports that her menstrual period was regular, with heavier flow prior to the procedure.

What is the most likely cause of her cyclical abdominal pain?

A. Cervical cancer

B. Pelvic inflammatory disease

C. Leiomyoma

D. Cervical stenosis

E. Endometriosis

Correct Answer:Cervical stenosis

Explanation:

Cervical stenosis involves the pathological narrowing of the uterine cervix. It is clinically defined as cervical narrowing that prevents the insertion of 2.5mm wide dilator.

Cervical stenosis has many aetiologies including:

In-utero exposure to diethylstilbestrol

Endometriosis

Chronic cervicitis

Cervical carcinoma

Cervical polyp

Post-radiation therapy

Cryotherapy

Cone biopsy or other electrosurgical excision procedures

In this scenario, the patient presents with cyclical abdominal pain and reduced menstrual flow, following a recent cone biopsy. This history is strongly suggestive of cervical stenosis with secondary haematometra (obstruction of the menstrual blood flow due to narrow cervix, resulting in its accumulation in the uterus). The diagnosis can be confirmed by transvaginal ultrasonography.

Pelvic inflammatory disease (PID) involves inflammation of the upper part of the female genital tract involving the uterus, fallopian tubes and ovaries (typically secondary to sexually transmitted infections such as chlamydia). Although it can be asymptomatic, it usually presents with irregular vaginal bleeding, abnormal vaginal discharge and dyspareunia. If untreated, it can lead to serious complications ranging from ectopic pregnancy, chronic pelvic pain and infertility.

Endometriosis is defined as the presence of normal endometrial tissue (glands and stroma) outside the endometrial cavity. The symptoms can vary depending on the area involved and can range from dysmenorrhoea, menorrhagia, irregular menstruation, pelvic pain, back pain and dyspareunia.

Cervical cancer usually presents as abnormal vaginal bleeding, most commonly postcoital. It can also present as inter-menstrual bleeding. With the introduction of the cervical screening program, the majority of cervical cancer cases are identified prior to the development of any symptoms.

Leiomyomas are benign smooth muscle tumours that commonly occur in the uterus. Their presenting symptoms vary depending on the size and site of the fibroid. This can vary from being asymptomatic to causing menorrhagia, recurrent miscarriages or gastrointestinal symptoms like constipation.

Further reading:

https://patient.info/doctor/colposcopy-and-cervical-treatments-pro#nav-3

Question:

A 78-year-old lady presents to the GP following an episode of feeling faint as she stood up this afternoon. She did not collapse but had to sit down for a few minutes before getting up again. She has a history of asthma, hypertension, type 2 diabetes, and a partial rotator cuff tear. Her lying BP today is 115/82 and standing BP is 82/65. She took her first dose of a newly prescribed medication this morning.

Which of the following medications is the most likely to have caused this episode?

A. Ibuprofen 400mg as required

B. Ramipril 5mg once daily

C. Salbutamol inhaler as required

D. Metformin 500mg once daily

E. Omeprazole 20mg once daily

Correct Answer:Ramipril 5mg once daily

Explanation:

The medication most likely to have caused this ladies pre-syncopal episode is ramipril.

This lady has signs of postural hypotension- a position-dependent decrease in blood pressure. This is evident from her feeling faint on standing and her decrease in blood pressure when standing.

A common side effect of ACE-inhibitors and other anti-hypertensives is postural hypotension; in this instance, after her first dose of ramipril- a phenomenon known as ‘first-dose hypotension’. This has caused this lady’s pre-syncopal episode.

Salbutamol has been reported to rarely cause syncope but this question is asking for the most likely cause of this lady’s syncopal episode. The other drugs are not known to cause hypotension.

Other drugs which can cause postural hypotension include diuretics, anti-hypertensives, L-DOPA, tricyclic antidepressants, PDE-5 inhibitors and nitrates.

Further reading:

https://patient.info/doctor/hypotension

Question:

A 45-year-old man is referred to the surgical assessment unit after his GP noticed a bulge on his abdominal wall during a routine examination. The patient says this has been present for a long time and has not been causing him any symptoms. He is obese and has had a previous open appendicectomy.

On examination, there is a Lanz incision scar and a soft reducible swelling in the upper midline with a palpable fascial defect 5cm above the umbilicus.

What is the most likely diagnosis?

A. Epigastric hernia

B. Spigelian hernia

C. Incisional hernia

D. Paraumbilical hernia

E. Divarication of the recti

Correct Answer:Epigastric hernia

Explanation:

The most likely diagnosis, in this case, is an epigastric hernia. Epigastric hernias are a less common type of ventral hernia. They pass through the linea alba in the upper midline above the umbilical territory. They are often asymptomatic and have a low risk of obstruction or strangulation as they usually only contain extraperitoneal fat. Epigastric hernias are more likely to occur in younger men. Obesity is an important risk factor for all types of ventral hernia as it causes raised intra-abdominal pressure and weakens the fascial layers of the abdominal wall.

Paraumbilical hernias are the most common type of ventral hernia. They pass through a fascial defect in the linea alba within 3cm of the umbilical ring. The majority are small and asymptomatic and can safely be managed conservatively. They are more likely to affect women, especially during or after pregnancy, but are more likely to cause problems requiring surgery in men. Ascites secondary to liver disease is another important risk factor.

Spigelian hernias are a rare type of lateral ventral hernia. They pass through the Spigelian fascia lateral to the rectus sheath. They are usually very small and present with localised pain or a lump immediately lateral to the rectus abdominis muscle. They have a fairly high risk of obstruction or strangulation due to the tight fascial layers around the hernia neck.

Incisional hernias are ventral hernias which pass through the site of a previous surgical incision. They occur because the fascial closure of the abdominal wall failed to heal properly. This patient has had an open appendicectomy via a Lanz incision, which is a transverse incision over McBurney’s point in the right iliac fossa. He has not had any incisions through the midline of the abdominal wall.

Divarication of the recti, also known as rectus diastasis, is an important differential diagnosis for a midline abdominal swelling. It occurs when the rectus abdominis muscles separate, stretching the linea alba to a width of more than 2cm. This causes a prominent midline bulge which can look quite striking on examination. However, it is not a hernia as there is no underlying fascial defect. It is usually treated with physiotherapy and exercise programmes and rarely requires surgery.

Further reading:

https://geekymedics.com/hernias/

Question:

A 7-year-old boy is brought to the hospital by his aunt as she is worried about a worsening of his ear-related symptoms. He initially presented to the GP 2 weeks previously with ear pain and itch that was affecting his sleep. He was prescribed topical steroid ear drops, with a suspected diagnosis of otitis externa due to eczema; however, his symptoms have not improved. The boy has now developed a fever and is complaining of a severe, 'boring' headache. He now has difficulty in opening his jaw and swallowing, which prompted his aunt to bring him to A&E.

The boy has had a number of infections in the past and is under investigation for a suspected immunodeficiency syndrome. The admitting doctor is therefore extremely concerned about the boy's presentation, especially as observations recorded in A&E reveal a significant tachycardia and a drop in blood pressure. He tells the boy's aunt that he is worried about a rare complication of the initial ear infection, and starts some IV antibiotics as well as bleeping the on-call Paediatric consultant and ordering some relevant blood tests.

Given the probable diagnosis, which of the following organisms is most likely to be responsible?

A. Pseudomonas aeruginosa

B. Burkholderia cepacia

C. Bartonella henselae

D. Borrellia burgdorferi

E. Haemophilus influenzae

Correct Answer:Pseudomonas aeruginosa

Explanation:

The most likely diagnosis, in this case, is malignant otitis externa, a rare, potentially life-threatening complication of otitis externa. The term refers to a form of osteomyelitis of the temporal bone and possibly the skull base, usually in those unable to clear the initial infection of the external auditory meatus due to underlying issues with the immune system such as diabetes or primary immunodeficiency. The symptoms are far more extreme than otitis externa, with patients usually showing signs of sepsis, headache, and agonising otalgia.

Pseudomonas aeruginosa the main causative organism for the condition; it is also the pathogen most frequently implicated in diffuse otitis externa. Management of malignant otitis externa due to this pathogen will likely require IV antibiotics, as well as traditional management of co-existing sepsis. Surgery may be necessary if an abscess or localised collection is present due to the infection.

Bartonella henselae is the bacteria responsible for causing cat-scratch fever; the most common presentation being flu-like symptoms and lymphadenopathy.

Haemophilus influenzae can cause severe disease in unvaccinated patients; it is the most common cause of epiglottitis, which can be life-threatening. It is not responsible for otitis externa or its complications.

Burkholderia cepacia is a pathogen that does not frequently affect humans but can cause infection in those with a compromised immune system, such as those with cystic fibrosis or chronic granulomatous disease. Whilst this patient may have an underlying immunodeficiency, the organism usually causes a respiratory tract infection rather than otitis externa and is unlikely to responsible for the presentation.

Borrelia burgdorferi is the spirochaete responsible for causing Lyme disease, which usually presents with the classical rash referred to as erythema migrans. It is not implicated in head and neck infections.

Further reading:

https://cks.nice.org.uk/topics/otitis-externa/management/acute-diffuse-otitis-externa/

Question:

A 55-year-old gentleman is seen in the A&E department following a syncopal episode. He has never experienced anything like this before but remembers feeling lightheaded and dizzy beforehand. He has felt fine since the episode but an ECG is recorded on the recommendation of his doctor. The trace shows several skipped QRS complexes and is suggestive of second-degree heart block, Mobitz type 1.

Which of the following is true regarding second-degree heart block (Mobitz type 1)?

A. Patients usually require a pacemaker

B. The PR interval is always at least 0.2 seconds

C. The P waves are irregular

D. It is a regularly irregular rhythm

E. It is usually due to dysfunction of the His-Purkinje system

Correct Answer:It is a regularly irregular rhythm

Explanation:

The correct answer is a regularly irregular rhythm. Mobitz type 1 heart block, also known as Wenckebach’s block/phenomenon, involves progressive prolongation of the PR interval following each atrial impulse. An impulse eventually fails to be conducted to the ventricles, at which point a QRS complex is skipped. This occurs in a pattern; for example, if every third P wave is blocked, there is a 3-to-2 block. Mobitz type 1 is, therefore, a regularly irregular rhythm. It is generally benign, and patients are often asymptomatic.

Patients with Mobitz type 1 heart block do not usually require a pacemaker; however, this is often indicated for Mobitz type 2. Third-degree/complete heart block is the most common ECG indication for pacemaker insertion, whether temporary or permanent.

P waves are usually regular in Mobitz type 1. The PR interval progressively increases, but the time between P waves remains relatively constant. Irregular P waves may be seen in sinus arrhythmias.

A PR interval of at least 0.2 seconds is the definition of first-degree heart block. This remains relatively constant in these patients and is due to prolonged conduction in the AV node. The PR interval in Mobitz type 1 heart block progressively increases and is not necessarily this long immediately after the QRS interval.

Dysfunction of the His-Purkinje system is found in second-degree heart block but in Mobitz type 2 rather than type 1. Type 1 typically involves dysfunction of the AV node.

Source

Further reading:

https://patient.info/doctor/ecg-identification-of-conduction-disorders

Question:

A 71-year-old man is admitted with lower abdominal pain and increasing difficulty passing urine over the last three days. He has been unable to pass urine for the last 12 hours. Examination reveals bladder distension. His past medical history includes prostatic hyperplasia, for which he declined intervention. His biochemistry results show the following:

Results Reference Range

HCO3- 15 mmol/L (24-30)

K+ 5.6 mmol/L (3.5–5.3)

Creatinine 564 micromol/L (59–104)

Urea 24 mmol/L (2.5 - 7.8)

What is the most likely diagnosis?

A. Conn's syndrome

B. Diabetic ketoacidosis

C. Pyloric stenosis

D. Salicylate overdose

E. Acute kidney injury

Correct Answer:Acute kidney injury

Explanation:

The most likely diagnosis in this scenario is acute kidney injury. This patient has presented with an acute history of oliguria and has been anuric for the past 12 hours (remember the rate of urine production in healthy adults is roughly 0.5ml/kg/hr, which for the average male equates to approximately 35-40ml urine produced per hour). The patient has a low bicarbonate, consistent with metabolic acidosis, along with raised potassium, urea and creatinine, all of which point towards a biochemical diagnosis of AKI. After establishing a diagnosis of AKI, the underlying cause must be identified and treated promptly to avoid further deterioration and worsening of renal failure. Underlying causes that are important to be aware of can be helpfully classified as

Pre-renal - hypovolaemia, reduced cardiac output leading to renal hypoperfusion, e.g. organ failure and sepsis, and medications – typically antibiotics and anti-hypertensives).

Renal – drugs, including antibiotics and contrast agents, vasculitis, acute tubular necrosis and interstitial nephritis.

Post-renal – renal calculi, blocked urinary catheters, genitourinary tract tumours and neurogenic bladders.

In this case, the finding of a distended bladder (elicited on examination as suprapubic tenderness and dullness to percussion up to the umbilicus) should immediately raise suspicion of urinary retention secondary to obstruction, most likely from this gentlemen’s history of prostatic enlargement.

Both Conn’s syndrome and pyloric stenosis are associated with a metabolic alkalosis rather than a metabolic acidosis due to increased excretion of protons via excess aldosterone secretion, and loss of protons through excessive vomiting, respectively.

The history is not consistent with diabetic ketoacidosis, which typically presents with abdominal pain, nausea and vomiting, breathlessness and malaise and lethargy, and there is no mention of a history of diabetes.

Salicylate overdose causes a mixed respiratory alkalosis and metabolic acidosis, and although there may be a history of abdominal pain, this would normally be associated with shortness of breath and, in severe cases tinnitus, confusion, seizures and reduced GCS.

Further reading:

https://www.nice.org.uk/guidance/ng148

Question:

A 44-year-old female presents with a 1-month history of sudden, sharp shooting pains around her left cheek and mandible. These episodes last less than a second and occur several times a day. The pain is sometimes brought on by brushing her teeth or drinking ice cold drinks. Neurological examination is normal. Carbamazepine is prescribed.

What is the most important statement to tell the patient?

A. She must not breastfeed

B. She requires weekly monitoring for 4 weeks

C. Present urgently if she develops a fever or infectious symptoms

D. Side effects include headache, nausea and dry mouth

E. Carbamazepine should be taken with food

Correct Answer:Present urgently if she develops a fever or infectious symptoms

Explanation:

This case demonstrates trigeminal neuralgia. Trigeminal neuralgia presents with recurrent, electric shock type pains in the distribution of the trigeminal nerve (CN 5), most commonly the maxillary (V2) and mandibular (V3) divisions. The pain generally lasts seconds to minutes and can be triggered by light touch to the face (e.g. washing, shaving, brushing teeth), eating, talking and cold air. Carbamazepine is the first-line medication.

Agranulocytosis is a rare but serious side effect of carbamazepine. Patients should be told to present urgently if they develop a fever or infectious symptoms.

Headache, nausea and a dry mouth are side effects of carbamazepine. However, in this single-best-answer question, it is more important to inform the patient of the risk of agranulocytosis.

There are no restrictions around taking carbamazepine with food, and it can be taken with or without food.

The BNF recommends that plasma concentration be measured after 1–2 weeks, with an optimum concentration of 4–12 mg/litre. However, this is not required weekly.

The BNF states that the amount of carbamazepine found in breast milk is probably too small to be harmful. Breastfeeding during monotherapy does not appear to adversely affect infant growth or development.

Further reading:

https://cks.nice.org.uk/topics/trigeminal-neuralgia/

Question:

A 62-year-old woman presents to her local hospital eye casualty department with a 10-day history of worsening eye pain and redness. She describes a 'deep' pain in her left eye that is made worse by moving her eyes and looking at light.

She has a past medical history of rheumatoid arthritis, managed with methotrexate 7.5mg PO OW and 5mg PO OW. No drug allergies are known. She wears glasses for reading only.

On ocular examination, the left eye is noticeably red and visual acuity is reduced to 6/9; the right eye is normal with an acuity of 6/6. Visual fields are full when testing via confrontation however motility is restricted due to pain. Pupils are equal, round and reactive to light with no RAPD in both eyes. Intraocular pressures are recorded as 18mmHg in the left eye and 17mmHg in the right eye.

Slit-lamp examination of the left eye reveals a deep violaceous injection and application of 2.5% phenylephrine does not cause vessel blanching. The anterior chamber of both eyes is clear and quiet.

What is the most likely diagnosis in this patient?

A. Anterior uveitis

B. Episcleritis

C. Bacterial conjunctivitis

D. Acute angle-closure glaucoma

E. Scleritis

Correct Answer:Scleritis

Explanation:

The most likely diagnosis in this patient is anterior scleritis - a potentially sight-threatening disease characterised by transmural scleral inflammation. This patient has a past medical history of rheumatoid arthritis (RA), a common systemic disorder associated with the development of scleritis; other associated conditions include vasculitides, seronegative spondyloarthropathies and inflammatory bowel disease. Scleritis typically presents with subacute onset, moderate to severe eye pain, often described as 'deep' and 'boring' in nature; pain is exacerbated by any eye movement and even gentle palpation of the eye. Associated symptoms include photophobia, reduced visual acuity and tearing. A key sign of scleritis is the presence of non-blanching vessels when topical phenylephrine is applied.

Patients with episcleritis typically report an acute onset, irritation or mild pain that is associated with hyperaemia but no photophobia or visual disturbance. Episcleritis is most commonly idiopathic; therefore, the past medical history of RA in this patient should raise concerns of a more serious cause of red-eye. Additionally, in episcleritis, episcleral vessels blanch with the application of phenylephrine.

Patients with bacterial conjunctivitis typically report irritation or mild pain, mucopurulent discharge and mild or absent pruritus. The presence of severe pain, photophobia and decreased visual acuity make bacterial conjunctivitis a less likely diagnosis.

Whilst the history of anterior uveitis, also known as iritis, and scleritis may sound similar, clinical examination helps to distinguish between the two conditions. Typically, patients with anterior uveitis present with moderate to severe pain, blurred vision, tearing and photophobia. However, patients with iritis often have a constricted or non-reactive pupil that may also be irregular in shape due to posterior synechiae. Furthermore, slit-lamp examination in iritis reveals inflammatory cells in the anterior chamber.

Typically acute angle-closure glaucoma (AACG) presents with rapid onset, severe eye pain, headache and nausea ± vomiting. Examination reveals red-eye with a mid-dilated, unresponsive pupil and elevated intraocular pressure (>21mmHg).

Further reading:

https://geekymedics.com/painful-red-eye/

Question:

A 49-year-old woman presents with a 3-hour history of right upper quadrant pain that started after breakfast this morning. She experienced a similar pain 1 week ago, which resolved spontaneously after a few hours. The pain is non-radiating, constant and she rates it as 6/10 in terms of severity.

She has a past medical history of type 2 diabetes mellitus for which she is prescribed metformin 500mg PO BD. Her BMI is 24.

On examination her observations are stable. On palpation of the abdomen, there is marked tenderness in the right upper quadrant but no guarding or rebound tenderness.

Routine blood tests are requested which demonstrate that her amylase and inflammatory markers are within the normal range. Liver function tests reveal a slightly elevated ALP but are otherwise normal.

What would be the most appropriate investigation to request next?

A. Abdominal X-ray

B. Abdominal CT scan

C. Abdominal ultrasound scan

D. Magnetic resonance cholangiopancreatography (MRCP)

E. Endoscopic ultrasound scan

Correct Answer:Abdominal ultrasound scan

Explanation:

The most likely diagnosis in this patient is biliary colic, and as such, the most appropriate investigation to request next is an abdominal ultrasound scan. Given that she is clinically stable with no obvious systemic signs of inflammation that would warrant more complex imaging, this would allow visualisation of the gallbladder to look for evidence for stones and any bile duct dilatation that could suggest more complicated pathology. The presence of stones in the gallbladder is known as ‘cholelithiasis’ and the presence of stones in the bile duct (which may or may not include bile duct dilatation as a result) is known as ‘choledocholithiasis’.

An abdominal X-ray is usually a redundant form of imaging in a presentation such as this, as it does not allow detailed imaging of the gallbladder and biliary tree that is necessary for deciding on further patient management.

If the USS was unremarkable, in the presence of biliary pain an abdominal CT scan may be requested which may identify more complicated gallstone pathology (e.g. acute cholecystitis).

If the bile duct were dilated on USS but no stones were identified, an MRCP may be indicated.

An endoscopic ultrasound scan is not commonly performed but may be indicated if gallstones in the bile duct are suspected based on presentation and deranged liver function tests, but USS and MRCP have failed to identify the presence of stones.

Further reading:

https://patient.info/doctor/gallstones-and-cholecystitis

Question:

A 40-year-old female presents to the Emergency Department accompanied by her partner. She complains of widespread skin redness that is very painful to touch and has been getting progressively worse over the last few days. Her partner mentions that the patient had been started on a new drug 2 weeks previously and didn’t know whether this was related. On examination, the patient has a fever of 39 oC, widespread tender erythema affecting around 60% of her skin surface area (including the mucosa of her mouth) and has large blisters >1cm all over her body which are Nikolsky positive.

What is the MOST LIKELY drug that may lead to this presentation?

A. Allopurinol

B. Salbutamol

C. Propanolol

D. Paracetamol

E. Simvastatin

Correct Answer:Allopurinol

Explanation:

The patient is most likely suffering from toxic epidermal necrolysis (TEN). The initiation of certain drugs can result in the development of TEN.

Drugs that most commonly cause TEN include:

Allopurinol

Sulphonamides

Non-steroidal anti-inflammatories

Anticonvulsants (i.e. phenytoin, lamotrigine and carbamazepine).

TEN is characterised by fever and tender erythema affecting >30% of the skin's surface, with mucosal involvement and blisters that spread with lateral pressure (Nikolsky's sign).

Paracetamol does not commonly result in TEN.

Propanolol does not commonly result in TEN.

Salbutamol does not commonly result in TEN.

Statins do not commonly result in TEN.

Further reading:

https://www.dermnetnz.org/cme/emergencies/toxic-epidermal-necrolysis/

Question:

A 59-year-old man presents to A&E via ambulance with right-sided back and loin pain. You are called in to see him by a worried A&E nurse. He is sweaty and looks uncomfortable, and is breathing rapidly. He is rolling around the bed with his pain and explains he has been taking NSAIDs at home for the last 24 hrs for this pain. He has had morphine with the ambulance, which had helped, but is now wearing off. His past medical history includes a previous myocardial infarction, COPD, and osteoarthritis. He takes aspirin and inhalers, but is poorly compliant.

His vital signs are as follows:

HR 115 bpm

BP 90/45 mmHg

RR 28

Temp 37.8 oC

Sats 94% on room air

You examine his abdomen and find he is generally mildly tender, but he is much more tender in the right flank. He shows no rebound, no guarding and no peritonism.

Which of the following diagnoses should be excluded first?

A. Lumbar disc prolapse

B. Renal colic

C. Myocardial infarction

D. Pyelonephritis

E. Leaking or ruptured abdominal aortic aneurysm

Correct Answer:Leaking or ruptured abdominal aortic aneurysm

Explanation:

The most important diagnosis to exclude in a patient with this history is a ruptured or leaking abdominal aortic aneurysm (AAA). He has clinical signs of shock and has a significant cardiovascular history. Many patients presenting as renal colic have actually got a leaking AAA.

The evidence is equally strong for renal colic or pyelonephritis, however, AAA must remain forefront in your mind to be excluded. There is some evidence to support a myocardial infarction, but this would not explain his severe abdominal pain.

Lumbar disc prolapse is an unlikely diagnosis in this context and would not explain the patient's abdominal pain and haemodynamic instability.

Further reading:

https://lifeinthefastlane.com/ccc/abdominal-aortic-aneurysm-aaa/

Question:

A 17-day-old baby is brought into the hospital by his mother, who is concerned about the fact that he is jaundiced. This initially began around day 5 after birth, but she was reassured that this was likely due to the initiation of breastfeeding and should resolve. However, she believes that her son has become more yellow, and is worried about him.

She describes the birth as being an uncomplicated vaginal delivery, with both her and the baby able to go home very shortly after. Since then, her baby has been feeding and sleeping well, with the heel prick test revealing no abnormalities. She has however noticed that recently his urine appears darker than normal; this appears to have coincided with the increase in apparent jaundice. She wonders if he is dehydrated and whether she needs to encourage him to feed more often.

The paediatric consultant examines the baby; transcutaneous bilirubin measurement reveals that levels are significantly above the normal range for the baby's age. He orders serum bilirubin levels, which demonstrate an elevated concentration of conjugated bilirubin, and based on this result, orders an ultrasound scan, which confirms the presence of a congenital abnormality.

Given the likely diagnosis, which of the following is most likely to form part of the management plan?

A. Splenic transplant

B. Marsupialisation

C. Kasai's procedure

D. Lifelong thyroxine replacement

E. Ladd's procedure

Correct Answer:Kasai's procedure

Explanation:

The most likely diagnosis in this scenario is biliary atresia; a congenital failure of the biliary tree to develop, leading to a build-up of bilirubin, as it cannot be excreted into the intestine. The important features in the history that point towards this as a likely diagnosis are the darkening of the urine (pale stools can often accompany this) and increased conjugated bilirubin fraction - these both indicate a post-hepatic origin of the pathology. The liver is still able to conjugate the bilirubin; thus, the problem must lie beyond this, with the biliary system implicated.

Liver ultrasound is often used to make a diagnosis of biliary atresia, with HIDA scanning (a form of nuclear medicine imaging) also sometimes used. It is essential to confirm the presence of the disease as quickly as possible, as without early treatment there is a significant risk of progression to liver failure. Surgical intervention is warranted, with Kasai's procedure (hepatoportoenterostomy); this involves directly connecting the liver to the small bowel to allow bile to pass out of the hepatic system. Whilst this procedure reduces the likelihood of a liver transplant being required, it is associated with a number of complications, including ascending cholangitis and bile leakage.

Ladd's procedure is used in the setting of intestinal rotation, a congenital disorder that can often lead to midgut volvulus. The surgery involves dividing the fibrous tissues that anchor the small bowel within the peritoneum and then restoring the usual orientation of the intestines.

Congenital hypothyroidism is a possible cause of prolonged jaundice and may cause a slightly elevated level of conjugated bilirubin. However, this is screened for on the heel prick test carried out at 5-7 days - as this was normal, the diagnosis is far less likely. Therefore, lifelong thyroxine replacement is not an appropriate management option in this case.

Marsupialisation is a surgical procedure often used for the draining of cysts; most commonly those within the Bartholin glands.

Those with biliary atresia may require a liver transplant if surgery is unsuccessful; however, a splenic transplant would not address the site of pathology. This is not a procedure currently carried out for any indication.

Further reading:

https://patient.info/doctor/biliary-atresia

Question:

A 22-year-old man presents to the emergency department with acute right knee swelling and associated pain. On examination, the knee joint is tense and swollen, but there are no signs of injury, and he is able to stand fully on the affected leg with slight discomfort. His temperature is 37°C, his heart rate is 89 bpm, and his blood pressure is 123/83 mmHg. He plays football regularly for a local team but denies any antecedent trauma.

An x-ray is requested, which shows no fracture or joint damage. An ultrasound shows evidence of a joint effusion. Needle aspiration is performed, which demonstrates the presence of blood.

What is the most likely cause for his presentation?

A. von Willebrand's disease

B. Tibial plateau fracture

C. Osteoarthritis

D. Medial collateral ligament injury

E. Haemophilia A

Correct Answer:Haemophilia A

Explanation:

Haemophilia A is correct. Haemarthrosis is the most likely diagnosis, due to the presence of a swollen joint which demonstrates blood when aspirated. He is systemically well, ruling out other conditions such as septic arthritis, and his ability to stand makes a significant fracture less likely. Haemarthrosis usually follows trauma, however, if it presents spontaneously without any antecedent trauma, it is suggestive of haemophilia.

von Willebrand's disease is incorrect. Although von Willebrand's disease is the most common hereditary coagulopathy, haemoarthroses and severe internal haemorrhage are less common than in haemophilia A and B, unless patients have the most severe type, which is type 3. Patients presenting with spontaneous haemarthrosis without any antecedent trauma are more likely to have haemophilia. Conditions affecting platelets and platelet function, such as von Willebrand's disease, are more likely to have features such as easy bruising and prolonged bleeding rather than spontaneous haemarthrosis and haematoma formation.

Tibial plateau fracture is incorrect. The absence of antecedent trauma, his ability to fully weight bear on the affected leg, and the absence of radiographic findings make this diagnosis unlikely. Patients presenting with a tibial plateau fracture often have their knee forced either into a valgus or varus position.

Medial collateral ligament injury is incorrect. The absence of antecedent trauma, his ability to fully weight bear on the affected leg, and the absence of radiographic findings make this diagnosis unlikely. Patients presenting with a medial collateral ligament injury often have an antecedent injury where the leg is forced into a valgus position (the knees are brought together) by an external force.

Osteoarthritis is incorrect. This patient is relatively young and active, making osteoarthritis much less likely. Even if he plays sports regularly, it is unlikely to have caused enough damage, given his age. The absence of radiographic findings and other features seen in osteoarthritis, such as joint pain worsening towards the end of the day or morning stiffness <30 minutes, makes this diagnosis less likely.

Further reading:

https://geekymedics.com/haemophilia/

Question:

A 60-year-old man presents to his general practitioner complaining of chest pain. This pain has been present intermittently for the past 4 months - occurring while gardening and walking his dog. He describes the pain as heavy. There is no radiation, nausea, vomiting, shortness of breath, or sweating. The pain is relieved by a few minutes of sitting.

He has a past medical history of hypertension. His only regular medication is ramipril, with no known drug allergies.

On examination, his BP is 132/88 mmHg. Cardiovascular, respiratory and abdominal examinations are all normal. His BMI is 24.8 kg/m2.

What is the most likely diagnosis?

A. Atypical angina

B. Myocardial infarction (MI)

C. Pulmonary embolism (PE)

D. Typical angina

E. Gastro-oesphageal reflux disease (GORD)

Correct Answer:Typical angina

Explanation:

This gentleman is presenting with the features of typical angina. Typical angina is characterised by all three of the following:

Pain or tightness in the chest/neck/shoulders/arms/jaw

Pain caused by exertion

Pain relieved by rest or GTN

In angina, the pain is caused by myocardial ischaemia, most commonly due to coronary artery disease reducing the flow of oxygenated blood to the myocardium. Therefore, the pain is more likely to manifest at times of exertion.

Risk factors for angina include male sex, hypertension, increasing age, diabetes, hypercholesterolemia, hypercholesterolemia, smoking and obesity.

Atypical angina would present with 2/3 of the above typical features. If there were only ⅓ of the above features then this could be classified as non-anginal chest pain.

Acute coronary syndrome (including myocardial infarction) should always be considered in a patient presenting with acute chest pain. However, this patient's history is more longstanding and very typical of angina.

GORD can be mistaken for cardiac chest pain. However, GORD can be described as a "burning pain", which can be worse on lying down.

A pulmonary embolus would not present over a period of 4 months. In PE the chest pain is pleuritic and could be accompanied by shortness of breath. In addition, this gentleman has no risk factors for pulmonary embolism.

Further reading:

https://cks.nice.org.uk/topics/angina/diagnosis/assessment-of-stable-chest-pain/

Question:

A 26-year-old medical student has their hepatitis serology performed as part of an occupational health screen before starting placement. Their results are as follows:

HBsAg - positive

Total anti-HBc – positive

IgM anti-HBc – negative

Anti-HBs – negative

What is the most likely interpretation of these results?

A. Previous hepatitis B infection, now cleared

B. Vaccination against hepatitis B

C. No exposure to hepatitis B

D. Acute, active, hepatitis B infection

E. Chronic hepatitis B infection

Correct Answer:Chronic hepatitis B infection

Explanation:

These results represent chronic hepatitis B infection, in which both HBsAg (surface antigen, representing the presence of viral particles) and anti-HBc antibodies are present together. HBsAg indicates active infection, and that the patient is infectious.

In acute, active hepatitis B infection, HBsAg is present, representing the presence of viral antigen, anti-HBs is positive, and IgM anti-HBc is positive. The presence of IgM anti-HBc is indicative of acute infection, as IgM antibodies represent the initial phase of the immune response. Anti-HBs antibodies would be negative, as their presence is taken to indicate a patient who has recovered from infection, or achieved immunity via vaccination.

In previous hepatitis B infection which had now cleared, HBsAg would be negative, as the viral particles have been eliminated, but anti-HBc and anti-HBs would be positive, indicating immunity due to previous infection.

In patients who have been vaccinated against hepatitis B, only anti-HBs antibodies are present, there is no anti-HBc as seen in patients who have been previously infected.

In patients who have had no exposure to hepatitis B, either through vaccination or natural exposure, all tests would be negative.

Further reading:

https://www.cdc.gov/hepatitis/hbv/pdfs/serologicchartv8.pdf

Question:

A 63-year-old dockworker presents to his general practitioner for a routine medical assessment for his job. The patient reports feeling generally well, although he mentions to the general practitioner that he had significant exposure to asbestos throughout his career. himself. He denies experiencing chest pain, unintentional weight loss, or haemoptysis. He has never smoked tobacco and drinks 8-units of alcohol each week.

On examination, there is no increased work of breathing at rest. Breath sounds are vesicular and heart sounds 1 and 2 are present with no additional sounds.

A chest X-ray is requested, showing no obvious consolidation. The X-ray report describes pleural calcification following the contour of the 8th rib bilaterally, consistent with pleural plaques.

What follow-up should the patient receive with respect to their chest X-ray findings?

A. PET-CT staging

B. MRI thorax

C. No follow-up required

D. Urgent CT chest abdomen and pelvis

E. Repeat chest x-ray in 6 months

Correct Answer:No follow-up required

Explanation:

The correct answer is no follow-up required as this patient's pleural calcifications are consistent with benign pleural plaques. Benign pleural plaques are the commonest manifestation of past exposure to asbestos, with a latency period of around 20 years. This patient is asymptomatic and has a history of asbestos exposure; these factors, combined with the chest x-ray findings, are typical of pleural plaques. These plaques are not premalignant and do not progress to mesothelioma. The British Thoracic Society (BTS) advises that pleural plaques do not require repeat imaging or monitoring as the risks of repeated radiation exposure outweigh the benefits.

An urgent CT chest abdomen and pelvis is not indicated in this patient as pleural plaques are benign and do not undergo neoplastic transformation. This patient has no systemic signs or symptoms suggestive of mesothelioma and does not require urgent CT imaging at this time. If this patient becomes symptomatic then further imaging may be required.

A repeat chest X-ray in 6 months is not indicated, as pleural plaques are benign and the British Thoracic Society recommends that further imaging is not required in asymptomatic patients due to the risk of harm associated with repeated exposure to radiation. If this patient becomes symptomatic then further imaging may be required.

An MRI thorax is not indicated as the patient is asymptomatic and their pleural plaques are not premalignant. The British Thoracic Society recommends that further imaging is not required in asymptomatic patients due to the risk of harm associated with repeated exposure to radiation. If this patient becomes symptomatic then further imaging may be required.

PET-CT staging is not required as there is no indication that this patient has cancer. The patient's asymptomatic state, history of asbestos exposure, and chest x-ray findings are all in keeping with benign pleural plaques rather than mesothelioma. Signs and symptoms of mesothelioma would include unexplained weight loss, chest pain, and haemoptysis.

Further reading:

http://library.nhsggc.org.uk/mediaAssets/Respiratory%20Medicine/BTS%20Plueral\_Plaques299912\_acc.pdf

Question:

A 33-year-old female presents to the general practitioner with dull right upper quadrant pain for the past 3 weeks. The pain has been gradually worsening and paracetamol has not helped. It does not radiate anywhere else.

She has a history of pelvic inflammatory disease for which she did not complete her full course of antibiotics at the time of diagnosis 4 years ago. She has no other medical problems. She has had multiple sexual partners in the last 5 years and rarely uses contraception. Her last menstrual period was 3 days ago.

Her observations are as follows:

Temperature: 38.1 degrees Celsius

Heart rate: 84 beats/minute

Respiratory rate: 16 breaths/minute

SpO2: 99% on room air

Blood pressure: 120/88 mmHg

Physical examination demonstrates right upper quadrant tenderness. The patient is not jaundiced and Murphy’s sign is negative. A viral hepatitis serology screen has been performed and is negative.

What is the most likely diagnosis?

A. Pancreatitis

B. Cholangitis

C. Tubo-ovarian abscess

D. Acute cholecystitis

E. Perihepatitis

Correct Answer:Perihepatitis

Explanation:

This patient most likely has perihepatitis, a complication of pelvic inflammatory disease resulting in inflammation of the liver capsule. There is usually limited stromal involvement and examination is characterised by right upper quadrant tenderness. On laparoscopy, ‘violin string’ adhesions can often be visualised.

Cholangitis typically causes right upper quadrant pain with fevers and jaundice that requires prompt intravenous antibiotics. The patient in the above scenario has stable vital signs and no jaundice.

A tubo-ovarian abscess is a mass involving the fallopian tube or ovary which usually presents with spiking fevers and a palpable adnexal mass on physical examination.

Acute cholecystitis typically presents with right upper quadrant pain that radiates to the right shoulder with a positive Murphy’s sign.

Pancreatitis classically presents with central abdominal pain radiating to the back in patients who have a history of gallstones or alcoholism.

Further reading:

https://patient.info/doctor/pelvic-inflammatory-disease-pro

Question:

A 60-year-old woman presents to her general practitioner with gradual onset swelling of the face, lips and tongue after starting on new medication 2-weeks ago. She denies any itching or pruritus and otherwise feels well in herself.

The patient has a past medical history of hypertension, type 2 diabetes, and acne rosacea. There is no personal or family history of atopy and the patient has no known drug allergies.

On examination:

Respiratory rate - 16/min

Heart rate - 90 beats/min

Chest clear on auscultation

No airway obstruction

No skin rash

Which of the following medication is the most likely cause of the diagnosis?

A. Brimonidine

B. Metformin

C. Ramipril

D. Amlodipine

E. Bendroflumethiazide

Correct Answer:Ramipril

Explanation:

Angioedema is a rare adverse effect which can occur in the weeks following commencement of an ACE inhibitor (e.g ramipril). It is mediated by the vasodilatory peptide bradykinin, which increases in concentration when angiotensin-converting enzyme (ACE) is inhibited. Raised levels of bradykinin also cause the vastly more common dry cough sometimes seen in patients starting on an ACE inhibitor.

Symptoms of ACE inhibitor-induced angioedema include swelling of the face, lips and tongue without corresponding urticaria or pruritus, which would otherwise point to a histamine-mediated angioedema as seen in anaphylaxis. Swelling of the tongue and pharynx may result in life-threatening upper airway obstruction, which presents with respiratory distress and stridor. Treatment includes the immediate cessation of the ACE inhibitor and admission to hospital for higher level care if upper airway obstruction is suspected.

Common side effects of the distractor answers listed here include:

Thiazide diuretics (bendroflumethiazide) - hypokalaemia

Calcium channel blockers (amlodipine) - ankle swelling

Metformin - lactic acidosis

Brimonidine is an alpha 2 adrenergic agonist used topically to reduce facial flushing in acne rosacea. It is a vasoconstrictor and as such is unlikely to produce angioedema.

Further reading:

https://dermnetnz.org/topics/ace-inhibitor-induced-angioedema

Question:

A 67-year-old female is reviewed by her General Practitioner. During an asthma review 2 weeks previously, the patient was noted to be newly hypertensive with a blood pressure of 172/91 mmHg. Following a series of ambulatory readings showing raised blood pressure, she began taking ramipril 2.5mg once daily 1 week ago. She has a background of asthma, peripheral vascular disease and diet-controlled type 2 diabetes mellitus. In addition to ramipril, she takes aspirin 75mg once daily and admits to not using her inhalers regularly. She smokes 10 cigarettes per day and doesn't drink alcohol, and has a family history of breast cancer but not of hypertension.

On examination today her blood pressure is 171/101 mmHg with the rest of her observations within normal limits. An ECG performed shows normal sinus rhythm. Blood tests are taken which reveal the following:

Na+ 142 mmol/L, K+ 5.1 mmol/L, Urea 13.2 mmol/L, Cr 201 μmol/L.

The patient's renal function was normal on blood tests taken 2 weeks previously.

What is the most likely diagnosis?

A. Phaeochromocytoma

B. Conn's syndrome

C. Primary (essential) hypertension

D. Cushing's syndrome

E. Renal artery stenosis

Correct Answer:Renal artery stenosis

Explanation:

This patient has significant late-onset hypertension, a background of cardiovascular disease and has suffered an acute kidney injury following beginning treatment with an ACE inhibitor. These features are all suggestive of renal artery stenosis, which is most commonly due to atherosclerotic disease or fibromuscular dysplasia. A renal bruit may be present on examination and early referral to renal medicine may be indicated particularly in the presence of renal impairment. Patient's are also susceptible to flash pulmonary oedema.

Primary hypertension is the term used for hypertension not due to secondary causes such as renal or endocrine disease. It is less likely in this case given the factors described above and is thought to be related to genetic factors, age, obesity and diet amongst other variables. Conn's syndrome, or primary hyperaldosteronism, is due to an aldosterone-secreting tumour and causes hypertension in association with hypokalemia, which is not present here. Cushing's syndrome is a constellation of features related to corticosteroid excess, including hypertension. There are no other specific features of Cushing's syndrome mentioned here and renovascular disease should be ruled out in the first instance. This is likewise the case for phaeochromocytoma, which causes hypertensive episodes usually in association with sweating and headaches. Symptoms are due to high circulating levels of adrenaline and noradrenaline.

Further reading:

https://patient.info/doctor/renovascular-disease

Question:

A 56-year-old builder is brought to A&E via ambulance. He had fallen from some scaffolding whilst at work and hit his head. He was initially conscious with paramedics but on his way into hospital became unresponsive. On arrival to A&E, his GCS is E1 M1 V3.

What is the most important initial step in his management?

A. CT head

B. Arterial blood gas

C. Intubation

D. Coagulation blood tests

E. Referral to neurosurgery

Correct Answer:Intubation

Explanation:

This man has a traumatic brain injury with reduced GCS. He needs intubation to protect his airway and to facilitate ongoing investigation and neuroprotection. He will then need a CT head and inevitably referral to the neurosurgeons. Bloods should be taken but these are not the initial priority.

Further reading:

https://lifeinthefastlane.com/ccc/traumatic-brain-injury/

Question:

A 12-month-old boy is brought to the GP by his father after the health visitor voiced some concerns about his son's development. The boy is still struggling to support himself in a seated position without assistance and crawls very infrequently. When pulled to a standing position, the child seems to lack any strength to support his torso, and his legs remain in an abnormal position; the child makes no attempt to take steps. There were no previous concerns about the boy's development, and he had been otherwise well, although a birth history elicits that he was born 7 weeks prematurely.

The GP examines the boy; the child is happy to interact, and smiles and laughs at the doctor. He is able to demonstrate a partial pincer grip and has a monosyllabic babble. However, the boy holds his legs in a stiff abnormal position; the doctor notes increased tone in the lower limbs compared to the upper limbs and hyperreflexia when testing knee and ankle jerks.

A referral to the paediatric unit is made based on the history and examination findings.

Which of the following investigations is required to confirm the likely diagnosis?

A. Thyroid function tests

B. Skeletal survey

C. MRI

D. CT head

E. Creatine kinase

Correct Answer:MRI

Explanation:

Cerebral palsy is defined as a group of permanent disorders of the development of movement and posture occurring due to non-progressive disturbances in the developing foetal or infant brain. For the condition to develop, the insult usually occurs before the age of 2, although the vast majority of cases of cerebral palsy arise due to issues arising before birth. The most common causative factor for cerebral palsy is prematurity; this is the likely cause in this case. Other possibilities include birth asphyxia, neonatal infection, and hypoxia due to seizures.

There are a number of subtypes of the condition; depending on the area of the brain that is affected. The most common subtype is spastic cerebral palsy, which arises due to pathology affecting the cerebral cortex. Children with spastic cerebral palsy will often have issues with motor development and may have delayed gross motor milestones. Upper motor neuron signs may be present on examination, and neonatal reflexes may persist beyond their usual duration. In this scenario, the lower limbs are affected more than the upper limbs, which is indicative of diplegic cerebral palsy.

Diagnosis of cerebral palsy is usually confirmed via an MRI of the brain, which will show the presence of the underlying abnormality in the majority of cases; the location of the lesion will usually fit with the symptoms of the child. The condition requires a multidisciplinary approach to management, with physiotherapy and the use of walking aids and splints frequently used. Medications such as baclofen can reduce spasticity, and surgery may be necessary in more severe cases.

A skeletal survey is a series of X-rays that image the entire skeleton. It may be indicated in the setting of systemic disease affecting the skeleton such as multiple myeloma or skeletal dysplasia, and also if non-accidental injury (NAI) is suspected, to investigate for the presence of previous fractures.

Abnormalities of thyroid function can cause issues with child development; hypothyroidism, in particular, can result in intellectual disability, affecting various developmental milestones. Therefore, in children with some form of developmental delay, it is worth considering the need for thyroid function tests. However, it is unlikely to result in isolated motor dysfunction as in this case.

Alongside cerebral palsy, muscular dystrophy is another crucial consideration in a child with gross motor delay. Creatine kinase levels will be raised in children with the condition. However, children with muscular dystrophy are unlikely to have signs of an upper motor neuron lesion, which makes a diagnosis of cerebral palsy more probable, and thus an MRI is a more appropriate investigation to confirm the diagnosis.

A CT head would potentially allow visualisation of underlying cerebral disease responsible for the child's symptoms; however it is not able to image the brain tissue in as much detail as an MRI, thus an MRI is preferable in this scenario.

Further reading:

https://cks.nice.org.uk/topics/cerebral-palsy/

Question:

A 73-year-old male is referred to the surgical admissions unit by his GP for a lump around the lower edge of his stoma. He underwent an emergency Hartmann’s procedure 2.5 years ago following obstruction secondary to distal colon cancer.

The resection at the time was curative and he is under ongoing surveillance. He reports that he has had one CT chest-abdomen-pelvis and is due a further follow-up scan. He has also had a tumour marker level measured every 6 months.

Which tumour marker is most likely to have been used in surveillance for this patient?

A. CA 125

B. Alpha-fetoprotein (AFP)

C. Prostate-specific antigen (PSA)

D. Carcinoembryonic antigen (CEA)

E. CA 19-9

Correct Answer:Carcinoembryonic antigen (CEA)

Explanation:

As per NICE guidance, carcinoembryonic antigen (CEA) levels should be measured at least every 6 months in the first 3 years following apparently curative resection of colorectal cancer. CA 19-9 is associated with pancreatic cancer. CA 125 is associated with ovarian cancer. Raise alpha-fetoprotein levels are associated with several cancers including hepatocellular carcinoma. Prostate-specific antigen is, as the name would suggest, related to prostate cancer.

Further reading:

https://www.nice.org.uk/guidance/cg131

Question:

A 3-year-old boy is referred to the paediatric clinic by the GP after concerns were raised by his parents concerning his development. They have noticed that he appears to be developing at a much slower rate than his sister (his only sibling). In particular, his motor function appears to be developing slowly; whilst he walked at 14 months, he still appears unsteady when taking steps, and rising to stand from a seated position takes a long time. He is still unable to climb stairs, hop, or run for any prolonged period. There are no concerns about the patient's speech and language or social milestones. The patient has no past medical history of note, and both the pregnancy and the birth were uncomplicated.

The child is happy to interact with the doctor during the examination and displays a good vocabulary for his age. There are no dysmorphic features evident, and examination of the boy's musculature reveals no significant wasting. Slightly reduced muscle tone is noted, but reflexes appear normal. The paediatric consultant remains concerned about the boy's lack of motor development despite this, and orders further investigations to attempt to pinpoint an underlying diagnosis.

Which of the following investigations would be the most appropriate to order first in this scenario?

A. Creatine kinase

B. Fragile X mutation screen

C. No investigations necessary - diagnosis can be made clinically

D. MRI head and spinal cord

E. Thyroid function tests

Correct Answer:Creatine kinase

Explanation:

In any patient with delayed gross motor milestones, it is essential to rule out muscular dystrophy by ordering a creatine kinase measurement; this would be raised in the setting of muscular involvement. Whilst this patient has presented without the classic symptoms of Duchenne's muscular dystrophy (the most well-known of this group of diseases), there are a number of subtypes of muscular dystrophy, with different types having different severities. Making an early diagnosis of these conditions is crucial, as they are often life-limiting, and require a multidisciplinary approach to management.

The other main differential for delayed gross motor milestones in the absence of global developmental delay is cerebral palsy; a static injury to a developing brain that results in problems with weakness and spasticity. This is less likely to be the underlying diagnosis in this scenario, as there are no features in the pregnancy or birth history that would indicate the possibility of cerebral palsy. Additionally, the condition will often present with hypertonia and hyperreflexia on examination due to the upper motor neuron lesion that is present. Therefore, MRI head and spine (the diagnostic test of choice in suspected cerebral palsy) is not the most appropriate first-line test in this case.

Hypothyroidism can cause developmental delay; however, this will usually affect intellectual development rather than presenting with an isolated motor delay. This condition is also screened for on the newborn heel prick test; therefore thyroid function tests are unlikely to be of benefit in this case.

Fragile X syndrome is a congenital disorder that arises due to CGG trinucleotide repeat expansions; this usually presents with intellectual disability and classical dysmorphic features such as a long face and large testicles. It does not fit with the history of this particular patient.

Muscular dystrophy (the most likely diagnosis in this case) cannot be diagnosed clinically; there are a number of different subtypes, and genetic testing will be required to determine the exact form that is present.

Further reading:

https://patient.info/bones-joints-muscles/muscular-dystrophies

Question:

A 35-year-old woman presents to A&E with sudden onset facial weakness affecting the right side.

She reports that she has been well recently and denies headache, facial pain, changes in hearing or vision, or recent head trauma. She is 30 weeks pregnant and reports that no issues have arisen during her antenatal appointments.

On examination, there is complete paralysis of the facial muscles on the right-hand side, with no forehead sparing. Neurological examinations of the upper and lower limbs are normal. Examination of the ear is normal.

What is the most likely diagnosis?

A. Left-sided ischaemic stroke

B. Ramsay Hunt syndrome

C. Trigeminal neuralgia

D. Posterior fossa tumour

E. Bell's palsy

Correct Answer:Bell's palsy

Explanation:

This patient has an acute lower motor neuron lesion (LMN) affecting the facial nerve (cranial nerve VII). The most likely diagnosis is Bell's palsy (e.g. idiopathic paralysis of cranial nerve VII). Not only is Bell's palsy the most common cause of isolated facial nerve paralysis, but it is also 3x more common in pregnant women.

Ramsay Hunt syndrome refers to LMN facial nerve palsy secondary to varicella-zoster virus and commonly presents with facial pain and vesicles in the ipsilateral ear. Trigeminal neuralgia presents with sudden onset, brief, unilateral pain in the distribution of the trigeminal nerve.

A left-sided intracranial ischaemic stroke would cause paralysis of the lower half of the face on the right side with sparing of the upper half. This is due to the bilateral supranuclear input to the dorsal aspect of the facial nerve nucleus.

A posterior fossa tumour is extremely unlikely due to the acute onset of paralysis and the lack of additional symptoms such as:

Symptoms/signs of raised intracranial pressure (e.g. nausea and vomiting, headaches)

Symptoms/signs of cranial nerve, brainstem, or cerebellar involvement

Constitutional signs/symptoms of malignancy

Further reading:

https://patient.info/doctor/facial-nerve-palsy

Question:

A 4-year-old boy is admitted to the paediatric ward. He has a seven-day history of high fevers and irritability. In addition, his mouth has become sore and desquamated, with a 'strawberry tongue' appearance. His feet are noted to be oedematous and red and he has a polymorphous rash over much of his body.

Which medication is most likely to reduce the risk of complications associated with this disease?

A. Ibuprofen

B. Amoxicillin

C. Intravenous immunoglobulin (IVIg)

D. Paracetamol

E. Dexamethasone

Correct Answer:Intravenous immunoglobulin (IVIg)

Explanation:

Kawasaki Disease is a rare vasculitis affecting children. It is classically characterised by persistent high fevers lasting for more than 5 days, as well as indications of multisystem involvement including a polymorphous rash, oral/mucosal involvement, oedema of the peripheries, desquamation and cervical lymphadenopathy. The most serious complications of Kawasaki disease are related to the cardiovascular system, with coronary artery aneurysms being the most widely-known. Intravenous immunoglobulin (IVIg) is given to help reduce the risk of these occurring and can be repeated if a single dose does not result in improvement. In addition, aspirin is given often at a high initial dose followed by a lower maintenance dose. All other NSAIDs, including ibuprofen, should be stopped. Paracetamol can be used for symptomatic relief and as an antipyretic but does not alter the likelihood of aneurysms occurring.

There is no role for the routine use of antibiotics such as amoxicillin for inflammatory disorders such as Kawasaki disease, although it may be required if there is a concomitant bacterial infection. Corticosteroids such as prednisolone may be used as an adjunct although there is no definitive guidance regarding their use, and dexamethasone is not routinely given.

Further reading:

https://patient.info/doctor/kawasaki-disease-pro#nav-6

Question:

A 3-year-old boy attends the GP with his worried mother. She reports that he has had small pearly lesions on his legs for the past six weeks, which have spread gradually to his arms. On examination, there are multiple small lesions with a central umbilicus. The child is otherwise well with normal vital signs.

What is the most appropriate management option?

A. Supportive treatment

B. Oral aciclovir

C. Urgent referral to dermatology

D. Oral prednisolone

E. Topical hydrocortisone 0.1%

Correct Answer:Supportive treatment

Explanation:

Molluscum contagiosum is a common viral infection in paediatric patients transmitted through skin-to-skin contact. The pearly lesions with a central umbilicus are characteristic of molluscum contagiosum. In the absence of immune compromise, treatment is supportive and the condition is usually self-limiting. The lesions often persist for months but eventually resolve on their own.

The use of hydrocortisone topically is only advised if itching is problematic or if inflammation or eczema develops around the lesions.

The use of acyclovir or oral prednisolone is not indicated or advised.

An urgent referral to dermatology is not indicated in this situation.

Further reading:

https://www.dermnetnz.org/cme/viral-infections/molluscum-contagiosum-cme/

Question:

A 1-year-old child is reviewed by her GP after a health visitor noted that although the child’s weight was in the 78th percentile on the WHO growth chart at birth, over the last year it had gradually dropped through three centile lines to reach the 18th percentile. The mother reports that the child is otherwise well, with normal bowels and feeding. There is no significant medical history or family history.

What is the most likely cause of this child’s presentation?

A. Normal development

B. Coeliac disease

C. Inadequate care

D. Intrauterine growth restriction

E. Cow’s milk protein allergy (CMPA; non-IgE)

Correct Answer:Inadequate care

Explanation:

This child is presenting with a classic case of faltering growth. Only 1% of children will cross three centile lines in their first year, so it is likely that there is an underlying issue. Greater than 90% of faltering growth is due to inadequate care: usually inadequate feeling, emotional abuse, or social isolation. The parents of such children will usually require support and guidance; however, in some cases, child protection issues are also present. Organic causes of faltering growth such as coeliac and CMPA are responsible for only ~5% of cases, but are important to rule out.

Five percent of children will cross 2 centile lines in their first two years, as they move from their placentally-determined weight centile (usually similar to their mother’s) to their genetically determined weight (an average of both their parents). However, crossing three centile lines is unusual, and the height of the father means that this is unlikely to be the underlying cause.

Coeliac disease is a gluten intolerance that presents with faltering growth, pale diarrhoea, and bloating shortly after a child starts to wean onto gluten-containing foods.

Non-IgE-mediated cow’s milk protein allergy presents with failure to thrive, regurgitation, eczema, food refusal, and abdominal pain with eating. It typically presents once a child starts to consume formula feed or other milk.

Intrauterine growth restriction is responsible for low birth weights, but children usually exhibit catch-up growth after birth.

Further reading:

https://patient.info/doctor/faltering-growth-in-children

Question:

An 88-year-old lady has been on an acute medical ward for 5 days, receiving treatment for a urinary tract infection. She had been making some progress, however, she was still struggling with adequate oral fluid intake. Today she became confused. She has a past medical history of mild heart failure. She normally takes furosemide 40mg once daily, however this was stopped on admission due to acute kidney injury.

Her fluids balance shows she has received 500ml of intravenous normal saline over the previous 24 hours. There is no recorded oral fluid intake.

Clinical assessment reveals:

Heart rate: 102 bpm

BP: 120/70 mmHg

Temperature: 36.5 oC

SpO2: 99% on air

Respiratory rate: 16

Capillary refill time: 3.5 seconds

Dry mucous membranes

A small amount of dark urine in the catheter bag

Blood tests reveal the following:

Creatinine: 200 μmol/L

Urea: 9.7 mmol/L

Na: 153 mmol/L

K: 4.7 mmol/L

CRP: < 5

WCC: 3.8 × 109/ L

What is the most likely cause of this patient’s hypernatremia?

A. Diuretics

B. Gastrointestinal losses

C. Diabetes insipidus

D. Heart failure

E. Dehydration

Correct Answer:Dehydration

Explanation:

The cause of this patient’s hypernatraemia is dehydration. She is recovering from a urinary tract infection (and AKI) and is struggling with oral fluid intake. Her fluid requirements are greater than the 500ml of normal saline administered intravenously. Doctors are often worried about fluid overload in elderly patients with heart failure and this can sometimes result in patients developing a negative fluid balance. The findings on clinical examination are all suggestive of dehydration (mild tachycardia, prolonged capillary refill time and dry mucous membranes). The absence of an infective focus on clinical examination and fever, in addition to normal inflammatory markers, make infection a less likely cause of the patient's acute confusion.

Causes of hypernatremia can include:

Dehydration

Diuretics (loop)

Diabetes insipidus

Iatrogenic (saline)

Gastrointestinal losses

The plasma urea disproportionately higher than increased plasma creatinine especially in AKI. But we do not have the baseline of the urea and creatinine to compare to in this vignette.

Diabetes insipidus (DI) is a condition characterised by the production of large amounts of dilute urine and increased thirst. It occurs due to a lack of secretion of antidiuretic hormone (ADH) or an insensitivity to ADH. DI is rare and the presence of concentrated urine in the catheter bag does not fit with this diagnosis.

Gastrointestinal losses are unlikely to be the primary cause of this patient's hypernatraemia given the absence of any mention of diarrhoea in this clinical vignette.

Furosemide, a loop diuretic, can cause hyponatraemia due to naturesis by sodium excretion in the urine. However, it has been stopped on admission for this patient, making it an unlikely cause.

Heart failure is more commonly associated with dilutional hyponatraemia.

Further reading:

https://patient.info/doctor/hypernatraemia

Question:

A 1-day-old neonate born by spontaneous vaginal delivery at 36-weeks gestation is reviewed by a paediatrician due to concerning findings in the newborn physical examination. The neonate has absent red reflexes bilaterally and a loud machinery murmur is heard on auscultation. Automated otoacoustic emission is suggestive of sensorineural deafness.

The pregnancy was unremarkable, other than a 1-week episode of fever and an exanthematous rash in the first trimester that resolved spontaneously. The mother arrived from overseas, where she was unable to access antenatal care.

What is the most likely diagnosis?

A. Holt-Oram syndrome

B. Congenital rubella syndrome

C. Congenital syphilis

D. Congenital cytomegalovirus infection

E. Congenital varicella syndrome

Correct Answer:Congenital rubella syndrome

Explanation:

The correct answer is congenital rubella syndrome. Congenital rubella syndrome classically presents with the triad of sensorineural deafness, congenital cataracts, and cardiac defects, specifically patent ductus arteriosus and pulmonary artery stenosis. While vaccination has eradicated rubella in many Western nations, it remains endemic in some African, middle-Eastern, and South-East Asian nations. Maternal manifestations of rubella infection include a nonspecific viral exanthematous rash, fevers, and lymphadenopathy, though rubella lacks pathognomonic features and must be confirmed with laboratory investigations.

Congenital cytomegalovirus infection may also present with sensorineural deafness, cataracts and cardiac abnormalities however patent ductus arteriosus is rare. Typical presentation is with jaundice and hepatosplenomegaly.

Congenital syphilis is incorrect, as this does not classically cause the triad of congenital cataracts, sensorineural deafness, and cardiac defects. Maternal syphilis infection is associated with miscarriage and stillbirth, though infants born to mothers with syphilis may have few clinical manifestations in early life. Signs of congenital syphilis infection include hepatosplenomegaly and low-birth-weight, while older children may have notched incisors, known as Hutchison's teeth, and a characteristic saddle-shaped nose.

Congenital varicella syndrome is incorrect, as although congenital varicella is associated with cataracts, sensorineural deafness is not a common finding. Congenital varicella syndrome may cause skin scarring in a dermatomal distribution, limb hypoplasia, microcephaly, and urinary/faecal incontinence.

Holt-Oram syndrome is incorrect, as this does not classically cause the triad of congenital cataracts, sensorineural deafness, and cardiac defects. Holt-Oram syndrome is an autosomal dominant genetic syndrome that is characterised by cardiac and upper limb defects. Defects associated with Holt-Oram syndrome include an absent radius and atrial septal defects.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK568794/

Question:

A study is conducted investigating the specificity of faecal immunochemical testing (FIT) in detecting colorectal cancer. The study concludes that FIT has a specificity of 82% in detecting colorectal cancer.

What is the most accurate interpretation of this specificity value?

A. 82% of those testing negative do not have colorectal cancer

B. 82% of those without colorectal cancer will test negative

C. 82% of those with colorectal cancer will test negative

D. 82% of those taking the test will test negative

E. 82% of those testing positive do not have colorectal cancer

Correct Answer:82% of those without colorectal cancer will test negative

Explanation:

The specificity of a test is the proportion of individuals without the condition who will test negative, for example, an 82% specificity means that 82% of individuals without the condition will test negative. Therefore, the correct answer is 82% of those without colorectal cancer will test negative.

Further reading:

https://geekymedics.com/statistics-for-medical-students/

Question:

A 19-year-old woman presents to the GP with a 3-month history of intermittent diarrhoea. She reports a 4kg weight loss over the last 3-months and increasing fatigue. She also mentions she has experienced recurrent ulcers in her mouth.

On examination, she appears pale and tired. Her abdomen is soft with normal bowel sounds; however, there is marked tenderness in the right lower quadrant. There is no guarding or rigidity.

What is the most likely diagnosis?

A. Diverticulitis

B. Endometriosis

C. Crohn's disease

D. Acute appendicitis

E. Ulcerative colitis

Correct Answer:Crohn's disease

Explanation:

The most likely diagnosis in this patient is Crohn's disease - a chronic, relapsing and remitting, non-infectious inflammatory disease of the gastrointestinal tract that occurs in discrete areas anywhere from the mouth to the anus. Crohn's disease should be suspected in patients who present with frequent loose stools lasting >4 weeks, abdominal pain and non-specific symptoms such as fatigue and malaise. Examination findings that support this patient's diagnosis are pallor, abdominal tenderness focussed in the right lower quadrant and aphthous mouth ulcers.

Patients with ulcerative colitis typically present with left-sided abdominal pain and frequent episodes of bloody diarrhoea. This patient has not reported any episodes of bloody stool. Additionally, as ulcerative colitis is isolated to the rectum and the colon, the presence of mouth ulcers in this patient makes this a less likely diagnosis.

Classically acute appendicitis presents with abdominal pain in the periumbilical region that worsens and migrates to the right lower quadrant over 24-48 hours. Appendicitis is also typically associated with fever, anorexia and nausea ± vomiting.

Patients with endometriosis typically present with cyclical symptoms, including dyspareunia, dysmenorrhoea and pelvic pain. Whilst endometrial tissue can grow in the bowel leading to an alteration to bowel habit, it is a less likely diagnosis in this patient given the absence of other suggestive features.

Diverticulitis should be suspected in older patients (>40 years) presenting with constant abdominal pain that starts in the hypogastrium and localises to the left lower quadrant. Diverticulitis is also typically associated with systemic symptoms such as fever ± nausea, and variable alterations to bowel habit.

Further reading:

https://cks.nice.org.uk/topics/crohns-disease/

Question:

A 70-year-old woman is brought to the emergency department by her daughter after experiencing worsening shortness of breath and increased sputum production. She was diagnosed with COPD 8 years ago.

An arterial blood gas is taken with the following results:

Value

pH 7.28

PaO2 7.1

PaCO2 7.8

HCO3- 26

Which of the following best describes this patient’s presentation?

A. Type 1 respiratory failure

B. Respiratory acidosis with metabolic compensation

C. Respiratory alkalosis

D. Metabolic acidosis with respiratory compensation

E. Type 2 respiratory failure

Correct Answer:Type 2 respiratory failure

Explanation:

The correct answer is type 2 respiratory failure. This involves O2 levels below 8kPa and CO2 levels above 6kPa, as is the case in this scenario. The patient has a known diagnosis for COPD and this scenario indicates an acute exacerbation.

Respiratory acidosis with metabolic compensation is incorrect as the HCO3- is within the normal range, ruling out metabolic compensation, suggesting the type 2 respiratory failure is acute. Metabolic compensation takes several days to develop, therefore it is most commonly seen in patients who are in respiratory acidosis for prolonged periods of time (e.g. end stage COPD).

The patient is not in type 1 respiratory failure; although her O2 is sufficiently low to fit the criteria, her CO2 level is high enough to be defined as type 2 respiratory failure.

The patient is not in metabolic acidosis; as this would typically present with a low level of HCO3- and secondary respiratory compensation resulting in a lowered CO2 level.

The patient is not in respiratory alkalosis; this would involve an elevated pH and low CO2.

Further reading:

https://geekymedics.com/abg-interpretation/

Question:

A 28-year-old woman presents to her GP complaining of feeling ‘generally under the weather’. When questioned further, she tells you that for the last couple of months she has experienced increasing fatigue, diarrhoea, and episodes of dizziness when standing.

Her past medical history is significant for type 1 diabetes mellitus. She is compliant with her insulin and rarely suffers hypoglycaemic episodes although she has noticed that her blood sugars have been low recently.

On examination, her observations are as follows: heart rate 89 bpm, blood pressure 105/70 mmHg, SpO2 97% on air, respiratory rate 12, and temperature 36.8⁰C. Her blood sugar is 3.9 mmol/L. The GP performs a lying-standing blood pressure which reveals the following results:

Lying: 110/75 mmHg

Standing: 90/65 mmHg

The GP orders U&Es, the results of which are reported below.

Na+ 130 mmol/L

K+ 5.5 mmol/L

Chloride 100 mmol/L

Urea 4.1 mmol/L

Creatinine 50 μmol/ L

What is the most likely diagnosis?

A. Addison’s disease

B. Hypothyroidism

C. Cushing’s syndrome

D. Insulinoma

E. Coeliac disease

Correct Answer:Addison’s disease

Explanation:

This patient has Addison’s disease or primary adrenal insufficiency which, in the developed world, is most often due to autoimmune destruction of the adrenal glands and a subsequent reduction in circulating adrenal hormones. Patients often present with a range of non-specific symptoms such as fatigue, weight loss, confusion, muscle cramps, change in bowel habit and dizziness.

This patient has a range of non-specific symptoms, postural hypotension and electrolyte derangements (hyponatraemia, hyperkalaemia) which are all typical of Addison's disease. The patient's lower than normal blood glucose readings also support a diagnosis of Addison's disease (decreased levels of glucocorticoids).

Further reading:

https://patient.info/doctor/adrenal-insufficiency-and-addisons-disease#nav-5

Question:

A 54-year-old male presents to the emergency department following an episode of right-sided weakness and slurred speech earlier today. He says he also found difficulty in expressing what he wanted to say. This lasted for around 60 minutes and has since resolved. On further questioning, he describes palpitations and a 'funny heartbeat' for the last week. He describes no changes to his vision.

On examination, his pulse is irregularly irregular. There are no neurological features present. He weighs 110kg. A transient ischaemic attack is suspected.

How would this transient ischaemic attack be classified?

A. Total anterior circulation infarct

B. Lacunar infarct

C. Partial anterior circulation infarct

D. Posterior circulation infarct

E. Lateral medullary syndrome

Correct Answer:Partial anterior circulation infarct

Explanation:

This is likely a partial anterior circulation infarct. The Oxford Stroke Classification can be used to classify cerebrovascular events (CVE). The tool uses the following to classify a CVE:

Unilateral hemiparesis and/or hemisensory loss of face, arm and leg

Homonymous hemianopia

Higher cognitive dysfunction (e.g. dysphasia)

A total anterior circulation infarct involves all three of the criteria. It is caused by occlusion of the middle and anterior cerebral arteries.

A partial anterior circulation infarct involves any two of the criteria. It is caused by occlusion of the small branches of the middle or anterior cerebral arteries.

A lacunar infarct is caused by occlusion of the perforating arteries around the pons, thalamus, basal ganglia and internal capsule. It presents with no loss of higher cerebral function and one of the following:

Pure sensory stroke

Pure motor stroke

Sensorimotor stroke

Ataxia hemiparesis

A posterior circulation infarct is caused by occlusion of the vertebrobasilar arteries, which supply the brainstem, cerebellum and occipital cortex. It presents with one of the following:

Cerebellar/brainstem dysfunction

Loss of consciousness

Isolated homonymous hemianopia

Lateral medullary syndrome is not part of the Oxford Stroke Classification and is caused by occlusion of the posterior inferior cerebellar artery. It is a triad of:

Ipsilateral loss of facial pain and temperature

Contralateral loss of body pain and temperature

Cerebellar dysfunction

Further reading:

https://geekymedics.com/stroke-classification/

Question:

A 34-year-old, 27 weeks pregnant female attends the maternity assessment unit after passing blood from her vagina. She explains that she passed a large volume of bright red blood earlier today and that the bleeding quickly stopped spontaneously. The patient denies any pain, trauma, or further symptoms. On further questioning, she comments that she did not attend any of her antenatal appointments.

She is gravida 3, para 2, with both previous children born via Caesarean section.

On examination, the uterus is soft and non-tender. The cervical os is closed, and CTG shows a reassuring trace.

Which of the following is the most likely diagnosis?

A. Placental abruption

B. Placenta praevia

C. Placenta accreta

D. Vasa praevia

E. Premature labour

Correct Answer:Placenta praevia

Explanation:

This patient is presenting with placenta praevia, an uncommon complication of pregnancy caused by an abnormally low lying placenta. It typically presents as painless vaginal bleeding in the second or third trimester. Many cases of placenta praevia can be diagnosed earlier on in pregnancy during antenatal ultrasound scans, and therefore it is important to ask about attendance at these during history taking. The strongest risk factor for placenta previa is uterine scarring secondary to a previous Cesarean section.

Placental abruption refers to the premature separation of the placenta from the uterine wall. It is an important differential in this case, however, the absence of pain in the history makes this diagnosis less likely. Placental abruption is also associated with a hard, tender uterus and abnormalities in the fetal CTG tracing.

Placenta accreta describes a condition where the placenta is embedded too deeply into the uterine wall. Its incidence is lower than that of placenta praevia, and it is also less likely to cause vaginal bleeding. Placenta accreta may be diagnosed on antenatal ultrasound scans, but it can also present as a cause of postpartum haemorrhage.

Vasa praevia occurs when unprotected fetal blood vessels cross the internal cervical os. If these vessels rupture, it typically presents as dark-red vaginal bleeding, amniotic sac rupture and a rapid decline in fetal health. In such a case an urgent Caesarean section is required.

Painless, vaginal bleeding is not a sign of premature labour. Signs of premature labour include regular contractions, new pain and rupture of the amniotic sac. Also, the fact that the cervical os is not dilated indicates that labour has not yet started.

Further reading:

https://geekymedics.com/antepartum-haemorrhage-aph/

Question:

A baby boy is born to a 35 year old mother. He has upward sloping palpebral fissures, prominent epicanthic folds, a single palmar crease and is hypotonic.

What is the most likely genetic cause of his condition?

A. Microdeletion of chromosome 15q11-13

B. Deletion of chromosome 5p

C. Trisomy 13

D. Trisomy 18

E. Trisomy 21

Correct Answer:Trisomy 21

Explanation:

Trisomy 21 is the cause of Down syndrome. Common dysmorphic features of Down syndrome include upward-sloping palpebral fissures, prominent epicanthic folds, a single palmar crease, brachycephaly (small head with a flat back) and hypotonia. Complications of Down syndrome includes cardiac defects (affecting 1 in 3 patients), most commonly atrioventricular septal defects. Other complications include hypothyroidism, visual problems, e.g. myopia, and eustachian tube abnormalities leading to glue ear and conductive hearing loss.

Trisomy 18 is the cause of Edward syndrome. Common features of Edward syndrome include microcephaly (abnormally sized jaw), micrognathia (undersized lower jaw), ventricular septal defect, overlapping of the 4th & 5th fingers and "rocker bottom feet". Those born with Edward syndrome usually only live for a few months.

Trisomy 13 is the cause of Patau syndrome. Common features of Patau syndrome include microcephaly, small eyes, cleft lip or palate, ventricular septal defect, polydactyly and "rocker bottom feet". Those born with Patau syndrome usually only live for a few weeks.

Deletion of chromosome 5p is the cause of cri-du-chat syndrome. The key feature to note is the characteristic "cat-like cry" heard in infants due to larynx and neurological problems, which can lead to feeding difficulty and, subsequently poor weight gain.

Mircodeletion of chromosome 15q11-13 is an example of genetic imprinting and is seen in both Angelman syndrome and Prader Willi syndrome. Key features to look out for in Angelman syndrome are severe developmental delay, a very happy demeanour, an unusual fascination with water as well as widely spaced teeth. Key features to look out for in Prader-Willi syndrome are developmental delay, central hypotonia & poor feeding in infancy which is followed by hyperphagia (constant insatiable hunger), leading to obesity in older childhood.

Further reading:

https://patient.info/doctor/downs-syndrome-trisomy-21

Question:

A 43-year-old man presents to the GP complaining of persistent joint pain, particularly in the back and knees, and a generalised itch. The pain is worse in the morning, but he finds that swimming helps. On further questioning, he reports suffering from diarrhoea and abdominal pain for a number of years and also describes a few occasions of self-resolving painful lesions on his shins. He takes no regular medication and has no family history of any relevant medical conditions.

On examination, there is no notable erythema of any of the joints; however, there is sacroiliac joint tenderness and slight discomfort on palpation of both knees. The patient is able to walk unassisted despite the pain, and observations are unremarkable.

What is the next most appropriate investigation?

A. Faecal calprotectin

B. Iron studies

C. Chest X-ray

D. Anti-CCP antibody screen

E. Faecal elastase

Correct Answer:Faecal calprotectin

Explanation:

The history of arthralgia, in combination with vague abdominal symptoms and erythema nodosum (the likely explanation for the patient's shin lesions), should lead to a consideration of inflammatory bowel disease (IBD) as a possible diagnosis. Enteropathic arthritis and erythema nodosum are relatively common extra-articular manifestations of both Crohn's and ulcerative colitis, and whilst irritable bowel syndrome could account for the patient's symptoms, this is a diagnosis of exclusion, and the history given suggests that the patient has not sought medical advice for his medical symptoms previously.

Of the options available, a faecal calprotectin measurement would be the most appropriate as the next investigation; this is a non-specific marker but would be expected to be raised if inflammatory bowel disease is indeed the cause of the patient's symptoms. A full blood count and inflammatory markers would also be beneficial to screen for general signs of inflammation. Should the results of these tests imply that IBD is a possibility, referral to the hospital for colonoscopy and biopsy for confirmation would be necessary.

Anti-CCP antibodies would be indicated if rheumatoid arthritis was the most likely diagnosis; whilst this can present with inflammatory-type joint pain, and could involve the joints involved in this patient's case, the distribution is less classical, and the abdominal pain and diarrhoea fit less well with this diagnosis.

Hereditary haemochromatosis is a possible cause of arthralgia - iron studies are often used as the first-line investigation for this condition, as they will reveal a raised level of ferritin and serum iron. The patient's history is not in keeping with this as a likely diagnosis. Iron studies may be beneficial if anaemia was present (IBD is a possible cause of iron deficiency due to blood loss), however, these would not be useful without a full blood count to accompany them.

A faecal elastase measurement may be useful if a diagnosis of chronic pancreatitis is being considered. The cause of this condition is usually excessive alcohol consumption over many years; there is no history of this. Joint pain is not a typical feature of the disease.

Sarcoidosis can commonly present with erythema nodosum in its acute stage and may also result in arthralgia. A chest X-ray would be a good first-line investigation for this condition; however, it is a less likely diagnosis than IBD in this case, as there is an absence of respiratory features, and abdominal pain is less likely to be attributed to sarcoidosis.

Further reading:

https://cks.nice.org.uk/topics/crohns-disease/background-information/extra-intestinal-manifestations/

Question:

Alex Johnson, 63, has been experiencing episodes of chest tightness that are brought on by exertion and relieved by rest or by his glyceryl trinitrate (GTN) spray. Episodes last around 10 minutes. He has no other medical problems. His current medications are aspirin, atorvastatin, atenolol and GTN spray. He is continuing to have episodes of pain.

Which of the following is the most appropriate next change to make to his medications?

A. Add diltiazem

B. Stop his atenolol and add ranolazine

C. Add verapamil

D. Add amlodipine

E. Add ivabradine

Correct Answer:Add amlodipine

Explanation:

This gentleman is experiencing episodes of angina. According to NICE, the first-line treatment for stable angina is a beta-blocker or a calcium channel blocker. If symptoms are not adequately controlled with a beta-blocker or a calcium channel blocker, it recommends either using a combination of the two or switching to the other option. However, combining beta-blockers with non-dihydropyridine calcium channel blockers such as verapamil or diltiazem, which are cardioselective, is contraindicated as this can precipitate severe bradycardia. Therefore, the most appropriate answer in the above question would be to add amlodipine.

Other anti-anginal drugs, such as ranolazine and ivabradine are not first-line treatments and are recommended further down the treatment ladder. Ranolazine improves coronary blood flow by blocking sodium currents in the heart, whilst ivabradine slows the heart by inhibiting funny channels in the myocardium.

Further reading:

https://www.nice.org.uk/guidance/cg126

Question:

A study is conducted investigating the effects of polypharmacy on cognition. Participants taking various numbers of medications are given 10 minutes to complete a 20-item questionnaire assessing their cognition. Feedback from study participants reveals that many felt pushed for time and therefore were not able to complete some of the questions.

What form of bias is most likely to be present in this study?

A. Misclassification bias

B. Confounding bias

C. Central tendency bias

D. Observer bias

E. Procedure bias

Correct Answer:Procedure bias

Explanation:

Procedure bias is the bias that arises from the conditions in which a study is undertaken, for example not giving participants enough time to complete a questionnaire may distort the results of the questionnaire.

Observer bias is the bias that arises due to a researcher’s expectations or preconceptions affecting the way they perceive and record a variable.

Misclassification bias is the bias that arises from incorrectly classifying a study participant.

Central tendency bias is the bias that arises from people’s tendency to rate items towards the middle of a scale.

Confounding bias is the bias that arises when an additional factor is independently associated with both the exposure and the outcome. This leads to an apparent correlation between the exposure and outcome.

Further reading:

https://geekymedics.com/statistics-for-medical-students/

Question:

You are working in a dermatology clinic and see John Smith, a 51-year-old man referred by his GP for a dark patch on his back. This was first noticed by his wife whilst on their yearly trip to the Bahamas 1 week ago. The patient reports not being aware of the lesion prior to this and is unsure of how long it has been there for. His wife reports it hasn’t appeared to change in size, colour or shape from a week ago. He has no significant medical or family history.

On examination, you notice his skin has a faint tan, mixed with redness and dry peeling skin on his arms and shoulders. He appears to have a large number of freckles on his torso. In the middle of his back, he has a dark pigmented lesion measuring 15mm in diameter. On palpation, it is raised and irregular. Its appearance on dermatoscopy is shown.

What would be the most appropriate first-line investigation for this lesion?

National Cancer Institute

A. Shave biopsy

B. Punch biopsy

C. CT head, chest, abdomen and pelvis

D. Sentinel lymph node biopsy

E. Excisional biopsy

Correct Answer:Excisional biopsy

Explanation:

The most appropriate first-line investigation for this lesion would be an excisional biopsy. The patient history although limited gives an indication of overexposure to the sun, a Fitzpatrick skin type II, and high freckle density. These are all significant risk factors for melanoma. This is a skin malignancy arising from melanocytes, with lesions typically appearing on sun-exposed locations and in fair-skinned people. Strong risk factors include family and personal history of melanoma, history of actinic keratosis, and history of atypical naevi. When considering a diagnosis of melanoma following the ABCDE mnemonic (Asymmetry, Border irregularity, Colour variability, Diameter >6mm, Evolving size, shape or colour).

The lesion, based on the examination findings and dermatoscopy image, strongly suggests a superficial spreading melanoma, the most common type of melanoma. Any lesion suspected to be a melanoma should undergo an excisional biopsy of the entire lesion with a margin of 2mm of normal skin and a cuff of fat.

An incisional punch biopsy is occasionally acceptable in the differential diagnosis of lentigo maligna (example below) on the face or an acral melanoma, however, in this situation given the clinical findings, it would not be the most appropriate investigation. This technique allows clinicians to obtain a tube-shaped specimen containing epidermis, dermis, and most of the time subcutaneous tissue. It is particularly useful in bullous lesions and to aid diagnosis or choice of treatment in cutaneous squamous cell carcinoma.

Shave biopsies are used predominantly for epidermal lesions without extension into the dermis such as papillomas, superficial basal or squamous cell carcinoma, and seborrhoeic or actinic keratoses. However, these should not be carried out for lesions suspicious of melanoma as they may lead to sampling errors and make the pathological staging of the lesion very difficult.

Sentinel lymph node biopsy (SLNB) is a staging investigation for patients with IB melanoma or higher with a Breslow thickness of >1mm. This can help diagnose if there has been metastatic spread to lymph nodes and then determine whether a lymphadenectomy is required.

Following biopsy and histopathological analysis of the lesion, CT staging, involving head, chest, abdomen, and pelvis should be offered to people with stage IIC melanoma who have not had SLNB, stage III, or suspected stage IV.

Lentigo maligna (this work is licensed under the Creative Commons Attribution 3.0 License)

Further reading:

https://doi.org/10.1111/j.1365-2133.2010.09883.x

Question:

A patient with suspected systemic lupus erythematosus (SLE) undergoes an anti-nuclear antibody (ANA) test. This test has a sensitivity of 100%.

What can be concluded about the test based on its sensitivity?

A. The test has a low false negative rate

B. The test has a high false negative rate

C. Nothing can be concluded about the test’s false positive or false negative rate

D. The test has a low false positive rate

E. The test has a high false positive rate

Correct Answer:The test has a low false negative rate

Explanation:

If a test has a high sensitivity, it is able to easily pick up individuals with a condition and is unlikely to miss those who have the condition. Therefore, the test has a low false negative rate.

Further reading:

https://geekymedics.com/statistics-for-medical-students/

Question:

An 11-year-old male from Sub-Saharan Africa is reviewed during a home visit with his mother. He describes joint pain affecting his knees and ankles for the last few days and says that his elbows were also painful a few days ago. His mother is more concerned at some strange jerky movements she has noticed over the past 24 hours involving his arms and sometimes his face. His vaccination history is up to date and his antenatal/perinatal history is unremarkable. He did have a nasty sore throat a month or so ago. His father has depression, but there is no other family history of relevance.

On examination the child appears unwell; he is pyrexial with occasional chorea-like movements. There is bilateral erythema and swelling of his knees. On inspection of his trunk and arms, there are multiple macules, these are not present on his legs or face. Otherwise, clinical observations are within normal limits. An ambulance is called and he is sent to the hospital.

What is the most likely diagnosis?

A. Rheumatic fever

B. Amitriptyline poisoning

C. Meningoencephalitis

D. Kawasaki disease

E. Septic arthritis

Correct Answer:Rheumatic fever

Explanation:

The most likely diagnosis is rheumatic fever, given the history of a recent throat infection, migratory arthritis, chorea (Sydenham's chorea), rash and fever.

The pathogenesis of rheumatic fever is not fully understood, however it is thought that group A beta-haemolytic streptococci can trigger an immune-mediated reaction which can affect the joints, skin, heart and nervous system.

The Jones criteria are used to identify patients who are likely to have a rheumatic fever (RF). Patients are felt to be likely to have RF if they have evidence of recent streptococcal infection (i.e. positive throat swab or raised ASOT) and either two major criteria or one major and two minor criteria. In this scenario, although the throat infection hasn't been confirmed as streptococcal, the child has three major criteria and one minor criterion, making the diagnosis more likely than the other options.

Major criteria include:

Arthritis - typically migratory affecting the large joints

Carditis - often presenting with chest pain and tachycardia

Chorea

Subcutaneous nodules

Erythema marginatum

Minor criteria include:

Fever

Raised ESR and CRP

Prolonged PR interval

Septic arthritis usually presents as a single swollen joint in a patient with other features of sepsis (i.e. fever, malaise).

Kawasaki disease typically presents in younger children around the age of 5 with prolonged fever (>14 days), conjunctivitis, cervical lymphadenopathy, strawberry tongue and desquamation of the palms and soles.

Amitriptyline poisoning can cause chorea in children and the father has a history of depression however the signs and symptoms, in this case, do not match that of poisoning. You would expect a much more acute deterioration with associated seizures and dysrhythmias.

Meningoencephalitis is the inflammation of the meninges and parenchyma of the brain. It is a medical emergency and is characterised by meningism (photophobia, headache and neck stiffness) and signs of encephalitis such as seizures. Although a very reasonable and important differential diagnosis, knowledge of the jones criteria would lead one to suspect rheumatic fever over this diagnosis.

Further reading:

https://patient.info/doctor/rheumatic-fever-pro

Question:

An 18-year-old male presents to his general practitioner with a history of multiple non-bloody bowel movements. He also describes mild diffuse abdominal pain. He denies any recent foreign travel and has no unwell contacts. He does report eating some leftover food with rice approximately 8 hours previously.

What pathogen is most likely responsible for his condition?

A. Cryptosporidium spp

B. Clostridium difficile

C. Entamoeba histolytica

D. Bacillus cereus

E. Campylobacter jejuni

Correct Answer:Bacillus cereus

Explanation:

The patient above has developed acute, non-inflammatory diarrhoea after eating rice approximately 8 hours previously. This is most likely to be caused by Bacillus cereus, a gram-positive bacteria that is frequently present in undercooked or reheated rice. The diarrhoeal syndrome is characterised by abdominal cramping and a large amount of non-bloody diarrhoea, which begins around 8-10 hours after ingestion. It usually resolves within 24 hours.

Cryptosporidium is transmitted via the faecal-oral route and is a cause of severe, life-threatening diarrhoea in patients with significant immunosuppression. The patient above is otherwise healthy and unlikely to be suffering from an infection from this pathogen.

Campylobacter jejuni is a gram-negative, ‘S’ shaped bacteria that is transmitted through the consumption of undercooked meat (especially poultry products). It is an important cause of bloody diarrhoea. Patients typically present with fever, headache and fatigue, as well as gastrointestinal symptoms.

E. histolytica is a protozoan which commonly causes bloody diarrhoea. It is transmitted via the faecal-oral route or through water products in areas of poor sanitation. The patient above has non-bloody diarrhoea.

C. difficile infection is a common cause of watery diarrhoea in hospitalised patients. Risk factors for C. difficile infections include recent antibiotic use, chronic proton pump inhibitor use, age > 65 years and immunosuppression.

Further reading:

https://patient.info/doctor/gastroenteritis-in-adults-and-older-children

Question:

A 66-year-old woman presents with constant pain in her left lower abdomen. The pain started three days ago and was initially dull but has now become sharp. She also describes constipation and nausea. She denies any weight loss but has noticed some blood in the stool and feels slightly feverish.

On examination, there is marked tenderness in the left iliac fossa with guarding and rebound tenderness.

Given the likely diagnosis, what is the most likely complication that has occurred?

A. Contained pelvic abscess

B. Contained pericolic abscess

C. Stricture

D. Colovesical fistula

E. Perforation

Correct Answer:Perforation

Explanation:

This woman is presenting with symptoms consistent with diverticulitis (left lower quadrant pain, constipation and fever). The transition of the pain from dull to sharp and the findings of guarding and rebound tenderness on examination indicate peritonitis, which can be purulent, resulting from rupture of an abscess, or faecal, resulting from perforation of the bowel wall. Peritonitis is not caused by a contained pericolic abscess or a contained pelvic abscess.

A colovesical fistula typically presents with pneumaturia or feculent matter in the urine.

Although a stricture may cause obstructive symptoms like constipation and nausea, it is a late complication of diverticulitis, occurring over months rather than days.

Further reading:

https://www.nice.org.uk/guidance/ng147/chapter/Recommendations#acute-diverticulitis

Question:

A 37-year-old woman is brought in to her GP surgery for review feeling generally unwell. She reports having had recurrent fevers over the last 2 weeks. She has also had a dry cough and pain in her ankles over a similar time period. On examination her chest is clear and she has tender red-purple nodules on her legs. She has no palpable lymphadenopathy and no mouth ulcers. Her recent blood tests showed a raised adjusted calcium, raised ESR and normal antinuclear antibodies. Her chest x-ray was reported as abnormal. She has been previously vaccinated against tuberculosis and denies any recent travel.

What is the most likely diagnosis?

A. Hodgkin’s lymphoma

B. Systemic lupus erythematosus

C. Rheumatoid arthritis

D. Tuberculosis

E. Sarcoidosis

Correct Answer:Sarcoidosis

Explanation:

The most likely diagnosis here is sarcoidosis, a multisystem disease characterised by granulomatous inflammation often affecting various sites. The most commonly affected sites include the respiratory system and skin (i.e. erythema nodosum). The disease also typically presents with constitutional symptoms such as fevers, malaise and arthralgias. Hypercalcaemia is often found and bilateral hilar lymphadenopathy is a classical chest x-ray finding.

Active tuberculosis (TB) classically presents insidiously with cough and haemoptysis, weight loss, night sweats and extrapulmonary symptoms. This is less likely given the patient is vaccinated and there is no mention of significant previous exposure to TB.

Hodgkin’s lymphoma typically presents with lymphadenopathy alongside constitutional symptoms and hepatosplenomegaly. The lack of lymphadenopathy makes it less likely in this scenario.

Rheumatoid arthritis more commonly presents with symmetrical inflammatory arthritis (typically MCP joints) and it would be unusual for other organ systems to be involved from the outset.

Lupus may mimic other diagnoses, but rashes would usually be on sun-exposed areas, mouth ulcers are relatively common and the antinuclear antibodies are typically raised.

Further reading:

https://patient.info/doctor/sarcoidosis-pro

Question:

Mrs E is a 55-year-old female who has presented to her GP complaining of episodes of feeling warm and sweating profusely. She also complains of irritability, poor sleep and a loss of libido. Her GP elicits how she had not had a period for 18 months. Mrs E has 3 children and has no history of hysterectomy.

On examination, there are no significant findings and Mrs E appears currently well. The GP considers that Mrs E may be going through the menopause.

What is the most appropriate management plan to consider?

A. Oestrogen and progesterone hormone replacement therapy

B. Advice to return following 2 years without a period

C. Suggest the use of herbal treatment phyo-oestrogen

D. Oestrogen-only hormonal replacement therapy

E. Topical hormone replacement therapy

Correct Answer:Oestrogen and progesterone hormone replacement therapy

Explanation:

This lady appears to be experiencing the menopause. She has not menstruated in 18 months and complains of vasomotor, sexual and psychological symptoms; therefore it would be appropriate to consider hormone replacement therapy. This patient still has a uterus, therefore, she requires a combination of hormones. If she had a history of hysterectomy, oestrogen-only may be considered more appropriate.

Although herbal or complementary treatments for menopausal symptoms are recognized, the evidence to support their effectiveness and safety is unknown.

Topical hormone replacement therapy would be more appropriate if the patient complained of urogenital atrophy, however she does not. NICE suggests that menopause can be diagnosed in women aged over 45 with menopausal symptoms who have not had a period for at least 12 months. It may be appropriate to ask the patient to return to consider HRT if she had not had a period for 8 months for example, but, as it has been 18 months she fulfils the criteria for diagnosis and therefore a treatment option can be considered immediately.

Further reading:

https://www.nice.org.uk/guidance/ng23/chapter/Recommendations#diagnosis-of-perimenopause-and-menopause

Question:

You are asked to review Mr B following a recent myocardial infarction 2 weeks ago. He was admitted with a crushing central chest pain which had resolved following successful percutaneous coronary intervention (PCI), but has now been replaced by a sharp central pain which is relieved on sitting forward.

On examination heart sounds are normal and the chest is clear. The JVP is not elevated and the abdomen is soft and non-tender. Observations are normal other than a low-grade temperature of 37.6 oC.

ECG shows widespread ST elevation with no reciprocal ST depression.

What is the most appropriate initial management option?

A. Non-steroidal anti inflammatories (NSAIDs)

B. Urgent percutaneous coronary intervention (PCI)

C. No change in management, repeat ECG in 12 hours

D. Urgent echocardiography

E. Initiation of acute coronary syndrome (ACS) medical management

Correct Answer:Non-steroidal anti inflammatories (NSAIDs)

Explanation:

The correct answer is NSAIDs. This presentation is typical of Dressler’s syndrome. This is thought to be an immune-mediated reaction following myocardial infarction (typically 2-4 weeks post-MI). It is characterised by a triad of pericarditis, pleuritic chest pain and low grade fever. Although textbooks often describe a pericardial rub, this is not always present. NSAIDs are very effective in the management of Dressler’s syndrome which is generally a self-limiting condition.

Echo may reveal a pericardial effusion but in the context of a stable patient is unlikely to change management.

This pain is not typical of ACS and therefore PCI or medical management of ACS is not appropriate.

Making no change to management is not appropriate given the patient has complained of pain. Some simple analgesia should be prescribed.

Further reading:

https://patient.info/doctor/complications-of-acute-myocardial-infarction

Question:

A 78-year-old woman presents to the emergency department after falling whilst getting out of bed. She complains of pain along her chest wall. A chest X-ray reveals a rib fracture as well as existing asymptomatic vertebral compression fractures.

She has a past medical history of hypertension and hypercholesterolaemia. She is currently taking amlodipine 10mg and simvastatin 20mg daily. She is allergic to aspirin (associated with anaphylaxis).

All blood tests taken on admission were normal.

What is the most likely underlying diagnosis?

A. Osteomalacia

B. Paget's disease

C. Primary hyperparathyroidism

D. Osteoporosis

E. Rickets

Correct Answer:Osteoporosis

Explanation:

The most likely underlying condition in this patient is osteoporosis. This patient has several features that put her at high risk of osteoporosis, including evidence of fragility fractures, a recent fall and an age >65. Osteoporosis is diagnosed through a bone density scan (dual-energy x-ray absorptiometry) and patients will have normal serum calcium, phosphate and parathyroid hormone levels.

In contrast to osteoporosis, patients with osteomalacia typically have low serum calcium, 25-hydroxyvitamin D and phosphate levels. X-ray images typically show pseudofractures, known as Milkman's fractures.

Osteomalacia and rickets are both disorders of impaired bone mineralisation. Rickets is specifically deficient mineralisation at the growth plates of long bones and manifests in childhood only.

Paget's disease of the bone typically presents with characteristic lytic and sclerotic changes on plain X-ray and raised alkaline phosphate.

Patients with primary hyperparathyroidism are typically confirmed biochemically with the elevation of serum calcium and parathyroid hormone.

Further reading:

https://cks.nice.org.uk/topics/osteoporosis-prevention-of-fragility-fractures/

Question:

A 21-year-old student presents to the GP to request a prescription of the combined oral contraceptive pill as she has recently entered a sexual relationship with a new partner. As part of the work-up before agreeing to the prescription, the patient has their blood pressure measured, with a reading of 168/108 obtained. The patient is surprised to learn this, as she has a normal BMI, and adheres to a healthy diet.

The GP carries out an examination and finds no abnormalities on palpation of the abdomen, and thyroid status assessment appears normal. However, on cardiac auscultation, a murmur is present, this is heard best under the left clavicle and appears to be continuous. Prompted by this, a blood pressure measurement is taken from the lower limb, this is notably different from the previous reading at 128/86. The GP tells the patient that she will require further investigations before she can be prescribed the oral contraceptive pill, orders a set of routine blood tests and makes a hospital referral.

Which of the following conditions is most strongly associated with the underlying diagnosis?

A. Marfan syndrome

B. Bicuspid aortic valve

C. Mitral valve prolapse

D. DiGeorge syndrome

E. Polycystic kidney disease

Correct Answer:Bicuspid aortic valve

Explanation:

This patient has presented with secondary hypertension; this should always be suspected in any young patient with elevated blood pressure and no risk factors for essential hypertension. There are a number of organ systems that can be implicated in secondary hypertension, renal most commonly (the kidneys play an essential role in blood pressure regulation), but also endocrine, cardiac and certain medications.

Given the discrepancy between the blood pressure in this patient's upper and lower limbs, and the presence of a heart murmur, the most likely diagnosis, in this case, is coarctation of the aorta; an area of abnormal narrowing, most commonly in close relation to the ductus arteriosus. Whilst this condition is most commonly detected at birth during the newborn and infant physical examination (NIPE) when the femoral pulses are palpated and the heart auscultated, smaller narrowings may not be detected. The condition can remain undetected until adulthood in rare cases, when upper limb hypertension is noted, due to restricted flow through the narrowed region causing a build-up of pressure. The coarctation can also cause turbulent blood flow, resulting in a murmur. This can be continuous and heard best below the clavicle, or possibly as an ejection systolic murmur, radiating backwards between the scapulae. Radio-femoral delay may be present, as the narrowing results in a reduced flow rate to the lower limbs.

Coarctation of the aorta can arise sporadically or can be associated with underlying medical conditions. Turner's syndrome is the most well-known, but in a large number of cases (up to 60%), patients have a concurrent bicuspid aortic valve. This can in itself cause an ejection systolic murmur and can give an increased risk of the valve becoming stenosed.

Investigation of suspected coarctation of the aorta involves imaging studies - a chest X-ray may reveal cardiomegaly and rib notching (arising due to an increased flow through the neurovascular bundles). Echocardiography is normally required for a definitive diagnosis to be made; management is principally surgical, with older patients such as that in this vignette usually having a stent inserted to relieve the narrowing.

Marfan syndrome is associated with a number of cardiac conditions. Most importantly, it gives a greatly increased risk of aortic root dilatation and dissection; patients with the conditions require regular echocardiograms for monitoring. Marfan syndrome is not associated with coarctation of the aorta, however.

Polycystic kidney disease can cause secondary hypertension in its own right; there are no features of the condition in this history, however. It can be associated with mitral valve prolapse, but there is no known association between this valvular abnormality and coarctation of the aorta, which is likely given then symptoms and examination findings.

DiGeorge syndrome is a chromosomal deletion syndrome that can give cardiac manifestations; however, these include interrupted aortic arch, Tetralogy of Fallot, and septal defects. There is no known association with coarctation of the aorta.

Further reading:

https://cks.nice.org.uk/topics/hypertension/diagnosis/investigations/

Question:

A 76-year-old lady who is normally fit and well is admitted to the emergency department with shortness of breath, fevers and a cough productive of yellow sputum. Chest x-ray shows a left basal consolidation and you diagnose her with community-acquired pneumonia.

What is the most likely causative organism?

A. Klebsiella

B. Mycoplasma

C. Staphylococcus aureus

D. Haemophilus influenza

E. Streptococcus pneumoniae

Correct Answer:Streptococcus pneumoniae

Explanation:

The most likely organism responsible for this patient's community-acquired pneumonia is Streptococcus pneumoniae. This is the most common cause of community-acquired pneumonia in people who are otherwise well (i.e. not immunocompromised). Atypical organisms always need to be considered in older people and when patients don't respond well to standard antibiotic treatment.

Staphylococcus aureus pneumonia is common in people who have recently had flu and Klebsiella is a common causative organism in patients with a background of diabetes or alcohol excess. Haemophilus influenza is more common in patients with a background of chronic obstructive pulmonary disease (COPD).

Mycoplasma pneumonia presents with flu-like symptoms, dry cough and hyponatraemia. CXR often shows reticular-nodular or patchy shadowing of one lobe which appears worse than would be expected based on the patient's symptoms.

Further reading:

https://patient.info/doctor/pneumonia-pro

Question:

A 2-year-old girl presents to the GP with a 1-day history of fever, lethargy and watery, loose stools. All of her vaccinations are up to date and she has been reaching her developmental milestones. She has no significant past medical history.

On examination, the girl’s temperature is 38.2 oC and she has generalised abdominal tenderness.

What is the most likely cause of this child's illness?

A. Bacterial gastroenteritis

B. Viral gastroenteritis

C. Coeliac disease

D. Inflammatory bowel disease (IBD)

E. Intussusception

Correct Answer:Viral gastroenteritis

Explanation:

The most likely cause of this child's illness is a form of gastroenteritis; in this case, it is viral gastroenteritis. Viral gastroenteritis is much more common than bacterial gastroenteritis.

In children, the most common pathogen involved in viral gastroenteritis is rotavirus. Since the introduction of the rotavirus vaccine, the number of cases of rotavirus has decreased significantly. However, being vaccinated does not provide complete protection (instead it provides around 85% protection).

To definitively differentiate between viral and bacterial gastroenteritis you need to send a stool culture.

IBD and coeliac disease are unlikely due to the very short duration of symptoms (1-day). Coeliac typically presents with faltering growth and offensive stools. IBD typically presents with chronic diarrhoea (with blood/mucus) and faltering growth.

Intussusception typically affects those under the age of 18 months and presents with colicky abdominal pain due to bowel obstruction.

Further reading:

https://patient.info/doctor/rotavirus-and-rotavirus-vaccination

Question:

A 62-year-old man presents with a progressive history of difficulty walking over the past year. He was initially suffering from foot drop but has found that the weakness of his lower limbs has spread proximally over the last few months. He also describes weakness of his hands and grip strength and twitching/cramping of his muscles.

On examination, there is overt muscle wasting, spasticity, upgoing plantars, visible fasciculations, and hyperreflexia.

Which of these pharmacological interventions has been shown to prolong survival?

A. Baclofen

B. Prednisolone

C. Modafinil

D. Riluzole

E. Antioxidant therapy

Correct Answer:Riluzole

Explanation:

This patient is suffering from amyotrophic lateral sclerosis (ALS), a form of motor neurone disease affecting the motor cortex and the anterior horn of the spinal cord, and thus characterised by the presence of both upper and lower motor neuron signs and symptoms. There is no curative treatment at present, and management should focus on symptom control and quality of life improvement. Riluzole, a drug that is thought to exert its effect via glutamate blockade, has been shown to improve life expectancy in patients with ALS and is the only drug shown to affect disease progression. This benefit is modest, of the order of 2-3 months on average, and most patients with this condition will die within 3-5 years of diagnosis. This highlights the importance of early multidisciplinary team involvement, and advance care planning in discussion with patients and their families. Note also that non-invasive ventilation has been shown to improve survival, and can be offered initially at night with progression to constant use if required. However, NIV is not as effective as invasive ventilation and is not a benign intervention. Therefore, again, it is important to have frank discussions with patients at the time of diagnosis regarding their wishes, as they may choose to decline ventilation in favour of comfort-focused measures.

Baclofen is a muscle relaxant that can be used for symptomatic muscle spasticity in patients with ALS, it does not prolong survival.

Modafinil is a medication used for the treatment of sleepiness in conditions such as narcolepsy. It has been trialled for the treatment of fatigue in motor neurone disease, but there is no evidence that prognosis is impacted.

Prednisolone is a corticosteroid, used for immunosuppression in a wide range of conditions. It has not been shown to be of benefit in slowing disease progression in ALS.

Antioxidants have not been demonstrated to improve survival in ALS.

Further reading:

https://www.nice.org.uk/guidance/NG42/chapter/Recommendations#managing-symptoms

Question:

An 8-year-old boy is brought to A&E by his mother after complaining of pain in his left hip over the last few hours; she is not sure of exactly how the injury happened, but the boy appears very unhappy and is hobbling. She wonders if he fell at school, as the joint now appears slightly red. The child is reported to have been otherwise well up until this point, with the exception of a recent bout of diarrhoea and vomiting which was attributed to a norovirus outbreak at school.

On examination, there is a small amount of erythema over the left hip joint, although there is a negligible temperature difference between the two sides. The patient is not keen to walk but can put weight on the affected leg. He has a temperature of 38.9 degrees, with his pulse elevated at 130bpm. The doctor notes a number of partially healed cuts and grazes over the boy's arms and legs, he and his mother both inform you that these are from playing football, and the injuries are in keeping with this.

The doctor is concerned about the boy's presentation and orders a number of investigations. An X-ray of the hip is booked, but there is a backlog of requests and the results of blood tests taken in triage return before this. These reveal the following:

Haemoglobin - 139 g/L

MCV - 89 fL

WBC - 13 x109/L

Platelets - 450 x109/L

ESR - 54 mg/L

What is the most likely cause of this boy's hip pain?

A. Simple knee trauma

B. Transient synovitis

C. Reactive arthritis

D. Septic arthritis

E. Gout

Correct Answer:Septic arthritis

Explanation:

A hot, swollen joint is a commonly encountered clinical dilemma in a hospital setting. With the history provided in this scenario, a septic joint is an essential diagnosis to exclude, however, there is a significant overlap with the features experienced in transient synovitis; a self-limiting infection that often follows a viral infection. In scenarios such as this where there is diagnostic doubt, the Kocher criteria can be beneficial. This is a 4-point checklist, consisting of the following:

Non-weight-bearing on the affected side

Erythrocyte sedimentation rate > 40

Fever > 38.5 °C

White blood cell count > 12,000

The presence of 3 or more of these features corresponds to a 93% probability that septic arthritis is present. Whilst this boy is able to weight-bear, he meets the other 3 criteria, and it is therefore likely that his presentation is due to septic arthritis. Transient synovitis is still a possibility, but the approach to investigation and management should be of a septic presentation, with blood cultures, joint aspiration and IV antibiotics all important.

The breakdown of the white blood cell results would also have been useful in differentiating between the two most probable presentations, although they were not provided in this case. As transient synovitis is usually due to a viral infection, lymphocytosis would be expected, rather than the neutrophilia that is classically seen in septic arthritis.

Reactive arthritis can develop after infection at a distant site; it is classically associated with Campylobacter, Neisseria gonorrhoea and chlamydia infections. Whilst this patient has a history of diarrhoea and vomiting, this had a likely viral origin and is unlikely to have triggered reactive arthritis.

Simple knee trauma would not give the changes observed on the blood results, and gout is much less likely in this age group than in older patients with risk factors for the condition.

Further reading:

https://cks.nice.org.uk/topics/knee-pain-assessment/

Question:

A 37-year-old man presents to the emergency department complaining of ongoing and worsening shortness of breath, productive cough and febrile episodes.

He was discharged from a respiratory ward two weeks ago where he had been treated for hospital-acquired pneumonia caused by staphylococcus aureus infection. He reports that he was given a course of oral antibiotics to complete in the community, but he did not take them as they made him feel sick.

His vital signs are shown below.

Vital sign Result

Respiratory rate 22 breaths per minute

Oxygen saturation 92% on air

Blood pressure 100/55 mmHg

Heart rate 106 beats per minute

Temperature 38.2⁰C

On examination of the chest, there are coarse crackles at the left middle and lower zones.

The patient's chest X-ray is displayed below.

Christaras A, CC BY-SA 3.0 via Wikimedia Commons

Which complication of his hospital-acquired pneumonia has most likely occurred?

A. Acute respiratory distress syndrome

B. Lung abscess

C. Pleural-thoracic empyema

D. Pleural effusion

E. Pneumothorax

Correct Answer:Lung abscess

Explanation:

The most significant features of this chest X-ray are consolidation affecting the left middle and lower zones and a round cavity adjacent to the left heart border. The latter feature is most likely a lung abscess caused by an ongoing staphylococcus aureus infection.

A lung abscess occurs when a microbial infection causes necrosis of the parenchyma resulting in a localised collection of pus. Staphylococcus aureus, Klebsiella species, and Pseudomonas species are particularly prone to causing necrotising pneumonia.

Pleural effusion appears on erect chest X-rays as blunting of the costophrenic or cardiophrenic angles. Large volume effusions may result in a crescentic (concave) fluid meniscus and mediastinal shift away from the effusion.

Thoracic empyema (i.e. pus in the pleural space) often appear similar to pleural effusions on chest X-ray but may be distinguished by their lenticular (biconvex) shape. Ultimately, a pleural tap is required to definitively differentiate between the two.

Pneumothorax (i.e. presence of gas in the pleural space) is identified by the loss of peripheral lung markings on a chest x-ray. Clinically, it would present as sudden- onset shortness of breath and can be associated with lateral chest pain.

Acute respiratory distress syndrome is seen as bilateral diffuse opacities on chest X-ray.

Further reading:

https://radiopaedia.org/articles/thoracic-empyema-1?lang=gb

Question:

A 68-year-old man presents to the emergency department with abdominal pain. He explains that he has experienced gnawing central abdominal pain for the last two days, which radiates through to the back.

He has a past medical history of hypertension, managed with amlodipine 10mg and candesartan 8mg. He drinks 16 units of alcohol a week and has a 40-pack-year tobacco history.

On examination, there is a palpable pulsatile mass in the midline, below the level of the umbilicus. He is hypertensive at 156/87 mmHg and a regularly regular heartbeat of 110 beats per minute.

What is the most likely diagnosis?

A. Abdominal aortic aneurysm

B. Pancreatitis

C. Appendicitis

D. Pyelonephritis

E. Irritable bowel syndrome

Correct Answer:Abdominal aortic aneurysm

Explanation:

The most likely diagnosis is an abdominal aortic aneurysm (AAA). Whilst this patient has presented with the classically associated symptom of abdominal pain radiating to the back, it is essential to remember that many patients are usually asymptomatic with an AAA. The presence of a palpable, pulsatile abdominal mass in the central abdomen strengthens the likelihood of an aneurysm. This patient also has important risk factors for AAA, including a history of hypertension, male sex, smoking and increased age. There should always be a high level of suspicion for AAA in men >65 presenting with central abdominal pain or features of shock. However, as this patient is haemodynamically stable, he is likely experiencing a symptomatic but unruptured AAA.

Acute pancreatitis typically presents with sudden-onset mid-epigastric abdominal pain, which often radiates through to the back. The absence of nausea, vomiting and anorexia in this patient make this differential less likely. A pulsatile mass is also not in keeping with pancreatitis and should raise concerns about vascular aetiology.

Typically acute pyelonephritis presents with flank pain and costovertebral angle tenderness. This is also associated with systemic symptoms of fever, myalgia, nausea and vomiting.

Classically appendicitis presents with abdominal pain that begins in the centre of the abdomen and, within 12 hours, moves to the right lower quadrants of the abdomen. The examination would elicit tenderness and occasionally a palpable mass; however, in appendicitis, this mass would not be pulsatile in nature. Notably, other systemic symptoms would be present in the history.

Irritable bowel syndrome (IBS) presents with cramping abdominal discomfort in the lower to mid-abdomen. It is associated with an alteration of bowel habits, bloating and a normal examination of the abdomen. IBS should be a diagnosis of exclusion, especially in the acute setting and in an older patient population.

Further reading:

https://www.nice.org.uk/guidance/ng156

Question:

A 26-year-old G2P0 attends her 28-week antenatal appointment. The pregnancy has been well to date, with no issues. On examination, her blood pressure is 156/98mmHg. Her blood pressure has been normal before this. Urine dip is negative for protein.

What is the most likely diagnosis?

A. Pre-existing hypertension

B. Eclampsia

C. Pre-eclampsia

D. Gestational hypertension

E. Whitecoat hypertension

Correct Answer:Gestational hypertension

Explanation:

This case demonstrates gestational hypertension, which is new-onset hypertension (blood pressure >140/90 mmHg) ≥20 weeks' gestation without proteinuria. There is an increased risk of pre-eclampsia or hypertension in future pregnancies.

Pre-existing hypertension is hypertension before 20 weeks gestation and is longstanding.

Pre-eclampsia is hypertension ≥20 weeks gestation with significant proteinuria.

Eclampsia is a tonic-clonic seizure in the presence of pre-eclampsia and is an obstetric emergency.

Whitecoat hypertension is a potential diagnosis, however, with previous blood pressure measurements being normal it is a less likely diagnosis.

Further reading:

https://cks.nice.org.uk/topics/hypertension-in-pregnancy/

Question:

A 43-year-old woman presents to the one-stop breast clinic having been referred by her GP for a new breast lump. It is not painful and causes no obvious skin changes. She has no significant family history and takes no regular medications. She is a smoker. She has a mammogram in the clinic which reveals a 2 x 3cm area of calcification.

What is the next most appropriate test to be performed?

A. USS guided biopsy

B. Genetic testing for BRCA 1+2

C. CA125 blood test

D. CT scan of thorax

E. Wide local excision and histology

Correct Answer:USS guided biopsy

Explanation:

Breast lumps require triple assessment via mammography (if >35yrs old), USS, and US-guided biopsy. From this, we generate a radiological and histological grading which will influence the management options. This lady is 43, and so has a mammogram. This has confirmed the presence of a lump, which now needs an ultrasound and biopsy.

CT scanning is not appropriate at this stage, and there is no family history suggesting a genetic basis.

Wide local excision is not an investigation, although it will generate tissue for histology, and CA125 is not an appropriate blood test for suspected breast cancer.

Remember, lots of breast lumps are benign, so don’t assume its cancer until all aspects of the triple assessment have been completed.

Further reading:

https://cks.nice.org.uk/breast-cancer-recognition-and-referral#!scenario

Question:

A 43-year-old lady has been referred to the ENT department with a 3-week history of hearing loss in her right ear, associated with foul-smelling green discharge from the right ear canal. The discharge has continued despite 5 days of oral amoxicillin, however she denies any fevers. She has no significant past medical history and takes no regular medication.

On examination, the external ear does not appear red or swollen. Otoscopic findings are shown below.

What is the most likely diagnosis?

Source: Michael Hawke MD [CC BY 4.0]

A. Cholesterol granuloma

B. Impacted wax

C. Otitis externa

D. Cholesteatoma

E. Otitis media with effusion

Correct Answer:Cholesteatoma

Explanation:

The most likely diagnosis is a cholesteatoma. The large mass of white keratin debris in the left upper quadrant of this left tympanic membrane is strongly suggestive of a cholesteatoma. The majority of the tympanic membrane is also missing due to perforation.

A cholesteatoma is a collection of epidermal and connective tissues within the middle ear, that can locally invade and destroy adjacent tissues. As a result, cholesteatomas can seriously damage the bones of the middle ear, tympanic membrane and local structures such as the facial nerve.

Cholesteatomas present with progressive conductive hearing loss, otorrhoea (due to secondary infection), vertigo, headache and facial nerve palsy.

Otitis externa is unlikely, given the absence of any inflammation in the external ear canal. Otitis externa typically presents with otalgia, discharge and pruritis of the external ear canal.

Otitis media with effusion could also present with ear discharge and conductive hearing loss, however, the absence of pain and the appearances on otoscopy are more in keeping with a diagnosis of cholesteatoma.

Impacted ear wax could cause conductive hearing loss, however it would explain the ear discharge or appearances on otoscopy.

Further reading:

https://patient.info/doctor/cholesteatoma-pro

Question:

A 45-year-old lady presents to her GP with pain in both her feet for the last month. It is a burning pain which keeps her awake at night, and her toes feel particularly sensitive to touch. She has had type 2 diabetes for ten years which you notice has been poorly controlled with lifestyle and three oral hypoglycemic agents.

What is the most appropriate treatment to help manage her pain?

A. Start subcutaneous insulin

B. Naproxen

C. Co-codamol

D. Duloxetine

E. Carbamazepine

Correct Answer:Duloxetine

Explanation:

This lady’s history fits with diabetic neuropathy, which can be very painful. There is good evidence for the use of duloxetine in these patients, which is recommended by NICE along with other agents such as pregabalin.

Other painkillers such as opiates, paracetamol and NSAIDs are less effective for neuropathic pain.

Carbamazepine (an anti-epileptic) is recommended first-line for neuropathic pain caused by trigeminal neuralgia, but not for diabetic neuropathy.

Her diabetes is poorly controlled by lifestyle interventions and three oral hypoglycemic agents, so it would be reasonable to consider intensifying treatment with insulin. However, this is not going to help her current complaint in the short term.

Further reading:

https://www.nice.org.uk/guidance/cg173/chapter/1-Recommendations

Question:

A 25-year-old female medical student attends her GP practice with flu-like symptoms. She returned from her elective placement in Sierra Leone around 14 days ago. The patient reports feeling feverish for the last 3 days. She also complains of myalgia (especially in her legs), a dull headache, new-onset non-productive cough, one episode of vomiting and a feeling of abdominal fullness over the last 2 days. On further questioning, the patient reports having taken ‘some’ of her prophylactic medications advised by her medical school prior to embarking on her elective. On examination, the patient has a temperature of 38.7 oC, dry mucous membranes, hepatosplenomegaly and mild yellowing of her sclera.

What is the gold-standard diagnostic investigation for the condition described?

A. Clotting studies

B. Thick and thin blood smears stained with Giemsa stain

C. Full blood count

D. Urea and electrolyte analysis

E. Liver function tests

Correct Answer:Thick and thin blood smears stained with Giemsa stain

Explanation:

The most likely diagnosis is malaria. The gold-standard investigation for this condition is a thick and thin blood smear stained with Giemsa stain. Other diagnostic investigations include rapid diagnostic tests that assess for parasite antigens and polymerase chain reaction. Malaria can be categorised into 4 groups according to the infecting organism:

Plasmodium falciparum (responsible for severe disease and malaria-related death)

Plasmodium vivax (causes benign tertian malaria - fever every third day)

Plasmodium ovale (responsible for relapsing-remitting disease)

Plasmodium malariae (causes benign quartan malaria - fever every fourth day)

Risk factors for Malaria include social deprivation, not adhering to malaria prophylaxis, extremes of age and pregnancy. Clinical features of malaria vary according to the underlying organism. They comprise flu-like symptoms (i.e. headache, chills, fever, myalgia, cough, vomiting, diarrhoea), hepatosplenomegaly and jaundice. Features of severe disease include bleeding, reduced Glasgow coma score, respiratory distress, seizures and hypovolaemia.

A full blood count (FBC) should indeed be carried out in cases of suspected malaria. However, it is not diagnostic. FBC may show a thrombocytopaenia, leucocytosis and anaemia.

Liver function tests (LFTs) should be carried out, but are not diagnostic. LFTs will most likely be deranged.

Urea and electrolytes (U&Es) should be investigated, but are not diagnostic. They may highlight hyponatraemia and raised urea in cases of dehydration and raised creatinine in instances of impaired kidney function.

Clotting studies are helpful in quantifying disease severity, however, they are not diagnostic.

Further reading:

https://patient.info/doctor/malaria-pro

Question:

A 39-year-old woman presents to the emergency department with sharp, severe right upper quadrant pain. This started 6 hours ago after eating fish and chips. She has vomited twice and complains of nausea. The pain is not relieved on leaning forward. She reports several episodes of similar abdominal pain over the last 6-months, with no fever. On examination, she has a temperature of 38.2oC and a BMI of 39kg/m². She is tender in the right upper quadrant, and there is no evidence of jaundice.

What is the definitive management for this condition?

A. Endoscopic retrograde cholangio-pancreatography (ERCP)

B. Laparoscopic cholecystectomy <4 weeks

C. Laparoscopic cholecystectomy <1 week

D. Percutaneous cholecystostomy

E. Broad-spectrum antibiotics

Correct Answer:Laparoscopic cholecystectomy <1 week

Explanation:

This patient has several risk factors for gallstones, including obesity, being middle-aged and having a high BMI. Acute cholecystitis is characterised by right upper quadrant pain (RUQ) and fever without jaundice and is more likely with a history of biliary colic.

NICE recommends a laparoscopic cholecystectomy <1 week (preferably within 72 hours) for acute cholecystitis. Delaying for an elective laparoscopic cholecystectomy <4 weeks would be inappropriate, as cholecystitis recurrence is likely.

Whilst broad-spectrum antibiotics may be indicated to prevent the progression of infection, they are not the definitive management. Laparoscopic cholecystectomy is still required to avoid recurrence.

Percutaneous cholecystostomy involves draining the gallbladder infection in those who are unfit for surgery. The gallbladder and gallstones remain, and so recurrence is likely. There are no features to suggest that this patient is unfit for surgery.

Endoscopic retrograde cholangiopancreatography (ERCP) involves the removal of the gallstones from the common bile duct or pancreatic duct. It has no role in managing gallbladder stones. Signs of biliary tract obstruction include jaundice, and ERCP would be appropriate in this case.

Further reading:

https://www.nice.org.uk/guidance/cg188

Question:

A 24-year-old male is brought to A&E by his parents after they received a call from his partner stating that he had locked himself in the bathroom and threatened to end his own life. Fortunately, they were able to talk to the patient and persuade him to seek medical help before any attempts to harm himself were made.

The patient's parents inform you that this is not the first such episode that has occurred with their son; he has had a number of relationships over the past few years, and in each seems extremely happy - on multiple occasions he has confided in them that he believes that he is likely to be married to his new partner in the future. However, these relationships appear to quickly break down; he often lists faults with others, often criticising things that he previously appeared content with. There are two previous instances on record of the patient self-harming due to relationship concerns.

The parents also describe that their son has always acted spontaneously, often making unwise decisions or that 'get him into trouble', and that his self-esteem and perceived self-worth appears to greatly fluctuate. Given the patient's past medical history, the admitting doctor is concerned about the possibility of an underlying personality disorder.

Which of the following ICD-10 recognised disorders of adult personality and behaviour is the patient most likely to be diagnosed with?

A. Emotionally unstable personality disorder

B. Histrionic personality disorder

C. Schizoid personality disorder

D. Dissocial personality disorder

E. Dependent personality disorder

Correct Answer:Emotionally unstable personality disorder

Explanation:

Personality disorders are ingrained and enduring behaviour patterns seen in individuals. These deviate from the norms of an average patient and can lead to distress and problems with social performance.

Patients with emotionally unstable personality disorder exhibit a tendency to act impulsively and without any consideration of the consequences. These individuals can often have swift changes in opinion and frequently result in conflict. Problems with maintaining interpersonal relationships are common, along with disturbances in self-image and perceptions of others, and self-destructive behaviour is frequently seen. The relationship issues described by the patient's parents and the previous episodes of self-harm make this diagnosis the most likely. This condition is referred to as 'borderline personality disorder' by the DSM V criteria.

Those with dissocial personality disorder exhibit a disregard for social obligations and can lack any concern for the feelings of others. These individuals can often become aggressive and violent, which can lead to issues with law-breaking. This patient does display destructive behaviour, but this is directed towards themselves, rather than others, and they do not appear to have issues with social norms, therefore, this is not the most likely diagnosis.

Those with histrionic personality disorder display shallow behaviour and theatricality and are often desperate for the attention of others. They may dress seductively in an attempt to obtain approval from other individuals and act provocatively. The patient in this case does not fit with this picture, and therefore this is not likely contributing to her behaviour.

Patients with schizoid personality disorder are often withdrawn individuals and may avoid interaction with others, instead preferring solitary activities. They may exhibit a flattened affect and often spend time undertaking fantasy activities rather than other social engagements.

Individuals with dependent personality disorder often exhibit reliance on others to make their decisions, with a fear of any form of abandonment and a general feeling of helplessness. They may show self-deprecating behaviour and often passively comply with the wishes of others.

Further reading:

https://icd.who.int/browse10/2016/en#/F60.4

Question:

A 30-year-old male with a long history of schizophrenia is referred to a psychiatrist for consideration of additional medical therapy. The patient has failed to respond to multiple antipsychotic medications and has a history of treatment-resistant symptoms, including persistent auditory hallucinations and delusions. The patient is started on clozapine.

Prior to starting this medication, what investigation is most important to perform?

A. Full blood count

B. Thyroid function tests

C. Urine drug screen

D. Serum alkaline phosphatase

E. Urea and creatinine

Correct Answer:Full blood count

Explanation:

Before starting clozapine, a baseline full blood count and absolute neutrophil count must be obtained to monitor for potential haematological side effects. Neutrophil levels must be within the normal range before commencing treatment. This is because clozapine carries a known risk of agranulocytosis, where neutrophil levels become significantly depleted. This increases the patient's susceptibility to infections which could potentially be life-threatening. Regular monitoring of full blood count is required throughout clozapine treatment to prevent the risk of agranulocytosis.

Serum alkaline phosphatase is not typically required before starting clozapine. However, monitoring liver function enzymes is recommended during treatment to reduce the risk of hepatic impairment.

While urea and creatinine levels may be monitored during treatment with clozapine, they are not an absolute requirement before starting the medication.

Thyroid function tests (TFTs) are not typically required before starting clozapine unless the patient has a history of thyroid disease or is taking other medications that affect thyroid function.

A baseline urine drug screen is not required before starting clozapine, although it may be requested if there is a suspicion of substance abuse.

Further reading:

https://bnf.nice.org.uk/drugs/clozapine/#directions-for-administration

Question:

A 23-year-old woman presents to the sexual health centre with increased amounts of non-offensive vaginal discharge. She is concerned that she may have a sexually transmitted infection as she recently had unprotected sexual intercourse with a new male partner. She is otherwise asymptomatic. A pregnancy test is negative and clinical examination is unremarkable.

On microscopy of her discharge, you see multiple gram-positive rods. You perform a screen for sexually transmitted infections.

What is the most appropriate management at this stage?

A. Oral doxycycline

B. Oral fluconazole

C. Topical clotrimazole

D. No treatment required at this stage

E. Oral metronidazole

Correct Answer:No treatment required at this stage

Explanation:

The correct answer is that no treatment is required at this stage. Microscopy where available can demonstrate candida, bacterial vaginosis, Trichomonas vaginalis, and Neisseria gonorrhoea. Gram-positive rods represent Lactobacilli, which are normal findings on microscopy of vaginal discharge.

Vaginal discharge is physiological and changes throughout the menstrual cycle. However, given the history of unprotected sexual intercourse, in this case, it would be appropriate to send a screen for sexually transmitted infections using vaginal swabs. In the absence of convincing symptoms, or history of contact with chlamydia or gonorrhoea, empirical treatment would not be warranted. Gonorrhoea may be seen as gram-negative diplococci on microscopy. Chlamydia is not seen on microscopy.

Other causes for a change in vaginal discharge can be bacterial vaginosis although this typically presents with offensive-smelling vaginal discharge. Microscopy findings would be mixed flora with Gardnerella vaginalis (gram variable coccobacilli) and Mobiluncus (pink, curved rods). The treatment for this is oral metronidazole.

Candida, which is treated with oral fluconazole and/or topical clotrimazole, generally presents with vulval itch or discomfort, and thick white discharge. Microscopy would demonstrate spores (gram-positive) and hyphae.

Further reading:

https://patient.info/doctor/vaginal-discharge

Question:

A 67-year-old male presents to the emergency department with central chest pain, which started 30 minutes ago. He has a history of hypertension and type 2 diabetes mellitus and takes amlodipine, metformin and atorvastatin.

On examination, his heart rate is 98 bpm, BP 155/91 mmHg, respiratory rate 17 breaths/min, oxygen saturation 98% on air, and temperature is 37.6ºC.

A 12-lead ECG shows a QRS duration of 134ms, dominant S waves in lead V1 and broad R waves in lead I, aVL and V5-6. These changes were not present in an ECG carried out two months ago.

What is the most likely diagnosis?

A. Pulmonary embolism

B. Atrial fibrillation

C. Right bundle branch block

D. Left bundle branch block

E. Brugada syndrome

Correct Answer:Left bundle branch block

Explanation:

This case demonstrates a new left bundle branch block (LBBB), which when associated with chest pain is suggestive of an anterior myocardial infarction. Other causes of LBBB include aortic stenosis, hypertension and ischemic heart disease. The ECG criteria for LBBB is a QRS duration >120ms, dominant S waves in V1 and broad R waves in lead I, aVL and V5-6.

Right bundle branch block (RBBB) is seen in conditions such as right ventricular hypertrophy, pulmonary embolism and ischemic heart disease. ECG features include a QRS duration >120ms, an RSR pattern in V1-3 and a wide S wave in leads I, aVL and V5-6.

WiLLiaM MaRRoW can be used to remember the difference between left and right bundle branch block.

In LBBB, V1 is shaped like a 'W' and V6 is shaped like an 'M'. Likewise, in RBBB V1 is shaped like an 'M' and V6 is shaped like a 'W'.

Brugada syndrome is a sodium channelopathy that can lead to sudden ventricular fibrillation. It typically presents with palpitations, syncope or sudden cardiac death, but can be asymptomatic. ECG commonly shows coved ST elevation in V1-V3 with T wave inversion.

A pulmonary embolism most commonly presents with pleuritic chest pain and dyspnoea, with associated risk factors for venous thromboembolism. The classic S1Q3T3 pattern (S wave in lead I, with Q wave and T wave inversion in lead III) is uncommon, and sinus tachycardia is more commonly seen.

Atrial fibrillation has a varied presentation and is asymptomatic in around 20% of patients. Common symptoms are palpitations, syncope, dyspnoea and angina. ECG typically shows an irregularly irregular rhythm with no visible P waves.

Further reading:

https://litfl.com/left-bundle-branch-block-lbbb-ecg-library/

Question:

A 67-year-old man presents to ophthalmology with a 6-month history of bilateral blurred vision. He denies any flashes or floaters, diplopia, eye discomfort or pain.

He has a 15-year history of type 2 diabetes, hypertension and hyperlipidaemia. He reports poor compliance with his medications, and has not attended his recommended diabetic eye screening for at least 5-years.

Visual acuity is reduced to 20/50 in the right eye and 20/40 in the left eye. Intraocular pressure is normal, and slit-lamp examination reveals no abnormalities in the anterior segment. A photograph of the fundus is taken and is shown below.

[Source]

What is the most likely diagnosis?

A. Rubeosis iridis

B. Proliferative diabetic retinopathy

C. Pre-proliferative diabetic retinopathy

D. Hypertensive retinopathy

E. Background diabetic retinopathy

Correct Answer:Proliferative diabetic retinopathy

Explanation:

The most likely diagnosis in this patient is proliferative diabetic retinopathy - an advanced form of diabetic retinopathy that occurs when abnormal new vessels grow on the optic disc (NVD) or elsewhere (NVE). Neovascularisation occurs in proliferative diabetic retinopathy due to chronic hypoxia, which promotes the release of growth factors (e.g. vascular endothelial growth factor (VEGF)) and the development of weak, leaky vessels. NVD and NVE are apparent on the fundus image shown.

Non-proliferative diabetic retinopathy is subdivided into background retinopathy and pre-proliferative retinopathy. Background retinopathy is an early stage of retinal damage, typically defined by the presence of at least one microaneurysm. Pre-proliferative retinopathy is characterised by the presence of multiple microaneurysms ± haemorrhages and hard exudates; it is further classified according to the severity of the disease and how many quadrants of the retina are affected. Unlike proliferative diabetic retinopathy, non-proliferative diabetic retinopathy rarely causes symptoms. Furthermore, the fundus photograph in this patient shows clear evidence of neovascularisation; therefore, non-proliferative diabetic retinopathy is not the correct diagnosis.

Progressed hypertensive retinopathy is characterised by diffuse arteriolar narrowing, retinal haemorrhage, hard and soft exudates, retinal oedema and disc swelling. Whilst hypertensive and diabetic retinopathy may be difficult to distinguish at times, in severe hypertensive retinopathy signs such as flame haemorrhages and cotton wool spots are concentrated near the optic nerve or macula. This is in contrast to diabetic retinopathy which may be present anywhere in the retina. Furthermore, hypertensive retinopathy is rarely complicated by neovascularisation, as is seen here.

Neovascularisation of the iris, also known as rubeosis iridis, is a condition commonly associated with advanced proliferative diabetic retinopathy. Slit-lamp examination in this patient was normal and did not reveal any evidence of blood vessel proliferation on the surface of the iris; therefore, this is a less likely diagnosis.

Further reading:

https://geekymedics.com/diabetic-retinopathy/

Question:

A 68-year-old man is referred for an urgent cystoscopy after presenting with the recent onset of painless visible haematuria, urgency and poor flow. He has a past medical history of well-controlled hypertension and a 50-pack-year smoking history.

The cystoscopy is performed, and biopsies are taken, which confirm a low-risk non-muscle-invasive bladder cancer.

What is the most appropriate management option for this patient?

A. Transurethral resection of bladder tumour (TURBT)

B. Radiotherapy

C. Active surveillance

D. Systemic chemotherapy

E. Radical cystectomy

Correct Answer:Transurethral resection of bladder tumour (TURBT)

Explanation:

NICE guidelines recommend that transurethral resection of bladder tumour (TURBT) is the first-line management option for patients with a low-risk non-muscle-invasive bladder tumour. This involves minimally-invasive endoscopic resection of the tumour using diathermy from the inside of the bladder and is the most common treatment option for non-muscle-invasive bladder cancer.

Radical cystectomy involves the surgical removal of the bladder and is the standard treatment option for patients with locally invasive tumours. This typically involves bilateral pelvic node dissection and the formation of a urinary stoma or continent urinary diversion.

Systemic chemotherapy or radiotherapy can be used in patients with metastatic disease or invasive bladder cancer in which surgical options are not suitable. Systemic chemotherapy typically involves a cisplatin-based chemotherapy regimen. Immunotherapy using medications such as atezolizumab and pembrolizumab may be used as second-line treatments.

Active surveillance is a conservative management option that involves routine investigations to monitor the progression of the disease. It is a management approach that can be used in patients with low-risk prostate cancer, however, it is not routinely used in the management of bladder cancer.

Further reading:

https://www.nice.org.uk/guidance/ng2

Question:

A 76-year-old man presents to the emergency department with a three-day history of a productive cough, dyspnoea, fever and rigors. He reports coughing up large volumes of green sputum, but no haemoptysis. He was recently discharged from hospital following admission for an influenza A infection. He is up to date with all his vaccines. Past medical history includes hypertension, with no history of respiratory disease.

A chest x-ray demonstrates an area of consolidation in the middle zone of the left lung. Pneumonia is suspected.

What is the most likely causative organism?

A. Haemophilus influenzae

B. Streptococcus pneumoniae

C. Chlamydia psittaci

D. Pneumocystis jiroveci

E. Staphylococcus aureus

Correct Answer:Staphylococcus aureus

Explanation:

This case demonstrates secondary bacterial pneumonia following influenza A virus infection. This is a common scenario, with Staphylococcus aureus being the most common causative organism.

Streptococcus pneumoniae is the most common cause of pneumonia, accounting for around 80% of cases. However, the pneumococcal vaccine is available, which this patient has received. This makes S. pneumonia a less likely cause.

Haemophilus influenzae is the common cause of pneumonia in chronic obstructive pulmonary disease patients. This patient has no history of respiratory disease.

Pneumocystis jiroveci is a fungal infection most commonly seen in the immunocompromised. It typically presents with a dry cough, exercise-induced desaturation and a lack of chest signs. There are no features to suggest this patient is immunocompromised, and the clinical features are not consistent with this diagnosis.

Chlamydia psittaci is typically contracted from infected birds. However, with no history of avian contact, this is a less likely causative organism.

Further reading:

https://patient.info/doctor/pneumonia-pro

Question:

A 67-year-old patient with a known diagnosis of non-Hodgkin's lymphoma presents to the emergency department with worsening shortness of breath, palpitations, and ankle swelling. He has been feeling more tired than usual over the past few weeks, which he had previously attributed to his cancer. Aside from his lymphoma, the patient has no other medical history of note. He is currently being treated for his cancer with a group of drugs, which he refers to as R-CHOP. On examination, his pulse is irregularly irregular, and his apex heartbeat is displaced.

Which drug is most likely to be responsible for the patient's presentation?

A. Doxorubicin

B. Cyclophosphamide

C. Rituximab

D. Prednisolone

E. Vincristine

Correct Answer:Doxorubicin

Explanation:

The drug most likely to be responsible for this patient's presentation is doxorubicin. Doxorubicin is an anthracycline commonly used to treat blood cancers including Non-Hodgkin's lymphoma. In some patients, doxorubicin can cause dilated cardiomyopathy, which often presents with symptoms of heart failure. Cardiomyopathy may occur in patients who have higher serum levels of anthracycline, and so this side effect is prevented by screening patients' baseline heart function with an echocardiogram prior to treatment and by restricting the doses of doxorubicin chemotherapy patients can receive.

Rituximab is an anti-CD20 monoclonal antibody drug. Important side effects of this drug may include severe infections, due to suppression of the immune system. Rarely, this drug can exacerbate pre-existing heart conditions; however, this is uncommon.

Cyclophosphamide is an immunosuppressant. Important side effects of this drug may include severe infections, agranulocytosis and haemorrhagic cystitis. However, this drug is not associated with cardiomyopathy.

Vincristine is a vinca alkaloid chemotherapeutic agent. Important side effects may include peripheral neuropathy and hypersensitivity. However, this drug is not associated with cardiomyopathy.

Prednisolone is a steroid immunosuppressant. important side effects include gastritis and gastric ulceration, osteoporosis, increased susceptibility to infections, thinning of the skin and changes to appearance (Cushing's syndrome). However, this drug is not associated with cardiomyopathy.

Further reading:

https://bnf.nice.org.uk/drug/doxorubicin-hydrochloride.html

Question:

A 34-year-old male who sustained a spinal cord injury two months ago, rendering him quadriplegic, is admitted to the national spinal cord injury unit for supportive care.

Six days following his admission, he becomes tachypnoeic with sudden onset chest pain, which is worse on inspiration. His pulse rate is 110bpm, oxygen saturation 90% on 5L oxygen by mask, and his temperature is 37.4°C. A few days earlier, he noticed that his left calf was swollen and tender.

What investigation is most likely to confirm the diagnosis?

A. Ventilation perfusion scan

B. Arterial blood gas

C. Chest x-ray

D. D-dimer

E. CT pulmonary angiography

Correct Answer:CT pulmonary angiography

Explanation:

The investigation most likely to confirm the diagnosis is CT pulmonary angiography (CTPA). The clinical findings - sudden onset pleuritic chest pain, tachypnoea and hypoxia together with Well's score of 9 (clinical evidence of DVT, HR>100 and recent immobility due to spinal cord injury) is highly suggestive of a pulmonary embolism (PE) secondary to a left deep venous thrombosis, with immobility being the major risk factor. When considering a diagnosis of PE, all patients should be initially assessed for alternative diagnoses, including a full blood count (may reveal a marked neutrophilia suggesting infection), cardiac troponins (may be elevated in an acute PE, particularly massive PE), an ECG (may show signs of right heart strain such as right axis deviation, and to rule out acute coronary syndrome), chest x-ray (to exclude pneumothorax or infection) and arterial blood gas (to confirm hypoxia, evidence of hyperventilation and increased arterial-alveolar gradient).

Arterial blood gas analysis is useful to quantify the degree of hypoxaemia and may reveal hypoxia, low pCO2 (hyperventilation), and an associated respiratory alkalosis, which, although consistent with a diagnosis of PE, is not diagnostic.

D-dimer testing is used mainly in cases where there is a low probability of PE (Wells score ≤ 4) as it has a high sensitivity (95-98%) and thus high negative predictive value for excluding PE. However, a raised D-dimer can also be observed following recent surgery, trauma, infection, heart disease and malignancy, so a positive result must be interpreted with caution.

Ventilation-perfusion scans have been used in the past (a mismatch of ventilation with perfusion, i.e. ventilated area which is not perfused can be seen with pulmonary emboli); however, they are time-consuming and nowadays are most commonly performed in pregnancy and in patients with contrast allergies or those with significant renal impairment. They have been largely superseded by CTPA, which is now widely available.

Chest X-rays are useful for ruling out alternative pathology, including spontaneous pneumothorax, however, are typically normal in PE, although rarely a wedge-shaped opacification may be seen - a so-called "Hampton's Hump" - as a sign of pulmonary infarction.

Further reading:

https://www.nice.org.uk/guidance/ng158/chapter/Recommendations

Question:

A 65-year-old patient, Mr Colin Nesbitt, attends the Emergency Department complaining of epigastric discomfort. He states that his pain has been present for several weeks and that it is affecting his quality of life. Mr Nesbitt explains that he has also been feeling a bit ‘run down’ with burping, occasional vomiting, loose stools and a full sensation after eating large meals. His past medical history includes non-insulin dependent diabetes mellitus, gout and carpal tunnel syndrome. Mr Nesbitt’s medications include colchicine, aspirin, simvastatin and metformin.

On examination, he appears well perfused. Respiratory, cardiovascular, and abdominal examination are unremarkable. Vital signs are all normal. You request a plain radiograph of his chest (shown below) and request a routine panel of blood tests.

What is the most likely diagnosis?

Source: Hellerhoff [CC BY-SA 3.0]

A. Myocardial infarction

B. Bowel perforation

C. Acute pancreatitis

D. Hiatus hernia

E. Boerhaave syndrome

Correct Answer:Hiatus hernia

Explanation:

The most likely diagnosis is a hiatus hernia.

A hiatus hernia occurs when abdominal contents herniate through the oesophageal hiatus of the diaphragm into the thoracic cavity. For this patient, you can see that the gastric fundus has been displaced above the diaphragm and appears as a retro-cardiac (behind the heart) mass with a fluid level. Many people with hiatus hernia are asymptomatic, however, those who do experience symptoms may require surgical intervention for symptomatic relief and prevention of complications such as gastric volvulus and intestinal obstruction.

Boerhaave syndrome is a spontaneous rupture of the oesophagus secondary to forceful vomiting. Clinical symptoms include vomiting, chest pain and subcutaneous emphysema. Commonly chest radiographs will be unremarkable, however, pneumomediastinum may be present. Oesophageal rupture is an unlikely diagnosis for this patient because of the chronic element to his presentation, moreover, the description of forceful vomiting is absent from this history.

Myocardial infarction is certainly a reasonable differential in any patient presenting with chest pain, especially associated with non-specific symptoms such as vomiting, nausea, and diaphoresis. Moreover, diabetic patients will commonly present with ‘atypical’ chest pain. In this case, a risk assessment for myocardial infarction along with a 12 lead ECG and serial serum troponin should be performed in order to exclude cardiac pathology. However, this patient presents with a 2-3 week history of chronic epigastric discomfort which makes an acute cardiac event less likely.

Patients suffering acute pancreatitis will complain of sudden onset persistent epigastric pain usually radiating to their back. Acute pancreatitis will be accompanied by an elevated serum lipase/amylase level. For this patient, the chronicity of symptoms make acute pancreatitis unlikely, however, all patients presenting with new abdominal pain should have liver function tests, lactate and amylase checked.

Bowel perforation is a surgical emergency. Patients will present acutely with severe abdominal pain and a rigid peritonitic abdomen on clinical examination. Erect chest radiographs for bowel obstruction may reveal pneumomediastinum. The chronic history from this patient and the presence of regular bowel motions make a diagnosis of bowel obstruction unlikely.

Further reading:

https://radiopaedia.org/articles/hiatus-hernia

Question:

A 55-year old man presents to the GP for his annual health check as the has some symptoms of urinary frequency. The doctor does some beside tests and orders some blood tests.

Results:

HR 72 beats per minute

BP 138/86 mmHg

Urea 5.5 mmol/l

Creatinine 110 mmol/l

Cholesterol 7.4 mmol/l

LDL cholesterol 4.8 mmol/l

HBA1c 51 mmol/l

The GP counsels the patient regarding his cholesterol and commences a statin.

What is the most appropriate next step for this patient?

A. Metformin

B. Gliclazide

C. Amlodipine

D. Bisoprolol

E. Ramipril

Correct Answer:Metformin

Explanation:

Metformin is the correct answer. This patient is presenting with a HBA1c result indicative of diabetes. Diabetes is diagnosed with an HBA1c result over 48mmol/L, with the pre-diabetic range being 42-47mmol/l. It is important to control his blood sugar promptly as he has other risk factors (high cholesterol) which make him at risk of cardiovascular events such as a myocardial infarction or a stroke. As the patient is symptomatic (polyuria), a single abnormal HbA1c can be used to diagnose diabetes.

In the UK, the National Institute for Health and Care Excellence (NICE) recommends supporting the patient to to aim for an HbA1c level of 48 mmol/mol (6.5%) if they manage their type 2 diabetes either with lifestyle and diet, or with lifestyle and diet combined with a single drug not associated with hypoglycaemia.

Ramipril is incorrect. If this patient had high blood pressure, Ramipril would be prescribed, as ACE-inhibitors or angiotensin receptor blockers (ARBs) are now recommended first-line for blood pressure control in patients with type 2 diabetes irrespective of age. Home blood pressure monitoring for one week is considered for clinic blood pressure over 140/90 mmHg. If the home blood pressure is over 135/85 mmHg, an antihypertensive is commenced.

Amlodipine is incorrect. Calcium channel blockers are first-line antihypertensives in patients over 55-years-old or in black-African or Afro-Caribbean patients. However, this patient’s clinic blood pressure is just below the cut-off for home blood pressure monitoring, so it is not relevant in this case.

Gliclazide is incorrect. This patient does not have hyperglycaemia symptoms that would require rescue therapy with hypoglycaemics with review treatment when blood glucose control has been achieved. Long-term control is usually with metformin (on top of or instead of anti-hypoglycaemics).

Bisoprolol is incorrect. Indications for beta-blockers are tachycardia, secondary prevention of cardiovascular events (usually begun post-MI), heart failure, or resistant hypertension.

Further reading:

https://patient.info/doctor/diabetes-mellitus-pro

Question:

A 42-year-old man presents to the emergency department concerned that he is 'having a heart attack'. He complains of sweating, palpitations, and a headache, but denies chest pain. He has presented similarly twice in the last week, with no indication of myocardial ischaemia.

He has a heart rate of 132/min and a blood pressure of 193/125 mmHg. He has responded poorly to antihypertensives in the past. On examination, café-au-lait macules are noted.

What is the most likely diagnosis?

A. Cushing's disease

B. Craniopharyngioma

C. Malignant hypertension

D. Tuberous sclerosis

E. Phaeochromocytoma

Correct Answer:Phaeochromocytoma

Explanation:

The triad of sweating, headaches and palpitations should alert the clinician to consider phaeochromocytoma. While this is a rare condition, these signs/symptoms in the presence of café-au-lait spots are concerning for this tumour. Phaeochromocytoma is a rare endocrine cancer that secretes catecholamines such as adrenaline. This causes a chronic fight-or-flight response in patients, manifesting as persistent hypertension (often severe), anxiety (which might explain why he has presented so often), headaches, sweating, and palpitations. While 90% are spontaneous, the rest are associated with familial multiple endocrine neoplasia type II and neurofibromatosis (which is indicated in this man from the presence of café-au-lait spots).

Cushing's disease is caused by the excessive release of adrenocorticotropic hormone by a pituitary adenoma. Cushing's disease can give treatment-resistant hypertension, but would likely also give symptoms such as easy bruising, muscle wasting, weakness, and weight gain. It would not be consistent with café-au-lait spots.

Craniopharyngioma is another rare tumour found usually in the sella turcica. It is usually benign, but it can cause bitemporal hemianopia similar to a pituitary tumour. It does not account for this man's persistent hypertension, palpitations, or sweating. It can cause headaches.

Malignant hypertension is a medical emergency usually characterised by the loss of arteriolar autoregulation. This man has very high blood pressure, and malignant hypertension could account for his headaches. However, his café-au-lait macules indicate that there is a secondary cause of his hypertension, and his triad of symptoms points more towards phaeochromocytoma. Additionally, patients with phaeochromocytoma will often have treatment-resistant hypertension, whereas malignant hypertension should respond to appropriate treatment in most cases. Therefore, this is not the best answer.

Tuberous sclerosis is an autosomal dominant condition with some similarities to neurofibromatosis. It causes subungual fibromas, 'ash-leaf' hypopigmented macules, shagreen patches (coarse skin over the sacrum), seizures, and more. It is associated with café-au-lait spots, although they are uncommon and associated more with neurofibromatosis. Tuberous sclerosis doesn't account for the symptoms caused by increased sympathetic drive suggested in the stem, such as severe hypertension.

Further reading:

https://patient.info/doctor/phaeochromocytoma-pro

Question:

A 44-year-old man presents to the GP, concerned about recent symptoms. He feels he has become increasingly clumsy over the past few weeks which has led to him struggling to ride his bike to work, having a few near misses. He reports becoming increasingly sweaty and has a persistent headache; he wonders if he is working too hard in his job as a banker.

On further questioning, he mentions that he is struggling in his relationship with his partner; she has been complaining that he has begun to snore extremely loudly at night, which is preventing her from sleeping. She blames him for doing this purposefully, as he has never snored in the past. He now consistently wakes up with a headache in the morning, which he attributes to excessive worrying about whether or not he is snoring.

The patient has been otherwise well up until this point, with his only past medical history being a recent diagnosis of type 2 diabetes; this came as a surprise to him, as he believes he keeps to a healthy diet. Examination reveals generally clamminess of the hands, with a normal pulse rate and no tremor. On palpation of the abdomen, the doctor notices masses in both the left and right subcostal regions. There are no abnormalities on examination of the head and neck; the thyroid gland appears a normal size.

What is the most likely diagnosis in this patient?

A. Pituitary tumour

B. Cocaine use

C. Meningioma

D. Phaeochromocytoma

E. Hyperthyroidism

Correct Answer:Pituitary tumour

Explanation:

The most likely diagnosis, in this case, is a pituitary tumour; more specifically a somatotroph adenoma producing excessive amounts of growth hormone, causing acromegaly. A persistent headache, worse in the morning, is relatively classic of any form of raised intracranial pressure, and the clumsiness described by the patient may indicate the presence of a visual field defect. The pituitary gland is closely situated to the optic chiasm, and therefore tumours may compress the fibres that run through this area, causing bitemporal hemianopia.

Whilst the patient may lack the classically described appearance changes seen in acromegaly such as increased coarseness of facial features and increasing size of hands and feet, these may not always be noticed by the patient themselves, as they can develop slowly over a prolonged period. The patient does have a number of signs and symptoms of growth hormone excess, however, hyperhidrosis, obstructive sleep apnoea (usually due to macroglossia) and hyperglycaemia leading to type 2 diabetes are all frequently seen in those with acromegaly. Hepatosplenomegaly is also in keeping with the diagnosis. This patient will likely require visual field testing and an MRI to detect the pituitary tumour, and then further investigations such as IGF-1 level measurements or an oral glucose tolerance test to confirm the diagnosis of acromegaly.

A benign brain tumour such as a meningioma can present with a headache and other signs of raised intracranial pressure and can affect all age groups. However, these benign masses are non-secretory and do not metastasize, and are therefore unlikely to explain the other symptoms experienced by this patient.

Cocaine use can lead to excessive sympathetic activity due to its properties as an amphetamine; this may give hyperhidrosis, and withdrawal from the drug could result in a headache. However, it would not explain the organomegaly on examination, which is a likely indicator that some form of organic pathology is present.

Hyperthyroidism could also lead to hyperhidrosis but is unlikely to cause a headache or snoring at night. There were no findings on examination that suggested an abnormal thyroid status.

Phaeochromocytoma (a tumour secreting catecholamines) can cause hyperhidrosis and hypertension, which could explain the patient's headache. However, it would not fit with the new-onset snoring, and there have been no reported episodes of palpitations. A normal pulse rate on examination makes the diagnosis even less likely.

Further reading:

https://patient.info/doctor/acromegaly-pro

Question:

A 35-year-old man presents for a review of his blood pressure. He is currently taking ramipril, amlodipine, and indapamide. Despite these interventions, his blood pressure today is 160/90 mmHg. Over the last few weeks, he has noticed some fatigue and weakness in both legs. An examination is unremarkable and investigations are performed:

Investigation Result Reference range

Sodium 148 mmol/L (135 - 145)

Potassium 3.2 mmol/L (3.5 - 5.0)

Urea 3.5 mmol/L (2.0 - 7.0)

Creatinine 119 µmol/L (50 - 120)

Plasma renin activity 2.1 nmol/L (0.8 - 3.0)

What is the most likely underlying cause for his refractory hypertension?

A. Renal artery stenosis

B. Excess cortisol due to pituitary adenoma

C. Bilateral adrenal hyperplasia

D. Adrenal adenoma

E. Phaeochromocytoma

Correct Answer:Bilateral adrenal hyperplasia

Explanation:

Bilateral adrenal hyperplasia is correct. This patient has medication-resistant hypertension, deranged electrolytes, and associated fatigue and weakness in his legs, indicating that his hypertension may not be essential in nature and that there may be an underlying pathological cause. The presence of hypertension, hypernatraemia, and hypokalaemia is strongly suggestive of primary hyperaldosteronism, along with fatigue and weakness of the limbs. The most common cause of primary hyperaldosteronism is bilateral adrenal hyperplasia. Aldosterone retains sodium ions and promotes the excretion of potassium ions. In general, where sodium goes, water follows, meaning as well as the sodium being retained, water is retained as well, increasing the blood volume and hence, blood pressure. Plasma renin activity is normal, ruling out renal artery stenosis, which is another differential.

Excess cortisol due to pituitary adenoma is incorrect. This would lead to Cushing's disease characterised by features such as truncal obesity, abdominal striae, proximal myopathy etc. Although Cushing's disease can lead to hypertension and similar blood findings, the absence of any of the aforementioned features makes this diagnosis less likely. As well as this, if the pituitary adenoma was large enough, it may exert pressure on the optic chiasm leading to bitemporal hemianopia, which is also not seen.

Phaeochromocytoma is incorrect. This is characterised by episodes of palpitations, sweating, anxiety, headaches, and extreme hypertension due to the release of catecholamines from the phaeochromocytoma. This patient does not have any of these features, nor is his presentation episodic.

Renal artery stenosis is incorrect. Stenosis of the renal arteries can lead to activation of the renin-angiotensin-aldosterone (RAAS) system, as the kidneys are hypo-perfused and activate the RAAS in an attempt to raise the blood pressure. This can lead to an increased amount of aldosterone which can lead to signs, symptoms, and investigations similar to primary hyperaldosteronism. The way to differentiate the two is either by plasma renin activity or renin:aldosterone ratio, as the kidneys would release more renin to try and activate the RAAS. Since the plasma renin activity is normal, renal artery stenosis can be ruled out.

Adrenal adenoma is incorrect. This can be a cause of primary hyperaldosteronism, which is what this patient is most likely to be presenting with, however, it is not as common of a cause as bilateral adrenal hyperplasia.

Further reading:

https://geekymedics.com/hypertension/

Question:

A 67-year-old woman presents to her GP with a new lump in her left breast, which she first noticed three months ago. She denies any pain or nipple discharge, however, she has lost 5kg in the last month and also complains of new back pain.

On examination, there is a solid lump in the upper outer quadrant of the left breast with overlying oedema and dimpling of the skin. She is referred to a specialist under a two-week wait pathway, and she is examined in the clinic, and a full history is taken.

What is the most appropriate next step?

A. Mammogram and core biopsy

B. CT chest abdomen and pelvis

C. Ultrasound and core biopsy

D. Fine needle aspiration

E. MRI of the whole spine

Correct Answer:Mammogram and core biopsy

Explanation:

This woman most likely has metastatic breast cancer. All patients with suspected breast cancer should undergo a triple assessment consisting of a physical examination, imaging, and histology. A mammogram is preferred in women over the age of 35, whereas increased breast tissue density means an ultrasound is preferred in women under 35 and men. A core biopsy is generally preferred to fine needle aspiration, as it provides full histology rather than just cytology and therefore allows differentiation between ductal carcinoma in situ and invasive ductal carcinoma. Therefore, mammogram and core biopsy is the correct answer; ultrasound and core biopsy and fine needle aspiration are incorrect.

Although the new onset back pain in the context of likely breast cancer is suggestive of spinal metastases, a full triple assessment should be completed before conducting further assessments, such as an MRI of the whole spine.

Similarly, a CT chest abdomen and pelvis will be useful in staging the breast cancer, however, a triple assessment should be completed first.

Further reading:

https://teachmesurgery.com/breast/presentations/triple-assessment/

Question:

A 30-year-old woman presents to her GP with a month-long history of weight loss, palpitations and fevers. She describes a recent upper respiratory tract infection a month ago, but is otherwise fit and well.

Blood tests reveal:

TSH: < 0.4

T4: 25

CRP 34

ESR 20

A thyroid uptake scan reveals low radio-iodine uptake.

What is the most likely diagnosis?

A. Hyperparathyroidism

B. Subacute thyroiditis

C. Toxic multinodular goitre

D. Grave’s disease

E. Follicular carcinoma of thyroid

Correct Answer:Subacute thyroiditis

Explanation:

The most likely diagnosis is subacute thyroiditis. This is a rare acute inflammatory disease of the thyroid, usually caused by a virus. It typically presents with discomfort in the thyroid gland, alongside symptoms of hyperthyroidism and later symptoms of hypothyroidism. Other symptoms may include fever, fatigue, weakness, hoarse voice and difficulty swallowing.

Thyroid function tests usually reveal excessive T4 alongside a suppressed TSH level early in the disease. Inflammatory markers such as CRP and ESR are often raised in the condition. A radio-iodine uptake scan of the thyroid usually shows reduced uptake as a result of the thyroid tissue being destroyed by the inflammation.

Grave’s disease is an autoimmune disease that involves thyroid-stimulating immunoglobulins recognising and binding to the TSH receptor stimulating the secretion of thyroxine (T4) and triiodothyronine (T3). As a result, patients typically present with features of hyperthyroidism, in addition to eye signs such as proptosis. TSH-receptor antibodies are highly sensitive and specific for Grave's disease, which can help differentiate it from toxic multinodular goitre, which presents similarly (although without the eye signs mentioned).

Toxic multinodular goitre is the second most common cause of hyperthyroidism. The thyroid gland is enlarged and there are multiple autonomously functioning nodules causing an overactive thyroid.

Further reading:

https://patient.info/doctor/hyperthyroidism#nav-2

Question:

A 72-year-old woman is brought in from the care home where she lives after she is found drowsy and difficult to rouse. On arrival, her vital signs show oxygen saturation 98% on 5L oxygen, respiratory rate 25 per minute, heart rate 118 beats per minute, blood pressure 92/67 mmHg, and temperature 38 degrees Celcius. Her GCS is E3V3M5. On examination, there is a 5cm circular erythematous pressure sore on her lower back with purulent discharge. She is started on intravenous fluids and empirical antibiotics, and blood cultures are sent.

The team subsequently notice that the patient has developed epistaxis, and widespread bruising has appeared over both her upper limbs. Her blood pressure has not responded to multiple fluid challenges. Disseminated intravascular coagulation secondary to sepsis is suspected.

Which of the following set of clotting study results is most supportive of this diagnosis?

A. Low platelet count <100 x10^9/L, prolonged PT >3s, decreased fibrinogen <1g/L, decreased fibrin degradation products

B. Low platelet count <100 x10^9/L, reduced PT <3s, decreased fibrinogen <1g/L, elevated fibrin degradation products

C. Elevated platelet count >400 x10^9/L, prolonged PT >3s, decreased fibrinogen <1g/L, elevated fibrin degradation products

D. Low platelet count <100 x10^9/L, prolonged PT >3s, decreased fibrinogen <1g/L, elevated fibrin degradation products

E. Low platelet count <100 x10^9/L, prolonged PT >3s, elevated fibrinogen >1g/L, elevated fibrin degradation products

Correct Answer:Low platelet count <100 x10^9/L, prolonged PT >3s, decreased fibrinogen <1g/L, elevated fibrin degradation products

Explanation:

Disseminated intravascular coagulation (DIC) is the dysregulated activation of coagulation pathways precipitated by another disease process and can lead to life-threatening haemorrhage and acute renal failure. Examples of conditions that can precipitate DIC include major burns, sepsis, malignancy, obstetric disorders such as placental abruption and pre-eclampsia, and severe immune reactions.

Diagnosis is made by a combination of identifying clinical features (bruising, bleeding, haemodynamic instability), and lab test results. Indicative clotting results include a low platelet count <100 x109/L, prolonged PT >3s, decreased fibrinogen <1g/L, and elevated fibrin degradation products.

Reference: Levi, M., Toh, C.H., Thachil, J. and Watson, H.G. (2009), Guidelines for the diagnosis and management of disseminated intravascular coagulation. British Journal of Haematology, 145: 24-33. doi:10.1111/j.1365-2141.2009.07600.x

Further reading:

https://doi.org/10.1111/j.1365-2141.2009.07600.x

Question:

Barry Welsh, a 76-year-old gentleman, presents with a 2-week history of painless jaundice. He reports feeling fatigued and has been passing foul-smelling stools. On inspection, he is frankly jaundiced and cachexic. Palpation of the abdomen reveals a non-tender palpable gallbladder. His vital signs are unremarkable.

What is the most likely diagnosis?

A. Pancreatic cancer

B. Gallbladder abscess

C. Gallstones

D. Acute pancreatitis

E. Ascending cholangitis

Correct Answer:Pancreatic cancer

Explanation:

Painless obstructive jaundice is due to cancer until proven otherwise. A non-tender palpable gallbladder (Courvoisier’s sign) is a textbook feature of pancreatic cancer. Steatorrhoea is due to a loss of exocrine function.

Courvoisier’s law states that the presence of a non-tender enlarged gallbladder means that jaundice is unlikely to be due to gallstones, as chronic cholecystitis causes the gallbladder to become shrunken and fibrotic.

Ascending cholangitis is an infection of the biliary tree secondary to gallstones. Can present with Charcot’s triad of right upper quadrant pain, fever and jaundice.

Acute pancreatitis would classically present with sudden onset jaundice and severe upper abdominal pain.

Gallbladder abscess would present with swinging pyrexia and systemic illness.

Further reading:

https://www.nice.org.uk/guidance/ng85/chapter/Recommendations#diagnosis

Question:

You are the evening on-call doctor covering the acute medical unit. The nursing staff have asked you to review a patient you were made aware of during handover. The patient is a 21-year-old male who was admitted with diabetic ketoacidosis (DKA) at lunchtime. He has been gradually improving over the last few hours on a fixed-rate insulin infusion and fluids containing potassium as per the hospital DKA protocol.

His insulin infusion monitoring chart is below.

The nursing staff inform you that during his 18:00 blood glucose testing he reported feeling nauseous. On review, he is clammy, seems to be slurring his words and is sweating profusely.

What is the most appropriate next step in treatment?

Source: Geeky Medics

A. Administer 200 ml of 20% dextrose intravenously

B. Give the patient some chocolate from his backpack

C. Administer ondansetron 4 mg intravenously

D. Stop the insulin infusion

E. Increase the rate of the insulin infusion

Correct Answer:Administer 200 ml of 20% dextrose intravenously

Explanation:

The patient is hypoglycaemic and symptomatic of this. He has become hypoglycaemic during his treatment but has not yet resolved his diabetic ketoacidosis (DKA). His ketones are still elevated and resolution is defined as ketones less than 0.6 mmol/L with pH over 7.3.

Treatment of his hypoglycaemia is therefore required. A stat dose of 200 ml 20% dextrose intravenously is the best way to achieve this. He will likely need some background dextrose prescribed until he has resolved which will require that more than one cannula is placed in the patient. At this point you must refer to your hospital DKA protocol – it will have instructions on what concentration and rate of dextrose to use when the patient becomes hypoglycaemic on the DKA treatment regime.

Do not stop insulin in a patient being treated for DKA, as this is what is resolving their metabolic disturbance. Some protocols may advise reducing the insulin rate once blood glucose falls below 14. Increasing the rate of insulin would also be inappropriate.

Chocolate contains a lot of fat and is therefore not a good treatment for hypoglycaemia. Sugary drinks and a slower-release carbohydrate such as a sandwich are a preferred choice.

An antiemetic such as ondansetron may help with the patient's feeling of nausea, but ultimately treating his hypoglycaemia will resolve the underlying cause and ondansetron will not do this.

It is important to review and familiarise yourself with the local DKA protocol.

Further reading:

https://www.diabetes.org.uk/professionals/position-statements-reports/specialist-care-for-children-and-adults-and-complications/the-management-of-diabetic-ketoacidosis-in-adults

Question:

A 15-year-old girl is brought to the GP by her mother. She is concerned her daughter is underweight and has not yet started her periods. She also reveals that her daughter gets very upset when made to eat dinner and spends most of her free time exercising in the gym.

The patient explains that she started counting calories six months ago and has been trying to reduce her intake since. She does not think she has a problem with her diet.

On examination, the patient is reluctant to step on the scale. She explains she is worried that she has gained too much weight since her last visit. Her weight is 37kg, and her height is 1.55m.

What is the most likely diagnosis?

A. Binge eating disorder

B. Anorexia nervosa

C. Avoidant-restrictive food intake disorder

D. Bulimia nervosa

E. Atypical eating disorder

Correct Answer:Anorexia nervosa

Explanation:

The most likely diagnosis in this patient is anorexia nervosa (AN) - an eating disorder characterised by the restriction of caloric intake leading to low body weight. In AN, there are also associated symptoms such as fear of weight gain, body dysmorphia, hormonal disturbance and often personal denial of illness. This patient describes restriction of her caloric intake and a compensatory behaviour of excessive exercise, which has resulted in low body weight (BMI 15.4). Other features to suggest AN include behaviour changes around food, distortion of body image and primary amenorrhoea.

Patients with bulimia nervosa typically present with recurrent episodes of binge eating. Patients with bulimia nervosa may also engage in compensatory behaviours, including vomiting, excessive exercise or laxative use. However, typically bodyweight is within normal limits or above the weight range for age.

Patients with binge eating disorder typically present with recurrent episodes of binge eating without any compensatory behaviours. Additionally, body weight in patients with binge eating disorder is often within normal limits or above the weight range for age.

Atypical eating disorders have features that closely resemble but do not meet the strict criteria for other diagnostic categories. As this patient has a low body weight (BMI <18.5), restrictive eating, body dysmorphia, fear of weight gain and hormonal imbalance, the diagnostic threshold for anorexia nervosa has been met, making this a less suitable answer.

Patients with avoidant-restrictive food intake disorder (ARFID) do not have a preoccupation with body shape or weight. Typically, patients with ARFID engage in restrictive eating due to sensory issues related to the eating process (e.g. avoidance of foods due to a particular feel, test or smell) or concerns regarding the consequences of eating (e.g. choking, vomiting).

Further reading:

https://cks.nice.org.uk/topics/eating-disorders/

Question:

A 64-year-old presents with worsening vision when driving. He has recently noticed that he has become 'hypersensitive' to the lights of oncoming vehicles and that the glare prevents him from staying straight on the road.

His past medical history includes rheumatoid arthritis, Hashimoto's thyroiditis, and osteoarthritis, for which he takes methotrexate, prednisolone, levothyroxine, and ibuprofen. He has had surgical fixation of an ectropion in his left eye.

On examination, the patient has a visual acuity of 6/24 in the right eye, and 6/12 in the left eye, with an altered red reflex in the right eye. There are no issues with eye movement, and colour vision remains intact when tested with Ishihara plates.

What is the definitive management option for this patient?

A. Enucleation

B. Peripheral iridotomy

C. Bifocal lenses

D. Conservative management alone

E. Phacoemulsification

Correct Answer:Phacoemulsification

Explanation:

The history of an altered red reflex, unilateral vision loss and glare, particularly when driving at night make the most likely diagnosis, in this case, the presence of a cataract in the right eye. Cataracts develop due to opacification of the lens secondary to structural alterations of the crystallin proteins within this portion of the eye; the condition is extremely common with increasing age. Patients will often complain of progressive painless visual loss, often with blurring and glare in sunlight or when driving at night.

The only real management option for cataracts is surgical intervention; no conservative or drug treatments currently exist. Phacoemulsification is the procedure carried out; this involves breaking up the lens using ultrasound waves and inserting a prosthetic lens to replace it. This is normally carried out as a day case, with no need for general anaesthetic, provided that patients are able to lie still during the surgery. The procedure has an extremely high success rate, and patients usually report a drastic improvement in visual acuity. In some cases, there can be complications post-surgery, with an extremely small risk of damage to other ocular structures or the introduction of infection (endophthalmitis).

Bifocal lenses are used to treat individuals with either hypermetropia or myopia who also develop issues with accommodation due to age-related changes (presbyopia). This patient does not report wearing glasses, and these are unlikely to be of benefit in the setting of cataracts.

Enucleation is the surgical removal of the entire globe; this is usually reserved for ocular malignancies. Retinoblastoma can present with a reduction in the red reflex within an eye, however, it does not occur in this age group, or cause the symptoms described which are classical of cataracts.

Peripheral iridotomy is a procedure used to create an opening within the iris to allow for the drainage of aqueous humour. It is often carried out after an episode of acute angle-closure glaucoma to reduce the risk of recurrence.

Further reading:

https://patient.info/doctor/cataracts-and-cataract-surgery

Question:

A 79-year-old lady attends A&E after a fall at home. She has severe pain around her right hip and on examination has a shortened, externally rotated right leg. The patient has already had IV paracetamol and several doses of IV morphine, however, she remains in severe pain.

What is the next most appropriate analgaesic option to offer?

A. Oramorph

B. Femoral nerve block

C. Diclofenac PR

D. Epidural

E. Gabapentin

Correct Answer:Femoral nerve block

Explanation:

The most appropriate analgaesic option in this scenario would be a femoral nerve block. NICE guidance states to ‘consider adding nerve blocks if paracetamol and opioids do not provide sufficient preoperative pain relief, or to limit opioid dosage’.

Oramorph would not be appropriate given the patient has already had several doses of IV morphine with little effect.

NSAIDs such as diclofenac are not recommended by NICE in this context.

Further reading:

https://www.nice.org.uk/guidance/cg124/chapter/Recommendations#analgesia

Question:

An 18-year-old female patient attends her GP with lumpy breasts. The patient reports that she first noticed the lumps around 1 month ago and mentions that she has noticed 5 lumps (2 in the left breast and 3 in the right). Examination reveals lumps that are all firm, circular with smooth borders, painless, highly mobile and measure 1-2cm in diameter. The patient is referred to a one-stop breast clinic where she has an ultrasound scan of the lumps which highlights all lumps to be solid masses.

What is the MOST LIKELY diagnosis?

A. Breast cysts

B. Fat necrosis

C. Fibroadenoma

D. Phyllodes tumours

E. Intraductal papilloma

Correct Answer:Fibroadenoma

Explanation:

The most likely diagnosis is a fibroadenoma. Fibroadenomas are benign tumours and are the most common form of breast lesion. Young women are most commonly affected (with a peak age between 15-30 years). Fibroadenomas develop within the lobules of breasts and comprise of both epithelial and fibrous matter. Clinical features of fibroadenomatous breast lumps include firm, non-tender lumps that are highly mobile (often referred to as ‘breast mice’). Similar to all indeterminate breast lumps, a formal investigation should take place at specialist breast clinics where triple assessment can be carried out. Triple assessment includes examination, imaging (either ultrasonography in those <40 years or mammography in those greater than or equal to 40 years), as well as needle biopsy (which is not always required in those < 25 years). Management is often conservative if the diagnosis can be confirmed. Otherwise, surgical excision is required.

Phyllodes tumours are often difficult to distinguish from fibroadenomas clinically. They tend to occur in older women (between 40-50 years of age) and grow much larger, eventually requiring wide excision.

Breast cysts present as fluid-filled masses on ultrasound scanning (not solid masses as in this scenario).

Intraductal papillomas exist behind the areola and are benign, warty lesions. They present as a small lump felt behind the areola that exudes a blood-stained or cheese-like discharge.

Fat necrosis typically occurs in overweight-obese females, often after trauma. This condition presents with a red, bruised lesion that has a pitted appearance.

Further reading:

https://patient.info/doctor/benign-breast-disease

Question:

A 54-year-old woman admitted to the hospital for acute pancreatitis two days ago suddenly develops hypotension and fever.

On examination, her temperature is 39.4°, her pulse is irregularly irregular at 110 beats per minute, and her blood pressure is 85/62mmHg. Whilst measuring her observations, blood is noted to be oozing around her IV sites, and her abdomen is covered in a number of non-blanching macules.

Urgent haematological investigations show increased prothrombin time (PT), partial thromboplastin time (PTT) and D-dimer and decreased fibrinogen and platelets. A peripheral blood smear identifies schistocytes.

She has no other significant past medical history.

What is the most likely diagnosis in this patient?

A. Haemolytic uraemic syndrome

B. Thrombotic thrombocytopenic purpura

C. Disseminated intravascular coagulation

D. Cirrhosis

E. HELLP syndrome

Correct Answer:Disseminated intravascular coagulation

Explanation:

The most likely diagnosis in this patient is disseminated intravascular coagulation (DIC) - a dysregulated blood clotting syndrome that leads to paradoxical bleeding and thrombosis. DIC occurs due to systemic activation of coagulation pathways, resulting in the formation of microvascular thrombi, which deplete levels of platelets and coagulation factors. Common causes of DIC include sepsis, trauma and malignancy. The diagnosis of DIC should involve both clinical and laboratory information. Key haematological findings in DIC include: the presence of schistocytes, thrombocytopenia, increased prothrombin time (PT) and partial thromboplastin time (PTT), increased D-dimer and decreased fibrinogen. This patient has observations consistent with sepsis, secondary to acute pancreatitis, which is the likely underlying cause of the haematological dysregulation. The presence of oozing blood, petechiae and the subsequent laboratory findings make DIC the most likely diagnosis.

Haemolytic uraemic syndrome (HUS) and thrombotic thrombocytopenic purpura (TTP) are classified as thrombotic microangiopathies. HUS predominantly affects children and is caused by exposure to bacterial toxins, whereas TTP can be congenital or acquired, typically secondary to systemic disease. Both HUS and TTP present with an identical haematological picture, including schistocytes on a blood smear, low platelets and raised LDH, but a normal PT/PTT, fibrinogen and D-dimer. This patient has an abnormal D-dimer, fibrinogen and PT/PTT; therefore, HUS and TTP are less likely diagnoses.

Usually occurring after 28 weeks gestation in pregnant woman, HELLP syndrome is a severe form of pre-eclampsia characterised by haemolysis (H), elevated liver enzymes (EL) and low platelets (LP). Like HUS and TTP, HELLP syndrome is also classified as thrombotic microangiopathy, presenting with schistocytes on a blood smear, low platelets and raised LDH, but a normal PT/PTT, fibrinogen and D-dimer. This patient is 54-years old and has no relevant past medical history, which makes co-existing pregnancy unlikely. Additionally, this patient has an abnormal D-dimer, fibrinogen and PT/PTT, further making HELLP syndrome a less likely diagnosis.

Severe liver disease, such as cirrhosis, may present with bleeding diathesis and prolonged PT and PTT. However, this patient does not have any other manifestations of liver disease (including jaundice, asterixis, ascites), making this a less likely diagnosis.

Further reading:

https://geekymedics.com/disseminated-intravascular-coagulation-dic

Question:

A 55-year-old woman is referred to the urogynaecology clinic by her GP. She explains that she has had to start wearing a sanitary pad in her underwear, and regularly has to change it 5-6 times each day due to urine leakage whenever she stands up from sitting or coughs. She also complains of a ‘dragging and heavy feeling down below’ which is uncomfortable. Her symptoms are restricting her daily activities.

She has previously had 4 vaginal deliveries, 2 of which were instrumental. She was recently prescribed vaginal oestrogen cream for vaginal dryness. She has been amenorrhoeic for 3 years and is not currently sexually active. Her other past medical history includes hypertension (for which she takes ramipril) and diabetes (for which she takes metformin). Her BMI is 35kg/m2.

On examination with a Sim’s speculum, you notice urine leakage when you ask her to cough and vaginal prolapse. A urine dipstick is negative for leukocytes and nitrites.

You ask her to complete a bladder diary over the next week and give general advice regarding reducing fluid intake, reducing caffeinated drinks and promoting lifestyle changes for weight loss.

What further management would be most appropriate at this stage?

A. Pelvic floor exercises

B. Oxybutynin

C. Urodynamic testing

D. Colposuspension surgery

E. Bladder retraining exercises

Correct Answer:Pelvic floor exercises

Explanation:

The most appropriate management option would be pelvic floor exercises. Stress incontinence is caused by a weak pelvic floor, which usually keeps the urethra in place to maintain continence. A weak pelvic floor is more common in post-menopausal women who have had lots of previous vaginal births (particularly if they were instrumental, had a long 2nd stage or delivered a large baby). Symptoms are exacerbated if there is excessive intra-abdominal pressure, for example in obesity, pregnancy or conditions causing a chronic cough. Pelvic floor exercises are a conservative yet effective method of improving pelvic floor strength, and therefore an appropriate initial measure to recommend to women suffering from stress incontinence. At least 8 contractions, repeated 3 times per day, for a minimum of 3 months is the guideline-recommended exercise course.

It may be useful to arrange a urodynamic testing appointment to confirm the type of incontinence but it would be appropriate to begin conservative treatment measures first, especially given the classical history of stress incontinence. Also, an appointment for urodynamic testing would typically need to be arranged in advance. During testing, catheters are placed in the rectum and bladder, the bladder is filled to the point at which the patient feels the need to urinate, and the patient is then asked to perform actions to provoke leakage to test continence (such as coughing, star jumps and the sound of running water). A urodynamic diagnosis (such as stress incontinence, urge incontinence or mixed incontinence) is then made to aid management. This is particularly useful when the history is unclear.

Colposuspension surgery involves elevating the bladder so that the urethra is in a position that is better supported by the pelvic floor and continence is improved. It is an appropriate procedure for treating stress incontinence, but there is a risk of bladder injury and voiding dysfunction so needs to be carefully considered. As a general rule in planning management, it is usually most appropriate to begin with conservative measures first. Another surgical option in managing stress incontinence is to form a sling to place around the bladder neck using autologous tissue (usually the rectal fascia). Vaginal mesh surgery used to be an alternative surgical option but due to associations with long-term pain and nerve damage it has fallen out of favour and is deemed a ‘last resort’ by NICE.

Oxybutynin is used in urge incontinence rather than stress incontinence. It is an anti-cholinergic drug which helps to inhibit parasympathetic fibres from stimulating detrusor contraction. This case is typical of stress rather than urge incontinence, but it is useful to note that in some cases there is a mixed picture of stress and urge incontinence; in these cases, oxybutynin may be appropriate to consider.

Bladder retraining exercises consist of patients delaying voiding for several minutes beyond when they would normally void, to increase the interval between voiding. This is a helpful conservative option in managing urge incontinence rather than stress incontinence.

Further reading:

https://cks.nice.org.uk/incontinence-urinary-in-women

Question:

A 42-year-old male presents to his psychiatrist for a follow-up appointment. The patient has a history of schizophrenia and has trialled many antipsychotic medications with minimal relief of his symptoms.

After discussion with the patient, the psychiatrist decides to commence the patient on clozapine.

Which of the following should the patient be informed about regarding treatment with this medication?

A. Baseline echocardiogram will be required

B. Baseline chest radiograph will be required

C. Regular thyroid function tests are needed

D. Regular liver function tests are needed

E. Regular full blood counts are needed

Correct Answer:Regular full blood counts are needed

Explanation:

Clozapine is a potent second-generation antipsychotic medication used in the management of schizophrenia which is resistant to first-line treatment. Clozapine carries a risk of agranulocytosis and therefore regular full blood counts are required. Other notable side effects of clozapine include myocarditis, metabolic syndrome, arrhythmias and weight gain.

Clozapine is unlikely to cause liver dysfunction, therefore routine monitoring of liver function is not needed. Sodium valproate is well known for its hepatotoxicity and is an example of a medication that requires periodic liver function tests.

Clozapine does not cause deregulated thyroid hormone levels and therefore routine monitoring of thyroid function is unnecessary. Lithium is an example of a medication that needs frequent monitoring for thyroid dysfunction.

Baseline chest x-rays are required for medications that may cause pulmonary fibrosis such as methotrexate.

Echocardiograms are needed prior to commencing medications that have a higher chance of causing congestive heart failure such as Herceptin.

Further reading:

https://bnf.nice.org.uk/drug/clozapine.html

Question:

A 54-year-old male presents to the emergency department following an episode of right-sided weakness and slurred speech earlier today. This lasted for around 60 minutes and has since resolved. On further questioning, he describes palpitations and a 'funny heartbeat' for the last week.

On examination, his pulse is irregularly irregular. However, the examination is otherwise unremarkable, with no neurological features. He weighs 110kg.

Based on the likely diagnosis, what is the most important initial management option?

A. Clopidogrel 75mg

B. Edoxaban 60mg

C. Discharge with safety netting advice

D. Aspirin 300mg

E. CT head

Correct Answer:Aspirin 300mg

Explanation:

This patient has likely experienced a transient ischaemic attack (TIA). This is an episode of temporary neurological dysfunction caused by reversible cerebral ischaemia. NICE states that aspirin 300mg should be administered immediately (unless contraindicated) and continued for two weeks. Aspirin prevents platelet aggregation and reduces the risk of another TIA or stroke.

NICE states that a CT head should not be offered to patients with a suspected TIA unless there is clinical suspicion of an alternative diagnosis that CT could detect. No features suggest an alternative diagnosis in this patient.

Discharging this patient with a TIA would be highly inappropriate as they require urgent intervention and potential further investigation.

This patient has complained of palpitations over the last week, which with a recent TIA, suggests atrial fibrillation (AF). Edoxaban is an appropriate anticoagulant to manage AF (where anticoagulation is required); however, it would not be administered before aspirin.

Clopidogrel is an antiplatelet used for secondary prevention of a TIA but is started once the two-week course of aspirin 300mg is complete. In addition, if this patient were in AF, anticoagulation would be prescribed following the aspirin, rather than another antiplatelet.

Further reading:

https://cks.nice.org.uk/topics/stroke-tia/

Question:

A 2-year-old boy is brought to the GP by his mother after complaining of ear pain for the last 2 days. She explains that he has been repeatedly rubbing his ear and has been generally irritable. A few hours ago, the boy complained of an episode of severe pain, and his mother has since noticed some green discharge from the affected ear, which prompted her to bring her child to see a doctor. A COVID-19 swab taken on admission to the surgery is negative.

Otoscopy carried out by the GP reveals that the tympanic membrane is red and inflamed; the cone of light is absent. A small, well-defined perforation is visible in the superior aspect, through which the ossicles bones can be viewed. The external auditory meatus appears unobstructed, with no signs of erythema.

Which of the following organisms is most likely to be responsible for the underlying condition?

A. Pseudomonas aeruginosa

B. Parvovirus B19

C. Fusobacterium necrophorum

D. Clostridium perfringens

E. Streptococcus pneumoniae

Correct Answer:Streptococcus pneumoniae

Explanation:

The most likely diagnosis in this scenario is acute otitis media, a condition that classically affects younger children and those with underlying risk factors such as craniofacial abnormalities, exposure to cigarette smoke, and allergies. Whilst viruses are also a common cause of acute otitis media, bacteria are usually responsible for causing more severe disease that results in tympanic membrane perforation. The classic respiratory pathogens are the most frequently implicated, with Streptococcus pneumoniae being a common culprit.

Clostridium perfringens is a bacteria that is implicated in the development of gas gangrene; it is not a known cause of otitis media.

Pseudomonas aeruginosa is a bacterial infection that can cause severe pneumonia in those with cystic fibrosis, as well as ocular diseases such as bacterial keratitis. It is one of the most common causative organisms for otitis externa alongside Staphylococcus aureus but does not often cause infection of the middle ear as is present in otitis media.

Parvovirus B19 is a virus that is implicated in erythema infectiosum ('slapped cheek disease'); it can cause issues for the developing foetus if the mother contracts it for the first time during pregnancy. It is not known to cause otitis media.

Fusobacterium necrophorum is a gram-negative bacteria that can cause pharyngitis and the rare Lemierre syndrome; a disease arising due to the thrombosis of the internal jugular vein.

Further reading:

https://cks.nice.org.uk/topics/otitis-media-acute/management/acute-otitis-media-initial-presentation/

Question:

A 35-year-old female attends her GP with blurred vision in her right eye. The patient reports that her vision became hazy over the space of a few hours the previous day and has become progressively worse. She mentions that she now notices a red hue affecting her vision. The patient describes no associated pain with her visual deficit. On examination, there is right-sided decreased visual acuity with impaired light perception and a red shadow extending anteriorly from the retina into the vitreous space. On review of her electronic record, the patient suffers from poorly controlled type 2 diabetes mellitus complicated by diabetic retinopathy.

What is the MOST LIKELY diagnosis in this case?

A. Branch retinal artery occlusion

B. Retinitis pigmentosa

C. Vitreous haemorrhage

D. Central retinal artery occlusion

E. Retinal detachment

Correct Answer:Vitreous haemorrhage

Explanation:

The most likely diagnosis, in this case, is vitreous haemorrhage. This condition can be defined as bleeding into the vitreous humour.

Risk factors that make the development of vitreous haemorrhage more likely include:

diabetic retinopathy

hypertension

anticoagulant medication

retinal tears

age-related macular degeneration

eye trauma

Clinical features of this condition depend on the severity of the underlying haemorrhage. Small vitreous haemorrhage presents with visual floaters, moderate haemorrhage presents with dark streaks obscuring vision and severe vitreous haemorrhage presents with decreased visual acuity with impaired light perception. Clinical examination typically reveals blood in the vitreous space. Diagnosis of this condition is relatively straightforward using fundoscopy and slit-lamp examination. Management is more challenging as it varies depending on the underlying cause.

Central retinal artery occlusion reveals a ‘cherry-red spot’ on fundoscopic examination of the retina.

Retinal detachment typically presents with a dark shadow affecting peripheral vision that spreads like ‘a curtain is being pulled’ across a patients’ visual field.

Branch retinal artery occlusion usually occurs in elderly individuals due to embolic disease. It typically presents with a ‘whitening’ of certain areas of the retina depending on which artery is occluded.

Retinitis pigmentosa usually presents with night blindness and peripheral visual loss followed by central visual loss and photopsia. Fundoscopic examination often reveals a speckled pattern of retinal pigmentation.

Further reading:

https://patient.info/doctor/vitreous-haemorrhage-pro

Question:

A 69-year-old woman presents to the emergency department with a 6-month history of breathlessness and cough. The cough is present throughout the whole day, and she has recently noticed a few spots of blood in a tissue. She denies night sweats or fevers, however, admits to feeling tired all of the time and feels she has lost weight. She has a past medical history of rheumatoid arthritis and hypertension.

On examination, there is tobacco staining on her fingers and teeth. On chest auscultation, there is widespread wheeze and reduced air entry at the left lung base. Vital signs reveal RR 20/min, SpO2 of 94% on air and a temperature of 36.4oC.

Her blood results reveal:

Hb 91 g/L (130 – 180)

WCC 8.0 x 109/ L (3.6 – 11.0)

Her chest X-ray is shown below:

Source: James Heilman, MD [CC BY-SA 3.0]

What is the most likely diagnosis?

A. Pneumonia

B. Tuberculosis

C. Cardiac failure

D. Empyema

E. Pulmonary carcinoma

Correct Answer:Pulmonary carcinoma

Explanation:

The correct answer is pulmonary carcinoma. The patient has presented with a longstanding history of respiratory symptoms, such as cough and breathlessness, in combination with demonstrable heavy tobacco smoking abuse. The patient also mentions ‘red-flag’ symptoms, including haemoptysis, weight loss and lethargy.

The chest radiograph shows a unilateral left-sided pleural effusion, for which there are many differentials, and images should be interpreted within their clinical context. Pulmonary carcinoma is the most likely differential in this question predominantly due to the patient’s risk factors for developing malignancy, and important negative findings that would rule out an alternative diagnosis. Moreover, a pulmonary malignancy is a likely cause of a unilateral transudative effusion.

Tuberculosis is a reasonable differential for a patient presenting with a long-standing cough, however, the absence of night sweats and fevers, in combination with a significant smoking history, makes lung cancer the more likely diagnosis for this patient.

Pneumonia is more likely to present with short-term acute symptoms and elevated inflammatory markers. Likewise, an empyema may show a unilateral effusion on plain film imaging, but a patient would usually present with swinging fevers, purulent sputum, and raised inflammatory markers. Moreover, an infectious cause may not account for the lethargy and weight loss.

Cardiac failure usually presents with different symptoms and cardiac disease risk factors. On plain film, cardiac failure most commonly presents with bilateral pleural effusions.

Further reading:

https://radiopaedia.org/articles/lung-cancer-3

Question:

A 34-year-old woman presents to her GP with a three-year history of chronic pelvic pain. The pain is worse during menstruation and sometimes spreads to the posterior aspect of her thighs. In addition, she describes deep dyspareunia and occasional pain on defecation. She married her husband five years ago, and they have been trying to conceive ever since.

There is generalised tenderness during vaginal examination, and the uterus appears fixed and retroverted.

What is the most significant risk factor for the likely diagnosis?

A. Early first sexual encounter

B. Nulliparity

C. Late menarche

D. Multiparity

E. High BMI

Correct Answer:Nulliparity

Explanation:

This case demonstrates endometriosis, where endometrial tissue is found outside the uterine cavity, most commonly around the pelvic peritoneum and ovaries. Endometriosis typically presents with chronic or cyclical pelvic pain, deep dyspareunia, dysmenorrhoea and subfertility. In addition, non-gynaecological symptoms such as dysuria and dyschezia may also be seen. There is commonly diffuse tenderness during vaginal examination, and the uterus is typically fixed and retroverted.

Nulliparity is the most significant risk factor in this case.

Other risk factors include:

Early menarche

Late menopause

Delayed childbearing

Family history

Vaginal outflow obstruction

White ethnicity

Low body mass index

Autoimmune disease

Late first sexual encounter.

Smoking

Further reading:

https://geekymedics.com/endometriosis/

Question:

A 7-year-old girl is brought to the GP by her mother, who is worried about a rash that she has developed over the past few weeks. It initially started as a small area of redness over the anterior aspect of the girl's arm but has since spread to involve the elbow crease, and appears to be starting on the other arm. The patient states that it is extremely itchy, and is affecting her sleep and ability to focus at school. On examination, there are areas of poorly demarcated erythema on both flexural surfaces of the upper limb, with notable excoriations and areas of thickened skin in this area. The skin appears especially dry, with some areas of cracking and fissuring.

The patient has been otherwise well, her mother mentions that she had a rash over her face when she was very young, but this resolved with topical creams, and she has been developing well, enjoying school. There is little family history of note, although the mother explains that she has extremely bad asthma, for which she is currently taking monoclonal antibody therapy. The GP explains the likely diagnosis to the patient and her mother; prescribes two different topical agents and encourages the girl to avoid scratching at the lesions. He explains that the two creams should not be applied at the same time, in order for them both to function effectively.

What is the minimum length of time recommended to wait between the application of emollients and topical steroids?

A. 60 minutes

B. 2-5 minutes

C. 30-60 seconds

D. At least 3 hours

E. 20-30 minutes

Correct Answer:20-30 minutes

Explanation:

The most likely diagnosis, in this case, is atopic eczema; a very common inflammatory skin dermatosis. It falls under the heading of atopic conditions along with asthma and allergic rhinitis - all three are thought to involve an underlying type 1 hypersensitivity reaction. Whilst this hypersensitivity is thought to play a role in this disease, the exact pathophysiology is more complex. Skin barrier dysfunction is thought to play a significant role, with strong links being drawn to the filaggrin gene, mutated in approximately 50% of those with eczema. This mutation can disrupt the normal skin barrier, allowing for the entry of irritants and other pathogens that can then drive the hypersensitivity reaction and worsen symptoms.

Atopic eczema affects different areas of the body depending on the age group suffering from the condition; in young infants, the face and scalp are most frequently affected, with the more classical flexural distribution seen in older children and adults. The pattern of disease is often a chronic one, with flare-ups occurring during periods of emotional stress or due to exposure to specific triggers. Management of mild eczema is principally via emollients to repair the skin barrier, and topical steroids to manage the underlying inflammation. The British Association of Dermatologists recommends waiting at least 20-30 minutes between applying the two therapies, as otherwise there is a risk of diluting the steroid and reducing its efficacy.

Additional therapies may include antihistamines to address the underlying itch, and in more severe cases, more potent immunosuppression may be necessary, tacrolimus cream being one such option. Wet bandages may be used in younger children to attempt to prevent excessive scratching at the lesions, which can damage the skin barrier further.

30-60 seconds and 2-5 minutes are both too short a period to leave before the application of the second topical therapy; this would risk compromising the efficacy of the steroid.

60 minutes and at least 3 hours are excessive in terms of leaving a gap between the therapies. The most important aspect of any topical therapy for a dermatological disease is compliance; informing patients to leave too long a period may lead to reduced compliance with the treatment regime.

Further reading:

https://www.bad.org.uk/shared/get-file.ashx?id=183&itemtype=document

Question:

A 36-year-old woman presents to her GP. She has a new pruritic and erythematous rash on her wrist, which has appeared over the past 48 hours. She received a new bracelet for her birthday, which she wore on the affected wrist.

She notes the rash is very itchy. She is apyrexial and feels well in herself otherwise. On examination the skin on her wrist is erythematous, dry and cracked.

What is the first-line management for this condition?

A. Temovate 0.5% ointment

B. Avoidance of the stimulus

C. Fusidic acid cream

D. Clotrimazole Cream 1%

E. Re-exposure treatment

Correct Answer:Avoidance of the stimulus

Explanation:

Avoidance of the stimulus is the most important element of treatment and prevention of recurrent episodes of contact dermatitis. Contact dermatitis is an inflammatory skin condition induced by exposure to an external irritant or allergen, with nickel jewellery being a common cause. The appearance of contact dermatitis is highly variable. It is often an erythematous and pruritic rash. Other aspects of management include the use of liberal emollient and soap substitutes to maintain skin hydration and improve barrier repair.

Temovate 0.5% ointment is a very potent steroid cream. Topical steroids may be needed to manage contact dermatitis, however, a less potent steroid would be started first. Typically, avoidance with the addition of topical emollients would be more appropriate initially.

Clotrimazole cream is an anti-fungal which is often used to treat thrush.

Fusidic acid cream is an antibiotic cream used to manage infections such as cellulitis or impetigo.

Re-exposure will worsen the rash by causing an ongoing type IV hypersensitivity reaction.

Further reading:

https://cks.nice.org.uk/topics/dermatitis-contact/management/management/

Question:

A 33-year-old man with a history of intravenous drug use is admitted to the hospital with unexplained fevers. On examination, he has splinter haemorrhages and splenomegaly. An echocardiogram shows vegetations on the mitral valve. The patient is started on gentamicin for endocarditis.

Which of the following side effects is it important for the staff looking after him to be aware of?

A. Orange secretions

B. Myasthenia gravis

C. Hearing loss

D. Red man syndrome

E. Hepatitis

Correct Answer:Hearing loss

Explanation:

This patient is being treated with gentamicin for infective endocarditis. Gentamicin is an aminoglycoside and an important adverse effect to be aware of is hearing loss due to damage to the auditory or vestibular nerve.

Hepatitis is an important adverse effect of rifampicin, another antibiotic that can be used to treat infective endocarditis in patients with a penicillin allergy or MRSA. It does not occur with gentamicin.

Myasthenia gravis is not an adverse effect of gentamicin, but rather it is a contraindication to it. This is because gentamicin can exacerbate the symptoms of myasthenia gravis.

Orange secretions are another side effect associated with rifampicin. They do not occur with gentamicin.

Red man syndrome is a side effect associated with vancomycin (another antibiotic that can be prescribed for infective endocarditis) when it is infused rapidly. It is an anaphylactoid reaction that presents with a pruritic, erythematous rash of the face, neck and upper torso. It is not associated with gentamicin use.

Further reading:

https://bnf.nice.org.uk/drug/gentamicin.html

Question:

A 45-year-old woman presents to A&E complaining of severe upper abdominal pain. This began approximately 2 hours previously and has increased in severity; it initially appeared to come in waves - however, it is now present almost constantly. She is now feeling extremely unwell, and has vomited twice; she feels extremely hot and sweaty.

On examination, the patient is significantly overweight and looks pale and unwell. Her sclerae appear slightly icteric, and general observations reveal a pulse rate of 128, respiratory rate of 24 and temperature of 38.8 degrees. Abdominal examination reveals severe tenderness in the right upper quadrant with guarding, although there are no masses, nor any evidence of rigidity or rebound tenderness. Murphy's sign is negative. Blood tests taken on admission reveal neutrophilia and an elevated CRP.

The admitting doctor is concerned about the patient's symptoms and arranges for a senior review.

Which of the following is the most likely diagnosis?

A. Ascending cholangitis

B. Fitzhugh-Curtis syndrome

C. Myocardial infarction

D. Alcoholic hepatitis

E. Ruptured abdominal aortic aneurysm

Correct Answer:Ascending cholangitis

Explanation:

Ascending cholangitis is a potentially life-threatening infection of the biliary system, arising due to bile stasis allowing for the colonisation of the tract with bacteria. The most common trigger for this stasis is choledocholithiasis (gallstones), although any pathology causing obstruction can potentially be implicated (such as biliary strictures, tumours etc...). The classic presentation is with Charcot's triad of clinical features, which consists of fever, jaundice, and right upper quadrant pain - the patient is displaying all of these, and this is therefore the most likely diagnosis.

A septic screen and initiation of the Sepsis 6 protocol is essential in ascending cholangitis, due to the severity of the infection. The diagnosis will usually be confirmed via ultrasound of the biliary system; this will typically reveal dilation of the common bile duct (the stones themselves are unlikely to be visualised, as only calcified gallstones are visible on ultrasound). Antibiotic provision is the most important aspect of management, with biliary drainage also often necessary; this involves endoscopic retrograde cholangiopancreatography to remove the obstruction, with a stent possibly also inserted.

Alcoholic hepatitis is another possible differential for right upper quadrant pain and jaundice; however, there is no history of alcohol abuse, and it would be less likely to present with the signs of sepsis exhibited by this patient.

Fitzhugh-Curtis syndrome is a rare complication of pelvic inflammatory disease that involves inflammation of the liver capsule and right upper quadrant pain. There is no history of a sexually transmitted infection, nor any vaginal discharge or pelvic pain; thus is unlikely to be the cause of the patient's symptoms.

Myocardial infarction can potentially present atypically without the classic chest pain; it would be a possible explanation for the patient's sweating. However, it is unlikely to cause neutrophilia or jaundice as are present in this particular scenario. The same is true of a ruptured aortic aneurysm; whilst this is an important consideration in any patient with abdominal pain, the symptoms point towards a likely biliary or hepatic cause.

Further reading:

https://patient.info/doctor/cholangitis

Question:

A 27-year-old female and 30-year-old male attend a gynaecology clinic in order to further investigate their inability to conceive for the last 2 years. The couple has not previously conceived a child together (or indeed with any other partner). They report having regular, unprotected sexual intercourse. The female patient admits to suffering from galactorrhoea. On examination of the female patient, the presence of bitemporal hemianopia is noted. A range of blood tests is performed on the female patient and high prolactin levels are later noted. Additionally, the male patient’s semen is sent for analysis, with the following results:

5ml semen volume

sperm concentration of 200x109/ml

70% total motility

90% sperm vitality

Which of the following MANAGEMENT options is MOST LIKELY to resolve this couple’s inability to conceive?

A. Dietary adjustment for the female patient

B. Vasovasostomy for the male patient

C. Clomiphene citrate for the female patient

D. Dopamine agonist for the female patient

E. Epididymal sperm aspiration

Correct Answer:Dopamine agonist for the female patient

Explanation:

The most appropriate treatment, in this case, is the use of a dopamine agonist for the female patient. The female is likely suffering from a pituitary adenoma that is reducing her fertility due to excessive production of prolactin. The management for a pituitary adenoma is either the use of a dopamine agonist (e.g. cabergoline) or trans-sphenoidal surgical removal. This condition typically presents with a combination of bitemporal hemianopia and galactorrhoea.

Infertility can be defined as the inability to conceive over a period of 12 months of regular, unprotected sexual intercourse. There are numerous causes for female and male infertility.

Some male causes of subfertility include:

small testicular size resulting in oligospermia

undescended testicles

chronic prostatitis

varicocele

Female causes of subfertility include:

high BMI

polycystic ovarian syndrome (PCOS)

Turner’s syndrome

endometriosis

Although dietary adjustment and weight loss can improve fertility in overweight females, it is not a management option for a pituitary adenoma.

Clomiphene citrate is given to patients with polycystic ovarian syndrome (PCOS) who are attempting to conceive.

Vasovasectomy is not appropriate in this case. This procedure would be appropriate for a confirmed blockage of the vas deferens.

Epididymal sperm aspiration with the intention to carry out assisted conception techniques (e.g. IVF) is not appropriate in this case as the male patient's semen sample was normal. This management would be appropriate if the male patient suffered from azoospermia and was not a candidate for surgical correction of a condition relating to abnormal sperm analysis.

Further reading:

https://www.nice.org.uk/guidance/cg156

Question:

A 2-year-old boy is brought in to A&E after a tonic-clonic seizure that lasted 2 minutes; he is now sleepy. The boy’s parents tell you he has been “under the weather” lately. This is the first time anything like this has happened. It would appear no injuries were sustained.

What is the MOST important initial investigation?

A. Urine dip

B. EEG

C. Capillary blood glucose

D. MRI brain scan

E. U&Es

Correct Answer:Capillary blood glucose

Explanation:

Don’t ever forget glucose! Hypoglycaemia can cause seizures and has a high mortality rate, despite being easily treatable (when recognised early by checking capillary blood glucose). The most common cause of a generalised seizure in a young child is a febrile convulsion, however, hypoglycaemia should always be excluded. The history provided here is very non-specific, however, signs and symptoms of febrile illness in children under the age of 3 tend to be non-specific. One must assume on the basis this child has been “under the weather lately” it is most likely he has a febrile illness.

Although it is important to check U&Es to rule out electrolyte abnormalities, the results wouldn't be available immediately and therefore quickly checking a capillary blood glucose would take priority, so that hypoglycaemia could be quickly recognised and treated if present.

If the clinical presentation is strongly suggestive of a febrile seizure there is no indication to perform an EEG or MRI brain scan. EEG and MRI brain are specialist tests, which should only be performed after a child’s second afebrile seizure. An EEG can support a diagnosis of idiopathic generalised epilepsy. An MRI brain scan is not a routine investigation for making a diagnosis of idiopathic generalised epilepsy, however, it can be useful for identifying any structural abnormalities if there are concerns.

Further reading:

https://www.nice.org.uk/guidance/cg137

Question:

A 23-year-old male presents to the emergency department complaining of a fainting episode. The patient describes going for a 13km run this morning with a friend, which he usually does four times a week. Five minutes after finishing his run, he started to feel very faint and passed out. He reports feeling nauseous and sweaty before passing out. His friend reported him appearing very pale before slumping to the floor, but he did not hit his head, and there was no visible jerking of the limbs. He eventually came round after 5 minutes and appeared tired but not confused. He has no relevant past medical history and takes no medications. He is a non-smoker, drinks alcohol socially and does not use recreational drugs. He has no significant family history.

Observations: RR 24/min, BP 89/55 mmHg, HR 48 bpm, SpO2 98% on room air, temperature 36.7°c. The patient appears pale, but alert and well orientated. Clinical examination is unremarkable, in particular, there are no cardiac or neurological abnormalities.

A cannula is inserted, IV fluids given and an ECG performed. During the ECG, the patient suddenly faints again, becoming unresponsive for a minute before coming round albeit slowly. A section from lead II on the ECG is shown.

What would be the most appropriate initial management of the patient’s current presentation?

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A. Transcutaneous pacing

B. Atropine 500 mcg IV

C. Urgent referral to cardiology for placement of an implantable pacemaker

D. Admit for continuous cardiac monitoring and observation

E. Discharge with reassurance and advice. No treatment required.

Correct Answer:Atropine 500 mcg IV

Explanation:

The patient has presented following a syncopal episode following exercise with evidence of bradycardia. His ECG demonstrates a type 1 second-degree AV block, also known as a Mobitz type 1 or Wenckebach phenomenon. This is characterised by progressive prolongation of the PR interval on consecutive beats culminating in a non-conducted P wave and a dropped QRS complex. The underlying pathophysiology is usually due to a reversible conduction block at the level of the AV node. Common causes of Wenckebach phenomenon include:

Drugs: beta-blockers, calcium channel blockers, digoxin and amiodarone

Inferior myocardial infarction

Myocarditis

Cardiac surgery (e.g. mitral valve repair)

Increased vagal tone (e.g. athletes)

It is usually a benign rhythm causing minimal haemodynamic instability, with a very low risk of converting to full third-degree heart block. However, based on the current 2021 Resuscitation Council Guidelines for bradycardia, given he has a concomitant adverse feature (syncope), treatment with atropine 500 mcg IV would be indicated. This can be repeated if necessary every 3-5 minutes to a total of 3mg. Commonly this rhythm would require no treatment however given the adverse features this would not be appropriate in this scenario

Referral to cardiology for placement of an implantable pacemaker would be the definitive treatment for patients with AV block that has no reversible cause. This is more commonly indicated in type 2 second-degree AV block and third-degree AV block.

If bradycardia with adverse signs persists despite atropine, the use of cardiac pacing can be considered. Transcutaneous pacing should be initiated if there is no response to atropine, or if atropine is contraindicated.

Should the patient have had a satisfactory response to the atropine, he could be admitted for continuous cardiac monitoring and observation, however initial management of his bradycardia would be a priority.

Further reading:

https://litfl.com/av-block-2nd-degree-mobitz-i-wenckebach-phenomenon/

Question:

A 64-year-old man with Parkinson's disease presents for a neurology review. His current medications include levodopa and carbidopa. He is experiencing a greater amount of off-time, where his symptoms begin to reoccur around 3-4 hours after his last dose. The neurologist wishes to start bromocriptine, a dopamine receptor agonist.

What important investigation should be requested before starting this medication?

A. Thyroid function tests

B. Full blood count

C. Serum potassium

D. ECG

E. Chest x-ray

Correct Answer:Chest x-ray

Explanation:

Bromocriptine has been associated with pulmonary, retroperitoneal, and pericardial fibrotic reactions. Therefore, a chest x-ray, echocardiogram, ESR and serum creatinine should be requested before starting the medication.

Bromocriptine is also associated with impulse control disorders, including gambling, binge eating, and hypersexuality.

Further reading:

https://bnf.nice.org.uk/drug/bromocriptine.html

Question:

A 56-year-old man presents to A&E with an acutely painful left ankle, which is swollen and red. He is only able to walk a few metres due to the pain and the cold compresses that he has been applying to soothe the pain are not working. He has never experienced similar pain before.

He has a past medical history of hypertension, and one of the medications that he is taking is hydrochlorothiazide. He is a non-smoker, drinks around 10 units of alcohol per week and describes consuming a highly calorific and fatty diet.

On examination he is obese. His observations are stable and he is apyrexial. His left ankle is erythematous and swollen, and warm to touch. He is extremely uncomfortable when the ankle is palpated. There are no other obvious signs of dermatological or rheumatological disease.

Initial blood tests demonstrate a serum uric acid level of 9mg/L, but all other parameters are within range. He undergoes an arthrocentesis of the ankle joint affected.

What is the most likely finding on synovial fluid analysis from the joint arthrocentesis?

A. Rhomboid-shaped crystals that are positively birefringent under polarised light

B. Rhomboid-shaped crystals that are negatively birefringent under polarised light

C. Raised white blood cell count and positive culture

D. Needle-shaped crystals that are positively birefringent under polarised light

E. Needle-shaped crystals that are negatively birefringent under polarised light

Correct Answer:Needle-shaped crystals that are negatively birefringent under polarised light

Explanation:

This history, examination and investigation results are suggestive of a diagnosis of gout. Gout is characterised by sudden onset severe joint pain, and patients will often present with swelling and erythema of the affected joint. It is caused by hyperuricaemia (typically defined in men as a serum uric acid level of >7mg/dL), which results in the deposition of uric acid crystals in joints. Commonly affected joints include the first toe, foot and ankle, but it can also affect joints such as those in the hands and the knee. Multiple acute episodes can lead to joint destruction.

Diagnosis is achieved by arthrocentesis of the affected joint, which will typically demonstrate synovial fluid containing needle-shaped crystals that are negatively birefringent under polarised light. The synovial fluid will also typically demonstrate an elevated white blood cell count (i.e. >2x109/L). Acute episodes are typically treated with NSAIDs such as ibuprofen or naproxen, or colchicine. NSAIDs will need to be co-prescribed with a gastro-protective agent such as a proton pump inhibitor. In the long-term, usually 2-3 weeks after the acute episode resolves, a uric acid lowering agent such as allopurinol can be administered, which is a xanthine oxidase inhibitor.

Rhomboid-shaped crystals that are positively birefringent under polarised light are suggestive of pseudogout rather than gout, which can present similarly to gout and therefore synovial fluid analysis is essential for diagnosis.

Rhomboid-shaped crystals that are negatively birefringent under polarised light and needle-shaped crystals that are positively birefringent under polarised light are not typical of gout or pseudogout.

Raised white blood cell count and positive culture of the synovial fluid would be consistent with a diagnosis of septic arthritis, but the rest of the history and examination are not suggestive of this diagnosis.

Further reading:

https://patient.info/doctor/gout-pro

Question:

A 21-year-old man clinic has just received a new diagnosis of human immunodeficiency virus (HIV). The diagnosis has been explained, and he has been counselled on the potential treatment options. A decision is made to start enfuvirtide, a cell fusion inhibitor.

Which step of the HIV life cycle is targeted by this medication?

A. Binding of viral protein gp120 to CD4+ and co-receptor CCR5

B. Merging of HIV and host DNA by viral integrase enzymes

C. Cleavage of HIV protein by viral protease

D. Penetration of viral protein gp41 into the host cell membrane

E. Conversion of HIV single-stranded RNA into double-stranded DNA

Correct Answer:Penetration of viral protein gp41 into the host cell membrane

Explanation:

The correct answer is penetration of viral protein gp41 into the host cell membrane. This is the second stage of the HIV life cycle, and is known as fusion (allowing fusion of the virus and the host cell). Cell fusion inhibitors (such as enfuvirtide) target this process.

Gp120 binding to CD4+ and CCR5 is incorrect as this is targeted by CCR5 antagonists (such as maraviroc) in the first stage of the HIV life cycle: binding.

HIV protein cleavage is incorrect as this process is targeted by protease inhibitors (such as ritonovir), which prevent budding (the final stage of the HIV life cycle).

Integration of HIV DNA and host DNA is incorrect as this stage is targeted by integrase inhibitors (such as relategravir) during integration (fourth stage of the HIV life cycle).

Conversion of single-stranded RNA into double-stranded DNA is incorrect, as this is the process of reverse transcription. This is targeted by non-nucleoside reverse transcriptase inhibitors (NNRTIs, such as nevirapine) and nucleoside reverse transcriptase inhibitors (NRTIs, such as abacavir) in the third stage of the HIV life cycle.

Further reading:

https://geekymedics.com/human-immunodeficiency-virus-hiv/

Question:

A 55-year-old man presents to his GP with a 2-year history of recurrent episodes of epigastric pain, sometimes radiating through to the back. He has lost 10kg over the past two months, despite reporting a good appetite. He also describes his stools as greasy and hard to flush. He has recently been diagnosed with diabetes but has no other significant past medical history. He has been drinking 5 pints of beer a day for the past 20 years and does not smoke.

On examination, the patient appears cachectic, and there is tenderness in the epigastric region, however, the abdomen is soft.

What is the most likely diagnosis?

A. Chronic pancreatitis

B. Cystic fibrosis

C. Acute pancreatitis

D. Pancreatic cancer

E. Cholangiocarcinoma

Correct Answer:Chronic pancreatitis

Explanation:

This man is presenting with chronic epigastric pain and signs of pancreatic endocrine dysfunction (diabetes) and pancreatic exocrine function (malabsorption leading to weight loss and steatorrhea). These all point towards a diagnosis of chronic pancreatitis.

Although acute pancreatitis typically presents with epigastric pain radiating through to the back, this usually presents over hours to days rather than years. In addition, acute pancreatitis would not cause weight loss, steatorrhoea or diabetes at presentation.

Cholangiocarcinoma most commonly presents with jaundice and weight loss, with or without abdominal pain. The absence of jaundice in this patient, combined with signs of pancreatic exocrine and endocrine dysfunction, makes chronic pancreatitis the more likely diagnosis.

Although pancreatic cancer can cause pancreatic exocrine and endocrine dysfunction, it is often associated with jaundice, especially if it is in the head of the pancreas. Pancreatic cancers in the body and tail of the pancreas may cause epigastric pain radiating through to the back without jaundice, however, these are less common than cancers in the head of the pancreas. In addition, pancreatic cancer is, on the whole, rarer than chronic pancreatitis, making the most likely diagnosis chronic pancreatitis.

Although cystic fibrosis can cause pancreatic exocrine and endocrine dysfunction, most cases are diagnosed before the age of 2 and are associated with pulmonary symptoms.

Further reading:

https://teachmesurgery.com/hpb/pancreas/chronic-pancreatitis/

Question:

A 50-year-old man presents to his general practitioner (GP) with abdominal pain, pale stools and yellowing of the skin and sclera. The patient is frequently seen in the Accident & Emergency department (A&E) with acute alcohol intoxication and drinks roughly 50 units of alcohol per week.

As part of liver screening, the GP requests liver function tests (LFTs).

Which of the following LFT patterns is characteristic of alcoholic liver disease?

A. Isolated raised ALP

B. ALT / AST ratio of 2:1 or more

C. Isolated unconjugated bilirubinaemia

D. Raised ALP with accompanying raised GGT

E. AST / ALT ratio of 2:1 or more

Correct Answer:AST / ALT ratio of 2:1 or more

Explanation:

An AST / ALT of 2:1 or more is highly suggestive of alcoholic liver disease. A helpful mnemonic to remember this is "wASTed".

An ALT / AST ratio of 2:1 or more is indicative of chronic liver disease but has no specificity for alcoholic causes.

A raised ALP with accompanying raised GGT is highly specific for cholestatic disease (e.g gallstones obstructing the biliary tree). However, ALP is also raised in disease affecting the bones (e.g Paget's disease of bone, bony metastases, recent fractures). ALP is also produced by the placenta, so pregnant women will have physiologically raised ALP levels. Therefore, an isolated raised ALP is not specific for disease affecting the biliary tree and patients require further investigation.

An isolated raised unconjugated bilirubin should raise concerns about haemolytic disease (remember that bilirubin is a breakdown product of red blood cells) and Gilbert's syndrome, which is an autosomal recessive condition affecting an enzyme which conjugates bilirubin in the liver.

Further reading:

https://geekymedics.com/interpretation-of-liver-function-tests-lfts/

Question:

A 23-year-old man has an 8-month history of progressively worsening polyuria and polydipsia. Over the last few months, he has had unexpected weight loss and recurrent urinary tract infections. He has no past medical history, but his mother has hypothyroidism. On examination, he appears well with no significant findings. His BMI is 28 kg/m2. He does not smoke, nor does he drink alcohol.

Investigations are performed:

Test Result Reference Ranges

Fasting blood glucose 16.9 mmol/L (3.9 - 5.6 mmol/L)

C-peptide 0.04 ng/mL (0.50 - 2.00 ng/L)

What is the most likely diagnosis?

A. Maturity-onset diabetes of the young (MODY)

B. Diabetes insipidus

C. Type 2 diabetes mellitus

D. Type 1 diabetes mellitus

E. Prediabetes

Correct Answer:Type 1 diabetes mellitus

Explanation:

Type 1 diabetes mellitus is correct. This patient has signs and symptoms consistent with diabetes mellitus (due to the presence of his polyuria and polydipsia). The next step is to distinguish what form of diabetes mellitus it is. The NICE guidelines recommend that alongside blood glucose measurements, C-peptide and diabetes-specific autoantibodies should be considered in patients with features that are considered atypical (≥50 years old, BMI of ≥25 kg/m2, or slow evolution of hyperglycaemia or a long prodrome). This patient is relatively young to have type 2 diabetes mellitus, and their presentation is not typical for type 1 diabetes mellitus (which often presents suddenly with abdominal pain and diabetic ketoacidosis, unlike this patient, whose symptoms have evolved over months). The C-peptide helps to differentiate between the two. C-peptide is low or undetectable in type 1 diabetes mellitus and normal or high in type 2 diabetes mellitus. The beta cells in the Islets of Langerhans release proinsulin which is then split into insulin and C-peptide in roughly equal amounts. It is a more useful marker than measuring insulin directly because C-peptide remains in the blood longer than insulin. In type 1 diabetes mellitus, there is an absolute insulin deficiency, meaning that no proinsulin is released, causing both reduced insulin and C-peptide.

Type 2 diabetes mellitus is incorrect. This patient is relatively young to have type 2 diabetes mellitus, and their C-peptide measurement is low, which is suggestive of type 1 diabetes mellitus. In type 2 diabetes mellitus, the C-peptide measurement is normal or high. This is because the person is capable of producing insulin (unlike type 1 diabetes), however, there is insulin resistance (i.e. the body does not respond properly to the insulin), meaning levels are either normal or high in an attempt to function.

Maturity-onset diabetes of the young (MODY) is incorrect. Although this may present in adolescents and young adults, an autosomal dominant mutation causes MODY, and this patient does not have a family history of diabetes mellitus. Also, in MODY, the C-peptide levels are normal or high. This is because the person is capable of producing insulin (unlike type 1 diabetes), however, there is insulin resistance (i.e. the body does not respond properly to the insulin), meaning levels are either normal or high in an attempt to function.

Prediabetes is incorrect. This is defined as fasting glucose of 5.5 - 5.9 mmol/L and does not have associated symptoms. This patient's blood glucose is higher than this, and they have symptoms suggestive of diabetes mellitus (polyuria and polydipsia).

Diabetes insipidus is incorrect. Although this can cause polyuria and polydipsia, this diagnosis would not explain the increased fasting glucose and C-peptide value, which would both be normal. There is also no mention of a predisposing factor, such as head trauma/surgery or renal disease.

Further reading:

https://patient.info/doctor/management-of-type-1-diabetes

Question:

A 58-year-old man presented to the GP complaining of a dull ache in the calves for the last 4-months. His symptoms are relieved by lying down and worsen on standing for a longer period. On physical examination, he is noted to have tortuous dilated veins on the abdomen and the medial aspect of his lower extremities, oedema in the lower limbs and massive splenomegaly and hypogonadism. He has a past medical history of rheumatoid arthritis, managed with methotrexate and oral steroids. He drinks 30-units of alcohol a week and has a 30-pack-year tobacco history.

What is the most likely cause of this condition?

A. Hepatic cirrhosis

B. Klippel-Trenaunay syndrome

C. Iliac vein thrombosis

D. Retroperitoneal fibrosis

E. Deep vein thrombosis

Correct Answer:Hepatic cirrhosis

Explanation:

The most likely cause of the varicose veins, in this case, is hepatic cirrhosis. Portal hypertension in liver cirrhosis leads to splenomegaly and dilation of veins on the abdomen (caput-medusae). Hypogonadism is also a common complication of hepatic failure, Methotrexate and alcohol intake are the most possible factors leading to liver cirrhosis in this case.

Iliac vein thrombosis is a surgical emergency and presents with acute symptoms which are mostly unilateral not bilateral.

Deep vein thrombosis presents with throbbing or cramping pain in 1 leg (rarely both legs), usually in the calf or thigh and is rarely related to portal hypertension and hepatic failure.

The most common presentation in retroperitoneal fibrosis is pain, which may occur in the loin, back, scrotum or lower abdomen. Fever, weight loss, nausea and vomiting, malaise and peripheral oedema may occur. At later stages, it can cause varicose veins in bilateral lower limbs which extend to the anterior abdominal wall. However, it does not explain the splenomegaly and hypogonadism in the question stem.

Klippel-Trenaunay syndrome (KTS) is a rare congenital vascular disorder in which a limb may be affected by port wine stains (red-purple birthmarks involving blood vessels), varicose veins, and/or too much bone and soft-tissue growth. The limb may be larger, longer, and/or warmer than normal.

But it rarely causes abdominal symptoms such as ascites, caput medusae and splenomegaly.

Further reading:

https://patient.info/doctor/varicose-veins-pro

Question:

A 21-year-old man presents to the emergency department with severe pain in his right eye. The pain started two days ago and is getting worse. He also complains of blurring, photophobia, and a gritty sensation in his eye but has no diplopia, headaches, or fevers. He wears contact lenses frequently and sometimes forgets to take them out when he goes to sleep at night.

On gross examination, the right eye appears erythematous with mucopurulent discharge. When viewed under magnification, a small white spot is visible on the cornea which appears green post fluorescein staining under blue light. Pupils are round and equally reactive in both eyes. The examination of the left eye is unremarkable.

Based on the likely diagnosis, what complication can occur if left untreated?

A. Strabismus

B. Meningitis

C. Corneal perforation

D. Amblyopia

E. Night blindness

Correct Answer:Corneal perforation

Explanation:

This patient most likely has bacterial keratitis which classically presents with severe unilateral eye pain, foreign body sensation, blurry vision, photophobia, red eye, and mucopurulent discharge. Patients often have a history of improper contact lens use such as wearing them overnight or while swimming or showering. It is often caused by Pseudomonas in contact lens wearers. Bacterial keratitis can present similarly to simple corneal abrasions and other aetiologies of keratitis such as viral or fungal. All keratitis have an aspect of corneal abrasion (a compromised epithelium allows infection) and both may show green staining post fluorescein application. In the case of a simple abrasion, no white spots should be visible on the cornea as these imply corneal oedema due to inflammation and infection (as is the case with keratitis). Herpes simplex keratitis will classically reveal a dendritic ulcer with fluorescein staining.

One of the most serious complications of untreated bacterial keratitis is corneal perforation, which can occur within days. Therefore prompt diagnosis and management is imperative. Other common complications include corneal scarring, endophthalmitis, and secondary glaucoma.

Amblyopia and strabismus are not usually associated with bacterial keratitis in this age group.

Night blindness, usually associated with retinal disorders, is not seen in bacterial keratitis.

Meningitis could theoretically occur following bacterial keratitis, especially if it spread to become endophthalmitis, but would be an extremely rare complication.

Further reading:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3074777/

Question:

A 32-year-old man presents to his GP with a four-day history of fever, coryza and fatigue. Over the last two days, he has also developed a cough that is occasionally productive. He has no medical co-morbidities.

On examination, observations are all within normal limits. Wheezes and rhonchi are heard on chest auscultation.

What is the most likely diagnosis?

A. Chronic obstructive pulmonary disease

B. Empyema

C. Pneumonia

D. Acute bronchitis

E. Nephrotic syndrome

Correct Answer:Acute bronchitis

Explanation:

Acute bronchitis is the most likely diagnosis given the presentation. Acute bronchitis affects the large airways and doesn't extend down to the alveoli (small airways). Diagnosis is clinical and doesn't require any particular investigation. Symptoms usually last for 7-10 days, although the cough can linger for several weeks. 90% of cases are due to a viral infection, especially in otherwise fit and well individuals, and therefore a lymphocytic cellular infiltrate is seen. The cough can be productive or non-productive, but regardless there is a decreased mucociliary function and copious mucus secretion in the large airways. There is no evidence to support the use of antibiotics for acute bronchitis, with simple over-the-counter symptom control medications advised.

Pneumonia is unlikely, given the short history, presence of other viral symptoms, normal observations and the recovery with simple measures. Alveolar inflammation with the accumulation of fluid rich in infective organisms would be a defining pathological feature.

Chronic obstructive pulmonary disease is unlikely, given this patient has no history of smoking or any lung pathology. Histology would show characteristic findings of mucous hypersecretion and ciliary dysfunction, airflow obstruction and hyperinflation.

Empyema is an accumulation of frank pus in the pleural space, usually associated with pneumonia following the formation of a para-pneumonic effusion. Patients have a longer history of more severe symptoms, and examination will reveal an area of dullness to percussion and reduced breath sounds, with increased tactile fremitus. Patients often don't clinically improve, even after appropriate antibiotic therapy, Tube thoracostomy is usually required in order to drain the pus in combination with targeted antibiotic therapy. Pleural fluid analysis would reveal purulent fluid, with fluid protein >30g/L, LDH greater than 1000 IU/L and low pleural fluid glucose level.

Nephrotic syndrome is a constellation of symptoms occurring as a result of glomerular disease, resulting in proteinuria, hypoalbuminaemia, hyperlipidaemia and oedema. Pleural fluid will have fluid protein <30g/L.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK448067/

Question:

A 54-year-old woman undergoing routine blood tests as part of her annual hypertension screen is found to have abnormal liver function tests (LFTs) as demonstrated below:

Alkaline phosphatase (ALP): 184

Gamma-glutamyl transferase (GGT): 92

Alanine transaminase (ALT): 33

Aspartate aminotransferase (AST): 15

Bilirubin: 12

Albumin: 40

On questioning, she mentions that she had been getting increasingly tired over the past few years but felt that this was simply a result of her age and work pattern. She also describes occasional itch that feels as if it is deep underneath the skin and that is not associated with a rash. She has tried over the counter topical emollients and steroid creams, but these do not help. The patient denied any abdominal pain or change in stool or urine colour. She describes having a normal appetite and no unintended weight loss. Other than hypertension, for which she takes ramipril 2.5mg, she has no other past medical history and no allergies. She reports having a family member who had autoimmune thyroid disease. She does not drink alcohol and reports never taking hepatotoxic medication.

Clinical examination reveals excoriations on her arms related to the itch and xanthelasma around the eyes. Otherwise, there are no peripheral stigmata of chronic liver disease.

What would be the most sensitive investigation to confirm the likely diagnosis?

A. Ultrasound abdomen (US abdomen)

B. Immunoglobulin M (IGM)

C. Anti-mitochondrial antibodies (AMA)

D. Liver biopsy

E. Magnetic resonance cholangiopancreatography (MRCP)

Correct Answer:Anti-mitochondrial antibodies (AMA)

Explanation:

The patient has many key features suggesting a diagnosis of primary biliary cholangitis (PBC). Clinically she has symptoms of fatigue and pruritus, in addition to signs of xanthelasma. These all would raise suspicion of underlying liver disease. The underlying pathophysiology is of autoimmune destruction of the small intrahepatic bile ducts, leading to cholestasis and bile acid retention. This can continue to cause further damage leading to fibrosis and ultimately cirrhosis. Patients who present with early-onset PBC will generally not be jaundiced as this is a late sign of advanced disease, along with metabolic changes (weight loss and muscle atrophy) and evidence of portal hypertension (splenomegaly, ascites, and varices). Her symptoms combined with raised ALP and GGT, in the absence of an alternative cause would warrant further investigation, of which the most sensitive to diagnose PBC is anti-mitochondrial antibodies or AMA. This autoantibody is present in ~95% of patients with the condition. Anti-nuclear antibodies are also present in ~30% of patients and are commonly tested alongside AMA.

US abdomen is the first-line imaging investigation for PBC, however, it is used to exclude alternative diagnoses, such as gallstone disease and malignancy in the biliary tree, rather than rule in PBC.

Raised immunoglobulin M (IgM) levels are common in patients with PBC, however, currently do not form part of the standard diagnostic investigations and are useful in patients with atypical other features.

Magnetic resonance cholangiopancreatography (MRCP) like ultrasound, is a useful investigation for ruling out diagnoses such as primary sclerosing cholangitis (PSC) and its mimics which can present like PBC. MRCP is usually normal in PBC patients.

The role of liver biopsy is limited now due to the diagnostic accuracy provided by both liver biochemistry and autoantibody test (AMA and ANA). The sensitivity of liver biopsy in early-stage PBC is ~50% due to the patchy occurrence of the disease at all stages. It is only recommended when autoantibodies are negative with a cholestatic picture on LFTs or the presence of co-existing disease (e.g. viral hepatitis, alcoholic liver disease, autoimmune hepatitis, or non-alcoholic fatty liver).

Further reading:

https://gut.bmj.com/content/67/9/1568

Question:

You are the Foundation Year 1 (FY1) doctor on the orthopaedic ward clerking Mrs Black, a 76-year-old-woman who has fallen and broken her right hip this evening. She sustained no other injuries and is otherwise well. She takes warfarin for atrial fibrillation which is well rate controlled. On examination, she has an obvious deformity to her right leg and her observations are within normal limits with an irregular pulse. The orthopaedic registrar informs you that Mrs Black is planned for surgery to fix her hip on tomorrow afternoon's trauma list.

On admission, her admission international normalised ratio (INR) is 2.5.

What is the most appropriate action with regards to her anticoagulation?

A. Give 5 mg vitamin K intravenously and omit tonight's dose of warfarin

B. Omit tonight’s dose of warfarin only

C. Continue with warfarin at patient's usual dose

D. Give prothrombin complex concentrate at 25 - 50 units per kilogram

E. Continue with warfarin at half the patient’s usual dose

Correct Answer:Give 5 mg vitamin K intravenously and omit tonight's dose of warfarin

Explanation:

The British Society for Haematology has clear guidelines for the preoperative management of anticoagulation with warfarin. This patient needs a relatively urgent operation for fixation of her hip fracture and the registrar has identified a time scale of greater than 6 to 12 hours. She will, therefore, need reversal of her warfarin with intravenous vitamin K 5mg and her usual evening dose of warfarin should be omitted. Her INR will also need to be rechecked in the morning prior to theatre.

If her operation was more urgent and could not be delayed for 6 to 12 hours she would need prothrombin complex concentrate alongside intravenous vitamin K.

Continuing warfarin at full or half of her normal dose is inappropriate as her INR would still be raised and this would likely delay surgery. Omitting her usual evening dose only would likely not completely reverse her anticoagulation in time and again likely delay surgery.

It is good practice to check with the surgical team planning to carry out an operation their expectations and usual practice with regards to anticoagulants and anticoagulation reversal.

Further reading:

https://b-s-h.org.uk/guidelines/guidelines/oral-anticoagulation-with-warfarin-4th-edition/

Question:

A 74-year-old retired architect with end-stage idiopathic pulmonary fibrosis is admitted to the hospice for end-of-life care. Despite oxygen therapy, he remains short of breath and is clearly distressed by this.

What medication is most appropriate to relieve his dyspnoea?

A. Diamorphine

B. Midazolam

C. Cyclizine

D. Hyoscine butylbromide

E. Haloperidol

Correct Answer:Diamorphine

Explanation:

This case demonstrates idiopathic pulmonary fibrosis (IPF). It is characterised by progressive exertional dyspnoea, a dry cough and bibasal fine end-inspiratory crepitations. Finger clubbing is commonly seen on examination. This patient has reached the end of his life and now requires anticipatory medications to keep him as comfortable as possible. These are commonly given subcutaneously via a syringe driver. In reality, a number, or all of these medications may be used towards the end of life, however, diamorphine works best to both reduce pain and relieve breathlessness. As an opioid, diamorphine reduces the sensation of breathlessness by decreasing the respiratory rate without causing hypoxia or hypercapnia.

Midazolam is a benzodiazepine, commonly used to manage agitation and anxiety. Whilst the breathlessness is likely contributing to the patient's anxiety, diamorphine has a more significant role in reducing the sensation of breathlessness.

Haloperidol is an anti-psychotic and less commonly used to manage agitation and anxiety.

Hyoscine butylbromide is an anticholinergic medication used to manage respiratory tract secretions.

Cyclizine is a histamine H1 receptor antagonist used to manage nausea, at the end of life.

Further reading:

https://patient.info/doctor/prescribing-in-palliative-care

Question:

A 62-year-old female presents to the emergency department with left leg pain, swelling and redness for the past 2 days. The patient works as a commercial flight pilot and returned from a long international flight 5 days ago. She uses a combined oestrogen-progestin hormone replacement therapy for severe hot flashes. She also smokes 20 cigarettes per day.

Her observations are unremarkable. Examination of the lower extremities reveals an erythematous left calf which is tender on palpation.

An ECG reveals now acute changes. Her serum D-dimer level is elevated, and duplex ultrasound of the lower extremities reveals a lack of compressibility of the left femoral vein.

What is the most appropriate management for this patient?

A. Repeat duplex ultrasound in 1 week

B. Prescribe warfarin only

C. Prescribe aspirin and clopidogrel

D. Prescribe slow-release dipyridamole only

E. Prescribe rivaroxaban only

Correct Answer:Prescribe rivaroxaban only

Explanation:

The patient in the above scenario has clinical and ultrasound findings consistent with deep vein thrombosis (DVT) of the left lower limb. Direct oral anticoagulants (DOACs) like rivaroxaban or apixaban are now licensed for use in the management of DVT, and monotherapy with one of these agents is a suitable option in this case. DOACs are a good alternative to warfarin as they have a faster therapeutic onset, do not require frequent laboratory monitoring and do not require bridging with heparin. Treatment in patients with DVT, without underlying malignancy, should be continued for a minimum of 3 months. If DVT is diagnosed in the context of an underlying malignancy, then treatment is generally recommended for a minimum of 6 months. NICE guidelines updated in 2020 state that DOACs are suitable for people with active cancer and confirmed proximal DVT. This patient also needs to be taken off hormone replacement therapy (HRT) as HRT leads to hypercoagulability. A medication such as fluoxetine or sertraline can be trialled for the management of the patient’s hot flashes.

Prescribing warfarin monotherapy would be inappropriate as warfarin is pro-thrombotic in the first 48 hours of its prescription and therefore is likely to worsen the current DVT. Warfarin is typically bridged with a heparin derivative in the treatment of DVT.

Slow-release dipyridamole is occasionally used in conjunction with aspirin in the secondary prevention of strokes. The patient in the above situation is suffering from a DVT and is unlikely to benefit from dipyridamole monotherapy. Aspirin and clopidogrel are also used in TIA and stroke management.

The patient has clinical and radiological findings consistent with DVT, therefore delaying treatment and repeating the ultrasound in 1 week is inappropriate. In patients who have a positive D-Dimer, negative ultrasound, and a Wells score of greater than or equal to 2, the ultrasound can be repeated in one week.

Further reading:

https://patient.info/doctor/deep-vein-thrombosis-pro

Question:

A 33-year-old woman who is nine weeks pregnant has presented to her booking appointment. She was diagnosed with type 2 diabetes mellitus two years ago.

What additional investigation should be offered to this patient?

A. Haemoglobinopathy screening

B. Combined test

C. 20-week ultrasound scan

D. Chorionic villus sampling

E. Digital retinal imaging

Correct Answer:Digital retinal imaging

Explanation:

Digital retinal imaging is a retinal assessment that would be offered to this patient due to her pre-existing diabetes. This is to assess for diabetic retinopathy.

The combined test, haemoglobinopathy screening test, and the 20-week ultrasound scan are routinely offered to all pregnant women, regardless of the history of type 2 diabetes mellitus.

A combined test is a Down's syndrome screening test that can be carried out from week 11 to week 13+6. It involves a nuchal translucency scan, a serum β-hCG (beta-human chorionic gonadotrophin) test, and a serum PAPP-A (pregnancy-associated plasma protein-A) test.

Haemoglobinopathy screening is offered to patients before 10 weeks of pregnancy to screen for inherited haemoglobinopathies - sickle cell disease and thalassaemia.

A 20-week ultrasound scan, also known as a fetal anomaly scan, is a scan that assesses for any structural abnormalities of the fetus. This scan is done from week 18 to week 20+6.

Chorionic villus sampling is a diagnostic test for Down's syndrome. A pregnant woman with pre-existing diabetes may be offered this (if the combined test shows elevated risk) as diabetes in pregnancy is a risk factor for Down's syndrome. It is a definitive test that is not routinely performed as it carries a 1% risk of miscarriage. The test can be carried out from week 11 to week 14. However, this patient is only 9 weeks pregnant, which is why this would not be offered at this stage.

Further reading:

https://www.nice.org.uk/guidance/ng3/chapter/Recommendations#antenatal-care-for-women-with-diabetes

Question:

A 68-year-old man with Fitzpatrick type V skin presents to his GP with a new skin lesion on the sole of his foot. He is unsure when it first developed.

On examination, there is a flat pigmented lesion measuring 7 mm in diameter. It is asymmetrical with irregular borders and contains areas of brown, red and black.

What is the most likely diagnosis?

A. Pigmented basal cell carcinoma

B. Nodular melanoma

C. Superficial spreading melanoma

D. Lentigo maligna melanoma

E. Acral lentiginous melanoma

Correct Answer:Acral lentiginous melanoma

Explanation:

This man most likely has an acral lentiginous melanoma. This type of melanoma is found on the palms, soles or under the nails. Although rare, they are the commonest type of melanoma in those with dark skin.

Nodular melanomas present as rapidly growing nodules, presenting over weeks to months. They may be dark bluish-red nodules or amelanotic.

Although superficial spreading melanoma is the commonest type of melanoma and presents as a flat lesion, it is rare in those with darker skin.

Lentigo maligna melanoma is a melanoma that develops from lentigo maligna, a slow-growing patch of discoloured skin commonly found on the head and neck in older adults. It is less common in darker skin types.

Pigmented basal cell carcinomas are extremely rare. They present as a raised pigmented, slow-growing lesion, emerging over months to years.

Further reading:

https://dermnetnz.org/topics/acral-lentiginous-melanoma

Question:

A 78-year-old woman presents to the emergency department after falling whilst getting out of bed. She complains of pain along her chest wall. A chest x-ray reveals a rib fracture as well as existing asymptomatic vertebral compression fractures.

She has a past medical history of hypertension and hypercholesterolaemia. She is currently taking amlodipine 10mg and simvastatin 20mg daily. She is allergic to aspirin, causing anaphylaxis.

Which of the following is the best investigation to confirm the underlying diagnosis?

A. Quantitative ultrasound of the heel (QUS)

B. Serum 25-hydroxy vitamin D

C. Fracture Risk Assessment Tool (FRAX)

D. Dual-energy x-ray absorptiometry (DXA)

E. Serum calcium

Correct Answer:Dual-energy x-ray absorptiometry (DXA)

Explanation:

The most likely underlying condition in this patient is osteoporosis. This patient has several features that put her at high risk of osteoporosis, including evidence of fragility fractures, a recent fall and an age >65. Dual-energy x-ray absorptiometry (DXA) is considered the gold standard for measuring bone density and confirmation of osteoporosis.

Quantitative ultrasound of the heel (QUS) is not considered a sufficient investigation for assessing bone mineral density. QUS does not have standard parameters for the diagnosis of osteoporosis.

The Fracture Risk Assessment Tool (FRAX) calculates the 10-year fragility fracture risk; it can be calculated before or after a DXA. Whilst it is a useful clinical tool, it is not considered diagnostic. Additionally, NICE recommends that people over 50 years of age with a history of fragility fracture should be offered a DXA scan to measure bone mineral density as a first-line, so it would likely not be used in this patient either.

The use of haematological markers, including serum calcium and serum 25-hydroxy vitamin D, is important in patients with osteoporosis. However, as both calcium and vitamin D should be normal in patients with osteoporosis, they cannot be considered diagnostic.

Further reading:

https://cks.nice.org.uk/topics/osteoporosis-prevention-of-fragility-fractures/

Question:

A 57-year-old male presents to the emergency department with a twelve-hour history of epigastric pain. This radiates through to the back and is improved on leaning forward. He has vomited twice and complains of nausea. The patient is awaiting referral to alcohol support services, and he admits to drinking 1 litre of vodka a day. On examination, he has a heart rate of 112bpm, respiratory rate 24/min, blood pressure 98/68mmHg and a temperature of 38.1oC.

Based on the likely diagnosis, which scoring system can be used to determine the severity of the condition?

A. CURB-65 Score

B. Glasgow-Blatchford Score

C. GAD-7 Score

D. Glasgow-Imrie Criteria

E. Child-Pugh Score

Correct Answer:Glasgow-Imrie Criteria

Explanation:

The likely diagnosis in this patient is acute pancreatitis, especially given the significant alcohol history. The Glasgow-Imrie Criteria can be used to determine the severity of acute pancreatitis.

The Glasgow-Blatchford score is used in upper gastrointestinal bleeds, to determine which patients can be safely discharged from the emergency department.

The Child-Pugh score is used to assess the severity of liver cirrhosis and predict mortality.

The CURB-65 score estimates the mortality of community-acquired pneumonia and helps to guide inpatient or outpatient treatment.

The GAD-7 score is the general anxiety disorder-7 score, used to assess the severity of anxiety.

Further reading:

https://patient.info/doctor/acute-pancreatitis-pro

Question:

An 82-year-old patient is admitted to the hospital after falling over on his way to church; he landed awkwardly on the curb and is complaining of severe pain in his forearm. There is an obvious deformity on examination, but no signs of a break in the skin, and neurovascular examination reveals no abnormalities.

A radial fracture is suspected, and an X-ray is ordered. This shows an oblique fracture of the proximal 1/3 of the radial shaft, without articular involvement or comminution. The radiologist reporting the scan has also commented on abnormalities of the bone itself; stating that there are several small areas of lucency visible, and the shaft of the radius appears bowed. The cortex of the bone appears abnormally thickened.

The patient is otherwise well, with no known medical conditions, other than a recent diagnosis of hearing loss. This came on relatively rapidly but was diagnosed as presbyacusis by the GP. Investigations reveal a normal FBC and U&Es. Bone profile reveals an elevated alkaline phosphatase with calcium levels being within the normal range.

The consultant responsible for the patient's care is suspicious of a pathological fracture and orders a bone scintigraphy scan.

What is the most likely diagnosis in this case?

A. Multiple myeloma

B. Metastatic prostatic cancer

C. Hyperparathyroidism

D. Paget's disease of bone

E. Ewing's sarcoma

Correct Answer:Paget's disease of bone

Explanation:

Paget's disease of bone is a slowly progressive bone disease that is characterised by excessive bone turnover, resulting in the development of abnormal woven bone that is prone to fracture. The condition often remains asymptomatic for many years and is usually diagnosed incidentally when a pathological fracture occurs. Other possible symptoms include deafness (as described by this patient) due to skull bone overgrowth and vestibulocochlear nerve compression and evidence of deformities such as bowed shins or increasing head size.

A greatly elevated alkaline phosphatase is classically seen in the condition, as this can be used as a marker of osteoblast function; these cells are overly active in the disease. Bone scintigraphy will reveal areas of focal hyperactivity within the bone, and individual X-rays (often taken in the setting of fracture) may demonstrate bony expansion and cortical thickening.

Hyperparathyroidism can cause excessive bone resorption and predispose to pathological fracture. It is unlikely to be present in this scenario as a raised calcium would be expected due to the actions of PTH; the bone profile was reported as normal with the exception of the alkaline phosphatase reading.

There is no evidence in the patient's history to suggest the presence of malignancy such as multiple myeloma or Ewing's sarcoma; abnormalities in the blood results would be expected in multiple myeloma, and a single lytic lesion would be expected in the setting of Ewing's, rather than bony thickening and deformity. Whilst prostatic cancer can often be asymptomatic until late-stage disease and could therefore cause metastasis without other symptoms, this most commonly causes sclerotic lesions within the bone, rather than a lytic appearance.

Further reading:

https://patient.info/doctor/pagets-disease-of-bone-pro

Question:

A 36-year-old G2P1 woman presents to her general practitioner at 29-weeks gestation complaining of a swollen leg. She describes a 2-day history of left calf swelling and erythema. She denies trauma, fever, shortness of breath, and pain in the leg.

She suffered from significant nausea and vomiting earlier in this pregnancy and has recently been troubled with back and pelvis pain, resulting in her taking time off her work to rest. Her previous pregnancy was complicated by pregnancy-induced hypertension and gestational diabetes.

She has no past medical history of note and no known drug allergies. She currently smokes 5 cigarettes per day (reduced from 20 per day pre-pregnancy).

On examination, the left calf is swollen, with diffuse erythema extending to the knee. The calf is hot and tender to the touch. Observations are as follows:

Heart rate: 85 beats per minute

Respiratory rate: 12 breaths per minute

Blood pressure: 134/87 mmHg

Temperature 37.2°C

Oxygen saturation: 98% (room air)

What is the most likely diagnosis?

A. Cellulitis

B. Deep vein thrombosis (DVT)

C. Eclampsia

D. Normal finding in pregnancy

E. Pre-eclampsia

Correct Answer:Deep vein thrombosis (DVT)

Explanation:

This lady is presenting with features of a deep vein thrombosis, including calf swelling, tenderness and erythema. This lady also has risk factors for venous thromboembolism (VTE) in pregnancy (pregnancy itself is a significant risk factor for VTE, increasing risk by 4-5x):

Age >35

Smoking history

Reduced mobility

The Royal College of Obstetrics and Gynaecology (RCOG) recommend that a compression duplex ultrasound should be completed to diagnose deep vein thrombosis. Importantly, they state that d-dimer should not be tested to aid in the diagnosis of VTE in pregnancy.

In cellulitis, you may find that one calf is swollen, erythematous and tender. However, in cellulitis, the erythema may be better demarcated and associated with a fever. In addition, you should consider that this patient has multiple risk factors for VTE.

Pre-eclampsia can cause oedema of the arms, legs and face, but this would more likely be bilateral. In addition, her normal blood pressure excludes pre-eclampsia. Eclampsia is when a seizure occurs due to pre-eclampsia - this is clearly not the case in this patient.

Peripheral oedema can be a normal finding in pregnancy, however again this would more likely be bilateral. In this patient, the short history, unilateral swelling, erythema and tenderness suggest that this is not normal peripheral oedema of pregnancy.

Further reading:

https://cks.nice.org.uk/topics/deep-vein-thrombosis/management/management/

Question:

You are an SHO working in Paediatrics. A 14-year-old boy is reviewed in clinic accompanied by his mother with difficulties in mobilising. The mother explains that her son struggles to walk at speed as well as climb stairs. You are told that these problems have been present for the past year and have been getting progressively more noticeable. On further questioning, you discover that the boy was delayed in starting to walk as an infant, has always complained of muscle cramps on exercise and struggles with all school sports. On examination, you note that the boy is able to walk independently, has proximal muscle weakness and wasting affecting both his arms and legs, as well as mild hypertrophy of his calf muscles.

The child undergoes a range of investigations, listed below:

Raised creatinine kinase

Abnormal dystrophin staining on muscle biopsy

What is the MOST LIKELY mode of inheritance that underlies the condition described?

A. Mitochondrial inheritance

B. Autosomal dominant

C. X-linked recessive

D. X-linked dominant

E. Autosomal recessive

Correct Answer:X-linked recessive

Explanation:

The most likely diagnosis, in this case, is Becker’s muscular dystrophy. This condition is inherited in an X-linked recessive pattern. However, some cases may occur due to a new (de novo) mutation, so not all affected patients have carrier mothers. Risk factors for this condition include male gender, age (adolescence to early adulthood) and family history. Becker’s muscular dystrophy is caused by an abnormality of the dystrophin gene (as opposed to an absence of the dystrophin gene that underlies Duchenne's muscular dystrophy).

Clinical features for this condition include:

a history of delayed motor milestones

exercise-induced muscle cramps

proximal muscle weakness

hypertrophy of the calf muscles

the ability to mobilize independently until the age of ~16 years

cardiomyopathy

This clinical picture is in contrast to Duchenne's muscular dystrophy, whereby affected patients lose motor function much earlier due to complete loss of dystrophin in their skeletal muscle. Duchenne's muscular dystrophy requires supportive management, as no curative treatment exists.

Autosomal recessive inheritance underlies conditions such as cystic fibrosis, Tay-Sachs disease and sickle cell anaemia.

Autosomal dominant inheritance underlies conditions such as Huntington’s disease and Marfan’s syndrome.

Mitochondrial inheritance underpins conditions such as Leber’s hereditary optic neuropathy.

X-linked dominant inheritance underlies diseases such as vitamin D resistant rickets, fragile-X syndrome and most cases of Alport’s syndrome.

Further reading:

https://patient.info/doctor/beckers-muscular-dystrophy

Question:

A 22-year-old female presents to the A&E department with a severe headache. She reports that over the last 48 hours, she has developed worsening pain in her head, spreading down to her neck, and increased sensitivity to light.

She is normally fit and well. She takes the combined oral contraceptive pill daily and has tried paracetamol to ease the current headache, but it has not helped.

On examination, there is fever, and some neck stiffness elicited. Neurological examination is otherwise normal. At the end of the examination, the patient begins to feel nauseous and vomits once.

What is the most likely diagnosis?

A. Migraine

B. Encephalitis

C. Subarachnoid haemorrhage

D. Meningitis

E. Idiopathic intracranial hypertension

Correct Answer:Meningitis

Explanation:

The most likely diagnosis in this patient is meningitis - inflammation of the meninges. The classic triad associated with meningitis is fever, neck stiffness and altered mental state. However, this triad is not required for diagnosis and is only seen entirely in a minority of cases. Meningitis should be considered in patients, especially those at the extremes of age, with vague and non-specific systemic symptoms such as fever, headache, nausea ± vomiting and more specific features such as photophobia, neck stiffness and neurological symptoms. A non-blanching rash is commonly associated with meningitis; however, it only occurs in meningococcal disease and is therefore not seen in all cases of meningitis.

Patients with migraine may present with a moderate to severe headache, photophobia and nausea ± vomiting. However, the presence of fever and neck stiffness in this patient are indicative of meningism and an acute, infective aetiology.

Patients with encephalitis typically present with fever and variable neurological dysfunction, including altered consciousness, seizures, focal neurological deficits and personality changes. Given the patient is alert and has a normal neurological examination, this is a less likely diagnosis.

Patients with subarachnoid haemorrhage (SAH) classically present with a severe and sudden-onset headache referred to as a 'thunderclap headache'. In SAH, the neurological examination may be normal, and some neck stiffness may be present. However, as this patient has co-existing fever and photophobia, SAH is a less likely diagnosis.

Idiopathic intracranial hypertension (IIH) typically occurs in young women. It is characterised by raised intracranial pressure, leading to an alert and oriented patient without any localising neurological findings. Patients with IIH classically present with long-standing, daily headaches and visual changes. The presence of neck stiffness and fever in this patient, as well as the acute onset of symptoms, make this a less likely diagnosis.

Further reading:

https://cks.nice.org.uk/topics/meningitis-bacterial-meningitis-meningococcal-disease/

Question:

A 39-year-old woman is reviewed by her General Practitioner. She reports a 2-week history of generalised pains, low mood, fatigue, tingling of the fingers and face and muscle cramps. Her background is significant for surgery 3 weeks previously to remove a large thyroid nodule.

She has no other medical problems and takes no regular medications.

What is the most likely underlying cause of her symptoms?

A. Hyperkalaemia

B. Depression and anxiety

C. Hypokalaemia

D. Hyperparathyroidism

E. Hypoparathyroidism

Correct Answer:Hypoparathyroidism

Explanation:

This patient's symptoms are likely due to hypocalcaemia, secondary to iatrogenic hypoparathyroidism related to her recent thyroid surgery. The parathyroid glands or their blood supply can be damaged in surgeries related to the thyroid gland, oesophagus or larynx. The resultant hypocalcaemia may be asymptomatic or result in symptoms such as those described above, and clinical signs including Chvostek's sign (latent tetany of the facial muscles) and Trousseau's sign (inducible carpopedal spasm)

Hyperparathyroidism causing hypercalcaemia would result in symptoms which may be similar to this patient's but would be less likely given the history of recent thyroid surgery.

Hyper- and hypokalaemia would not cause these symptoms. They typically cause cardiac disturbances - in addition, the patient has no identifiable risk factors for developing these electrolyte disturbances and so this is less likely than calcium disturbance.

Depression and anxiety can cause low mood and potentially episodic tingling secondary to hyperventilation, but should not be the primary diagnosis here until organic causes are ruled out.

Further reading:

https://patient.info/doctor/hypoparathyroidism-pro

Question:

A 17-year-old male is brought in by ambulance with sudden onset dyspnoea following a road traffic collision. He was the driver of a motorbike that collided with a lampost.

On examination, RR 37/min, HR 132/min, BP 89/59, SpO2 87% on air. The trachea is deviated to the right. Percussion is hyper-resonant, and breath sounds are decreased over the left side of the chest. Examination of the right side of the chest is normal.

What is the most important initial management option?

A. High flow oxygen and monitor for 24 hours

B. Chest x-ray

C. Needle decompression

D. Analgesia

E. Intercostal chest drain insertion

Correct Answer:Needle decompression

Explanation:

This case demonstrates a tension pneumothorax, which commonly presents with acute shortness of breath, tachypnoea, tachycardia and hypotension. On examination, chest sounds are typically reduced over the side of the pneumothorax, and the trachea deviates away from that side. A tension pneumothorax is most commonly due to:

Trauma (e.g. an open-chest wound like a stab wound or gunshot, or a closed-chest wound like a rib fracture)

Mechanical ventilation

The immediate management requires urgent needle decompression, by inserting a large bore cannula into the pleural space through the second intercostal space in the mid-clavicular line or the fifth intercostal space in the mid-axillary line. To prevent a recurrence, an intercostal chest drain should then be inserted immediately after needle decompression.

Whilst analgesia is important in this patient, needle decompression is required immediately. Without decompression, the pneumothorax can quickly reduce venous return to the heart, reducing cardiac output and cardiac perfusion, leading to cardiac arrest.

A tension pneumothorax is a clinical diagnosis, and a chest x-ray should never be requested before initial intervention. This unnecessarily delays treatment and puts the patient at significant risk of cardiac arrest.

High-flow oxygen and ongoing monitoring will be required in this patient following the initial intervention, but it does not provide any active treatment or resolution of the tension pneumothorax alone.

Further reading:

https://geekymedics.com/pneumothorax/

Question:

A 35-year-old female presents to the emergency department with right lower quadrant pain which came on started suddenly 2 hours previously. The pain is severe, constant and radiates to the right groin region. The patient also complains of nausea. Her last menstrual period was 3 days ago. She has no past medical history or family history.

Observations show a mild tachycardia and normal temperature. Physical examination is significant for a tender, right-sided adnexal mass. Her urine pregnancy test is negative.

What is the most appropriate next step in management?

A. Chest radiograph

B. Intravenous antibiotics

C. Discharge patient

D. Pelvic ultrasound with Doppler

E. Abdominal plain films

Correct Answer:Pelvic ultrasound with Doppler

Explanation:

This female patient has presented with acute onset pelvic pain, nausea and a likely adnexal mass. This is most consistent with ovarian torsion. Ovarian torsion is a twisting of the ovary on its ligamentous supports resulting in impaired blood flow and potentially necrosis of the ovary. Risk factors for ovarian torsion include the presence of an adnexal mass and large ovaries (ovary > 5 centimetres in diameter). Patients typically present with acute onset abdominal pain, nausea, vomiting and fever. Immediate pelvic ultrasound with Doppler is recommended in these patients. Surgical intervention is required for treatment.

Discharging the patient who has presented with the above clinical presentation would not be appropriate. Complications of delayed intervention for patients with ovarian torsion include ovarian necrosis, infarction and haemorrhage.

Intravenous antibiotics would be recommended if the patient’s presentation was consistent with an infectious process such as pelvic inflammatory disease. The patient is afebrile and does not exhibit any other signs of an underlying infectious disease.

A chest radiograph would be appropriate in the setting of pneumonia or if pneumoperitoneum was being considered in the differential. The patient above is more likely to have an ovarian torsion.

Abdominal plain films would be able to demonstrate a small bowel obstruction or toxic megacolon, for example. The above patient does not have features consistent with these conditions.

Further reading:

https://patient.info/doctor/benign-ovarian-tumours

Question:

A 30-year-old man presents to the emergency department with severe pain in his right shin. The pain started 2 days ago, gradually worsening over several hours, and is now described as a "10/10" severity. He also complains of feeling sweaty, fevers, and general malaise. He has no history of trauma. He has a past medical history of type 1 diabetes mellitus.

On examination, he has tenderness over the mid-tibia and the area appears swollen and mildly erythematous.

Observations:

Respiratory rate: 18/min

O2 saturation: 96% on room air

Heart rate: 120bpm

Blood pressure: 110/65 mmHg

Temperature: 38.4° C

Based on the likely diagnosis, what is the definitive investigation?

A. MRI

B. X-ray

C. CT scan

D. Ultrasound

E. Joint aspiration

Correct Answer:MRI

Explanation:

This patient has presented with osteomyelitis, which classically presents with pain in the affected area (may be acute or chronic) and fever. It is difficult to differentiate from other differentials, such as septic arthritis, gout, and cellulitis, with septic arthritis and gout requiring joint aspirations as part of their investigations. Osteomyelitis is the most likely diagnosis because the affected area is an area overlying bone rather than a joint (seen in gout or septic arthritis), the skin does not appear extremely erythematous (as is classically seen in cellulitis), and the patient is septic and experiencing excruciating pain (seen in septic arthritis or osteomyelitis).

An MRI scan is the best imaging modality when suspecting osteomyelitis as it provides detailed imaging of any bony destruction and surrounding oedema, even within three days of infection.

A CT scan provides less detailed imaging than an MRI and has a limited role in the diagnosis of osteomyelitis. CT also carries the risk of radiation. However, it may be considered if an MRI scan is unavailable and is considered the gold-standard imaging for bone biopsies. Unfortunately, a CT cannot provide much information other than the extent of bony destruction or abscesses.

An x-ray is quick and cheap but will only provide evidence of grossly abnormal damage to the joint and bone and will often only show evidence of osteomyelitis around 7-10 days after symptoms begin.

Ultrasound is not routinely performed for osteomyelitis as it provides less detailed imaging than an MRI. However, if an MRI is unavailable or contraindicated (such as metal fragments in areas like the skull, back, or chest), an ultrasound scan may be recommended, as it can help identify changes associated with septic arthritis or aid in an ultrasound-guided biopsy.

Joint aspiration is recommended for suspected septic arthritis or gout. Furthermore, osteomyelitis affects the bone, so a joint aspiration would not typically provide useful information unless the pathogen had invaded the joint space.

Further reading:

https://patient.info/doctor/osteomyelitis-pro

Question:

A 63-year-old lady presents to A&E in excruciating pain; she reports that this started around an hour ago, and appears to come and go in waves. When asked to localise the pain, she points to her right-hand side and states that it radiates down into her groin. She has felt extremely nauseous, but has not vomited, and is desperate for some medication to relieve the pain.

The patient informs you that she is currently undergoing chemotherapy for high-grade diffuse large B-cell lymphoma; she is now on her third round of treatment. Other than this, she takes no regular medications. Observations reveal an elevated pulse rate, but no fever, with normal blood pressure.

The clerking doctor is suspicious she may have renal colic and orders several investigations. Urinalysis reveals blood (++) but no protein, leukocytes or nitrites. FBC reveals no signs of neutropenia. An abdominal X-ray is taken in A&E, as a CT scan cannot be arranged; this is reported as showing no evidence of a stone within the urinary tract.

Blood tests reveal the following:

Na+ - 137 mmol/L

K+ - 5.7 mmol/L

Ca2+ - 2.0 mmol/L

Urea - 6.8 mmol/L

Creatinine - 72 μmol/L

Given the likely diagnosis, which of the following urinary tract calculi is most likely to be responsible for the patient's symptoms?

A. Cysteine

B. Struvite

C. Calcium oxalate

D. Uric acid

E. Xanthine

Correct Answer:Uric acid

Explanation:

This patient is most likely suffering from a uric acid calculus secondary to tumour lysis syndrome. This arises most commonly due to some form of excessive cell turnover; classically in those with aggressive, high-grade malignancies, or those undergoing chemotherapy. In these scenarios, there is a high level of cell breakdown, meaning intracellular products are released in high quantities. Uric acid production will be high, explaining the stone formation, and potassium is also predominantly an intracellular ion; thus explaining the hyperkalemia on the blood results. Calcium classically falls in tumour lysis syndrome, as the phosphate released causes excessive binding with the ion, leading to reduced levels of free calcium within the blood.

Uric acid stones are also common in those who have a high purine intake, or who have renal dysfunction (less clearance of uric acid). Generic risk factors for urinary calculi such as dehydration and high salt or protein diet will also increase the risk. Uric acid stones are usually radiolucent on X-ray - this explains why no stones were visualised.

Although calcium oxalate stones are the most common subtype, given the patient's past medical history, a uric acid stone is more probable. These stones would likely be visible on an X-ray.

A struvite stone is a subtype that can most commonly form a 'staghorn calculus' - a large stone occupying the renal pelvis. These usually arise secondary to infection - Proteus mirabilis is a common causative organism. These stones are usually radiopaque and would be visible on X-ray.

Stones comprised of cysteine and xanthine are very rare; these normally only occur in the setting of an underlying hereditary syndrome (cystinuria and xanthinuria respectively).

Further reading:

https://patient.info/doctor/oncological-emergencies

Question:

A 26-year-old woman attends for her first cervical smear test. She is worried about the risk of a cancer diagnosis and wants to know what the screening process involves. She is informed that the sample cells are initially screened for a virus, and if the specific virus is not present, she will be sent a negative result.

What high-risk virus(es) is/are being tested for?

A. Human papilloma virus strains 16 and 18

B. Herpes simplex virus 1

C. Herpes simplex virus 2

D. Human papilloma virus strains 6 and 11

E. Human immunodeficiency virus

Correct Answer:Human papilloma virus strains 16 and 18

Explanation:

The correct answer is Human papilloma virus strains 16 and 18. Human papillomavirus (HPV) strains 16 and 18 are found in up to 95% of cervical cancer cases, and so the cervical screening programme has recently been changed, so the first line investigation now involves testing for these two high-risk strains of HPV. Other high-risk strains that are tested for include 31. 33, 45, 52 and 58. If positive, cell cytology will be assessed, and the patient may be referred for colposcopy if dyskaryosis is visualised. If negative, the patient will be informed of the result and returned to normal recall.

Human papilloma virus strains 6 and 11 is incorrect. HPV strains 16 and 18 are associated with cervical cancer; strains 6 and 11 are causes of genital warts. They are not screened for as part of the cervical screening programme.

Human immunodeficiency virus (HIV) is incorrect. Although HIV infection is a risk factor for cervical cancer, it is not routinely screened for as part of the cervical screening programme.

Herpes simplex virus 1 (HSV-1) is incorrect. HSV-1 is a virus known to cause cold sores around the mouth in humans. It is not known to be a risk factor for cervical cancer and is therefore not tested for as part of the cervical screening programme.

Herpes simplex virus 2 (HSV-2) is incorrect. HSV-2 is the commonest cause of genital herpes in humans. The virus is most commonly spread through close contact during sexual intercourse or through infected bodily fluids. It causes painful genital ulceration and is not known to be associated with cervical cancer.

Further reading:

https://cks.nice.org.uk/topics/cervical-screening/

Question:

A 79-year-old female patient presents to the emergency room with increasing shortness of breath over the previous 2 days. She states that she has had to use more pillows than usual in order to fall asleep and has had a dry cough for the last week. Her past medical history is significant for hypertension and she is not compliant with her medication regime. She has no surgical history or family medical history. She does not smoke or drink alcohol.

Her observations are as follows:

Temperature: 36.4 degrees Celsius

Blood pressure: 166/99 mmHg

Breathing rate: 28 breaths/minute

Pulse: 91 beats/minute

SpO2: 95% on room air

Physical examination is significant for bilateral crackles on auscultation of the lungs. No murmurs are present. An electrocardiogram (ECG) is normal. A chest radiograph shows vascular congestion and pulmonary oedema.

What is the most appropriate initial step in management?

A. Intravenous antibiotics

B. Intravenous steroids

C. Intravenous diuretics

D. Intravenous thrombolytics

E. Intravenous beta-blockers

Correct Answer:Intravenous diuretics

Explanation:

This patient’s presentation is consistent with acute, decompensated congestive heart failure (CHF). Acute CHF typically occurs secondary to either left ventricular systolic or diastolic dysfunction which may be secondary to a host of reasons such as myocardial infarction, hypertensive cardiomyopathy and valvular abnormalities. It is imperative that this patient is given treatment to reduce her cardiac preload with the prescription of intravenous diuretics such as furosemide. This is also likely to relieve pulmonary oedema.

Intravenous antibiotics would be indicated if an infectious process was being considered in the differential. The patient does not have any chest radiograph findings or clinical findings that would suggest an infectious aetiology.

Intravenous steroids are used in an exacerbation of chronic obstructive pulmonary disease, for example. This is unlikely to be beneficial in the above patient.

Intravenous thrombolytic therapy is indicated for patients who are critically ill from a pulmonary embolism (PE). PE is more likely to present with pleuritic chest pain, shortness of breath at rest and hypoxia.

Intravenous beta-blockers should be avoided in a patient suffering from decompensated heart failure as this decrease the heart rate and lead to poor cardiac output.

Further reading:

https://patient.info/doctor/heart-failure-management

Question:

A 59-year-old female presents to her general practitioner (GP) complaining of worsening hand stiffness for the last 2 weeks. Her symptoms are worst in the mornings and it takes about 1.5 hours for her hand stiffness to subside. Review of systems is normal. Past medical history and family history is insignificant.

Physical examination of the hands reveals soft, boggy swelling of the proximal interphalangeal joints and metacarpophalangeal joints bilaterally. The distal interphalangeal joints (DIPs) are normal.

What is the most likely diagnosis?

A. Osteoarthritis

B. Gout

C. Rheumatoid arthritis (RA)

D. Parvovirus B19 infection

E. Systemic lupus erythematosus (SLE)

Correct Answer:Rheumatoid arthritis (RA)

Explanation:

This patient’s presentation is consistent with rheumatoid arthritis (RA). Prolonged morning stiffness, inflammation of the metacarpophalangeal and proximal interphalangeal joints with distal interphalangeal joint preservation in a middle-aged or elderly female is suggestive of RA. Laboratory tests for rheumatoid factor, anti-CCP antibodies, inflammatory markers and a full blood count should also be completed to confirm the diagnosis. Radiographs to investigate characteristic joint erosions of affected joints are also essential to establish a baseline for monitoring disease activity.

Clinical manifestations of parvovirus B19 infection are dependent on the patient’s age and immunocompetence. In a relatively healthy, adult female, parvovirus B19 typically affects the smaller joints of the hands with prodromal symptoms like fever, nausea and malaise which this patient does not have.

Osteoarthritis (OA) is a degenerative disease that typically affects the weight-bearing joints (knees, hips and ankles) in older patients. Although the smaller joints of the hands can be affected in the form of Bouchard's (bony overgrowths at the proximal interphalangeal joints) and Heberden's nodes (bony overgrowths at the distal interphalangeal joints), the patient above has sparing of the DIPs.

Gout presents acutely with an extremely painful single joint like the large toe or knee.

Although SLE can present with arthritic findings, other clinical manifestations like a butterfly rash, oral ulcers, alopecia, haematological abnormalities, renal dysfunction and constitutional symptoms are likely to be seen. The above patient has findings that are limited only to her hands.

Further reading:

https://patient.info/doctor/rheumatoid-arthritis-pro

Question:

A 5-year-old girl presents to her general practitioner with her mother with a 2-day history of facial tics. The patient’s mother states that she has never had problems with tics in the past. She reports that the child was unwell four weeks ago with a sore throat. There is no family history of psychiatric problems. The patient has met all of her developmental milestones and is up to date with her vaccinations.

Her vital signs are normal. The examination shows a repetitive facial tic but is otherwise normal.

What is the most likely causative organism to have precipitated this condition?

A. Pseudomonas aeruginosa

B. Pasteurella multocida

C. Streptococcal infection

D. Epstein-Barr virus (EBV)

E. Parvovirus B-19

Correct Answer:Streptococcal infection

Explanation:

This child is most likely suffering from a paediatric autoimmune neuropsychiatric disorder associated with group A streptococci (PANDAS). The proposed pathogenesis suggests that group A streptococcal pharyngitis can lead to an abnormal neurological response in certain children, thus leading to the clinical manifestations of facial tics or obsessive-compulsive symptoms. The incidence of PANDAS is rare, and patients typically have on-and-off neuropsychiatric symptoms for a period of weeks to months, followed by gradual resolution. Treatment should be holistic, with the management of both the underlying infection, as well as the tics, being imperative for a positive outcome.

EBV is typically associated with infectious mononucleosis, Burkitt's lymphoma and nasopharyngeal carcinoma, but is not associated with the development of tics in a young child.

Parvovirus B-19 in the paediatric population typically leads to a ‘slapped cheek’ appearance or aplastic crisis in rare scenarios. It is not associated with the development of neuropsychiatric signs.

P. aeruginosa is associated with many complications and infections, however, the development of facial tics is unlikely to be due to P. aeruginosa.

Pasteurella multocida typically colonises the nasopharynx of animals such as cats, dogs and pigs and has the potential to cause wound infection if a patient is bitten by a colonised animal. The development of tics is not a recognised complication of P. multocida.

Further reading:

https://patient.info/doctor/pandas-paediatric-autoimmune-neuropsychiatric-disorder-associated-with-streptococcal-infection

Question:

A 19-year-old female is seen in the clinic complaining of fatigue. For the past five weeks, she has been unable to attend volleyball practices because of unshakeable tiredness and feverishness. She also complains of generalised itchiness, but there is no rash. The patient denies any other symptoms and physical examination is otherwise insignificant.

Temperature is 38°C, blood pressure is 122/82 mmHg, and pulse is 92/min. On examination, there are several enlarged, non-tender firm cervical and supraclavicular lymph nodes.

What investigation would be most useful to reach a definitive diagnosis?

A. Heterophile antibody testing

B. Tuberculin skin testing

C. Antinuclear antibody assay

D. Excisional lymph node biopsy

E. Rapid plasma reagin

Correct Answer:Excisional lymph node biopsy

Explanation:

This young patient’s ongoing fever, fatigue, pruritis and painless cervical and supraclavicular lymphadenopathy (LAD) are strongly suggestive of Hodgkin lymphoma (HL) which has a bimodal distribution with peak incidences occurring in individuals between the ages of 15-35 and >60.

HL typically begins in a single lymph node and then spreads to contiguous lymph nodes via the lymphatic and thoracic ducts, Patients most often present with painless peripheral LAD, particularly in the cervical and supraclavicular chains. Significant mediastinal LAD also occurs in approximately 50% of patient and can lead to cough dyspnoea and chest pain. The majority of patients have B-symptoms (fever, night sweats, and weight loss) as well as pruritis (a paraneoplastic process associated with HL and likely caused by interleukin and cytokine release).

Patients with unexplained LAD and findings concerning for malignancy (supraclavicular LAD) need an excisional lymph node biopsy. Malignant Reed-Sternberg cells among non-neoplastic inflammatory cells are diagnostic of HL.

Heterophile antibody testing is used to diagnose infectious mononucleosis, which frequently presented with fever, fatigue and peripheral, painful LAD (predominantly in the cervical chain). Most patients also have a sore throat and evidence of pharyngitis. This condition usually resolves within a month and splenomegaly on examination is common.

Rapid plasma reagin is often used to diagnose syphilis. Secondary syphilis can cause painless, peripheral LAD (predominantly in the epitrochlear chain) but supraclavicular LAD in uncommon and most patients also have a widespread maculopapular rash including the palms and soles.

Antinuclear antibodies are elevated in systemic lupus erythematosus (SLE) which can present with fatigue, fever and painless peripheral LAD in the cervical, axillary and inguinal chains; supraclavicular LAF is uncommon and is indicative of malignancy. This patient lacks diagnostic features of SLE such as a malar rash, arthralgias and serositis.

Tuberculin skin testing can help to identify individuals who have been exposed to tuberculosis. While tuberculosis is a common cause of painless, peripheral LAD in developing countries, it is much rarer in the UK. This patient lacks risk factors for exposure (travel to an endemic area) and pruritis is rarely seen

Further reading:

https://patient.info/doctor/hodgkins-lymphoma-pro

Question:

A 35-year-old male presents to his GP with a 3-week history of retrosternal burning, acid reflux, nausea, and increased belching. This occurs most commonly after meals and at night. He reports no weight loss, difficulty swallowing, or changes in bowel habits. His past medical history is unremarkable, and he takes no regular medications. He is a non-smoker.

The GP prescribes omeprazole 20mg for one month. One month later, the patient returns and reports no improvement in his symptoms.

What is the most appropriate action for the GP to take?

A. Trial a month of omeprazole 40mg

B. Urgent suspected cancer referral

C. Trial a further month of omeprazole 20mg

D. Test and treat for H. pylori

E. Trial a month of famotidine 20 mg

Correct Answer:Test and treat for H. pylori

Explanation:

This patient is presenting with a history of dyspepsia. He is young and does not present with any red flags, and is suitable for a trial of medication in primary care. NICE CKS recommends initial lifestyle advice and medication review, followed by either:

Full dose proton pump inhibitor (PPI) for 1 month

Test for Helicobacter pylori infection and treat if positive

If either of these fails, then the other should be tried next. As this patient has failed a trial of a PPI, then testing and treating for H. pylori should be offered.

This patient has already tried omeprazole 20mg for 1 month with no improvement, so an extended trial is not recommended. Instead, alternative treatments should be offered. Long-term PPIs increase the risk of osteoporosis, Clostridium difficile infection and hypomagnesemia.

The BNF states that uninvestigated dyspepsia should be managed with omeprazole 20mg for 4 weeks. Further increasing omeprazole to 40mg without addressing the potential other causes would not be the best course of action here.

Famotidine is an H2-receptor antagonist and reduces gastric acid production. H. pylori testing should be carried out before commencing long-term treatment as it may be the underlying cause of dyspepsia.

As this patient is 35 years old and has not presented with any red flag features, an urgent suspected cancer referral is not yet warranted. However, if symptoms are refractory to further medical treatment, then a referral for endoscopy should be considered.

Further reading:

https://cks.nice.org.uk/topics/dyspepsia-unidentified-cause/

Question:

A 42-year-old patient is rushed into hospital by paramedics after being rescued from the wreckage of a road traffic accident. He remains conscious and is able to hold a conversation with the admitting doctors, albeit he appears slightly confused. He has suffered a number of wounds to his upper chest and limbs; the paramedics estimate that he lost approximately 500mls of blood at the site. The patient is complaining of severe shortness of breath, and some dull central chest pain.

Assessment of the patient reveals significant tachycardia and tachypnoea, with a prolonged capillary refill time, and cold, clammy extremities. The patient's JVP is notably elevated at 6cm above the sternal angle. His blood pressure is noted to be 80/52; back-to-back fluid boluses help to raise this slightly. Auscultation of the lungs reveals no added sounds, but the heart sounds are unable to be commented on, as they appear to be unusually quiet.

The admitting doctor attaches ECG leads and seeks senior support; he is extremely concerned about this patient's presentation. The ECG result gives further evidence to support his suspicions.

Given the likely diagnosis, which of the following is most likely to be seen on ECG?

A. Pulseless electrical activity

B. Shortened PR interval

C. Electrical alternans

D. Epsilon wave

E. J waves

Correct Answer:Electrical alternans

Explanation:

This patient has presented with likely cardiac tamponade secondary to the sustained chest trauma. This can result in non-specific symptoms of shock, as the accumulation of fluid within the pericardial space can obstruct diastolic ventricular filling and reduce cardiac output. This patient also has a number of examination features that point towards this as the likely diagnosis - the combination of muffled heart sounds, elevated JVP and hypotension is referred to as 'Beck's triad' and is classically associated with this condition.

An ECG taken in the setting of tamponade may reveal electrical alternans; a pattern of QRS complexes that alternate in size with each beat. This arises due to fluid accumulation allowing for the heart to swing within the pericardial sac.

This patient will likely require echocardiography to confirm the diagnosis should he remain stable, with treatment being via pericardiocentesis; a needle is passed under the rib-cage into the pericardial space to allow for the drainage of the fluid and the relief of the pressure on the heart. It is essential that this occurs as swiftly as possible, as there is a significant risk of cardiac arrest (most frequently in the form of pulseless electrical activity) and subsequent morbidity and mortality.

A shortened PR interval is usually indicative of pre-excitation, and potentially the presence of an accessory pathway such as in Wolff-Parkinson-White syndrome. It is not associated with cardiac tamponade.

An epsilon wave is a rare ECG finding that is characteristically associated with arrhythmogenic right ventricular dysplasia; a form of cardiomyopathy.

Those with cardiac tamponade can often suffer a cardiac arrest, with pulseless electrical activity (PEA) being the most common ECG appearance. However, as this patient is still conscious, this is unlikely to have taken place, and therefore PEA is not the most likely ECG finding in this scenario.

J waves/Osborn waves are deflections at the J point of the QRS complex; they are usually seen in the setting of severe hypothermia.

Further reading:

https://patient.info/doctor/cardiac-tamponade

Question:

A 90-year-old woman is seen in general practice accompanied by her son. Concerns have been reported about the patient's cognition, in particular a recent decline in short-term memory and inattention. The patient states that she feels low in mood but otherwise has no issues to raise.

Past medical history is significant for hypertension, type 2 diabetes and ischaemic heart disease. She is a non-smoker and drinks minimal alcohol. She lives alone in a bungalow following the death of her husband 6-months previously. There is no family history of dementia.

On examination:

Observations normal

Oriented to time, place and person, 4AT - 0+0+0+0

MMSE - 26/30 (no cognitive impairment)

Mental state examination:

The patient is dressed appropriately and is sitting quietly. Her speech is slow and sparse. Mood is described as "low" with an objectively fixed and flattened affect. Thought processing is slow with normal flow and coherence. The patient has had no thoughts of self-harm or suicidal ideation. There are no apparent psychotic symptoms (e.g., delusions or hallucinations). Cognition is as above, with preserved insight.

What is the most likely diagnosis?

A. Delirium

B. Lewy body dementia

C. Alzheimer's disease

D. Age-related cognitive impairment

E. Pseudodementia

Correct Answer:Pseudodementia

Explanation:

Reversible causes of cognitive impairment must be excluded before diagnosing a patient with organic dementia. The diagnosis here is pseudodementia which is defined as cognitive impairment attributable to an ongoing psychiatric illness such as depression or psychosis. Slowing of thought and flattened affect are known features of depressive illness, and other evidence pointing to this in the question stem include the mental state examination, history of recent bereavement, and isolation.

The patient scores well in the Mini-Mental State Examination (MMSE) suggesting little to no cognitive impairment when focused on a task. Management of pseudodementia involves addressing the underlying psychiatric illness, which in this case could involve counselling, cognitive behavioural therapy (CBT) or the introduction of antidepressant medication such as a selective serotonin reuptake inhibitor (SSRI).

Age-related cognitive impairment is a plausible answer, rendered less likely by the patient's MMSE score and ongoing low mood.

Delirium is an acute decline in cognition that is characterised by inattention, altered consciousness level, and a fluctuating course. There is usually an identifiable precipitant (e.g., change in the environment, medication change, acute illness). This patient does not demonstrate signs of delirium and has a normal 4AT score.

Alzheimer's disease and Lewy body dementia are neurodegenerative diseases that cause progressive cognitive decline. They are made unlikely by the patient's MMSE score and clinical presentation. Lewy body dementia, in particular, is characterised by vivid visual hallucinations, and it is often associated with Parkinson's disease.

Further reading:

https://alz-journals.onlinelibrary.wiley.com/doi/full/10.1002/dad2.12027

Question:

A 19-year-old is brought to A&E by their partner after he suffered severe burns to his chest and arms whilst leaning over a hot hob during a 'Bake-Off' that they were having against one another. The patient has removed his T-shirt as it was loose and non-adherent to the site, and the burns are clearly visible in the upper chest region and over his left forearm.

The clerking doctor is concerned about the extent of the patient's injuries and estimates that he has suffered approximately 9% superficial partial-thickness burns using a Lund and Browder chart. Observations reveal tachycardia and tachypnoea, and a decision is made to start the patient on fluids. The Parkland formula is used to estimate the patient's requirements; the doctor calculates the volume of fluid that needs to be given over the first 8 hours. The patient's weight is measured to be 65kg.

Which of the following volumes would be the most appropriate to give this patient over the first 8 hours after admission?

A. 2.3 litres

B. 3 litres

C. 1.2 litres

D. 400 millilitres

E. 800 millilitres

Correct Answer:1.2 litres

Explanation:

The Parkland formula can be used to estimate an individual's fluid requirements in the setting of burns, in order to ensure haemodynamic stability. Loss of the skin barrier can result in patients losing excessive amounts of fluid and becoming dehydrated if replacement is not provided.

The formula involves calculating:

4 x patient weight (kg) x % burns (excluding first-degree burns)

The value obtained from this calculation gives the total fluid requirements of the patient; half of this should be given over the first 8 hours, with the remainder given over the subsequent 16 hours.

In this case, the calculation will be:

4 x 65 x 9 = 2340

Therefore, the patient requires a total of 2.3 litres of fluid over 24 hours; approximately half of this should be given over the first 8 hours, meaning that of the options available, 1.2 litres is the most appropriate.

Both 400 millilitres and 800 millilitres are insufficient amounts of fluid to provide in this case, while 3 litres over 8 hours would be extremely excessive, and would risk causing fluid overload.

Further reading:

https://cks.nice.org.uk/topics/burns-scalds/diagnosis/assessment/

Question:

An 82-year-old male care home resident is brought to the emergency department with reduced urine output and abdominal discomfort. His medical history includes dementia, hypertension and benign prostatic hyperplasia.

Abdominal examination reveals a palpable enlarged bladder. Urinalysis is unremarkable. Blood tests reveal an acute kidney injury.

What is the next most appropriate investigation?

A. Ultrasound renal tract

B. MRI prostate

C. Abdominal x-ray

D. Transperineal prostatic biopsy

E. CT kidneys ureter and bladder

Correct Answer:Ultrasound renal tract

Explanation:

Due to the history of benign prostatic hyperplasia and palpable bladder on abdominal examination, an obstructive cause of acute kidney injury (AKI) should be suspected. An ultrasound scan of the renal tract would be an appropriate investigation to look for hydronephrosis (upper urinary tract dilation) causing acute kidney injury. NICE guidelines would also recommend US renal tract if the cause of AKI is unknown or suspected to be pyelonephritis (infected and obstructed kidneys).

CT kidney ureters and bladder (CT KUB) and abdominal x-ray can be useful investigations when a patient presents with suspected renal stones, another possible cause of obstructive uropathy. Common symptoms of renal stones causing obstruction would be intermittent loin to groin pain. The first line of investigation in the above scenario would be an ultrasound scan of the renal tract to investigate for hydronephrosis.

MRI prostate and transperineal prostatic biopsy are both investigations for prostate cancer, these would not be suitable first-line investigations for an acute presentation.

Further reading:

https://www.nice.org.uk/guidance/ng148/chapter/Recommendations#identifying-the-causes-of-acute-kidney-injury

Question:

A 33-year-old woman presents with a 4-month history of persistent, pulsatile headaches. She states they occur mostly on waking and whilst in bed at night and are worse when lying down or coughing. The headaches are associated with repeated episodes of bilateral visual disturbance, which last for around 10 seconds.

Subsequent investigations suggest the likely diagnosis of idiopathic intracranial hypertension, with a lumbar puncture opening pressure of 260 mm H2O (normal 10-25 mm H2O).

What is the most appropriate medical therapy?

A. Naproxen

B. Prednisolone

C. Latanoprost eye drops

D. Acetazolamide

E. Spironolactone

Correct Answer:Acetazolamide

Explanation:

Idiopathic intracranial hypertension (IIH) is characterised by headaches, pulsatile tinnitus, transient visual loss, neck and back pain, and diplopia. IIH is thought to be caused by impaired cerebrospinal fluid (CSF) absorption. Acetazolamide is a carbonic anhydrase inhibitor that reduces CSF production, reducing intracranial pressure and providing symptomatic relief.

Whilst naproxen will provide some symptomatic relief, it does not address the issue of excess CSF. However, it can be used in conjunction with acetazolamide, if pain persists.

Prednisolone has no role in managing IIH.

Latanoprost is a prostaglandin analogue, commonly used in open-angle glaucoma. It has no role in IIH.

Spironolactone is a mineralocorticoid receptor antagonist and whilst it is a diuretic, it is not typically used in the management of IIH. Several cases studies have actually linked spironolactone to be a potential cause of intracranial hypertension.

Further reading:

https://patient.info/doctor/idiopathic-intracranial-hypertension-pro

Question:

An 82-year-old is found collapsed at home and was last seen 3 days ago. The patient is unable to provide any form of history; whilst she is conscious, she appears very confused and increasingly lethargic.

Observations: HR 38 bpm, BP 90/48 mmHg, temp 36.0°C. On examination, the patient has bruising on her arms, but no signs of focal tenderness or fracture. Neurological exam is unremarkable. No evidence of shivering. A 12-lead ECG shows evidence of J waves.

Given the most likely diagnosis, what is the most appropriate management option?

A. 300mg amiodarone

B. Repeated ECG's every 30 minutes

C. Immediate defibrillation

D. Gentle rewarming of the patient with a target of 3 degrees per hour

E. Gentle rewarming of the patient with a target of 0.5 degrees per hour

Correct Answer:Gentle rewarming of the patient with a target of 0.5 degrees per hour

Explanation:

This patient has presented with a history of a long lie; there is no way of determining exactly how long she was on the ground, but there is a chance that she may have been immobile for as long as 3 days. In any patient who has been immobile for such a time, it is crucial to consider the potential for severe hypothermia, especially in elderly individuals, whose ability to regulate their body temperature may be impaired. Bradycardia, hypotension, confusion and lethargy are all possible symptoms of this condition.

In this case, both the lack of shivering and low-grade temperature drop detected on the thermometer may be falsely reassuring. Regular tympanic thermometers can often fail to register extremely low temperatures; therefore, in any patient who records a temperature below 36.5 degrees, a rectal, low-reading thermometer should be used to ascertain the exact temperature. At very low temperatures, the shivering mechanism will often fail; thus, the lack of shivering in combination with a recorded temperature of 36 degrees (a temperature that would normally cause shivering) should be worrying rather than reassuring. It is essential, in this scenario, for a low-reading thermometer to be obtained.

Severe hypothermia can cause a number of abnormalities seen on further investigations; most classically, the presence of J waves on ECG. These are positive deflections at the J-point of the QRS complex; the pathophysiology behind their development is not known, but the finding is the most specific ECG change in the setting of a reduced core body temperature.

The management of hypothermia, once confirmed, involves gently rewarming the patient at a target of 0.5 degrees per hour. This should take place alongside the remainder of the classic ABCDE management; with patients often requiring fluids and oxygen. Rewarming a rate quicker than this risks causing excessive vasodilation and causing worsening shock, and therefore should be avoided (a targeted increase of 3 degrees per hour represents too rapid rewarming)

This patient has bradycardia and does not have one of the shockable rhythms (pulseless ventricular tachycardia or ventricular fibrillation). Therefore, defibrillation is not indicated, nor 300mg amiodarone, both of which form part of the resuscitation pathway.

Repeated ECG monitoring is unlikely to be of the most benefit in this scenario; the patient is likely to have hypothermia, which is a medical emergency that needs to be addressed. Whilst checking the ECG is important, as there is a risk of cardiac arrest in those with an extremely low body temperature, slow rewarming should be the priority.

Further reading:

https://patient.info/doctor/hypothermia-pro

Question:

A 6-month old baby is brought into the GP as he has developed a cough and appears to be struggling with his breathing. For the past 2 days, he has had a slight temperature and runny nose but has otherwise been well. His mother reports that he hasn’t fed this morning as he usually does.

He appears restless and clingy. He has a temperature of 37.9⁰C, respiratory rate of 60bpm, heart rate 150bpm and oxygen saturation of 94%. On examination of the chest, you can auscultate crepitations at the end of each inspiration and you detect a high-pitch wheeze in expiration. He has a sharp dry cough.

He was born at 38 weeks, has been attending routine GP check-up appointments and is up to date on all vaccinations. He has not been diagnosed with any other medical conditions and has no known allergies. Nobody else is ill at home, and there is no significant family history of respiratory diseases.

What is the most likely cause of his breathlessness?

A. Whooping cough

B. Croup

C. Bronchiolitis

D. Laryngomalacia

E. Pneumonia

Correct Answer:Bronchiolitis

Explanation:

Bronchiolitis is a common cause of respiratory tract infection in infants under 1 year, particularly in winter months. The condition involves inflammation of the bronchioles and is caused almost exclusively by respiratory syncytial virus (RSV) which initially infects the upper respiratory tract to produce coryzal symptoms, followed by the lower respiratory tract resulting in a collapse of the small distal airways that can result in breathlessness and respiratory distress. Bronchiolitis is characterised by a sharp dry cough that increases in severity over the disease course, as well as a high-pitched expiratory wheeze caused by the lower respiratory tract obstruction. Typically it presents at 1-3 days, peaks at 4-5 days and then improves within 2 weeks. In terms of investigations, basic observations are essential to assess for respiratory distress and guide admission to hospital. Nasopharyngeal aspirate with PCR can confirm RSV as the causative organism, informing isolation protocols once admitted. Treatment is supportive, focusing on maintaining oxygenation and hydration, with the condition usually resolving within 2 weeks.

RSV can also cause pneumonia which can present similarly with respiratory distress, but the clinical course of this child’s symptoms is more typical of bronchiolitis. The high pitched wheeze and sharp dry cough are key signs of bronchiolitis, and in a case of pneumonia signs of consolidation are more likely to be present on examination – for example, a dull percussion note, reduced breath sounds and bronchial breathing.

Laryngomalacia causes upper airway obstruction and is the most common cause of stridor in infants. It occurs due to supraglottic collapse during inspiration and will typically present in an infant 2-6 weeks old. Although noisy respiration is common in laryngomalacia and a cough may be present, there are not usually signs of infection as in this case.

Croup is also a cause of upper airway obstruction and classically presents in slightly older children (~2 years) with a barking ‘seal-like’ cough and harsh stridor. It involves inflammation of the sub-glottis, most commonly due to parainfluenza viruses. Although it is usually preceded by a few days following coryzal symptoms and can occur in infants, this is not a classical croup presentation.

Whooping cough involves inflammation of the bronchi caused by the highly contagious Bordetella pertussis bacteria and is now much less common due to successful vaccination (the DTaP vaccine is given at 2, 3 and 4 months). Endemics do still occur every 3-4 years despite the vaccine but the highest incidence of infection is in adolescents and adults. It classically presents with inspiratory whooping cough that is worse at night, rather than the sharp dry cough of bronchiolitis.

Further reading:

https://cks.nice.org.uk/cough-acute-with-chest-signs-in-children

Question:

A 4-year-old boy is brought to see the GP by his parents, who cite concerns about his development. They have been tracking his progress using the child health record (red book) and have noticed that he has been missing the majority of his milestones and that his development is increasingly lagging behind what is expected. The parents report that he was slightly late in starting walking, with this not happening until 2 years, but it is their child's speech that is most worrying to them. He still cannot construct a sentence consisting of more than 2 words and has an extremely limited vocabulary. He seems relatively uninterested in social interaction, which is a major worry, as the boy is due to start school soon.

On examination, the boy seems unwilling to interact with the doctor and avoids eye contact. He avoids speaking to either his parents or the doctor, instead, making incomprehensible noises that do not resemble words. The patient has a long, thin face, with extremely large ears, and when observed playing with some trains in the corner of the room demonstrates that he has hyper-flexibility of his finger joints.

The GP makes a hospital referral for global developmental delay, where further investigations are carried out, including a full range of blood tests and a microarray. Given the patient's dysmorphic features, the paediatric consultant also sends a specific genetic test; this reveals the presence of an abnormal number of trinucleotide repeats.

Given the likely diagnosis, which of the following trinucleotides is likely to be repeated in this patient?

A. GAA

B. CTG

C. GCC

D. CAG

E. CGG

Correct Answer:CGG

Explanation:

The most likely diagnosis, in this case, is Fragile X syndrome; a common inherited cause of intellectual disability in children thought to affect approximately 1 in 10,000 patients. It arises due to a trinucleotide repeat expansion; mutations result in overexpression of CGG repeats - these can be detected using specific genetic screens; Fragile X syndrome cannot be diagnosed on a standard microarray.

The usual presenting features are of delayed social and speech and language milestones; with children often presenting with similar features to those with an autistic spectrum disorder. Learning disabilities are common, particularly in boys, and those with the condition often have characteristic physical features, which can include:

Large ears

Long, thin face

Large testicles

Flat feet

Hypermobility of the digits

Fragile X syndrome cannot be cured; rather management focuses on therapy to help with the intellectual disabilities that are usually present. Patients may benefit from targeted educational plans, as well as speech and behavioural therapy.

CTG repeats are present in those with myotonic muscular dystrophy, an autosomal recessive condition that can cause issues with voluntary muscle relaxation, as well as arrhythmias.

CAG is the trinucleotide repeated in those with Huntington's disease; a neurodegenerative disease characterised by chorea and cognitive decline.

GAA trinucleotide repeats are present in Freidrich's ataxia; a condition that can affect young children and present with features of cerebellar disease.

Repeats of the GCC trinucleotide have not been identified in any known medical condition.

Further reading:

https://patient.info/doctor/fragile-x-syndrome

Question:

A 71-year-old man is brought to the emergency department by his daughter due to concerns about his behaviour. She explains that her father has become increasingly confused over the past 2 weeks. His daughter also comments that the patient has complained of a persistent, worsening headache and has vomited 4 times since his symptoms began.

On further questioning, she mentions that the patient suffered a fall 2 weeks ago, although she didn’t seek any medical attention at the time because he appeared well and did not lose consciousness. His past medical history is significant for atrial fibrillation, for which he takes apixaban. He also consumes approximately 35 units of alcohol a week.

On examination, his Glasgow Coma Scale (GCS) score is 14/15. Left-sided muscle power is recorded at 3/5 and right-sided power is normal. There is no tenderness on palpation of the cranium.

Which of the following is the most likely diagnosis?

A. Extradural haematoma

B. Subarachnoid haemorrhage

C. Subdural haematoma

D. Transient ischaemic attack (TIA)

E. Parkinson’s disease

Correct Answer:Subdural haematoma

Explanation:

This patient is presenting with a subdural haematoma, which describes the collection of blood between the dura mater and arachnoid mater meningeal layers. It typically follows trauma, and symptoms may present acutely or may develop over the course of weeks. Clinical features of a chronic subdural haematoma include confusion, a persistent headache, vomiting and hemiparesis which is contralateral to the site of bleeding. Anticoagulant use and alcohol consumption are strong risk factors for developing a subdural haematoma.

A transient ischaemic attack (TIA) may be diagnosed in patients who develop a sudden-onset, focal neurological deficit that resolves within 24 hours. Symptoms such as vomiting, confusion and headache are not associated with TIAs, and the duration of this patient’s symptoms rules this out as a diagnosis.

Parkinson’s disease is a progressive neurological disorder characterised by bradykinesia, postural instability, rigidity and a resting tremor. It is not associated with confusion, headaches or vomiting and its symptoms usually develop slowly over years.

An extradural haematoma refers to bleeding between the dura mater and the inner surface of the skull. Its presentation can be very similar to a subdural haematoma, however, patients with an extradural haematoma often experience a brief loss of consciousness following their injury. If a lucid period follows, this is unlikely to last more than a few hours. Also, extradural haematomas are usually secondary to injury at the pterion, and so patients may have tenderness at this site.

A subarachnoid haemorrhage characteristically presents as a sudden-onset, severe headache that reaches its peak intensity within a few minutes. This may then be followed by a loss of consciousness and a rapid decline in GCS score.

Further reading:

https://geekymedics.com/subdural-haemorrhage-an-overview/

Question:

A 4-month-old girl is brought to the Paediatric Assessment Unit attached to A&E with a fever of 38.8°C for the past 24 hours. Around one week ago, the child had a runny nose and a cough, which improved by itself. Yesterday, she became increasingly unsettled and was refusing feeds.

On physical examination, her temperature is 38.5°C, blood pressure is 81/54 mm Hg, pulse is 103/min, and respiratory rate is 30/min. Her conjunctiva appear normal. Her mucous membranes are dry, and her nasal mucosa appears slightly inflamed. On examination of her ears, you see a left tympanic membrane that is erythematous and bulging.

Given that she has no known allergies to medications, what is the most appropriate management choice?

A. Prescribe cefuroxime (oral)

B. Prescribe azithromycin (oral)

C. Prescribe ampicillin (intravenous)

D. Prescribe amoxicillin (oral)

E. Observe for 48 to 72 hours without antibiotic therapy

Correct Answer:Prescribe amoxicillin (oral)

Explanation:

Acute otitis media (AOM) occurs in the highest frequency in children between 2 and 18 months of age. The most common presentation describes a preceding viral respiratory tract infection. The inflammatory oedema of the respiratory tract causes obstruction of the Eustachian tube, which inhibits drainage of the middle ear and acts as a nidus for infection.

Pain is the most common symptom of AOM. In very young infants (and children who cannot articulate pain) symptoms are often nonspecific (e.g. fever, unsettled, disturbed sleep, decreased feeding, vomiting, diarrhoea). Diagnosis of AOM is confirmed clinically by the presence of a bulging tympanic membrane or other signs of acute inflammation and a middle ear effusion.

Antibiotics are generally recommended in patients with AOM If they are:

<6 months of age

6 months to 2 years with bilateral AOM

>2 years or older who

appear toxic

have persistent otalgia for > 48 hours

have temperature > 39 C in the past 48 hours

have bilateral AOM

Initial observation may be a good initial treatment option for children > 6 months with unilateral AOM, mild symptoms and parents/carers who are comfortable with this management plan. Antibiotics can then be given if symptoms worsen or fail to improve after 48 to 72 hours. As this patient is 4 months old with signs of an ear infection, she should be given antibiotics as a first-line treatment. For patients with no signs of purulent conjunctivitis, no history of recurrent AOM, and no penicillin allergy, amoxicillin is the first-line of therapy.

Further reading:

https://patient.info/doctor/acute-otitis-media-in-children

Question:

A 30-year-old woman is seen in the endocrinology clinic following a diagnosis of Graves disease made in general practice. She is experiencing visual symptoms of diplopia and grittiness and is informed she is likely experiencing the active stage of thyroid eye disease.

Which of the following extraocular muscles is most frequently affected in thyroid eye disease?

A. Medial rectus

B. Inferior rectus

C. Lateral rectus

D. Superior rectus

E. Levator palpebrae superioris

Correct Answer:Levator palpebrae superioris

Explanation:

The most common extra-ocular muscle affected by thyroid eye disease is the levator palpebrae superioris (LPS). This produces the characteristic lid lag sign seen in thyroid eye disease, where the upper eyelid is slow to follow in rapid downward gaze.

A cruel question to ask, but a useful fact to remember just in case, is the order of frequency (highest to lowest) in which the extra-ocular muscles are affected in thyroid eye disease (IMSLOw):

Levator palpebrae superioris

Inferior rectus

Medial rectus

Superior rectus

Lateral rectus

Oblique muscles

Further reading:

https://radiopaedia.org/articles/thyroid-associated-orbitopathy-1?lang=gb

Question:

A 74-year-old man presents to the emergency department with wrist pain following a fall, earlier today. A plain radiograph series of the wrist is requested and is seen below.

Case courtesy of Assoc Prof Frank Gaillard, Radiopaedia.org, rID: 12382

Which is the most significant risk factor for this injury?

A. Prolonged steroid use

B. Lack of exercise

C. Late menopause

D. Male gender

E. Younger age

Correct Answer:Prolonged steroid use

Explanation:

This case demonstrates a transverse extra-articular distal radius fracture with dorsal angulation, otherwise known as a Colles' fracture. It most commonly occurs from a fall onto an outstretched hand (FOOSH). These fractures are typically seen in older women with osteoporotic bones. The angulation of the fracture is described by the position of the distal bone in relation to the proximal bone.

The main risk factors for distal radius fractures are those which also increase the risk of osteoporosis. In this case, the most significant risk factor is prolonged steroid use. Other risk factors are:

Older age

Female

Early menopause

Smoking or alcohol excess

Further reading:

https://geekymedics.com/fractures-of-the-distal-radius-wrist-fractures/

Question:

Mrs Jones is a 52-year-old lady who was recently diagnosed with hypertension after 24hr ambulatory blood pressure monitoring showed an average blood pressure of 152/98 mmHg. Her GP commenced her on Ramipril 5mg OD. At a follow-up appointment, her blood pressure is now 146/92 mmHg.

What would be the most appropriate next step in treatment?

A. Switch to losartan

B. Add in amlodipine

C. Add in indapamide

D. Increase ramipril to 10mg OD

E. Do nothing; this is adequate BP control

Correct Answer:Increase ramipril to 10mg OD

Explanation:

Given that this lady is under 80 with no other past medical history mentioned, the aim would be to keep her blood pressure under 140/90mmHg. When treating hypertension it is important to first titrate up the dose of medication before adding in another one. This lady's blood pressure may be controlled with a higher dose of ramipril, and adding another medication could cause confusion and decreased compliance. If her BP were not to be controlled with a maximum dose of ramipril, then a calcium channel blocker (amlodipine) would be the most appropriate next step.

An angiotensin receptor blocker (losartan) would typically only be used if the patient could not tolerate ramipril due to side effects.

Thiazide-type diuretics (indapamide) are typically indicated once ACE inhibitors and calcium channel blockers have been trialled.

Further reading:

https://cks.nice.org.uk/hypertension-not-diabetic

Question:

A new blood test is developed for detecting dermatomyositis. 200 individuals are recruited to evaluate the test and the results are shown below.

Dermatomyositis No dermatomyositis

Test positive 90 60

Test negative 10 40

What is the negative likelihood ratio for this new test?

A. 0.9

B. 0.6

C. 0.4

D. 0.25

E. 0.1

Correct Answer:0.25

Explanation:

The negative likelihood ratio (LR-) is the probability that a negative result is a false negative versus a true negative, in other words, it is the probability of a patient who has tested negative having the disease versus not having the disease. For example, a negative likelihood ratio of 0.25 means that a patient with a negative result has 4-fold lower odds of having a condition than not.

The negative likelihood ratio can be calculated by dividing the proportion of patients with the disease who test negative (10/(90+10) = 0.1) by the proportion of patients without the disease who test negative (40/(60+40) = 0.4), which gives a negative likelihood ratio of 0.25. Note that the negative likelihood ratio can also be calculated from the sensitivity and specificity using the formula below:

Further reading:

https://geekymedics.com/statistics-for-medical-students/

Question:

A mother brings in her 10-day old baby for its newborn baby check. On examination, you note a pan-systolic murmur at the lower left parasternal edge. The child is referred for an echocardiogram which reveals a tricuspid valve which is downwardly displaced in the right ventricle, with associated tricuspid incompetence. The right ventricle is also noted to be small. You note the child's mother has a diagnosis of bipolar disorder and was receiving treatment throughout the pregnancy.

Which of the following is the most likely diagnosis?

A. Ebstein’s anomaly

B. Fallot’s tetralogy

C. Innocent murmur

D. Transposition of the great arteries

E. Patent ductus arteriosus

Correct Answer:Ebstein’s anomaly

Explanation:

Ebstein’s anomaly may be caused by exposure to lithium in utero. It is a congenital heart defect characterised by the low insertion of the tricuspid valve resulting in a large right atrium and small right ventricle. It is associated with tricuspid incompetence which clinically presents as a pan-systolic murmur, heard best at the lower left parasternal edge.

Patent ductus arteriosus typically presents with a loud continuous murmur with bounding pulses and a wide pulse pressure.

Fallot’s tetralogy is a combination of four congenital cardiac anomalies, including a ventricular septal defect, overriding aorta, pulmonary stenosis and right ventricular hypertrophy. The condition typically presents with cyanosis when children are around 1-2 months old. Clinical findings include an ejection systolic murmur and low SpO2.

An innocent murmur is highly unlikely given the history and the findings on echocardiography.

Transposition of the great arteries presents soon after birth with cyanosis.

Further reading:

https://patient.info/doctor/ebsteins-anomaly-pro

Question:

A 54-year-old man presents to the emergency department following an episode of right-sided weakness and slurred speech earlier today. This lasted for around 60 minutes and has since resolved. On further questioning, he describes palpitations and a 'funny heartbeat' for the last week. He smokes 20 cigarettes a day and has done so for the past 30 years. He drinks 17 units of alcohol a week.

On examination, his pulse is irregularly irregular. His blood pressure is 147/91. There are no neurological features present. He weighs 120kg.

Which feature is the strongest risk factor for the likely diagnosis?

A. Irregularly irregular pulse

B. Blood pressure

C. Age

D. Weight

E. Cigarette smoking

Correct Answer:Irregularly irregular pulse

Explanation:

This patient has likely experienced a transient ischaemic attack (TIA). This is an episode of temporary neurological dysfunction caused by reversible cerebral ischaemia. There are several risk factors for cerebrovascular disease, with atrial fibrillation being one of the strongest. Atrial fibrillation (AF) leads to stasis in the left atrium, which increases the risk of thrombus formation in the left atrial appendage. The one-week history of palpitations and an irregularly irregular pulse suggests new AF. All the other options are also risk factors for cerebrovascular disease but are not as strong as hypertension.

Hypertension increases the relative risk of a TIA by approximately 2 to 5 times, however, with this patient having only stage 1 hypertension, atrial fibrillation is a greater risk factor.

Smoking is also a modifiable risk factor for cerebrovascular disease. Therefore, this patient should be encouraged to stop smoking to reduce the risk of a further cerebrovascular event.

Cerebrovascular disease increases with age, with the risk rapidly rising in the elderly. However, this patient is 54-years-old, and so his age is not the most significant risk factor here.

Obesity is a risk factor for many diseases, including cerebrovascular disease. This patient is overweight at 120kg and should be encouraged to lose weight.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK459143/

Question:

A 66-year-old woman presents to A&E with acute shortness of breath. She describes a 2-day history of worsening productive cough. Her past medical history includes chronic obstructive pulmonary disease (COPD), type 2 diabetes mellitus and hypertension. On examination, there is reduced air entry bilaterally and scattered coarse crackles.

Vital signs are as follows:

RR 20

HR 70

SPO2 84% on air

Temperature 38 oC

A CXR shows hyperinflated lung fields, but no evidence of focal consolidation or pneumothorax. The patient is started on high flow oxygen aiming for a SpO2 of 88-92%.

What is the most appropriate next step in the management of this patient?

A. Prednisolone

B. IV Piperacillin/Tazobactam

C. Nebulised salbutamol

D. Non-invasive ventilation (NIV)

E. Ipratropium bromide

Correct Answer:Nebulised salbutamol

Explanation:

Salbutamol is a beta-2 agonist that should help reduce symptoms of dyspnoea. As per NICE guidelines, nebulised salbutamol the first-line treatment option for an acute exacerbation of COPD.

Nebulised ipratropium bromide may be given in combination with nebulised salbutamol, however, salbutamol is still the first-line treatment. Ipratropium may be used instead of salbutamol, in cases where patients are intolerant to salbutamol however, in this scenario, there is in no indication that the patient can’t tolerate salbutamol.

NIV could be considered if the patient was felt to be developing type 2 respiratory failure, with rising levels of PaCO2 and worsening acidaemia. There is no evidence of this mentioned in the scenario, making nebulised salbutamol the most appropriate next treatment choice.

The use of systemic corticosteroids for the treatment of an acute exacerbation of COPD can help improve oxygenation, speed up recovery time and reduce the length of hospital stay. Systemic corticosteroids would be initiated after short-acting inhaled bronchodilators have been administered.

Antibiotics are warranted if there are signs of infection, such as crackles, purulent cough or focal consolidation on CXR. In this case, it is likely the patient will be started on antibiotics but this should be initiated after the short-acting inhaled bronchodilators.

Further reading:

https://www.nice.org.uk/guidance/ng114

Question:

A 60-year-old male patient presents with a lump on his upper back. He reports that it has been present over the last two years and that it is growing in size slowly. His wife had encouraged him to seek review and he isn't particularly bothered by the lump. He does not find it painful and he has no other lumps that he is aware of. He is otherwise well with no systemic symptoms. He has no significant past medical history.

On examination, a 3 x 3cm superficial lesion is noted in the upper back region. The lesion is firm and fluctuant. It appears to be tethered to the skin and there is a small dimple over the centre of the lesion. There is no associated erythema or pulsatility and the mass does not transilluminate. Clinical examination is otherwise unremarkable, with no evidence of lymphadenopathy.

Which of the following is the most appropriate management option?

A. Urgent referral to dermatology

B. Ultrasound scan

C. Oral flucloxacillin (500mg QDS for 7 days)

D. "Watch and wait" approach, with reassurance

E. Biopsy of the lesion

Correct Answer:"Watch and wait" approach, with reassurance

Explanation:

The most likely diagnosis in this scenario is a sebaceous cyst, given the lesions location, slow growth, findings on examination (a well defined fluctuant lesion with an overlying punctum) and the absence of any other concerning symptoms. Sebaceous cysts can also sometimes discharge their contents periodically, which is typically described as "cottage cheese" like, with an unpleasant odour. Occasionally sebaceous cysts become infected, which causes pain, erythema and a sudden increase in size.

Given the patient is not bothered by the lesion, the most appropriate management option would be to reassure the patient and adopt a "watch and wait" approach.

If the patient was bothered by the lesion, they could have it excised, aiming to remove the entire cyst capsule to prevent a recurrence.

A prescription of flucloxacillin would be appropriate for an infected sebaceous cyst, but there is nothing in the clinical vignette to suggest the lesion is infected.

An ultrasound of the lesion is not required, given the typical appearances of the lesion and no suggestion of a sinister cause. A biopsy of the lesion is also not required for the same reasons.

A referral to dermatology is not appropriate in this scenario as the GP would be capable of making the diagnosis. If surgical excision was required, this is often performed by plastic surgeons.

Further reading:

https://cks.nice.org.uk/neck-lump#!scenario

Question:

A 30-year old man with a past medical history of ulcerative colitis presents to A&E with abdominal pain and a distended abdomen. He has had multiple flare-ups of his ulcerative colitis recently, despite regular clinic assessment by the general surgery and gastroenterology teams. During flare-ups, he tends to experience faecal urgency and bloody diarrhoea.

His colitis is currently managed with oral mesalazine, and his last two flare-ups have resulted in hospital admission for IV corticosteroids. At his last clinic attendance, he was offered the option of colectomy to manage his symptoms.

On examination, his abdomen is distended and he is generally tender on abdominal palpation. He has a heart rate of 90bpm and his temperature is 37.8⁰C.

An abdominal X-ray is ordered and is shown below.

What is the most likely diagnosis given the clinical and abdominal X-ray findings?

Hellerhoff. Licence: CC BY-SA 3.0.

A. Small bowel obstruction

B. Volvulus

C. Toxic megacolon

D. Colonic perforation

E. Colonic stricture

Correct Answer:Toxic megacolon

Explanation:

The most likely diagnosis in this scenario is toxic megacolon. Toxic megacolon occurs when a section of the colon becomes inflamed and damaged, resulting in a breakdown of the mucosa and exposure of the muscular component of the bowel wall. As a result, there is a loss of tone and motility in the affected section that can result in a build-up of faecal matter and consequently complications such as infection and perforation. This patient has a past medical history of ulcerative colitis in which there is chronic inflammation of the bowel, and patients with inflammatory bowel disease are at a higher risk of developing toxic megacolon as a result. On abdominal X-ray, the large bowel appears dilated, often with a loss of haustral markings.

Small bowel obstruction is incorrect. It is the large bowel that is affected in toxic megacolon, rather than the small bowel. A key point to make is that toxic megacolon is dilatation of the large bowel without obstruction, which is associated with colitis. In this abdominal X-ray, the dilated section of bowel lies peripherally, and there are no valvulae conniventes visible, indicating that it is large rather than small bowel.

Colonic stricture is incorrect. There is clear bowel dilatation in this abdominal X-ray. Although chronic inflammation in inflammatory bowel disease can result in stricture formation, strictures would not result in dilatation of the large bowel.

Although toxic megacolon can result in colonic perforation, the abdominal X-ray in this clinical scenario only demonstrates large bowel dilatation, and there are no signs of colonic perforation such as Rigler’s sign (in which both the inner and outer wall are visible due to abdominal air providing additional contrast) and pneumoperitoneum (in which air can be visualised under the diaphragm).

Volvulus is also an incorrect diagnosis. Volvulus can result in large bowel obstruction, as the bowel twists on its mesentery and prevents the passage of bowel contents. Large bowel obstruction will cause colonic dilatation proximal to the obstruction, but on abdominal X-ray, the presence of volvulus will produce typical signs in addition such as the ‘coffee bean’ appearance in sigmoid volvulus and the ‘fetal’ appearance in caecal volvulus.

Further reading:

https://geekymedics.com/abdominal-x-ray-interpretation/

Question:

An 18-year-old college student presents to his GP with a history of difficulty breathing during rugby practice, a dry cough and wheezing with chest tightness. Outside of exercise, he does not have any symptoms. His family history includes a sister who has eczema and asthma. His parents are concerned that he could also have asthma.

What is most likely to confirm the diagnosis?

A. Bronchodilator reversibility

B. Fractional exhaled nitric oxide (FeNO)

C. Peak expiratory flow variability

D. Direct bronchial challenge test with histamine/methacholine

E. Spirometry with exercise challenge

Correct Answer:Spirometry with exercise challenge

Explanation:

This patient has exercise-induced bronchoconstriction (EIB) given that his symptoms come on during exercise only. Formal testing may support a diagnosis of asthma and should lead to a specific treatment, for example, the use of short-acting b2-agonists before exercise, A diagnostic test for this would be to conduct pre-exercise spirometry, then challenge with exercise (treadmill) and then measure spirometry again - which would show bronchoconstriction.

When the patient is asymptomatic, spirometry alone (without exercise challenge) or bronchodilator reversibility testing would not be able to detect exercise-induced bronchoconstriction.

The NICE 2017 guideline recommends a FeNO test for all adults presenting with acute respiratory symptoms suggestive of asthma if the equipment is

available and if testing will not compromise treatment of the acute episode. However, FeNO has been associated with EIB in the general population, but not in adult athletes. This means that EIB would not be picked up with a FeNO test alone. Unlike general asthma, where FENO can be used in patients aged 17 and over.

Peak flow variability can be checked if diagnostic uncertainty remains after spirometry and BDR in both groups (and not first line). A value of more than 20% variability after monitoring at least twice daily for 2-4 weeks is regarded as a positive result.

Further down the line, direct bronchial challenge test can be performed but this is not always available and not usually performed in children and young adults under 17. If this test is unavailable, then the guideline is to suspect asthma and review the diagnosis after treatment or refer to a centre with access to the test.

Further reading:

https://cks.nice.org.uk/topics/asthma/diagnosis/diagnosis/

Question:

A 38-year-old woman, with no previous medical history, presents to her GP with severe onset back pain, which came on in the absence of any trauma. She also describes thirst and a degree of fatigue.

A plain film X-ray is arranged, which demonstrates 2 fractures of her lumbar vertebrae.

In addition, a series of blood tests are arranged. Selected results, confirmed on repeat testing, are shown below:

Test Result Reference range

Ca2+(adjusted) 2.95 mmol/L (2.2-2.6 )

Phosphate 0.6mmol/L (0.80 - 1.50)

Parathyroid hormone 120 ng/L (10 - 65)

Vitamin D 600 nmol/L (> 500)

What is the most appropriate definitive management step for this patient?

A. Monitor and repeat bloods in 3 months

B. Refer for consideration of surgery

C. Commence oral alendronic acid

D. Commence IV zoledronic acid

E. Commence oral colecalciferol

Correct Answer:Refer for consideration of surgery

Explanation:

This patient is suffering from primary hyperparathyroidism, as evidenced by her markedly raised calcium and (inappropriately) elevated PTH in the context of a normal vitamin D level (making secondary hyperparathyroidism unlikely). Her fragility fractures are likely a result of ensuing osteoporosis, and symptoms are a result of markedly raised calcium. NICE guidelines are clear that people with a confirmed diagnosis of primary hyperparathyroidism should be referred to a surgeon with expertise in parathyroid surgery if they have:

symptoms of hypercalcaemia such as thirst, frequent or excessive urination, or constipation or

end-organ disease (renal stones, fragility fractures or osteoporosis) or

an albumin-adjusted serum calcium level of 2.85 mmol/litre or above (as in this case)

While this patient’s vertebral fractures are likely secondary to osteoporosis, it would be appropriate to consider DEXA scanning prior to commencement of treatment such as alendronic acid, in order to provide a baseline bone density measurement. NICE state “Measure [Bone Mineral Density] to assess fracture risk in people aged under 40 years who have a major risk factor, such as a history of multiple fragility fractures, major osteoporotic fracture, or current or recent use of high-dose oral or high-dose systemic glucocorticoids.” It may be appropriate to commence anti-resorptive therapy for this patient but, in any case, osteoporosis treatment should not take precedence over referral for surgery, which would be definitive management of this patient’s primary hyperparathyroidism.

Zoledronic acid is a bisphosphonate that can be given IV, for patients who have a significant risk of osteoporotic fracture as calculated by a risk tool such as FRAX or QFracture, or who have contraindications or difficulty taking oral bisphosphonates. NICE state “Measure [Bone Mineral Density] to assess fracture risk in people aged under 40 years who have a major risk factor, such as a history of multiple fragility fractures, major osteoporotic fracture, or current or recent use of high-dose oral or high-dose systemic glucocorticoids.” It may be appropriate to commence anti-resorptive therapy for this patient but, in any case, osteoporosis treatment should not take precedence over referral for surgery, which would be definitive management of this patient’s primary hyperparathyroidism. Zoledronic acid can also be used to lower calcium in cases of hypercalcemia secondary to malignancy (under specialist advice only).

NICE recommend measuring vitamin D in those with primary hyperparathyroidism, and providing supplementation, such as colecalciferol if required. However, this would not provide definitive management for this patient, who is symptomatic and demonstrating end-organ complications (this patient's vitamin D level is also normal).

In cases of mild primary hyperparathyroidism, with no end-organ complications, it may be appropriate to adopt a ‘watch and wait' approach, advocating increased fluid intake and cessation of exacerbating medications such as thiazides. However, this patient is symptomatic, has a markedly raised calcium, and has evidence of complications in the form of fragility fractures. Therefore, monitoring is not the most appropriate management option for this patient.

Further reading:

https://www.nice.org.uk/guidance/ng132/

Question:

A 39-year-old female attends her GP after not experiencing any menstrual bleeding for the past 12 months. She also explains that she has experienced hot flushes, night sweats and reduced libido since her menses stopped.

The patient began having periods at age 11 and previously had a regular 28-day menstrual cycle until her symptoms started. Her past medical history is unremarkable and she has no history of gynaecological surgery.

Her vital signs are within normal range. A pregnancy test is negative, and thyroid function tests are normal.

What is the most appropriate investigation to confirm the likely diagnosis?

A. Serum luteinisng hormone (LH) level

B. Transvaginal ultrasound scan

C. Serum testosterone level

D. Serum anti-Müllerian hormone (AMH) level

E. Serum follicle-stimulating hormone (FSH) level

Correct Answer:Serum follicle-stimulating hormone (FSH) level

Explanation:

This patient is presenting with premature ovarian insufficiency, which refers to the permanent cessation of menses before 40 years of age. Patients may present with the vasomotor symptoms of menopause alongside the absence of menstrual periods. While menopause is normally a clinical diagnosis, women under 40 should receive further investigations to confirm the presence of premature ovarian insufficiency. NICE guidelines recommend two serum follicle-stimulating hormone (FSH) level measurements taken 4-6 weeks apart, where a persistently raised value confirms the diagnosis.

Serum anti-Müllerian hormone (AMH) levels are a marker of ovarian reserve, and therefore decrease to undetectable levels after menopause. Assessing serum AMH levels may be useful if the initial investigations prove inconclusive.

Serum luteinising hormone (LH) levels usually increase as a result of premature ovarian insufficiency. However, guidelines prefer FSH levels for diagnosing this condition.

Serum testosterone levels are not significantly impacted by the menopause, but rather decrease gradually over the lifetime of a woman. They are therefore not useful in assessing a patient’s menopausal status.

The presence of smaller ovaries on a transvaginal ultrasound scan may be noted in post-menopausal patients however this investigation is not reliable enough to be used to confirm such a diagnosis.

Further reading:

https://patient.info/doctor/premature-ovarian-insufficiency-pro#nav-3

Question:

Lucy McArthur, a 28-year-old woman, presents to the GP with a breast lump. She reports that she first noticed the lump in her left breast 2 weeks ago and believes that it has been slowly growing in size since.

She states that she has not had any trouble with her breasts before and does not notice they or the lump change with her menstrual cycle. She has noticed no other symptoms and is otherwise fit and well. She has no family history of breast disease.

She has used the copper coil since the birth of her second son 2 years ago. She is not on any other regular medications and is a non-smoker.

On examination, you notice a small dimple on the lower left quadrant of the left breast, superficial to the lump. The lump is approximately 1cm in size and feels hard. The lump is tender to palpate. There are no other skin changes and there is no nipple inversion or discharge. Examination of axillary lymph nodes and the right breast is unremarkable.

What is the most likely diagnosis?

A. Duct papilloma

B. Fat necrosis

C. Breast cyst

D. Breast cancer

E. Fibroadenoma

Correct Answer:Fat necrosis

Explanation:

Fat necrosis is caused by trauma to breast tissue (sometimes seen in mothers with toddlers). They present as hard tender lumps and can cause changes to the skin and nipple. Whilst they may initially increase in size, they will resolve themselves. They are benign and do not increase a woman’s risk of breast cancer.

Breast cancer is uncommon in this age group and Lucy does not report any systemic signs of cancer (weight loss, night sweats, malaise etc.).

Fibroadenomas are common in women under the age of 30 but are non-tender and highly mobile.

Breast cysts are most common in women aged 35-50. They present as smooth, fluctuant lumps.

Duct papillomas are benign growths within a single duct that usually present with nipple discharge.

Further reading:

https://patient.info/doctor/benign-breast-disease

Question:

A 36-year-old pregnant lady at 30 weeks gestation presents to the Maternal Assessment Unit with some vaginal bleeding. It started an hour ago during sexual intercourse with her partner and she has continued to have light bleeding. She has experienced no abdominal or pelvic pain. The patient describes the vaginal blood loss as approximately 100mls of bright red blood with no clots.

The patient has had one previous pregnancy which went as planned with a caesarean section at 39 weeks due to maternal choice.

On examination, the patient appears well and haemodynamically stable. There is no abdominal or pelvic tenderness on palpation and fundal height is appropriate for the current gestation. Fetal heart sounds are normal and a CTG is reassuring. A speculum examination reveals a closed cervical os and no other abnormalities.

What is the most likely diagnosis?

A. Placental abruption

B. Loss of the cervical mucous plug

C. Cervical ectropion

D. Inevitable miscarriage

E. Placenta praevia

Correct Answer:Placenta praevia

Explanation:

The most likely diagnosis is placenta praevia.

Placenta praevia involves the abnormal insertion of the placenta into the lower segment of the uterus. Placenta praevia is graded as major if the placenta covers the internal os of the cervix and minor if the placenta is in the lower segment of the uterus but doesn't cover the os.

Risk factors for placenta praevia include a previous history of the condition, previous caesarian section (which is the case in this scenario), advancing maternal age, smoking and increasing parity.

Typical presenting symptoms of placenta praevia include painless vaginal bleeding after the 28th week of pregnancy. The blood loss is usually sudden and significant in volume, however the duration is typically short. There is a high risk of preterm delivery in the days following a bleed (25% of cases). An ultrasound scan can confirm the diagnosis and many cases of placenta praevia are picked up prior to the development of any symptoms due to routine scanning. A patient with a minor placenta praevia may still be able to deliver vaginally, however, in the case of major placenta praevia, the delivery has to be via caesarian section.

Placental abruption should always be considered, however, the absence of abdominal pain, haemodynamic instability and adverse CTG features make this diagnosis less likely.

A cervical ectropium can present with post-coital bleeding, however not at the volume described here. In addition, a cervical ectropium would have been visible on the speculum examination.

Loss of the cervical mucous plug (sometimes referred to as "the bloody show"), typically occurs in the final stages of pregnancy as the cervix and uterus prepare for delivery. Given the patient's current gestation, this is unlikely.

An inevitable miscarriage involves the presence of abdominal cramping, vaginal bleeding and an open cervical os during pregnancy.

Further reading:

https://patient.info/doctor/placenta-praevia

Question:

A 70-year-old man presents to the emergency department with new urinary incontinence and an abnormal gait. Additionally, his wife has noticed a gradual decline in his memory and mood over the past two months. He has no significant past medical history.

What is the most likely observation found on MRI imaging?

A. Ventriculomegaly out of proportion to sulcal enlargement

B. Hyperintense signal changes in the basal ganglia and thalamus

C. Micro-infarcts and white matter changes

D. Midbrain atrophy

E. Global cerebral atrophy

Correct Answer:Ventriculomegaly out of proportion to sulcal enlargement

Explanation:

Normal pressure hydrocephalus is a sub-type of dementia often found in elderly patients. It is reversible and involves the inadequate draining of CSF from the brain. It usually occurs over the course of a few months. It often presents with personality and mood changes, urinary incontinence, abnormal gait and dementia. First-line imagining involves a CT or MRI scan, and it classically shows hydrocephalus with ventriculomegaly out of proportion to sulcal enlargement. Management may involve the insertion of a ventriculoperitoneal shunt.

Global cerebral atrophy that is particularly prominent at the cortex and hippocampus is usually found in patients with Alzheimer’s disease. This usually presents with a progressive decline in memory loss and an early loss of visuospatial skills.

Midbrain atrophy, also known as the “hummingbirds sign“ on an MRI scan, is a classic clinical sign for patients with progressive supranuclear palsy (a Parkinson plus syndrome).

Micro-infarcts and white matter changes on imaging are commonly observed in patients with vascular dementia. This is generally characterised by a stepwise decline in cognitive function and a past medical history of cardiovascular disease.

Hyperintense signal changes in the basal ganglia and thalamus are often seen in patients with Creutzfeldt-Jacobs disease. This is a prion disease, and clinical features include rapid onset dementia and myoclonus.

Further reading:

https://radiopaedia.org/articles/normal-pressure-hydrocephalus?lang=gb

Question:

A 68-year-old female presents to her GP complaining of an intermittently itchy nodule that has started to bleed on the dorsal surface of her left forearm. She noticed it 2 weeks ago but believes it may have been present for longer. She is a retired farmworker, having experienced significant sun exposure throughout her life. Examination reveals extensive sun damage to her face, neck and arms. The nodule on her dorsal left forearm is 1.5cm in diameter with a pearly white appearance, prominent surface telangiectasia, well-defined margins and surrounding scabbing.

Which of the following investigations would be most appropriate to perform first?

A. Elliptical excisional biopsy with 2mm margins and send for histopathology

B. Moh’s surgery

C. Elliptical excisional biopsy with 4mm margins and send for histopathology

D. Shave biopsy for histopathology

E. Punch biopsy for histopathology

Correct Answer:Elliptical excisional biopsy with 4mm margins and send for histopathology

Explanation:

The lesion is a basal cell carcinoma (BCC).

It would be most appropriate to first perform an elliptical excisional biopsy with 4mm margins and send for histopathology. This approach achieves simultaneous diagnostic investigation (via histopathology) and treatment (via excision with appropriate margins). Excisional margins of 4mm achieve complete removal in 95% of BCCs measuring <2cm in diameter. This approach is appropriate if there is reasonable clinical certainty of BCC (such as in the case of the stereotypical BCC appearance described in this clinical scenario) and if the benefits of initial total excision by avoiding the need for a second procedure outweigh the risks of a potentially unnecessary procedure if the biopsy reveals that the lesion is not a BCC.

Elliptical excisional biopsy with 2mm margins is unlikely to achieve complete removal of the 1.5cm BCC in this clinical scenario. The narrow excision biopsy would likely produce histologically positive margins and require re-excision, increasing costs and risks to the patient.

While a punch biopsy for histopathology would provide a quick and accurate diagnosis and would be appropriate for the forearm as a cosmetically non-challenging area, tools are generally only available in sizes up to 10mm meaning a second consultation for total excision would be required for the 1.5cm lesion in this clinical scenario. This would be an appropriate approach if there is clinical uncertainty and it is deemed more appropriate to confirm the diagnosis of BCC prior to exposing the patient to the cost and morbidity of a potentially unnecessary total excisional biopsy.

The same clinical reasoning for punch biopsies can be applied to shave biopsies which, in addition, should be reserved for cosmetically challenging areas such as the face.

Moh’s surgery is a tissue-sparing treatment appropriate for low-risk BCCs in cosmetically challenging locations, high-risk BCCs, or BCCs which have produced positive margins on initial excision. As such, it is not an appropriate procedure for this clinical scenario which asks for the first-line investigation for a BCC in a cosmetically non-challenging location with no high-risk features.

Further reading:

https://www.nice.org.uk/guidance/csg8

Question:

A 57-year-old man with a background of chronic obstructive pulmonary disease (COPD) and rheumatoid arthritis presents with vomiting, abdominal pain and dizziness. For the last week, he has been in bed with flu-like symptoms. He has a BP of 92/58 mmHg with postural drop and a venous gas reveals a sodium of 116 mmol/L (133–146). A 500ml bolus of 0.9% sodium chloride IV is given.

What is the next most appropriate medication to administer?

A. 500ml 0.9% sodium chloride STAT

B. 1000ml 0.9% sodium chloride STAT

C. 500ml 1.8% hypertonic saline STAT

D. 4.5g IV piperacillin and tazobactam

E. 200mg IV hydrocortisone

Correct Answer:200mg IV hydrocortisone

Explanation:

Key points in the history here are the inferred use of long term steroids and the recent illness which should have prompted an increased dose of the steroids. If this man did not increase his steroid dose during his illness he is at risk of an adrenal crisis, which can present with fatigue, low blood pressure, abdominal pain and vomiting. Biochemically patients have low sodium, high potassium and low blood sugar. It is important to give steroids early on to try and replace the cortisol deficiency which is causing symptoms.

As part of an A-E approach to an unwell patient fluid resuscitation should always be considered in someone who is hypotensive; as in this case where the patient received 500ml of 0.9% sodium chloride. This is usually the fluid of choice, unless the patient is bleeding and requires blood, and is usually given in boluses of 500ml, or 250ml in those who are elderly or have heart failure. 1.8% hypertonic saline tends to be used in the ITU/HDU setting, and not something which is given routinely on the wards.

Further reading:

https://patient.info/doctor/adrenal-crisis

Question:

A 60-year-old man attends a routine follow-up appointment after undergoing an open mesh repair of a left inguinal hernia. He has made a good recovery but reports some burning pains where the hernia used to be and an unpleasant tingling sensation in his scrotum.

On examination, his wounds have completely healed, and there is no evidence of a recurrent hernia. There is painful hyperaesthesia over the groin incision site and a small area of numbness in the medial upper thigh. It's suspected that a nerve injury has occurred intra-operatively.

Which structure is most likely to have been damaged?

A. Femoral branch of the genitofemoral nerve

B. Iliohypogastric nerve

C. Medial cutaneous nerve of the thigh

D. Genital branch of the genitofemoral nerve

E. Ilioinguinal nerve

Correct Answer:Ilioinguinal nerve

Explanation:

The most likely diagnosis, in this case, is an ilioinguinal nerve injury. The ilioinguinal nerve (T12/L1) pierces the internal oblique muscle and enters the inguinal canal medial to the deep ring. It then runs alongside the spermatic cord (in men) or round ligament (in women) and emerges through the superficial ring. In both sexes, it supplies sensory innervation to the medial groin and a small patch of the upper anteromedial thigh, and motor innervation to the internal oblique and transversus abdominus muscles. In men, it also supplies sensation to the root of the penis and upper scrotum. In women, it also supplies sensation to the mons pubis and labia majora. The ilioinguinal nerve is the most commonly injured nerve during inguinal hernia surgery. It is often deliberately sacrificed if it is irretrievably stuck to the hernia.

The iliohypogastric nerve (T12/L1) runs above the ilioinguinal nerve. It supplies sensory innervation to the lateral groin, the suprapubic area (via its anterior cutaneous branch) and the gluteal region (via its lateral cutaneous branch). It also supplies motor innervation to the internal oblique and transversus abdominus muscles. The anterior cutaneous branch pierces the external oblique aponeurosis about 2.5cm above the superficial inguinal ring. Injury to this nerve is also common during open inguinal hernia surgery, but would not cause altered sensation in the thigh.

The genital branch of the genitofemoral nerve (L1/L2) passes through the deep inguinal ring and runs within the spermatic cord. In men, it supplies sensory innervation to most of the anterolateral scrotum and motor innervation to the cremaster muscle. In women, it supplies sensory innervation to the mons pubis and labia majora. This nerve is at risk of injury during inguinal hernia surgery but does not supply any structures in the thigh.

The femoral branch of the genitofemoral nerve (L1/L2) passes behind the inguinal ligament with the femoral vessels. It supplies sensory innervation to the skin over the femoral triangle. This structure is unlikely to be encountered during open inguinal hernia surgery but may be injured during laparoscopic inguinal hernia repair.

The medial cutaneous nerve of the thigh (L2/L3/L4) is a branch of the femoral nerve. It passes beneath the inguinal ligament lateral to the femoral artery. It supplies sensory innervation to a long strip of the medial thigh extending down to the knee. This structure is unlikely to be encountered during open inguinal hernia surgery.

It is worth remembering that the lateral cutaneous nerve of the thigh (L2/L3) is not a branch of the femoral nerve. This structure is at risk of injury during laparoscopic inguinal hernia repair.

Further reading:

https://geekymedics.com/hernias/

Question:

A 32-year-old woman, G1P0, presents to the emergency department at 37+1 weeks gestation with regular uterine contractions. She states that she had a ‘gush of fluid’ from her vagina a few hours ago. A swab taken one week ago was reported as positive for group B streptococcus (GBS).

On examination, her cervix is 4cm dilated and vital signs are normal.

What is the most appropriate management option?

A. IV oxytocin

B. IV piperacillin/tazobactam

C. Metronidazole pessary

D. Oral flucloxacillin

E. IV benzylpenicillin

Correct Answer:IV benzylpenicillin

Explanation:

The most appropriate management option is to commence IV benzylpenicillin immediately.

This patient has tested positive for group B streptococcus (GBS) and is now in labour. GBS is a bacteria that is normally present in the vagina of around 20% of women. During childbirth, GBS can be transmitted to infants and cause life-threatening infections. As a result, women receive GBS screening during pregnancy, typically 2-5 weeks before delivery. If GBS is identified, intrapartum IV benzylpenicillin is recommended to reduce the risk of transmission. IV benzylpenicillin should be continued until delivery of the child.

Further reading:

https://www.nice.org.uk/guidance/cg149/chapter/1-Guidance#antibiotics-for-suspected-infection-2

Question:

A 64-year-old male presents to the emergency department with a 2-day history of acute abdominal pain and bilious vomiting. His past medical and drug history are unremarkable, apart from an open appendectomy 15 years ago.

His observations are stable and he is afebrile. On examination, his abdomen is generally tender and tinkling bowel sounds are audible on auscultation. A 3-inch scar is visible in the right iliac fossa.

What is the most likely diagnosis?

A. Large bowel obstruction

B. Ruptured abdominal aortic aneurysm

C. Acute appendicitis

D. Acute diverticulitis

E. Small bowel obstruction

Correct Answer:Small bowel obstruction

Explanation:

Acute onset abdominal pain with generalised tenderness, bilious vomiting, and tinkling bowel sounds strongly suggest intestinal obstruction. Small bowel obstruction typically presents with early vomiting and late constipation, with adhesions being the most common cause. Therefore, adhesions secondary to the appendectomy are the most likely cause of the obstruction in this patient.

Acute appendicitis typically presents with a 1-3 day history of initial peri-umbilical pain which later localises to the right iliac fossa. Anorexia and nausea are common. Appendicitis is unlikely in this patient due to the scar suggestive of a previous appendectomy.

Acute diverticulitis often presents with acute left iliac fossa pain, nausea, diarrhoea and pyrexia. However, tinkling bowels are not typical of diverticulitis.

A large bowel obstruction often presents with early absolute constipation and late vomiting, with malignancy being the most common cause. Early vomiting and no evidence of constipation in this patient mean a large bowel obstruction is less likely.

A ruptured abdominal aortic aneurysm (AAA) typically presents with sudden onset abdominal pain radiating through to the back. In addition, the patient will be haemodynamically unstable and an expansile abdominal mass may be felt. This patient does not complain of pain radiating to their back and their observations are stable, making a ruptured AAA unlikely.

Further reading:

https://www.rcemlearning.co.uk/reference/bowel-obstruction/#1568203211329-68736ad1-f52c

Question:

A 78-year-old woman presents to the emergency department after a 30-minute episode of unilateral facial and limb weakness. On assessment, her symptoms have resolved, and her neurological examination is unremarkable. She has a history of angina and an aortic heart valve replacement, for which she is anticoagulated with warfarin.

A CT head rules out a haemorrhagic cause, and she is given 300mg of aspirin.

Given the likely diagnosis, what urgent investigation should be carried out?

A. Full blood count

B. Electroencephalography

C. Venous ultrasound

D. Ultrasound carotid doppler

E. Arterial blood gas analysis

Correct Answer:Ultrasound carotid doppler

Explanation:

Ultrasound carotid doppler is correct, as atherosclerosis of the carotid arteries is a common cause of transient ischaemic attack (TIA). A carotid doppler can assess whether this patient is eligible for carotid endarterectomy. This would be recommended if the patient is found to have carotid stenosis occluding greater than 70% of the lumen (according to ECST criteria).

Arterial blood gas analysis is not routinely required for TIA or stroke workup unless patients are very unstable. Therefore, this is incorrect.

Electroencephalography (EEG) is used to detect brain wave patterns, usually in the context of seizures or suspected epilepsy. While seizures can cause neurological signs and symptoms, the stem did not suggest seizure-like activity (for example, tonic-clonic activity or Jacksonian march). This patient has risk factors for stroke/TIA, and the fact her symptoms resolved after 30 minutes points more towards TIA.

Full blood count doesn't have much utility in the diagnosis or management of TIAs. If a blood test were to be ordered, it would probably be worthwhile checking this patient's INR, considering she is on warfarin.

Venous ultrasound doesn't have much utility in a TIA because the transient ischaemia results from an arterial source (for example, in carotid stenosis, hence why a carotid doppler is indicated). Venous ultrasound is useful more in the context of suspected deep vein thrombosis or pulmonary embolism.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK535369/

Question:

A 71-year-old man presents to his local eye department following sudden, painless visual loss in his left eye over the last 24 hours.

He describes a 3-month history of worsening vision; he finds reading difficult even with his usual reading glasses. He also describes lines sometimes appear wavy rather than straight.

He has a past medical history of hypertension, gout and type 2 diabetes. He takes amlodipine, allopurinol and metformin. He reports a heavy smoking history of approximately 50 pack years.

Ophthalmic examination reveals visual acuity is reduced at 6/18 in the left eye and 6/9 in the right eye. Intraocular pressure, pupils and extraocular muscle movements are normal bilaterally. Dilated fundoscopy examination reveals subretinal haemorrhage and grey discolouration in the macula area in the left eye; the right eye shows drusen and retinal pigment epithelial changes.

What is the most appropriate initial treatment for this patient's condition?

A. Thermal laser photocoagulation

B. Intravitreal anti-VEGF

C. Photodynamic therapy

D. AREDS2 formula

E. Intravitreal triamcinolone acetate

Correct Answer:Intravitreal anti-VEGF

Explanation:

The most likely diagnosis in this patient is wet age-related macular degeneration (AMD) - a degenerative disease of the retina characterised by the presence of choroidal neovascularisation. In contrast to dry AMD, wet AMD leads to a more rapidly progressive loss of vision, driven by the formation of exudate or subsequent haemorrhage from the newly formed choroidal vessels. This patient has evidence of subretinal haemorrhage in the left eye suggesting wet AMD. The growth of vessels in wet AMD is driven by vascular endothelial growth factor (VEGF); therefore, the recommended initial management is intravitreal anti-VEGF therapy such as intravitreal aflibercept. Intravitreal anti-VEGF is usually given once monthly for three months and then reviewed, with response to treatment dictating how often future doses are administered.

Antioxidant and mineral supplementation, such as the AREDS2 formula, have some benefit in patients with early dry AMD; however, they have no proven benefit in advanced dry AMD or neovascular disease. Therefore, this would not be the most appropriate initial therapy. However, it is important to note that some clinicians may consider AREDS2 supplementation alongside intravitreal anti-VEGF to reduce the risk of second eye involvement if the second eye is not affected yet.

Photodynamic therapy (PDT) is a treatment that uses a light-sensitive medicine (verteporfin) to induce occlusion of the pathological choroidal neovasculature. However, PDT is not a first line treatment for wet AMD; therefore, it would not be appropriate for the initial management of this patient.

Thermal laser photocoagulation and Triamcinolone acetate are no longer used routinely since the advent of anti-VEGF agents.

Further reading:

https://geekymedics.com/age-related-macular-degeneration-armd/

Question:

You are asked to see a 52-year-old lady with new-onset jaundice. She reports jaundice starting about 2 days ago. She denies any abdominal pain, vomiting, changes in her urinary or bowel motions. She smokes 2 cigarettes a day and only drinks 1-2 times per year. She has recently been unwell due to a chest infection. Her past medical history includes type 2 diabetes and hypertension.

On examination, there is no abdominal tenderness, masses or organomegaly. An abdominal ultrasound shows no abnormalities. Blood tests reveal Bilirubin 50, ALT 11, ALP 190, Albumin 41.

Which of the medications below is most likely to have caused her to develop jaundice?

A. Ibuprofen

B. Gabapentin

C. Co-amoxiclav

D. Metformin

E. Amlodipine

Correct Answer:Co-amoxiclav

Explanation:

The most likely cause of this patient's jaundice is co-amoxiclav. Co-amoxiclav is known to cause cholestatic jaundice in some patients, shortly after its use. The risk of acute liver toxicity is around 6 times greater with c-amoxiclav than it is with amoxicillin. The jaundice is typically self-limiting and resolves when co-amoxiclav is stopped.

Some other medications which can cause jaundice include:

Combined oral contraceptive pill

Flucloxacillin

Rifampicin

Isoniazid

Pyrazinamide

Chlorpromazine

Her other medications are not known to cause jaundice:

Ibuprofen can cause gastritis and acute kidney injury.

Metformin can cause diarrhoea and lactic acidosis.

Amlodipine can cause hypotension and ankle oedema.

Further reading:

https://bnf.nice.org.uk/drug/co-amoxiclav.html

Question:

A study is conducted to investigate whether there is a correlation between atrial fibrillation (AF) and mood disorders. The study calculates an odds ratio of 2 (95% confidence interval 0.9 – 3.6).

What is the most accurate interpretation of this odds ratio?

A. The odds of having a mood disorder were twice as high in those with AF than in those without

B. The odds of having a mood disorder were 20% higher in those without AF than in those with AF

C. There is no statistically significant increase in the odds of having a mood disorder in those with AF than in those without

D. The odds of having a mood disorder were twice as high in those without AF than in those with AF

E. The odds of having a mood disorder were 20% higher in those with AF than in those without

Correct Answer:There is no statistically significant increase in the odds of having a mood disorder in those with AF than in those without

Explanation:

The odds ratio is the ratio of the odds of having the condition in the exposed group compared to the odds of having the condition in the unexposed group. For example, an odds ratio of 2 means the odds of having the condition is twice as high in the exposed group than in the unexposed group. However, here the confidence interval includes 1 (an odds ratio of 1 means that there is no difference in the odds of having the condition in the exposed versus the unexposed group). Therefore, the correct answer is that there is no statistically significant increase in the odds of having a mood disorder in those with AF than in those without.

Further reading:

https://geekymedics.com/statistics-for-medical-students/

Question:

A 37-year-old woman presents with a 2-month history of lower abdominal pain and abnormal vaginal discharge over the last few days. She is sexually active has also been experiencing deep dyspareunia. There have been no changes in her periods, which are regular. She takes no regular medications, and her past medical history includes surgery for the replacement of a bicuspid aortic valve. She does not smoke and drinks 1-2 glasses of wine most nights of the week.

On examination, her vital signs are all within normal limits. There is discomfort on deep palpation of the lower abdomen, and cervical motion tenderness on bimanual vaginal examination.

The patient is given a single dose of intramuscular ceftriaxone 500mg. Which of the following antibiotic regimens is most appropriate for further treatment of this patient?

A. Oral doxycycline 100mg twice daily for 3 days

B. A further dose of intramuscular ceftriaxone 500mg in 7 days

C. No oral antibiotic therapy needed

D. Oral doxycycline 100mg twice daily plus metronidazole 400mg twice daily for 14 days

E. Oral flucloxacillin 500mg four times a day plus metronidazole 400mg three times daily for 7 days

Correct Answer:Oral doxycycline 100mg twice daily plus metronidazole 400mg twice daily for 14 days

Explanation:

This patient has pelvic inflammatory disease (PID), most commonly caused by ascending Neisseria gonorrhoeae, Chlamydia trachomatis, or Mycoplasma genitalium infection from the lower genital tract. For this reason, current guidelines suggest treatment with a single dose of intramuscular ceftriaxone 500mg, followed by oral doxycycline 100mg twice daily plus metronidazole 400mg twice daily for 14 days.

A further dose of intramuscular ceftriaxone 500mg is not indicated, as guidelines suggest that PID can be managed successfully with oral antibiotics following one intramuscular dose of ceftriaxone.

Flucloxacillin 500mg four times a day is used in treatment for cellulitis and infection caused by susceptible gram-positive bacteria, and would therefore not be therapeutic in this situation.

Oral doxycycline 100mg twice daily monotherapy for 3 days is insufficient to treat PID, as a 2-week course is required.

Reference: 2018 United Kingdom National Guideline for the Management of Pelvic Inflammatory Disease (British Association for Sexual Health and HIV)

Further reading:

https://www.bashhguidelines.org/media/1170/pid-2018.pdf

Question:

George Hunter is a 68-year-old gentlemen presenting to A&E with sudden onset back pain. He has a history of diabetes, osteoarthritis and prostate cancer. He reports the pain has been getting progressively worse over the last 48 hours. On examination, he has localised spinal tenderness and decreased power in his legs bilaterally.

Which of the following investigations would be most useful in confirming the likely diagnosis?

A. CT spine

B. X-ray of the spine

C. MRI spine

D. X-ray of the hips

E. PET scan of the body

Correct Answer:MRI spine

Explanation:

This patient most likely has a diagnosis of prostate cancer with spinal metastases causing spinal cord compression. The most useful imaging modality for confirming this diagnosis would be an urgent MRI spine. This is an oncological emergency.

Although an x-ray of the spine may show bony metastasis it would not be able to diagnose spinal cord compression.

An x-ray of the hips may reveal bony metastases and/or pathological fracture of the femur, however, given the patient's symptoms are bilateral, an acute fracture is less likely.

A CT spine would provide detailed imaging of the vertebrae, however it is less useful for assessing soft tissues, such as those of the metastases and the spinal cord itself.

Positron emission tomography (PET) scan looks at glucose metabolism in cells and can identify areas of high metabolism. This can be useful for identifying cancer metastasis but would not be useful for diagnosing spinal cord compression.

Further reading:

https://radiopaedia.org/articles/spinal-cord-compression

Question:

A 14-year-old boy presents to the emergency department with sudden onset, unilateral scrotal pain. This started 30 minutes ago whilst playing football. He feels nauseated and has vomited twice. He has no significant past medical history and takes no medications.

On examination, the left testicle appears swollen and is lying horizontally. It is exquisitely painful to touch, and the pain is not relieved by elevation of the scrotum.

What is the most appropriate management option?

A. Analgesia and outpatient urology review

B. Analgesia and antibiotics

C. Urgent surgical exploration

D. Therapeutic aspiration

E. Routine surgical exploration

Correct Answer:Urgent surgical exploration

Explanation:

This case demonstrates testicular torsion, in a young boy whilst playing sport. Testicular torsion is characterised by sudden onset, unilateral scrotal pain associated with nausea and vomiting. The testicle may appear inflamed with a horizontal lie and the pain is not relieved on elevating the testes. The cremasteric reflex may also be absent, whereby stroking the inner thigh fails to cause an upward movement of the testes. Urgent surgical exploration is required to relieve the torsion and assess the viability of the testicle. If viable, bilateral orchiopexy will be performed. The other management options are extremely inappropriate as they delay surgical intervention.

Therapeutic aspiration has no role in managing testicular torsion.

Further reading:

https://geekymedics.com/testicular-torsion/

Question:

A researcher would like to find out if there is a link between air pollution and asthma. They gather data from two cities – one has a high level of air pollution, and the other has a low level of air pollution. They record the prevalence of asthma in both cities to see if there is a link between air pollution and asthma.

What type of study is described?

A. Case-control

B. Prospective cohort

C. Ecological

D. Retrospective cohort

E. Case series

Correct Answer:Ecological

Explanation:

This is an ecological study. An ecological study compares different populations that have different rates of cases and different rates of risk factor exposure.

A case series identifies a group of people with a known exposure and follows them up to see if they develop the condition being studied.

Case-control studies involve comparing a group of cases with a group of controls and seeing if there are different rates of risk factor exposure between the two groups.

A prospective cohort study identifies a group of people with a known exposure and a group without the exposure, then follows them up to see if they develop the condition being studied.

A retrospective cohort study involves looking back into the past to determine if a group of people have been exposed to the risk factor. The exposure status was measured in the past, and some people may have already been diagnosed with the disease of interest.

Further reading:

https://guides.himmelfarb.gwu.edu/prevention\_and\_community\_health/types-of-studies

Question:

A 35-year-old male patient attends his GP with fatigue and vague abdominal pain. He reports that he has become progressively fatigued over the past 6 months and has noticed mild, right-sided, upper abdominal pain. The patient also mentions that he has lost his appetite, is constantly nauseated and has lost around 1 stone of weight over the last year unintentionally. On further questioning, the patient admits to being an intravenous drug user for 10 years and has at times shared needles with others.

On examination, the following are noted:

jaundice

palmar erythema

excoriation marks

8 spider naevi located on his trunk

bruising on his legs (for which the gentleman has no explanation)

hepatomegaly

What is the most likely aetiology underlying this patient’s presentation?

A. Hepatitis B

B. Hepatitis A

C. Wilson’s disease

D. Hepatitis C

E. Haemochromatosis

Correct Answer:Hepatitis C

Explanation:

The most likely aetiology of this patient’s presentation of chronic liver disease is hepatitis C. Hepatitis C is caused by an RNA flavivirus. Hepatitis C can be acquired via intravenous drug use, blood transfusion, needle-stick injury and sexual transmission. Hepatitis C more commonly presents with features of chronic liver disease (either due to the presence of cirrhosis or hepatocellular carcinoma), but may also present more acutely (i.e. with jaundice and prodromal flu-like features).

Chronic liver disease may present any of the following wide variety of features:

fatigue

weight loss

anorexia

oedema

ascites

spontaneous bruising

jaundice

pruritus

>5 spider naevi

palmar erythema

finger clubbing

hepatomegaly

Investigations required for suspected hepatitis C can include:

hepatitis serology

molecular analysis

liver function tests

liver ultrasound scanning

liver biopsy

Hepatitis B is less likely in this case. This condition more commonly presents acutely (with jaundice and a prodromal, flu-like illness). Methods of transmission for hepatitis B include vertical transmission from mother to child (most commonly), blood transmission, sexual transmission and salivary spread.

Wilson’s disease typically first presents with speech and behavioural issues followed by dementia, chorea, hepatitis, cirrhosis and Kayser–Fleischer rings.

Hepatitis A is less likely in this case, as it does not cause chronic liver disease. This condition has an incubation period of 4 weeks and presents with a prodromal flu-like illness, followed by jaundice, pale stools, dark urine, abdominal pain and pruritis. Complete clinical recovery can take up to 6 months. Risk factors for hepatitis A include direct contact with an infected individual, consumption of contaminated water, travel to high-risk areas, men who have sex with men and intravenous drug use.

Haemochromatosis is typically hereditary and presents with fatigue, arthropathy, impotence, loss of libido, testicular atrophy, and ‘leaden grey’ skin.

Further reading:

https://patient.info/doctor/hepatitis-c-pro

Question:

A 64-year-old presents with worsening vision when driving. He has recently noticed that he has become 'hypersensitive' to the lights of oncoming vehicles and that the glare prevents him from staying straight on the road.

His past medical history includes rheumatoid arthritis, Hashimoto's thyroiditis, and osteoarthritis, for which he takes methotrexate, prednisolone, levothyroxine, and ibuprofen. He has had surgical fixation of an ectropion in his left eye.

On examination, the patient has a visual acuity of 6/24 in the right eye, and 6/12 in the left eye, with an altered red reflex in the right eye. There are no issues with eye movement, and colour vision remains intact when tested with Ishihara plates.

Given the probable diagnosis, what is the most likely risk factor?

A. Male sex

B. Hypothyroidism

C. Surgical repair of ectropion

D. Methotrexate use

E. Prednisolone use

Correct Answer:Prednisolone use

Explanation:

The features of an altered red reflex, unilateral vision loss and glare, particularly when driving at night make the most likely diagnosis, in this case, the presence of a cataract in the right eye. Cataracts develop due to opacification of the lens secondary to structural alteration of the crystallin proteins within this portion of the eye; the condition is extremely common with increasing age. Patients will often complain of progressive painless visual loss, often with blurring and glare around lights.

Whilst age in itself is the most important risk factor for the disease, there are a number of other risk factors for developing the condition, including:

Congenital syndromes/infection - cataracts can be a feature of Down syndrome or intrauterine rubella infection

Diabetes mellitus

Chronic inflammation - anterior uveitis, glaucoma

Drugs - corticosteroids (the patient's long-term prednisolone use, therefore, represents a significant risk factor in this case), acetylcholinesterase inhibitors

Trauma to the eye

Methotrexate has not been shown to be associated with cataract development, and there is no link with hypothyroidism nor its treatment. The condition affects both males and females roughly equally, with male sex not being a known risk factor. Whilst trauma can predispose to cataract development, surgery for an ectropion should not affect the eye itself, and in this case, the side operated on is the opposite to that with the likely cataract.

Further reading:

https://patient.info/doctor/cataracts-and-cataract-surgery

Question:

An 18-year-old female presents to the emergency department with a 4-hour history of severe right iliac fossa pain, in addition to nausea and vomiting. Her only past medical history is depression for which she is taking sertraline. Her observations are as follows:

Heart rate: 110

Respiratory rate: 22

Oxygen saturation: 96% on room air

Blood pressure: 95/60

Temperature: .37.5 °C

Which of the following investigations should be performed most urgently?

A. Serum amylase levels

B. Pregnancy test

C. Laparotomy

D. Transvaginal ultrasound

E. Urine dipstick

Correct Answer:Pregnancy test

Explanation:

Without any further information, it is difficult to be sure of a particular diagnosis, as there are many causes of right iliac fossa pain. The answer here is pregnancy test as a ruptured ectopic pregnancy needs to be ruled out urgently. This characteristically presents with abdominal pain, vaginal bleeding, a recent history of amenorrhea and, if ruptured, the patient may be haemodynamically unstable.

Urine dipstick is incorrect as although a urinary tract infection is possible, a ruptured ectopic pregnancy would cause the greatest clinical concern and must be identified urgently.

Transvaginal ultrasound is an investigation used in ectopic pregnancy, however, this should be performed after a pregnancy test.

Laparotomy is incorrect as although it may be indicated depending on the outcome of the investigations, it is not the first investigation that needs to be performed.

Serum amylase is typically measured to screen for pancreatitis, which is a highly unlikely cause of abdominal pain in an otherwise well 18-year-old. Ectopic pregnancy is significantly more likely and therefore it would be more important to perform a pregnancy test.

Further reading:

https://www.rcog.org.uk/en/guidelines-research-services/guidelines/gtg21/

Question:

An 81-year-old lady is admitted to the acute medical ward generally unwell. She was commenced on trimethoprim 2 days previously by her GP for a urinary tract infection.

Routine blood tests show:

K+ 6.4 mmol/L

Na+ 136 mmol/L

Urea 9.1 mmol/L

Creatinine 102 μmol/L

Which of the following drugs acts to enhance potassium excretion in the management of hyperkalaemia?

A. Salbutamol

B. Calcium gluconate

C. Insulin

D. Magnesium sulphate

E. Calcium resonium

Correct Answer:Calcium resonium

Explanation:

Calcium resonium works as an ion exchange resin whereby calcium ions are exchanged for potassium (e.g. in the gut to enhance excretion). Out of the options presented, only calcium resonium actually enhances potassium excretion, the other agents (e.g. insulin, salbutamol) simply shift potassium to the intracellular compartment, providing only a temporary reduction in serum potassium.

Due to calcium resonium's mechanism of action, it does not reduce serum potassium levels as rapidly as other agents (e.g. salbutamol, insulin) which is why it is rarely used in the emergency management of hyperkalemia. Calcium resonium is typically recommended for use in severely oliguric or anuric patients, or those requiring dialysis to increase long term potassium excretion.

Insulin and salbutamol rapidly reduce serum potassium concentration by increasing cellular uptake.

Calcium gluconate stabilises the myocardium, which is an important first step in the management of hyperkalaemia.

Magnesium sulphate is not routinely used in hyperkalaemia management.

Further reading:

https://bnf.nice.org.uk/drug/calcium-polystyrene-sulfonate.html

Question:

A 70-year-old male is admitted to a general surgical ward with sudden-onset colicky lower abdominal pain. The patient’s abdominal pain is associated with gross abdominal distension and a failure to pass either flatus or stool for 1 week. The patient explains that similar episodes of pain and distension have occurred in the last few months, however, they were milder and were relieved by the passage of large amounts of stool. On examination, the gentleman’s abdomen is distended with no signs of peritonism. You order an abdominal x-ray (AXR) and an erect chest x-ray (CXR). Later, you notice a ‘coffee bean sign’ on AXR. No free air under the diaphragm can be seen on an erect CXR.

What is the MOST LIKELY diagnosis?

A. Sigmoid volvulus

B. Diverticular disease

C. Constipation

D. Toxic megacolon

E. Bowel perforation

Correct Answer:Sigmoid volvulus

Explanation:

The most likely diagnosis is sigmoid volvulus. Sigmoid volvulus occurs in cases of long-standing chronic constipation where patients develop a large, elongated, relatively atonic sigmoid colon. This results in a loop of sigmoid colon twisting on its mesenteric pedicle to result in a closed-loop obstruction. This condition typically presents with sudden-onset colicky lower abdominal pain, abdominal distension and failure to pass either flatus or stool. Vomiting may occur later when the distension is severe. An abdominal x-ray is the investigation of choice and typically shows a ‘coffee bean sign’.

Whilst the patient is likely to suffer from chronic constipation, sigmoid volvulus has developed as a result of this. Chronic constipation is also unlikely to result in the complete absence of flatus, and the acute onset of presentation stands against the diagnosis being constipation alone.

Bowel perforation is less likely as no free air is present under the diaphragm on erect chest x-ray.

Diverticular disease is less likely in this case as pain tends to be felt worst in the left iliac fossa and suprapubic regions in this condition.

Toxic megacolon is less likely as no history of inflammatory bowel disease is present.

Further reading:

https://radiopaedia.org/articles/sigmoid-volvulus

Question:

A research group has conducted a clinical trial on a new chemotherapy drug called limantine. They publish a research paper stating, “treatment with limantine and fluorouracil (5-FU) significantly reduces the risk of mortality in patients with stage IV colorectal cancer compared to 5-FU alone with a hazard ratio of 0.65 (95% confidence interval, 0.62-0.72).”

What is the most accurate interpretation of this statement?

A. Limantine reduces the risk of death by between 0.62-0.72% when given with 5-FU compared to 5-FU alone.

B. Limantine reduces the risk of death by between 62-72% when given with 5-FU compared to 5-FU alone.

C. Patients in the study were 65% less likely to die when treated with limantine and 5-FU than 5-FU alone.

D. Patients in the study were 0.65% as likely to die when treated with limantine and 5-FU than 5-FU alone.

E. Patients in the study were 65% as likely to die when treated with limantine and 5-FU than 5-FU alone.

Correct Answer:Patients in the study were 65% as likely to die when treated with limantine and 5-FU than 5-FU alone.

Explanation:

The hazard ratio describes the likelihood at any point in time of reaching the end outcome of a survival analysis. This end outcome is usually death but could also be disease progression. A hazard ratio of 0.65 means that patients in the study were 65% as likely to die when treated with limantine and 5-FU than 5-FU alone (in other words, the limantine and 5-FU group were 35% less likely to die compared to the 5-FU monotherapy group). The 95% confidence interval in brackets indicates that the researchers can be 95% certain that the true value for the hazard ratio lies between 0.62-0.72.

Further reading:

https://geekymedics.com/statistics-for-medical-students/

Question:

A 24-year old female IV drug user presents to her GP after being diagnosed with Hepatitis C on routine blood tests and wants to know more about the disease. Her HIV test is negative.

Which of the following pieces of information are correct regarding hepatitis C?

A. The chance of transmission to a neonate during pregnancy/childbirth is ~40% without medical intervention

B. Treatment with antivirals can reduce viral load but rarely clears the infection

C. More than half of adults infected with the virus are able to clear it without treatment

D. The probability of transmission via regular vaginal intercourse is less than 1% per year

E. Seroconversion usually causes flu-like illness often accompanied by jaundice

Correct Answer:The probability of transmission via regular vaginal intercourse is less than 1% per year

Explanation:

Although hepatitis C can be transmitted via sexual contact, the rate of transmission via vaginal intercourse is <1% per year. This rate increases if either partner is infected with HIV, if the intercourse is anal, or if vaginal sex occurs during menstruation.

The overall incidence of HCV transmission by sex was estimated to be 0.07 percent per year.

https://pubmed.ncbi.nlm.nih.gov/23175457/

Hepatitis B heterosexual sexual transmission is much more important with a transmission rate of 40% to non-immune partners of patients with acute or chronic hepatitis B.

The other options all describe hepatitis B. Vertical transmission occurs in ~40% of pregnant women infected with hepatitis B (although this depends strongly on E-antigen status), but ~5% of those infected with hepatitis C.

Hepatitis C is only cleared spontaneously in ~20% of infected adults, whereas Hepatitis B is cleared in ~95%.

Hepatitis C seroconversion is typically asymptomatic and is only associated with jaundice in ~10% of cases, whereas Hepatitis B infection is often accompanied by a flu-like illness, with ~40% of patients exhibiting jaundice.

With new (but expensive) antivirals, hepatitis C can be cured in ~90% of cases; hepatitis B conversely, is not usually curable once an individual becomes chronically infected.

Further reading:

https://patient.info/doctor/hepatitis-c-pro

Question:

Simon Jones, a 20-year old known type 1 diabetic, is rushed to hospital after being found collapsed at home this morning. His mother provides a collateral history – he has been unwell for 4 days with a productive cough and a mild fever. Last night he had been complaining of abdominal pain and had vomited several times. She does not think he has been taking his insulin regularly as he hasn’t been eating much. On examination, he appears drowsy and confused. Capillary blood glucose is 25 and capillary ketones are 4.2.

His observations and ABG test results are shown below.

Observations:

Temperature 37.8 oC

Heart rate: 98 bpm

BP: 95/65 mmHg

Respiratory rate: 23

SpO2: 93%

ABG results:

pH 7.29

PO2 13 kPa

PCO2 2.1 kPa

HCO3- 14 mmol

Base excess +2

Lactate 1 mmol

Given this history and findings, what is the most important definitive treatment for Simon’s presentation?

A. Subcutaneous injection of 10 units rapid acting insulin

B. 1mg glucagon intramuscularly

C. Intravenous antibiotics

D. Fixed rate insulin infusion

E. Variable rate insulin infusion

Correct Answer:Fixed rate insulin infusion

Explanation:

The correct answer is a fixed rate insulin infusion given at a rate of 0.1units/kg/hr. Simon has presented with diabetic ketoacidosis (DKA) secondary to a chest infection and not taking his insulin. DKA is suspected in this scenario as a type 1 diabetic is presenting with a history of an acute illness followed by epigastric pain and vomiting as well as altered consciousness. The findings show a metabolic acidosis with raised glucose and ketone levels.

A variable-rate insulin infusion would not be appropriate here as these are used primarily when diabetic patients are being kept nil by mouth pre-operatively.

Intravenous antibiotics may be required at some point, but the most important definitive treatment for DKA is a fixed-rate insulin infusion.

Glucagon would exacerbate his hyperglycemia.

Further reading:

https://patient.info/doctor/diabetic-ketoacidosis#nav-4

Question:

You see a 43-year-old male patient who has back pain. He can’t remember a particular injury but reports lower back pain which has been getting worse for 2 months. He has episodes of muscle spasm in his lower back over the last 2 days which have been particularly painful and have meant he has been off work. He works in a warehouse and frequently lifts heavy objects. He is overweight, however has no other relevant past medical history. He has no red flag symptoms of back pain.

Which statement regarding non-specific lower back pain is correct?

A. Paracetamol is first-line for analgesia

B. Advise the patient that the risk of recurrence is low

C. Advise the patient to not return to work or normal activities until they are pain-free

D. NSAID is first-line for analgesia

E. Diazepam should not be used in the management of lower back pain

Correct Answer:NSAID is first-line for analgesia

Explanation:

Low back pain affects the lumbosacral area of the back, between the bottom of the ribs and the top of the legs. It affects around one-third of the adult population each month. In most people, low back pain is non-specific and serious specific causes are rare.

Complications include:

Development of chronicity and depression.

Disability and loss of employment.

Non-specific low back pain is often a chronic problem in which periods of little pain or disability are interrupted by acute episodes of severe pain.

In people with low back pain:

Serious spinal pathology, inflammatory features, and sciatica should be excluded.

Non-specific low back pain should be diagnosed in people with low back pain which varies with posture and is exacerbated by movement.

X-rays of the back should not routinely be requested to diagnose non-specific low back pain.

Management of non-specific low back pain involves:

Assessing the person's risk of back pain disability using a risk stratification tool.

Providing adequate analgesia (an NSAID first-line, or codeine with or without paracetamol if an NSAID is contraindicated or not tolerated). If the paraspinal muscles are in spasm, a short course of a benzodiazepine such as diazepam can also be considered.

Providing information about the expected time course of pain, self-help measures, advice about staying active, resuming normal activities, and returning to work as soon as possible.

Offering people at higher risk of back pain disability referral for group exercise, and/or cognitive behavioural therapy, and/or physiotherapy.

Referral may be necessary:

Refer urgently to a neurosurgeon or orthopaedic surgeon if there are red flags including progressive, persistent, or severe neurological deficit.

If symptoms are not improving or are worsening, refer for group exercise, with or without cognitive behavioural therapy, and/or physiotherapy, and/or consider referral to specialist low back pain services for assessment.

Further reading:

https://cks.nice.org.uk/back-pain-low-without-radiculopathy

Question:

A 68-year-old woman presents with the GP with a worsening cough. She describes a 12-month history of cough and daily copious sputum production. Her cough has worsened over the last two days, and the sputum has changed colour. She shows you a tissue filled with the sputum, which is yellow-green.

She has a past medical history of two episodes of bacterial pneumonia (aged 6 and 22), hypertension, type 2 diabetes mellitus and osteoporosis. She cannot recount the drugs she takes but says she has no drug allergies.

On examination, her temperature is 37.6°C, pulse 84/min, RR 18/min, BP 132/84mmHg, SpO2 96% on room air. Respiratory examination reveals coarse crackles, expiratory wheeze and rhonchi.

What is the most appropriate initial management of this patient?

A. Oral clarithromycin

B. Oral azithromycin

C. Inhaled budesonide

D. Oral amoxicillin

E. Pulmonary rehabilitation

Correct Answer:Oral amoxicillin

Explanation:

The most likely diagnosis in this patient is bronchiectasis - a condition characterised by permanent dilation of bronchi due to destruction of the elastic and muscular components of the bronchial wall. This patient is likely suffering from an infective exacerbation of bronchiectasis secondary to a respiratory tract infection, evidenced by the acute change in cough and sputum colour. This patient has no history of previous microbiology culture; therefore, NICE guidelines recommend prescribing oral amoxicillin 500mg three times a day for 7-14 days.

The use of inhaled corticosteroids, such as budesonide, is not routinely recommended in suspected bronchiectasis unless there is a co-existing respiratory condition such as chronic obstructive pulmonary disease (COPD) or asthma. Therefore, this is not the most appropriate initial management without further investigation to confirm other respiratory pathology.

NICE guidelines recommend oral clarithromycin 500mg twice a day for 7-14 days for patients with a true penicillin allergy. However, as this patient does not have any history of allergy, this would not be the most appropriate initial management.

People with bronchiectasis who have three or more exacerbation per year may be offered antibiotic prophylaxis with oral azithromycin. This patient does not report previous exacerbations and is presenting with an acute, active exacerbation; therefore, azithromycin would not be a suitable treatment to initiate at this stage. Furthermore, before commencing prophylactic oral macrolides, an ECG, baseline liver function tests and sputum culture must be organised.

Patients with an initial presentation of bronchiectasis are recommended lifestyle changes such as increased exercise and improved nutrition, typically as part of a structured pulmonary rehabilitation course. However, antibiotics are the mainstay of treatment in an infective exacerbation. Therefore, pulmonary rehabilitation is not the most appropriate initial management, and this patient should only be referred for supportive services like these once the initial infection has cleared.

Further reading:

https://cks.nice.org.uk/topics/bronchiectasis/management/infective-exacerbation/

Question:

A 50-year-old woman with Fitzpatrick type II skin and a history of polycystic ovary syndrome presents to her GP with a new skin lesion on her neck, which she first noticed three months ago. She does not drink alcohol but has smoked ten cigarettes daily for the past ten years.

On examination, there is a flat pigmented lesion, 8 mm in diameter. It is asymmetrical with irregular borders and contains areas of light brown, dark brown and black.

Based on the likely diagnosis, what is this patient's most significant risk factor?

A. Fitzpatrick skin type

B. Being female

C. Smoking

D. Location of the lesion

E. Polycystic ovary syndrome

Correct Answer:Fitzpatrick skin type

Explanation:

This patient most likely has melanoma. The only risk factor for melanoma listed is her Fitzpatrick skin type, as those with Fitzpatrick type I and II skin are especially at risk of skin cancer.

The location of the lesion in melanoma is most commonly on the legs in women and on the trunk in men. Being female reduces the risk of melanoma, and polycystic ovary syndrome does not increase the risk of melanoma. Note that although smoking increases the risk of squamous cell carcinoma, it does not increase the risk of melanoma.

The risk factors for melanoma are listed below:

Fair skin, freckling, light hair, light-coloured eyes

Previous skin cancer or atypical naevi

Large number of moles

Family history of melanoma

Pale skin (Fitzpatrick type I and II)

Being male

Previous sunburn, outdoor occupation, sunbed use

Immunosuppression

Certain genetic conditions, e.g. xeroderma pigmentosum

Further reading:

https://geekymedics.com/malignant-melanoma-of-the-skin/

Question:

A 20-year-old man presents to the GP due to a lump in his neck. On examination, the lump is in the midline and is not painful on palpation. On protrusion of the tongue, the lump moves upwards. He is otherwise well and clinical examination is unremarkable.

What is the most likely diagnosis?

A. Hodgkin's lymphoma

B. Thyroglossal cyst

C. Lymphadenopathy

D. Cystic hygroma

E. Branchial cyst

Correct Answer:Thyroglossal cyst

Explanation:

The most likely diagnosis is a thyroglossal cyst, given the classic description of a midline neck lump that moves upwards on protrusion of the tongue. Thyroglossal cysts arise from a persistent epithelial tract, the thyroglossal duct, formed with the descent of the thyroid from the foramen caecum to its final position in the front of the neck. The thyroglossal duct is a connection between the tongue and thyroid gland which normally atrophies. The thyroglossal's connection to the tongue is why it moves upwards on during movement of the tongue. Thyroglossal cysts are generally benign but may become infected leading to complications. As a result, thyroglossal cysts are usually surgically excised, along with the tract and part of the hyoid bone.

Branchial cysts are rare and usually present when a patient is in their late teens with a solitary painless swelling in the anterior triangle of the neck. They vary in size and can be painful in some patients.

Cystic hygromas often present at birth or in the first few years of life as painless lumps below the angle of the mandible. They are typically soft, fluctuant and transilluminable.

Lymphadenopathy is a possibility, however, the description of mid-line neck lump that elevates when the tongue is protruded does not fit with this diagnosis.

Further reading:

https://patient.info/doctor/thyroglossal-cysts

Question:

A 58-year-old man presents with palpitations and chest tightness. He has a background of hypertension for which he takes amlodipine 10mg once a day. He had been out with friends last night and consumed 2 bottles of red wine, his normal alcohol intake is 26 units per week, having an alcoholic drink most nights.

ECG:

What rhythm is shown on the ECG?

A. Mult-focal atrial tachycardia

B. Atrial flutter

C. Atrial fibrillation

D. Mobitz Type 2 AV block.

E. Sinus arrhtyhmia

Correct Answer:Atrial flutter

Explanation:

The ECG shows an atrial flutter with a 4 to 1 block. The atrial rate is 300 beats per minute (calculated by 300 divided by the number of the large squares between two consecutive p waves). The ventricular rate is 75 beats per minute (calculated by 300 divided by the number of large squares between consecutive R waves).

The saw-tooth pattern can be seen in V1, highlighted below:

This is not atrial fibrillation as the ventricular rate is regular, atrial fibrillation will lead to an irregularly irregular rhythm.

This is not a sinus arrhythmia as the sawtooth pattern and atrial rate of 300 beats per minute show the underlying atrial flutter.

Mobitz Type 2 atrioventricular node block is a failure to conduct the electrical activity through the AV node. In the case of Mobitz Type 2, you would expect normal p wave morphology followed by a dropped QRS. This is not shown in this ECG.

Multifocal atrial tachycardia is an irregularly irregular rhythm, with at least 3 different p wave morphologies.

Further reading:

https://litfl.com/atrial-flutter-ecg-library/

Question:

A 35-year-old male presents to his GP with a one-week history of constipation and painful rectal bleeding. He reports pain on defecation, which may persist for some time afterwards, and fresh red blood on the toilet paper but none seen in the bowl. He has noted no fevers, weight loss or anorexia and is otherwise well aside from a recent flare-up of back pain for which he takes codeine analgesia.

On examination, he is apyrexial and haemodynamically stable. Abdominal examination is unremarkable. There is a small skin tag at the posterior anal verge, but nil else to note externally. Digital rectal examination is not possible as the patient reports extreme pain.

Which of the following is the most appropriate next step in management?

A. Prescribe a course of antibiotics with good gram-negative and anaerobic cover

B. Urgent referral for colonoscopy to exclude malignancy

C. Prescribe laxatives and a topical GTN ointment

D. Refer for digital rectal examination under general anaesthetic

E. Refer for band ligation of the painful skin tag

Correct Answer:Prescribe laxatives and a topical GTN ointment

Explanation:

This patient most likely has an acute anal fissure, implied by the recent change in bowel habit (likely brought on by his acute codeine use), defecatory pain and examination findings of the sentinel skin tag and severe proctalgia. Tears in the anal mucosa are relatively common in younger adults, especially after the passage of hard stool. They are commonly found in the posterior midline, for which a posited theory is that the fibres constituting the external anal sphincter project forwards and laterally from the coccyx, leaving a less-supported posterior apex where they diverge around the anal canal. The mucosal edges at the site of the tear may ruck up to form a skin tag or sentinel pile.

Primary care management consists of optimising fluid and dietary fibre intake, use of a bulk-forming laxative such as ispaghula husk, simple analgesia and 0.4% GTN ointment for patients who have symptoms for over one week without improvement. GTN helps to relax the smooth muscle of the sphincters, reducing tension across the fissure and thus improving blood flow to facilitate healing.

Most cases heal within a short few weeks of medical management, but refractory cases may be referred to secondary care for consideration of further management. This may entail further medical treatments, such as diltiazem or nifedipine ointments or Botulinum toxin injections to transiently reduce resting sphincteric tone, or in the most severe cases, surgery in the form of lateral sphincterotomy may be indicated.

This patient has none of the red flags mandating referral to secondary care for investigation of malignancy. According to NICE guidelines (see link below), adult patients under the age of 50 with rectal bleeding and an unexplained altered bowel habit should be referred for the exclusion of malignancy. This patient’s altered bowel habit, however, is more than likely explained by his new codeine usage.

Referral for rectal examination under anaesthesia may be worthwhile if there were diagnostic uncertainty and/or concerns for sinister underlying pathology, but there would likely be other features of the case to suggest malignancy or inflammatory bowel disease. Multiple anal fissures may be suggestive of an underlying process such as Crohn’s disease.

Antibiotics may have a role in the management of infective processes but are not routinely indicated for the management of anal fissures. Band ligation is an established procedure for the treatment of refractory haemorrhoids, but again is not routinely indicated in the management of the skin tag associated with anal fissure.

Relevant NICE guidance: https://cks.nice.org.uk/gastrointestinal-tract-lower-cancers-recognition-and-referral#!scenario

Further reading:

https://patient.info/doctor/anal-fissure-pro

Question:

A 40-year-old lady presents to her GP complaining of a lump adjacent to her right nipple. Upon further questioning, she reveals that it is occasionally painful and she has noticed some blood leaking from the nipple, but the lump itself has not changed in size. She is very anxious as her mother developed breast cancer aged 75. She has no significant past medical history and her only medication is the combined oral contraceptive pill.

On general examination, she looks well. Breast examination reveals a small 1cm sub-areola mass and some blood-stained discharge, however, no other changes are noted.

What is the most likely diagnosis?

A. Phyllodes tumour

B. Duct ectasia

C. Intraductal papilloma

D. Fibrocystic breast disease

E. Ductal carcinoma

Correct Answer:Intraductal papilloma

Explanation:

The most likely diagnosis is intraductal papilloma. The history of a breast lump in the areola/nipple region associated with blood-stained discharge in the absence of other skin or nipple changes (puckering, inversion, peau d’orange) makes this the most likely diagnosis.

Ductal carcinoma is less likely as the lump is not located in the upper outer quadrant where the majority of these carcinomas occur. Her mother developing breast cancer at aged 75 does NOT place her at high risk. A single first degree relative under 40 or two first-degree relatives diagnosed at any age is considered high risk.

Duct ectasia is seen in post-menopausal women and usually has white/green discharge.

In fibrocystic breast disease, there are often multiple mobile lumps whose symptoms coincide with the menstrual cycle.

Phyllodes tumour usually enlarges rapidly and can grow to be quite large.

Further reading:

https://patient.info/doctor/benign-breast-disease

Question:

A 60-year-old man presents to his GP with a 3-month history of new constipation. He denies any recent changes to his diet or medications. Upon further questioning, he mentions feeling more tired and having less of an appetite. The patient has a history of hypertension and is on simvastatin for high cholesterol. Examination reveals pallor, a mildly distended abdomen and an empty rectum on DRE.

What is the most appropriate management step at this point?

A. Look at the patient’s current medication list to see if there may be a medication that is causing the constipation

B. Explore the patient’s dietary habits and make suggestions on increasing dietary fibre if appropriate

C. Refer via the suspected cancer pathway referral for an appointment within 2 weeks

D. Refer via the suspected cancer pathway referral for a routine appointment

E. Refer for an OGD, as you think that the cause is most likely in the upper GI tract

Correct Answer:Refer via the suspected cancer pathway referral for an appointment within 2 weeks

Explanation:

Although a vague history, the clinical vignette is suggestive of a malignant cause and therefore the answer follows this. As per the NICE guidelines, any patient who is over 60 with iron deficiency anaemia or a change in their bowel habit qualifies for a 2-week wait appointment. Other qualifying patients/symptoms include:

40+ with unexplained weight loss and abdominal pain

50+ with unexplained rectal bleeding

Any age with occult blood in their faeces

Referring for an OGD would be inappropriate as it would delay in getting the patient to a 2-week appointment, and also the symptoms are more suggestive of lower gastrointestinal pathology. The other answers would potentially be appropriate but fail to take into account the potential severity of this presenting complaint in this age group.

Further reading:

https://www.nice.org.uk/guidance/ng12/chapter/1-recommendations-organised-by-site-of-cancer

Question:

A 52-year-old man presents to the GP, complaining of worsening hearing loss in his right ear, which started six months ago. He denies otalgia, otorrhoea, tinnitus, vertigo, and weakness and has no past medical history of note; nobody in his family has a history of hearing loss. He works as a banker, and is not frequently exposed to loud noises.

Examination of the ear including reveals no abnormalities, and Rinne's test is positive; however, there is lateralisation on Weber's towards the left ear. Audiometry reveals reduced hearing in the right ear, which is worse at higher frequencies. Audiometry of the left ear is unremarkable.

Given the likely diagnosis, what is the most appropriate investigation?

A. Otoacoustic emissions testing

B. MRI head

C. Tympanometry

D. Non-contrast CT head

E. Brainstem auditory evoked response

Correct Answer:MRI head

Explanation:

The most likely diagnosis, in this case, is an acoustic neuroma (also referred to as a vestibular schwannoma); a benign tumour of Schwann cells; this most commonly develops in the cerebellopontine angle and can compress the internal auditory meatus and vestibulocochlear nerve, resulting in sensorineural hearing loss (demonstrated in this patient by the findings of Weber's test, as well as the audiometry result). There should be a high index of suspicion of the condition in any patient with unilateral sensorineural hearing loss confirmed on audiometry; the more common causes of sensorineural hearing loss such as presbyacusis are usually bilateral, and therefore unilateral disease may be indicative of focal pathology.

An MRI head should be arranged for any patient presenting with unilateral sensorineural hearing loss; this will usually allow for the identification of the mass. Surgical resection is usually carried out in masses causing significant hearing loss, or tumours of significant size; further growth of an acoustic neuroma can potentially cause involvement of CN V and CN VII, due to their adjacent location to the cerebellopontine angle. Facial paraesthesia or weakness would likely indicate the involvement of these nerves.

A non-contrast CT head would be an appropriate investigation if a stroke was suspected, due to the fact it is more readily available than MRI. Whilst stroke is a key consideration in any patient with a possible neurological presentation; given that the patient's symptoms have been gradually worsening over a 6 month period, it is unlikely in this case, and an MRI is more appropriate, as it will allow more detailed imaging of any masses.

Tympanometry is often carried out alongside audiometry as a measure of the function of the tympanic membrane; it is unlikely to yield any useful information in the setting of an acoustic neuroma as the tympanic membrane is likely to be functioning normally.

Otoacoustic emissions testing and brainstem auditory evoked response are options for screening the hearing of newborns; they are not investigations that would be used in the setting of suspected acoustic neuroma.

Further reading:

https://patient.info/doctor/acoustic-neuromas

Question:

A 24-year-old man presents to the emergency department with a painful left calf. He describes a 1-day history of pain that came on suddenly and has worsened. He admits to using recreational drugs and often injects them into various sites. He has no significant past medical history but reports having a 10-pack-year smoking history.

On examination, the left calf is paler and colder compared to the right. Both the popliteal pulses are palpable, however, the anterior tibialis is not palpable on the left. He cannot move his left foot and has impaired sensation in his left calf.

What is the most likely diagnosis?

A. Compartment syndrome

B. Critical limb ischaemia

C. Acute limb ischaemia

D. Neuropathic ulcer

E. Deep vein thrombosis (DVT)

Correct Answer:Acute limb ischaemia

Explanation:

The most likely diagnosis is acute limb ischaemia. The typical history for this is a sudden onset, painful limb. The presentation for an acutely ischaemic limb can be remembered using the 6P'S: pain, pallor, pulselessness, paraesthesia, paralysis and perishingly cold. However, it is unlikely that all six symptoms will present simultaneously in clinical practice.

Compartment syndrome is characterised by the 5P'S: reduced power, paralysis, pallor, pain and raised pressure. However, it more typically presents with pain out of proportion to appearance. Whilst there is an overlap of symptoms between this and acute limb ischaemia, and both presentations need urgent treatment, compartment syndrome nearly always presents with a history of trauma or recent surgery/full limb casting.

Critical limb ischaemia also has an overlap of symptoms with acute limb ischaemia; however, the symptoms must be present for a minimum of 2 weeks for a diagnosis of critical limb ischaemia to be made. The natural progression of critical limb ischaemia also follows a different pattern. There would be a gradual worsening of symptoms over the 2 weeks alongside changes in the skin (ulceration or gangrene). As the history reported here is only for 1 day, a diagnosis of critical limb ischaemia would be unlikely.

Neuropathic ulcers typically cause paraesthesia and numbness and are commonly seen in diabetic patients. Whilst a neuropathic ulcer may cause some discomfort and pain, it would not cause pallor or a loss of pulses.

Deep vein thrombosis (DVT) is the formation of a thrombus in a deep vein of the lower limb and usually presents with unilateral erythema, swelling and pain. Whilst this patient does have unilateral symptoms and IV drug use is a risk factor for a DVT, loss of pedal pulses and cooling of the limb are not typical for a DVT and are suggestive of acute limb ischaemia.

Further reading:

https://geekymedics.com/acute-limb-ischaemia/

Question:

A 30-year-old man is being reviewed on the medical ward for acute abdominal pain. He was admitted three days ago for a severe flare of his ulcerative colitis.

He looks alert but pale. He has a heart rate of 123bpm, a respiratory rate of 23/min, a capillary refill time of 3 seconds, a blood pressure of 85/59mmHg, and a temperature of 37.9ºC.

On examination, the abdomen is distended with involuntary guarding and rebound tenderness on palpation. On auscultation, bowel sounds are absent. An abdominal X-ray is performed:

Source: Scott1751, License [CC BY-SA 3.0]

What is the most likely diagnosis?

A. Small bowel obstruction

B. Intestinal perforation

C. Volvulus

D. Large bowel obstruction

E. Toxic megacolon

Correct Answer:Intestinal perforation

Explanation:

Annotated abdominal radiograph showing Rigler sign. Black arrows indicate the ability to make out the continuous outline of the bowel wall. Source: Mikael Häggström, from original by Scott1751, License [CC BY-SA 3.0]

Intestinal perforation is the correct answer. Based on this patient's presentation (acute onset abdominal pain with distension, guarding, rebound tenderness, and absent bowel sounds) and abdominal radiography, the most likely diagnosis is intestinal perforation with pneumoperitoneum. The abdominal radiograph shows Rigler sign (also known as the "double-wall" sign), where the presence of air in the peritoneal cavity and lumen of the bowel accentuate both sides of the bowel wall on a radiograph. Patients with a flare of ulcerative colitis are at particularly high risk of developing intestinal perforation. Volvulus, large bowel obstruction, small bowel obstruction, and toxic megacolon can all progress to intestinal perforation if left untreated; therefore, this is an important complication to identify and rule out.

Volvulus is an abnormal twisting of the intestine and would typically present on the abdominal radiograph as a dilated section of the bowel loop. Volvulus is a form of bowel obstruction and may present with peritonism (guarding, rebound tenderness) and absence of bowel sounds. However, it is not associated with the Rigler sign, as there would be no air in the peritoneal cavity. Sigmoid volvulus is classically associated with the "coffee-bean" sign, whereas caecal volvulus is classically associated with the "embryo sign". Neither of these signs is evident in the abdominal radiograph shown. Furthermore, the air in the peritoneal cavity causing Rigler sign in the vignette would only be present if there is intestinal perforation.

Large bowel obstruction (LBO) results in dilation of large bowel loops (a diameter >6cm) and is most often caused by colorectal carcinoma. Large bowel obstruction typically presents with absolute constipation and vomiting (typically constipation preceding vomiting), and the abdominal radiograph would show dilated large bowel loops (which can be differentiated from small bowel through the appearance of haustra, which do not appear to completely traverse the bowel.)

Small bowel obstruction (SBO) results in dilation of small bowel loops (a diameter >3cm) and is most often caused by intrabdominal adhesions. SBO typically presents with absolute constipation and vomiting (typically vomiting preceding constipation), and the abdominal radiograph would show dilated small bowel loops (which can be differentiated from large bowel through the appearance of valvulae conniventes, which do appear to completely traverse the bowel).

Toxic megacolon (TM) is an important complication and differential for a patient with ulcerative colitis. This patient has had a severe flare of ulcerative colitis and, on assessment, has a low-grade fever which may be attributable to TM (a common complication of UC). On an abdominal radiograph, TM classically causes dilation of the transverse colon with associated loss of haustral markings. Although it is difficult to appreciate whether this is true for the abdominal radiograph in this vignette, the air in the peritoneal cavity causing the Rigler sign in this vignette would only be present if there is intestinal perforation.

Further reading:

https://geekymedics.com/abdominal-x-ray-interpretation/

Question:

A 26-year-old G2P2 is in theatre undergoing an emergency caesarean section due to prolonged labour and a failure to progress. During the procedure, a total of 600ml of blood loss is recorded and the bleeding continues after delivery. The patient is haemodynamically stable.

What is the most appropriate initial management option?

A. Ergometrine

B. Intrauterine balloon tamponade

C. Bimanual compression

D. Oxytocin

E. Hysterectomy

Correct Answer:Bimanual compression

Explanation:

This case demonstrates a primary postpartum haemorrhage (PPH). Primary PPH is defined as blood loss >500ml within 24 hours of delivery. The most common cause is uterine atony, which is more common following prolonged labour and where pregnancy has been induced. Uterine atony is where the uterus fails to contract adequately following delivery.

The four causes of primary PPH can be remembered as the 4 T’s:

Tone: uterine atony

Tissue: retained products of conception

Thrombin: bleeding disorders affecting hemostasis

Trauma: perineal tears, instrumental delivery etc

In the case of uterine atony, mechanical techniques such as bimanual compression and rubbing the uterus to stimulate contraction are typically performed first, with the aim of achieving haemostasis.

Oxytocin and ergometrine are both pharmacological agents used to manage uterine atony and work by increasing uterine contractility. If mechanical measures are ineffective, then these pharmacological agents are typically used.

Surgical measures such as intrauterine balloon tamponade are generally performed if both mechanical and pharmacological measures are ineffective. A hysterectomy is typically a last resort in a life-threatening haemorrhage if haemostasis cannot be achieved.

Further reading:

https://geekymedics.com/postpartum-haemorrhage/

Question:

A 67-year-old man presents to the A&E department with a sudden loss of vision in his left eye.

He was sat eating dinner two hours ago when he suddenly couldn't see out of his left eye. He describes the loss of vision like a "curtain falling down". He did not experience any pain. He reports a similar episode of sudden visual loss about a month ago, but he says that it resolved within seconds; he did not seek any medical attention at the time.

He has a history of type 2 diabetes, hypertension and hypercholesterolemia. He had a myocardial infarction three years ago. He takes metformin 500mg, atorvastatin 80mg, ramipril 10mg, atenolol 25mg and clopidogrel 75mg.

On examination, there is a relative afferent pupillary defect present and perception of light (PL) vision. Dilated fundoscopy reveals a cloudy retina with a cherry-red spot at the fovea centralis.

What is the most likely diagnosis?

A. Central retinal artery occlusion

B. Vitreous haemorrhage

C. Central retinal vein occlusion

D. Amaurosis fugax

E. Retinal detachment

Correct Answer:Central retinal artery occlusion

Explanation:

The most likely diagnosis is a central retinal artery occlusion (CRAO). CRAO is an ocular emergency caused by an embolism or thrombosis in the central retinal artery. It is sometimes referred to as an 'eye stroke'. This patient has significant risk factors for atherosclerosis which is an important risk factor for CRAO. Key features indicating a CRAO on fundoscopy include retinal oedema, a cherry-red macula and segmentation of blood in the retinal arterioles. This ultimately leads to a sudden, profound and painless loss of vision in the affected eye.

Vitreous haemorrhage typically presents with a sudden decrease in vision or large patchy areas of blurry vision in patients with poorly controlled diabetes. Dilated fundoscopy will show evidence of blood in the vitreous.

Whilst a retinal detachment may be described by patients as a "curtain falling down" in their vision, it rarely causes visual loss this profound. Additionally, the presence of a relative afferent pupillary defect and cherry-red macula should raise concerns of underlying ischaemia in the eye.

Ischaemic central retinal vein occlusion (CRVO) may present with an RAPD and severe visual loss; however, fundoscopy shows characteristic dot-and-blot or flame-shaped haemorrhages in all four retinal quadrants, classically referred to as a "blood and thunder" appearance. However, CRVO is an important differential to consider in presentations of sudden painless loss of vision in the elderly, as retinal vein occlusion is the second most common vascular disease of the retina (after diabetic retinopathy).

The previous event of painless loss of vision that spontaneously recovered within seconds is suggestive of amaurosis fugax. However, this presentation has not spontaneously resolved and is accompanied by retinal changes, indicating a more prolonged episode of ischaemia. Amaurosis fugax is a form of transient ischaemic attack.

Further reading:

https://geekymedics.com/central-retinal-artery-occlusion/

Question:

A 44-year-old manual worker presents to the GP worried about a skin lesion that has developed on his shoulder. He states that it has been growing over the past 2 months and has almost doubled in size. The lesion is pigmented and is now beginning to itch.

On examination, the lesion is approximately 10mm in diameter, with the pigment appearing equal throughout, and the border being regular. There is evidence of excoriations around the lesion.

What is the most concerning feature in this case, prompting urgent referral?

A. Regular border

B. Itch

C. History of prolonged sun exposure

D. Diameter greater than 7mm

E. Rapid growth of the lesion

Correct Answer:Rapid growth of the lesion

Explanation:

This case demonstrates malignant melanoma, which can present with a rapidly changing symptomatic, pigmented lesion on sun-exposed areas. Cytology findings of abnormal melanocytic proliferation in the epidermis are typical for malignant melanoma. The correct answer, in this case, is rapid growth of the lesion - this is included as one of the major criteria on the Glasgow/Weighted 7 Point checklist for malignant melanoma. This is a tool often used by GP's to determine whether a pigmented skin lesion warrants an urgent referral. The checklist is comprised of major and minor criteria, with major features scoring 2 points and minor characteristics 1 point - a score of 3 or more is sufficient to warrant a referral.

The criteria are as follows:

Major:

Change in size

Irregular shape or border

Irregular colour

Minor:

Largest diameter 7 mm or more

Inflammation

Oozing or crusting of the lesion

Change in sensation (including itch)

A diameter greater than 7mm is included in the Glasgow Checklist, but is a minor feature, and is unlikely to warrant a referral on its own. It is however an important feature to consider; it is included in the ABCDE mnemonic for melanoma:

A - asymmetry

B - border irregularity

C - change in shape/size

D - diameter greater than 7mm

E - evolution of the skin lesion

The fact the lesion has a regular border is a reassuring factor rather than one indicating a need for referral. Malignant melanomas classically have irregularities in terms of border and colour distribution; hence the reason for the GP describing the lesion as a non-classical presentation.

A history of prolonged sun exposure is a risk factor for melanoma (and any form of skin cancer for that matter) but is not included in the Glasgow Checklist, and will not be sufficient for a referral without worrying characteristics of the lesion.

Itch is included as a minor feature of the Glasgow Checklist but is not the most worrying feature of this presentation.

Further reading:

https://cks.nice.org.uk/topics/melanoma-pigmented-lesions/diagnosis/assessment/

Question:

A 60-year-old male golf player attends his GP with a lesion located on his right lower eyelid. He reports that he first become aware of the lesion around 4 months previously and has noticed that it has slowly grown in size over this period. There is no associated lesion pain.

On examination, there is a 10 x 12 mm hard, nodular lesion on the right lower eyelid. It has a ‘pearly’ appearance at the edges and telangiectasia can be seen.

What is the MOST LIKELY diagnosis in this case?

A. Basal cell carcinoma

B. Papilloma

C. Hidrocystoma

D. Melanoma

E. Squamous cell carcinoma

Correct Answer:Basal cell carcinoma

Explanation:

The most likely diagnosis, in this case, is periocular basal cell carcinoma (BCC). This is the most common periocular malignancy.

Risk factors for basal cell carcinoma include:

environmental factors (sun exposure, ionizing radiation, smoking and trauma)

inherited diseases (e.g. albinism)

immunosuppression

Fitzpatrick type 1 skin colour

The main causative factor is sun exposure. Symptoms of BCC include a slow-growing, painless lesion that may intermittently bleed.

Signs of this condition vary depending on the type of BCC:

nodular (hard nodule with a pearlescent appearance and telangiectasia)

nodulo-ulcerative (same as nodular plus a central ulcer with a peripherally rolled edge)

A papilloma is less likely in this case as they present as wart-like growths.

A squamous cell carcinoma would more likely present as an ulcerated lesion that is tender.

Hidrocystoma is not likely in this case. This condition presents as a translucent cyst filled with a jelly-like substance arising from an eyelid.

Melanoma of the eyelid would more likely present with a pigmented lesion.

Further reading:

https://patient.info/doctor/basal-cell-carcinoma

Question:

A 6-year-old girl is brought to the GP because of a rash on her chest lasting 48 hours. The mother is concerned as the skin looks blistered and red.

She has no significant past medical history and is up-to-date on all childhood vaccinations. She has no known drug allergies.

On examination, the girl appears well, and all vital signs are normal. Closer inspection of the chest reveals vesicles and some flaccid bullae; a thin band of erythema surrounds the bullae. The bullae are filled with clear fluid, and some are covered in a yellow crust.

What is the most appropriate initial management in this patient?

A. Topical hydrogen peroxide 1% cream

B. Oral flucloxacillin

C. Topical fusidic acid 2% cream

D. Advise on skin hygiene

E. Oral clarithromycin

Correct Answer:Oral flucloxacillin

Explanation:

The most likely diagnosis in this patient is bullous impetigo - a superficial infection of the skin caused by the bacteria Staphylococcus aureus. Bullous impetigo accounts for approximately 30% of cases of impetigo and is characterised by the development of vesicles that progress to form large, flaccid bullae, which persist for up to 2-3 days. When these blisters rupture, they leave behind a thin, flat, yellow/brown crust. If large areas of skin are affected, the patient may also present with systemic symptoms; however, this patient has a small area affected and is systemically well. NICE guidelines recommend a short course of oral antibiotics for all patients with bullous impetigo. In children aged 2-9 years, oral flucloxacillin for five days (125-250mg four times daily) is the recommended therapy.

In adults or children with a penicillin allergy, oral clarithromycin is recommended as a suitable alternative. Oral antibiotics are recommended to manage bullous impetigo and non-bullous impetigo if patients are systemically unwell or at high risk of complications. However, as this child does not have a history of a penicillin allergy, clarithromycin would not be considered the most appropriate initial management.

In patients with localised non-bullous impetigo, topical hydrogen peroxide 1% cream should be offered as a first-line treatment. This patient has clear evidence of bullae and vesicles on examination; therefore, topical therapy alone would not be recommended.

In patients with localised non-bullous impetigo, topical antibiotics such as fusidic acid 2% are considered a second-line treatment when hydrogen peroxide is not deemed suitable. This patient has clear evidence of bullae and vesicles on examination; therefore, topical therapy alone would not be recommended.

In addition to antibiotic therapy, providing information regarding good hygiene measures to reduce the spread of impetigo is also recommended. Key recommendations include twice-daily washing the affected area with soap and water, avoiding scratching, and reducing transmission by not sharing items such as towels. Skin hygiene measures are not considered suitable in isolation; however, they should form an adjunct to antibiotic therapy.

Further reading:

https://cks.nice.org.uk/topics/impetigo/

Question:

A 68-year-old female presents to the emergency department with a left-sided temporal headache, which started 16 hours ago. She scores the pain as 8/10 which is exacerbated when brushing her hair. She also notes pain in her jaw which is worse when eating. She has no change in vision, no nausea and has not collapsed. Her past medical history includes polymyalgia rheumatica and hypothyroidism.

Her temperature is 36.7°C, heart rate is 82 bpm, and her blood pressure is 130/84 mmHg. On examination, the left side of the scalp is tender to palpate. Neurological exam is unremarkable.

What is the most likely diagnosis?

A. Subarachnoid haemorrhage

B. Migraine

C. Tension headache

D. Cluster headache

E. Temporal arteritis

Correct Answer:Temporal arteritis

Explanation:

Temporal arteritis (also known as giant cell arteritis) is a systemic vasculitis. Temporal arteritis can present as a subacute onset unilateral headache with tongue and jaw claudication, scalp tenderness, and/or painless visual loss. It is a medical emergency that requires prompt management to prevent severe complications such as permanent vision loss.

Subarachnoid haemorrhage classically causes a sudden occipital (thunderclap) headache, nausea, vomiting, and meningism, and can present with coma or seizures. Temporal arteritis typically presents with gradual onset symptoms.

Cluster headaches can present with rapid onset severe pain around or behind the eye. It is often associated with an erythematous, watery eye and nasal congestion. Temporal arteritis pain is typically localised to the frontal area/scalp rather than the eye.

Migraines are typically felt as a unilateral throbbing pain, with photo- or phonophobia and nausea and vomiting. It is characterised by recurrent attacks and may occur with aura. Temporal arteritis can present with painless vision loss, but aura is not typical.

Tension headaches are typically bilateral and feel like a pressure or tightening band around the head. It may be worse on palpation. Tension headaches may cause neck tenderness, but are not normally associated with jaw claudication.

Further reading:

https://geekymedics.com/temporal-arteritis/

Question:

A 50-year-old man presents with a 3-week history of feeling generally unwell. He reports flu-like symptoms and nasal congestion, associated with chest pain and worsening shortness of breath. Past medical and family history are unremarkable.

On examination, he is tachypnoeic. His nasal septum is crusted, and you hear bilateral fine basal crackles on chest auscultation. His JVP is not raised. His abdomen is soft and non-tender.

Urinalysis shows blood (2+), protein (2+). Bloods show Hb 75 (130 – 180 g/L), WCC 8.2 (3.6 – 11.0 x 10⁹/L), CRP 60 (<5mg/L), ESR 120 (2-10), creatinine 400 (59 – 104 μmol/L), urea 19 (2.5 – 7.8 mmol/L)

CXR shows nodular shadowing and pulmonary infiltrates bilaterally.

What is the most likely diagnosis?

A. Goodpasture’s syndrome

B. Systemic lupus erythematosus

C. Churg-Strauss syndrome

D. Granulomatosis with polyangiitis

E. Microscopic polyangiitis

Correct Answer:Granulomatosis with polyangiitis

Explanation:

The correct answer is granulomatosis with polyangiitis (GPA). The question stem describes a pulmonary-renal syndrome. GPA is a small vessel vasculitis which commonly causes sinusitis which can progress to pulmonary haemorrhage (as demonstrated by clinical findings and CXR description) and renal involvement.

Goodpasture’s syndrome can cause haemoptysis/pulmonary haemorrhage and acute renal failure but is not associated with the chronic sinusitis seen in this case.

Microscopic polyangiitis is also a small vessel vasculitis but does not cause granuloma formation and would not result in respiratory involvement.

Churg-Strauss syndrome is a small vessel vasculitis which can present similarly to the case above but questions tend to point to a history of asthma.

Systemic lupus erythematosus very rarely causes acute pulmonary haemorrhage and would not result in granuloma formation.

Further reading:

https://patient.info/doctor/granulomatosis-with-polyangiitis-wegeners-granulomatosis-pro

Question:

Mr Sanderson, a 66-year-old man, presents to his GP with a one-month history of dysphagia. The dysphagia progressively worsened over the last month and as a result, he is now only eating soft foods, as other food types such as meat felt like they were getting stuck. He has a long history of acid reflux for which he takes gaviscon. He has lost around 5kg of weight in this time but puts this down to the change in his diet.

His GP refers him for an urgent upper gastrointestinal endoscopy. This reveals a stricture near to the oesophageal junction which appears malignant. A tissue sample is taken and sent for analysis.

What is the most likely histological finding?

A. Squamous cell carcinoma

B. Metaplasia

C. Leiomyoma

D. Squamous papilloma

E. Adenocarcinoma

Correct Answer:Adenocarcinoma

Explanation:

The history and endoscopy appearance are in keeping with a malignant oesophageal stricture. Adenocarcinoma is the most common type of oesophageal cancer. It arises from the columnar epithelium and is, therefore, most common in the lower two-thirds of the oesophagus. Acid reflux and Barrett’s oesophagus are the key risk factors for adenocarcinoma.

Squamous cell carcinoma is the second most common subtype. It arises from the squamous epithelium and therefore affects the upper third of the oesophagus. Smoking is a key risk factor for this type of oesophageal cancer.

Leiomyoma and squamous papilloma are both rare benign oesophageal tumours.

Further reading:

https://patient.info/doctor/oesophageal-cancer-pro

Question:

A 26-year-old man presents to the GP with a 3-day history of a painful, hot and swollen left knee and elbow. He explains he feels unwell and felt especially tired this morning, which prompted him to come in.

He has no other past medical history and has no known allergies. He mentions he rarely comes to the doctor. About one month ago, he experienced a few days of bloody diarrhoea after eating at a restaurant, however, did not seek medical attention.

On examination, his left knee and elbow joints have a limited range of movement and appear red and swollen. There is also notable conjunctival redness. All other vital signs are normal.

What is the most appropriate initial management in this patient?

A. Oral azithromycin

B. Oral sulfasalazine

C. Oral prednisolone

D. Oral clarithromycin

E. Oral naproxen

Correct Answer:Oral naproxen

Explanation:

The most likely diagnosis in this patient is reactive arthritis (ReA), formerly known as Reiter's syndrome. ReA is a form of inflammatory arthritis that belongs to the seronegative spondyloarthropathies and occurs after exposure to certain gastrointestinal or genitourinary infections. The brief history of bloody diarrhoea in this patient most likely represents campylobacteriosis. Typically, ReA presents with peripheral or axial arthritis, enthesitis, conjunctivitis and skin lesions, and systemic symptoms of fever and malaise. Treatment of ReA is aimed at symptomatic relief and preventing joint damage. Non-steroidal anti-inflammatory drugs (NSAIDs) such as naproxen or ibuprofen are typically prescribed. It is important to note that no one NSAID is considered superior to any other in the management of ReA.

The brief history of bloody diarrhoea in this patient most likely represents campylobacteriosis. The patient reports these symptoms lasted only a few days and have since resolved, indicating targeted antibiotic therapy is no longer required. Campylobacteriosis is frequently a self-limiting condition, and antibiotic treatment with oral clarithromycin is only recommended if patients are immunocompromised or have a severe infection.

Patients who have reactive arthritis with symptoms that are unresponsive to NSAIDs may be considered for corticosteroids, such as oral prednisolone. Corticosteroids are typically not regarded as first-line management and should only be used when a patient has failed to respond to NSAIDs in the first instance.

Disease-modifying rheumatic agents (DMARDs) such as sulfasalazine are only considered when NSAIDs fail or when more aggressive treatments are required to prevent joint destruction. Therefore, it would not be appropriate to prescribe sulfasalazine at this stage.

Reactive arthritis typically presents 2-4 weeks after a genitourinary tract or gastrointestinal infection; the history in this patient suggests an enteric infection. However, in patients with uncomplicated genital chlamydial infections, appropriate antibiotic treatment should be commenced. The treatment of choice for genital chlamydial infections is oral azithromycin. This patient has not reported any suggestive features of genital infections; therefore, this would not be appropriate management.

Further reading:

https://patient.info/doctor/reactive-arthritis-pro

Question:

An 80-year-old woman presents to the emergency department with left-lower quadrant pain. The pain came on gradually 5 days ago and is getting progressively worse. She also complains of anorexia and diarrhoea, which started around the same time. She is opening her bowels 5 times daily but has no urinary symptoms. She has a past medical history of Parkinson's disease and takes levodopa. Ten years ago, she developed angiooedema after being prescribed a macrolide for pneumonia.

On examination, she has tenderness in the left lower quadrant.

NEWS score 2:

Pulse: 105 bpm

Blood pressure: 135/80 mmHg

Respiratory rate: 15

Oxygen saturation: 97% on room air

Temperature: 38.4C

Given the most likely diagnosis, what is the most appropriate antibiotic to prescribe?

A. Clarithromycin

B. Piperacillin/tazobactam (Tazocin)

C. Cefalexin

D. Gentamicin and metronidazole

E. Co-amoxiclav

Correct Answer:Co-amoxiclav

Explanation:

The most likely diagnosis is diverticulitis due to the left-lower quadrant pain associated with diarrhoea, anorexia, and pyrexia. The pain is classically in the left lower quadrant due to the sigmoid colon being the most common area with diverticula. The lumen of the sigmoid colon is the narrowest of the whole bowel, leading to intraluminal higher pressures.

According to NICE, co-amoxiclav 500/125 mg three times daily is the recommended treatment for acute diverticulitis requiring hospitalisation. However, if the diverticulitis is complicated (usually implying an abscess, perforation, or sepsis), the patient may require the addition of metronidazole for additional anaerobic cover.

Cefalexin is usually prescribed in combination with metronidazole for diverticulitis in patients who are allergic to co-amoxiclav or where co-amoxiclav is unsuitable.

Gentamicin and metronidazole are usually not prescribed for acute diverticulitis but are commonly co-prescribed with amoxicillin for intra-abdominal sepsis.

Piperacillin/tazobactam (Tazocin) is a broad-spectrum antibiotic usually reserved for sepsis in specific health boards but may be considered if the diverticulitis worsens.

Clarithromycin is a macrolide that is not used for diverticulitis. Furthermore, the patient has an allergy to macrolides, where she developed angioedema, so it should be avoided.

Further reading:

https://cks.nice.org.uk/topics/diverticular-disease/management/acute-diverticulitis/

Question:

A 30-year-old woman presents to her GP with a new itchy rash on her left arm. She first noticed it yesterday, having bought herself a new watch the day before. On examination, there is an erythematous circular lesion on the dorsal aspect of her left wrist with dry and cracked skin. The surrounding skin appears normal and she has no other lesions on her body.

What is the most appropriate investigation to confirm the likely diagnosis?

A. Serum mast cell tryptase

B. Patch test

C. Prick test

D. Excision biopsy

E. Skin scraping

Correct Answer:Patch test

Explanation:

This patient likely has allergic contact dermatitis due to exposure to the nickel in her new watch. A nickel allergy is a common cause of allergic contact dermatitis, with earrings, belt buckles and watches being common nickel-containing triggers. Other common triggers include soaps, fragrances and cosmetics. The investigation of choice for diagnosing allergic contact dermatitis is a patch test, not to be confused with a prick test, which is used to diagnose allergies to foods and inhaled allergens.

A skin scraping is used to diagnose fungal infections of the skin. Although tinea corporis is an important differential for an itchy erythematous round rash, the description of the onset coinciding with the purchase of a new watch points more towards allergic contact dermatitis. Furthermore, the rash caused by tinea corporis is often described as ‘scaly’ and ‘annular’ (ring-like in shape).

An excision biopsy would be an appropriate investigation for suspected skin cancer. Although squamous cell carcinomas can present as a rough, scaly red patch that is itchy, they often develop over weeks to months and may have additional features such as bleeding, ulceration and irregular borders.

Serum mast cell tryptase is used to diagnose anaphylaxis, it plays no role in the diagnosis of allergic contact dermatitis.

Further reading:

https://dermnetnz.org/topics/patch-tests

Question:

A 12-year-old boy is having his annual review for his asthma. He was diagnosed last year and was started on a salbutamol inhaler. Over the past four weeks, he has had to use his inhaler 2-3 times each week and wakes up at least once a week at night with a cough. He also complains of shortness of breath nearly every day.

This patient's inhaler technique is checked in the clinic and is adequate.

What is the next best step in this patient's management?

A. Add a leukotriene receptor antagonist inhaler

B. Add an oral corticosteroid

C. Add a low dose inhaled corticosteroid inhaler

D. Add a short acting muscarinic agonist inhaler

E. Add a long acting beta agonist inhaler

Correct Answer:Add a low dose inhaled corticosteroid inhaler

Explanation:

Although the NICE and British Thoracic Society (BTS) guidelines may differ, they both agree that if a child between the ages of 5-17 has poorly controlled asthma in the past 4-8 weeks, the next best step would be to add a regular low dose inhaled corticosteroid (ICS).

Adding a leukotriene receptor antagonist inhaler is considered a potential first-line therapy in children under five or an add-on therapy if the asthma control is insufficient despite the addition of a regular low-dose ICS. This patient has only been on reliever therapy, so the next best step would be the addition of the low-dose ICS preventer.

Adding a long-acting beta-agonist inhaler may be considered as an add-on therapy for this child if he has inadequate control despite the addition of the low-dose ICS preventer. This patient has only been on reliever therapy, so the next best step would be the addition of the low-dose ICS preventer.

Short-acting muscarinic agonists are not routinely used in managing asthma in children and are not recommended in the NICE or BTS guidelines.

A specialist may initiate an oral corticosteroid following a poor response to a fixed high-dose ICS and long-acting beta-agonist therapy. This patient has only been on reliever therapy, so the next best step would be the addition of the low-dose ICS preventer.

Further reading:

https://geekymedics.com/asthma/

Question:

A 39-year-old male presents to the emergency department with knee pain following an injury he sustained 2 hours prior. He sustained a traumatic injury to his right knee and felt a pop in the knee at the time. He now has pain on ambulation.

Physical examination is significant for tenderness around the medial aspect of the right knee joint and increased laxity with valgus stress testing of the knee. A small effusion around the right knee joint can be appreciated.

What is the most likely diagnosis?

A. Lateral collateral ligament injury

B. Anterior cruciate ligament injury

C. Posterior cruciate ligament injury

D. Medial collateral ligament injury

E. Achilles tendon rupture

Correct Answer:Medial collateral ligament injury

Explanation:

This young male patient has likely sustained a medial collateral ligament injury. Tenderness at the medial aspect of the knee joint as well as increased laxity when a valgus force is applied to the knee joint are common physical findings of this type of injury. Treatment can vary from conservative management with measures such as analgesics, rest, ice and compression to orthopaedic surgery for patients that are looking to return to a high level of activity.

Lateral collateral ligament injuries are likely to have pain at the lateral aspect of the knee joint. Additionally, pain and increased laxity are more likely to be seen when a varus force is applied to the knee joint.

Anterior cruciate ligament injuries are more likely to present with a large knee joint effusion. The anterior drawer and Lachman’s test can be conducted in the clinical setting to confirm the diagnosis.

Posterior cruciate ligament injury is uncommon and is more likely to be seen when there is a direct posterior force applied to the knee joint. Posterior drawer test can confirm diagnosis clinically.

Achilles tendon rupture is seen in sports that require rapid acceleration and pivoting, such as basketball or squash. Clinically, it is more likely to present with severe pain with most patients stating it feels like they have struck violently at the back of the ankle.

Further reading:

https://patient.info/doctor/knee-ligament-injuries-pro

Question:

A 52-year-old woman is reviewed in the Neurology clinic having been referred by her GP with a 6-month history of slowly worsening neck pain and stiffness. She finds her head tilting to the right side and experiences an uncomfortable tightness with painful spasms. She has noticed that brushing her cheek occasionally eases the symptoms. The patient has no other medical problems and takes no regular medications, does not smoke and drinks 1-2 bottles of wine per week.

The neurologist diagnoses the patient with cervical dystonia.

Which intervention is most likely to be effective in managing her symptoms?

A. Botulinum toxin (Botox) injections

B. Cervical spine immobilisation

C. Morphine

D. Medial temporal lobectomy

E. Gabapentin

Correct Answer:Botulinum toxin (Botox) injections

Explanation:

Cervical dystonia, or spasmodic torticollis, is focal dystonia affecting the neck - most commonly the sternocleidomastoid muscle causing head tilt. It may be idiopathic and isolated or seen in conjunction with other movement disorders. Sensory tricks are often identified by the patient to relieve symptoms, such as stroking the cheek.

Botox injections are effective for managing the symptoms of focal dystonia. They are not curative but when provided regularly can be highly beneficial. Other treatment options include trials of medications such as muscle relaxants, physiotherapy and consideration of surgery.

Use of soft collars is sometimes helpful for patients in whom a sensory trick is effective, but cervical spine immobilization is a technique primarily used in trauma situations where there is the concern of a potential cervical spine injury. Medications such as gabapentin and morphine have not been shown to be effective treatments for torticollis, and have addictive properties and numerous side effects and should, therefore, be avoided.

The most routinely performed surgical procedure for cervical dystonia is deep brain stimulation (DBS). Medial temporal lobectomy is a surgical technique used in cases of epilepsy-related to conditions such as mesial temporal sclerosis and is not useful for cervical dystonia.

Further reading:

https://patient.info/doctor/neck-pain-cervicalgia-and-torticollis

Question:

A 6-year old boy presents to A&E with a 2-day history of limping. He complains of severe pain in his left leg whenever he weight bears. His father reports that his son has also suffered from several infections recently, including 3 throat infections and impetigo, all managed by the GP. He also reports fever over the last week or so and general fatigue. The child has no other past medical history, is up to date with his immunisations and takes no regular medications.

Clinical examination reveals pallor, generalised lymphadenopathy and splenomegaly. There is significant tenderness over the mid-shaft of the left femur on palpation, but normal range of motion in all joints and an antalgic gait. Vital signs reveal fever and tachycardia.

Blood tests reveal:

Hb: 7.0 g/L

WCC: 21 × 109/ L

Neutrophils: 1.0 × 109/ L

Serum LDH: 3090 U/L

What is the most likely diagnosis?

A. Perthes disease

B. Osteomyelitis

C. Acute lymphoblastic leukaemia (ALL)

D. Septic arthritis

E. Juvenile idiopathic arthritis

Correct Answer:Acute lymphoblastic leukaemia (ALL)

Explanation:

The most likely diagnosis is acute lymphoblastic leukaemia (ALL). ALL is the most common malignancy in young children aged 2-6 years old and involves the malignant transformation of a clone of cells from lymphoid progenitor cells. Lymphoid precursors proliferate and crowd-out normal cells in the bone marrow, leading to anaemia, thrombocytopaenia and neutropaenia.

Children typically present with fatigue, unusual bone/joint pain, recurrent infections, fever, dyspnoea, bruising, spontaneous bleeding and headache. Clinical signs include pallor, tachycardia, petechiae, hepatomegaly, splenomegaly, lymphadenopathy, testicular swelling, gum hypertrophy and cranial nerve palsies.

Blood tests usually reveal anaemia, thrombocytopaenia, raised WCC (although this can be normal or low), neutropaenia, raised LDH and blasts on blood film.

Perthes’ disease is caused by idiopathic avascular necrosis of the femoral head. This commonly affects boys aged 4-10 years old. Antalgic gait is common and there is usually groin tenderness which is not elicited in this patient. Perthes disease also causes a reduced range of motion of the hip joint (on abduction and internal rotation).

Children with septic arthritis usually present with joint swelling, erythema, reduced range of motion and fever. This child's presentation doesn't fit with this diagnosis, although infection should be considered in all children with ALL given their vulnerability for co-existing infection.

Juvenile idiopathic arthritis (JIA) is a chronic condition, usually affecting children aged less than 16 years old. Patient with JIA present with polyarthropathy and a history of morning stiffness with impaired joint function.

Osteomyelitis involves infection of the bone, typically caused by S.aureus. Patients typically present with fever, bone pain and raised inflammatory markers. The anaemia, raised LDH and neutropaenia in this scenario do not fit with this diagnosis.

Further reading:

https://patient.info/doctor/acute-lymphoblastic-leukaemia-pro

Question:

A 65-year-old male is found to have lower zone fibrosis on a chest x-ray to investigate for progressively worsening shortness of breath.

What is the most likely cause?

A. Ankylosing spondylitis

B. Coal workers' pneumoconiosis

C. Idiopathic pulmonary fibrosis

D. Extrinsic allergic alveolitis

E. Silicosis

Correct Answer:Idiopathic pulmonary fibrosis

Explanation:

The correct answer is idiopathic pulmonary fibrosis. All the other options listed predominate in the upper zones. In general, the inhaled causes of interstitial lung disease predominate in the upper zones.

Further reading:

https://litfl.com/pulmonary-fibrosis-ddx/

Question:

A 26-year-old woman presents to his GP with a rash that first appeared 3-days ago. She says has been feeling 'run down' over the last week as well.

She has no significant past medical history. She takes Yasmin (Ethinylestradiol 30 micrograms / Drospirenone 3 mg) once a day. NKDA.

She has not travelled abroad but recently went on a camping trip in the south of England.

On examination, her temperature is 37.8°C; all other vital signs are within normal limits. On closer inspection of the skin, multiple skin lesions are identified. The lesions measured between 3-7cm in diameter and have a large central clearing. A pregnancy test performed in the clinic is negative.

What is the most appropriate initial management step?

A. Oral amoxicillin

B. Intravenous ceftriaxone

C. Oral doxycycline

D. Oral ibuprofen

E. No treatment required

Correct Answer:Oral doxycycline

Explanation:

The most likely diagnosis in this patient is Lyme disease - an infectious disease caused by the spirochete Borrelia genus, most commonly transmitted to humans through the bite of infected ticks. NICE guidelines recommend that all people with erythema migrans, without any focal neurological signs or cardiac involvement, should be started on oral doxycycline as the first-line management.

If oral doxycycline cannot be given to a patient due to contraindications, such as allergy or pregnancy, oral amoxicillin can be used as an alternative. However, this patient does not have any apparent contraindications to doxycycline; therefore, amoxicillin would not be the most appropriate initial treatment option.

In patients presenting with symptoms secondary to central nervous system involvement (e.g. myelitis, encephalitis, vasculitis), the recommended first-line treatment is intravenous ceftriaxone. The duration of treatment is typically 2-3 weeks; however, these cases should be managed under specialist supervision.

In patients with arthritis secondary to Lyme disease, NSAIDs such as ibuprofen can be used for symptom relief. NSAIDs should only be used alongside antibiotic therapy and are not considered an alternative monotherapy. Therefore, ibuprofen alone would be regarded as an inappropriate initial management option.

All patients with clinically suspected or diagnosed Lyme disease should receive treatment with an antibacterial drug. Therefore, no treatment required would not be an appropriate management option for this patient.

Further reading:

https://bnf.nice.org.uk/treatment-summary/lyme-disease.html

Question:

A 50-year-old man presents to A+E with painless, frank haematuria with clots. This occurred the previous year but he did not attend the haematuria clinic for follow up. He has no fevers, does not remember hurting himself but complains of being off his food recently with some weight loss. He is normally fit and well. He has a 20-pack-year smoking history and drinks very little alcohol.

On examination, there is a mass palpable in the left flank. Prostate examination reveals a mildly enlarged but smooth prostate. A urine dip is performed that shows blood (+++), leucocytes (+), and no nitrites or protein.

What is the most likely cause of this man’s haematuria?

A. Renal stones

B. Urinary tract infection

C. Bladder cancer

D. Renal cancer

E. Prostate cancer

Correct Answer:Renal cancer

Explanation:

The most likely diagnosis is renal cell carcinoma, given the history of weight loss, frank haematuria and the presence of a mass in the patient's flank.

Renal cell carcinoma (RCC) is the most common of the tumours of the kidney in adults, accounting for over 80% of neoplasms arising from the kidney. Risk factors include smoking, obesity and hypertension.

In this case, there was no history of trauma and infection seems unlikely given the absence of infective-type symptoms (i.e. fever, dysuria, rigors) and negative nitrites on urine dip.

Renal stones typically present with renal colic and microscopic haematuria.

A smooth, mildly enlarged prostate is much more likely to be due to benign prostatic hyperplasia than prostate cancer.

Bladder cancer is a possibility, as it can also present with frank haematuria and weight loss. However, the presence of a mass in the flank makes a diagnosis of renal cell carcinoma more likely in this scenario.

Further reading:

https://patient.info/doctor/renal-cancer

Question:

You are a junior doctor working in an inner-city general practice seeing patients who have booked urgent, same-day appointments. Your next patient is a 62-year-old female who is accompanied by her son. She is complaining of a headache at the back of her head and is clutching at her head with her left hand. The headache came on very suddenly and reached its maximum intensity within a couple of minutes. She moans and groans in pain whilst sat in the consultation room, but tells you her headache is 7 out of 10 severity and she 'didn't want to bother anyone'. She is also complaining of a stiff neck and lower back. She has had her eyes closed most of the consultation as the light hurts them.

The limited neurological examination she allows you to conduct is grossly normal.

What is the most appropriate course of action?

A. Commence sumatriptan and review response

B. Advise resting in a darkened room and review next week

C. Commence codeine and reassure

D. Commence paracetamol and reassure

E. Urgent transfer to the local emergency department

Correct Answer:Urgent transfer to the local emergency department

Explanation:

A thunderclap headache is defined as a 'sudden onset headache reaching maximum intensity within 5 minutes'. The patient describes this and also exhibits signs and symptoms of meningism with photophobia and neck stiffness. The primary concern should be that she has sustained a subarachnoid haemorrhage - in this case, urgent transfer to the local emergency department is the most appropriate course of action. There she would required investigations including, but not limited to, a CT brain scan and/or lumbar puncture if required. Note that a grossly normal neurological examination is not reassuring here.

She does need analgesia however commencing codeine or paracetamol alone is not appropriate given the potentially serious underlying cause. Sumatriptan is used in the acute treatment of migraine and as such would not be indicated first-line in this instance. Likewise advising rest in a darkened room is appropriate advice for migraine management but not here.

Further reading:

https://www.nice.org.uk/guidance/cg150/chapter/Recommendations

Question:

A 36-year-old G3P2 woman at 11 weeks gestation is admitted with hyperemesis gravidarum. She is unable to tolerate oral fluids. On examination, she is tachycardia with dry mucous membranes.

Urea & electrolytes Result Reference values

Sodium 125 mmol/L 133 – 146

Potassium 3.3 mmol/L 3.5 – 5.3

Bicarbonate 32 mmol/L 22 - 26

Urea 9.2 mmol/L 2.5 - 7.8

Creatinine 105 μmol/ L 45–84

What is the most appropriate rehydration regimen?

A. 5% glucose with potassium chloride

B. 0.9% odium chloride with potassium chloride

C. 0.9% sodium chloride

D. 5% glucose

E. Compound sodium lactate

Correct Answer:0.9% odium chloride with potassium chloride

Explanation:

The most important intervention in hyperemesis gravidarum (HG) is an appropriate intravenous fluid and electrolyte replacement regime. There is no evidence to determine which fluid regimen is most appropriate but given that most women admitted to hospital with HG are hyponatraemic, hypochloraemic, hypokalaemic and ketotic, it seems appropriate to use 0.9% sodium chloride with potassium chloride.

This patient's blood results show that they are in metabolic alkalosis, with excess bicarbonate in the body fluids as well, due to the vomiting of the H+ from the stomach acid.

Dextrose-containing solutions can precipitate Wernicke’s encephalopathy in thiamine-deficient states. Hence, each day that intravenous dextrose is administered, high (e.g. 100 mg) doses of parenteral thiamine should be given to prevent Wernicke’s encephalopathy.

Further reading:

https://www.rcog.org.uk/globalassets/documents/guidelines/green-top-guidelines/gtg69-hyperemesis.pdf

Question:

A 35-year-old male presents to the GP for a repeat blood pressure assessment, after he was found to be hypertensive a week earlier (162/100 mmHg). He has experienced some intermittent headaches and fatigue but feels otherwise well. He has no past medical history and no significant family history. His blood pressure on this occasion is 168/102 mmHg.

Clinical examination of the cardiovascular system is unremarkable and there are no renal artery bruits noted on auscultation. Neurological examination is unremarkable, with no evidence of papilloedema. The patient appears a normal BMI and other vital signs are normal.

Blood tests taken the previous week reveal:

Hb 15.5 g/dL

Sodium 149 mmol/L

Potassium 3.0 mmol/L

Urea 3.0 mmol/L

Creatinine 60 umol/L

What is the most likely diagnosis?

A. Conn’s syndrome

B. Renal artery stenosis

C. Essential hypertension

D. Cushing’s disease

E. Cushing’s syndrome

Correct Answer:Conn’s syndrome

Explanation:

The most likely diagnosis is Conn's syndrome, given the presence of persistent hypertension, hypokalaemia and hypernatraemia in a young individual. Other associated symptoms can include headaches, weakness (due to hyperkalaemia) and fatigue.

Conn's syndrome involves the production of excessive amounts of aldosterone by an adrenal adenoma (a form of primary hyperaldosteronism). Further investigations to confirm the diagnosis include:

Spot renin and aldosterone levels - aldosterone will be raised and renin will be low in the context of Conn's syndrome

CT/MRI imaging - to identify the adrenal adenoma

Cushing's syndrome typically presents with truncal obesity, facial fullness, proximal muscle wasting, hypertension, striae, oedema, reduced libido and diabetes. Although hypertension is present in this scenario, the normal BMI, hypokalaemia, hypernatraemia and absence of other Cushingoid features make Conn's syndrome a more likely diagnosis. Cushing's disease is a sub-type of Cushing's syndrome, involving the production of excessive ACTH by a pituitary adenoma.

Renal artery stenosis is a possibility, as it typically presents with abrupt onset hypertension in middle-aged or older individuals. However, the absence of renal artery bruits and the normal renal function make the diagnosis less likely.

Essential hypertension of this degree would be unusual to develop in an otherwise well 35-year-old patient with no obvious cardiovascular risk factors. It would also not explain the presence of hypokalaemia and hypernatraemia.

Further reading:

https://patient.info/doctor/hyperaldosteronism

Question:

A new antibody test is developed for detecting lupus. It is found to have a sensitivity of 70% and a specificity of 98%.

What can be concluded about the test based on the sensitivity and specificity?

A. A positive result is likely to rule out lupus

B. A positive result is likely to rule in lupus

C. A positive result is equally likely to rule in and rule out lupus

D. A negative result is likely to rule out lupus

E. A negative result is likely to rule in lupus

Correct Answer:A positive result is likely to rule in lupus

Explanation:

If a test has a high specificity, it is unlikely to be positive in an individual without the condition. Therefore, if a test with a high specificity returns a positive result, this rules in the condition and so the correct answer is a positive result is likely to rule in lupus.

This can be remembered using the ‘SNOUT’ and ‘SPIN’ rule:

For a test with a high SeNsitivity, a Negative result rules OUT a diagnosis

For a test with a high SPecificity, a Positive result rules IN a diagnosis

Further reading:

https://geekymedics.com/statistics-for-medical-students/

Question:

A 23-year-old man presents to his GP with a swelling in his neck and associated weight loss of 5kg in the past month. He also reports a persistent fever and excess sweating during the night, for which he has to keep a spare change of clothes by his bedside.

On examination, there are two firm, non-tender nodules in the right anterior triangle of the neck.

After a 2-week wait referral to a specialist, a lymph node biopsy shows large abnormal lymphocytes containing more than one nucleus.

Given the most likely diagnosis, what is the most appropriate definitive treatment?

A. Surgical resection +/- radiotherapy

B. Surgical resection +/- chemotherapy

C. Excision biopsy

D. Chemotherapy +/- radiotherapy

E. Radiotherapy alone

Correct Answer:Chemotherapy +/- radiotherapy

Explanation:

The first-line treatment for Hodgkin’s lymphoma is chemotherapy +/- radiotherapy, with the most used chemotherapy regime being ABVD (adriamycin, bleomycin, vinblastine and dacarbazine).

Surgery does not play a role in the treatment of Hodgkin’s lymphoma, therefore surgical resection +/- chemotherapy and surgical resection +/- radiotherapy are incorrect.

An excision biopsy is used to diagnose Hodgkin’s lymphoma, however, it is not used in its treatment.

Radiotherapy may be used in combination with chemotherapy to treat Hodgkin’s lymphoma, however, radiotherapy alone is not used.

Further reading:

https://geekymedics.com/hodgkin-lymphoma/#:~:text=Key%20points-,Hodgkin%20lymphoma%20(HL)%20is%20a%20haematological%20malignancy%20that%20arises%20from,lymphoma%20is%20previous%20EBV%20infection.

Question:

A new blood test is developed for diagnosing pancreatic cancer. Following several studies, its negative predictive value is found to be 98%.

What is the most accurate interpretation of this negative predictive value?

A. 98% of those testing positive do not have pancreatic cancer

B. 98% of those testing negative do not have pancreatic cancer

C. 98% of those with pancreatic cancer will test negative

D. 98% of those taking the test will test negative

E. 98% of those without pancreatic cancer will test negative

Correct Answer:98% of those testing negative do not have pancreatic cancer

Explanation:

The negative predictive value of a test is the proportion of individuals testing negative who truly do not have the condition, for example, a 98% negative predictive value means that 98% of individuals testing negative do not have the condition. Therefore, the correct answer is 98% of those testing negative do not have pancreatic cancer.

Further reading:

https://geekymedics.com/statistics-for-medical-students/

Question:

A 20-year-old man presents to his GP with a 3-week history of diarrhoea and cramping abdominal pain. He is passing loose stool twice a day and has noticed blood and mucus mixed in with the stool.

An abdominal examination reveals mild generalised abdominal tenderness.

His observations are:

Oxygen saturation: 99% on room air

Respiratory rate: 16/min

Heart rate: 72 bpm

Blood pressure: 126/83 mmHg

Temperature: 37.3 °C

Appropriate blood tests are requested.

What is the most appropriate next investigation?

A. Stool culture, C. difficile toxin and calprotectin

B. Proctoscopy

C. Faecal calprotectin only

D. Colonoscopy

E. Abdominal X-ray

Correct Answer:Stool culture, C. difficile toxin and calprotectin

Explanation:

This is a young patient presenting with bloody diarrhoea and cramping abdominal pain, which is suggestive of ulcerative colitis. Although colonoscopy is the gold standard diagnostic test for inflammatory bowel disease, a stool culture, C. difficile toxin and calprotectin to investigate for gastroenteritis, pseudomembranous colitis, and inflammation of the bowel should be performed first before invasive tests like colonoscopy are considered.

Faecal calprotectin only is incorrect, as it is important to rule out other common causes of bloody diarrhoea, such as gastroenteritis.

Proctoscopy only views the inside of the rectum and anus. It is not the investigation of choice for diagnosing inflammatory bowel disease as it would miss lesions proximal to the rectum. Furthermore, less invasive investigations should be conducted before endoscopy.

An abdominal X-ray is useful to look for complications such as toxic megacolon during acute flares of inflammatory bowel disease. As this patient’s observations are within the normal range and there are no signs of abdominal distension or peritonism, an abdominal X-ray can wait until after initial investigations have been conducted.

Further reading:

https://geekymedics.com/ulcerative-colitis-uc/

Question:

A 25-year-old man with no medical history presents with a history of recurrent facial rash. On examination, there are thin, scaly, ill-defined, and symmetrical patches on the nasolabial folds, glabella, and eyebrows. It is not itchy. He has noticed that the rash can be triggered by stress.

Select the management option which could be used as prophylaxis for his condition

A. Adapalene 0.1% cream

B. Metronidazole 0.75% cream

C. Hydrocortisone 1% cream

D. Tacrolimus 0.1% ointment

E. Ketoconazole 2% shampoo

Correct Answer:Ketoconazole 2% shampoo

Explanation:

The likely diagnosis is seborrhoeic dermatitis, which is a common, chronic, and relapsing skin disorder and classically presents with the features described in this patient. Ketoconazole 2% shampoo can be applied to the skin every 1-2 weeks to prevent seborrheic dermatitis. The patient should be advised to leave the preparation on for 3-5 minutes before rinsing.

Mild hydrocortisone 1% cream may be used for 1-3 weeks to reduce the inflammation of an acute flare, but the question is asking about long-term prophylaxis.

Topical calcineurin inhibitors such as tacrolimus ointment may be recommended by specialists in resistant cases of seborrheic dermatitis.

Adapalene 0.1% cream is a retinoid used to treat mild to moderate acne vulgaris.

Metronidazole 0.75% cream is used to treat rosacea.

Further reading:

https://cks.nice.org.uk/topics/seborrhoeic-dermatitis/management/seborrhoeic-dermatitis-face-body/

Question:

An 84-year-old man is undergoing intensive rehabilitation on the stroke ward, following a right lacunar stroke. A nasogastric tube is in-situ for enteral feeding and maintenance fluids, due to an ongoing left hemiparesis affecting his ability to swallow.

Routine bloods are requested, which demonstrate the following:

Test Results Reference range

Sodium 125 mmol/L (135 - 145)

Potassium 4.5 mmol/L (3.5 - 5.3)

Calcium (adjusted) 2.5 mmol/L (2.2 - 2.6)

Phosphate 0.80 mmol/L (0.74 - 1.40)

Urea 5.0 mmol/L (2.5 - 7.8)

Creatinine 90 μmol/L (59 - 104)

What is the most likely cause of the deranged blood results?

A. Primary polydipsia

B. Dehydration

C. Syndrome of inappropriate ADH secretion (SIADH)

D. Prolonged enteral feeding via nasogastric tube

E. Renal impairment

Correct Answer:Syndrome of inappropriate ADH secretion (SIADH)

Explanation:

This patient's urea and electrolyte (U&Es) panel demonstrates moderate hyponatraemia (125 - 129 mmol/L). Hyponatraemia is defined as a serum sodium concentration of <135 mmol/L. Most patients with mild, chronic hyponatraemia are initially asymptomatic. There are a number of causes of hyponatraemia, one of the most important being a side effect of medications. Medications to remember include thiazide diuretics, selective serotonin reuptake inhibitors (e.g. sertraline) and antipsychotics. A less common cause of hyponatraemia is the syndrome of inappropriate ADH secretion (SIADH). The posterior pituitary gland overproduces ADH, which in turn causes increased water retention in the distal convoluted tubules of the kidneys. Plasma water concentration increases relative to sodium concentration, causing hyponatraemia. SIADH has a number of triggers, including CNS injury (stroke, trauma, infection), medication changes and malignancy. With the history of a lacunar stroke, this is the most likely diagnosis.

Dehydration would typically lead to hypernatraemia +/- pre-renal acute kidney injury, however, this patient is receiving NG fluids and urea is within the normal limits.

Acute renal impairment more commonly presents with deranged potassium levels (hyperkalaemia) and raised creatinine.

Whilst primary polydipsia is a cause of hyponatraemia, it is unlikely here as the patient is receiving NG fluids as his swallow is unsafe. With a fluid balance in place, excessive consumption of fluids would be prevented.

The vignette gives no suggestion of nasogastric decompression or drainage via the NG tube (e.g. for small bowel obstruction).

Further reading:

https://geekymedics.com/syndrome-of-inappropriate-antidiuretic-hormone-secretion-siadh/

Question:

A 4-year-old boy is brought to the emergency department by his mother due to a 5-day history of fever. The child has also been very irritable. He has no past medical history and no recent unwell contacts. He does not take any medications and his immunisations are up to date.

His observations are within normal limits. On physical examination, both eyes are red with normal pupils that are reactive to light. The lips are fissured and the tongue has a red, friable appearance. Cervical lymphadenopathy is present on the left side. Respiratory and cardiac examination is normal. The abdomen is soft and non-tender. Examination of the skin reveals a polymorphous rash on the extremities and trunk.

Which complication is this patient most likely to suffer from as a result of his underlying diagnosis?

A. Respiratory depression

B. Digit amputation

C. Vision loss

D. Chorea

E. Coronary aneurysms

Correct Answer:Coronary aneurysms

Explanation:

The patient in the above scenario is suffering from Kawasaki disease – an acute vasculitis of unknown aetiology which mainly affects young children. Kawasaki disease has a predilection for the coronary arteries and therefore has the potential to cause coronary artery aneurysms. It is essential that these patients undergo echocardiography at the time of diagnosis in order to attain a baseline for long term follow up.

Digital amputation is likely to be seen in patients who have been diagnosed with extensive thromboangiitis obliterans – a medium vessel vasculitis which is seen in middle-aged, male smokers. Most cases are thought to be caused by smoking,

Vision loss is a well-known complication of temporal arteritis – a large vessel vasculitis typically seen in older females. It classically presents with monocular vision loss, jaw claudication, scalp tenderness and unilateral headache.

Chorea is a complication of acute rheumatic fever which typically presents in children after an untreated infection with Streptococcus pyogenes.

Respiratory depression is a complication of Guillain-Barré syndrome – an autoimmune demyelinating condition which leads to an ascending paralysis/weakness and hyporeflexia typically in patients that have recently been infected with an agent such as Campylobacter jejuni.

Further reading:

https://patient.info/doctor/kawasaki-disease-pro

Question:

A 42-year-old female attends the GP as she has been experiencing episodes of seeing ‘kaleidoscope style’ colourful images and hallucinations of unknown faces regularly at night whilst going to sleep. The patient is very anxious about these hallucinations and is adamant that she sees these images coming from the end of her bed. The patient has no past medical or psychiatric history and is not taking any regular medications or recreational drugs.

Which of the following best describes the patient's hallucinations?

A. Functional hallucination

B. Extracampine hallucination

C. Pseudohallucination

D. Hypnagogic hallucinations

E. Hypnopompic hallucination

Correct Answer:Hypnagogic hallucinations

Explanation:

Hypnagogic hallucinations are visual or auditory hallucinations occurring during the transition from wakefulness to sleep. These hallucinations can be vivid, unusual and distressing for the patient. Visual hallucinations can involve coloured circles, animals and faces. Auditory hallucinations can involve melodies or any other type of sound. Hypnogogic hallucinations can occur in otherwise healthy individuals, however, there is an associated with narcolepsy.

Hypnopompic hallucinations are similar hypnogogic hallucinations, however they occur at the transition between sleep and wakefulness. They can also occur in healthy individuals, but do have an association with narcolepsy.

A pseudohallucination is an involuntary sensory experience that is vivid enough to be regarded as a hallucination but is considered by the person experiencing it to be unreal (whereas hallucinations are considered real by patients).

Extracampine hallucinations involve the sense of a presence or fleeting movement in the absence of an associated visual stimulus.

Functional hallucinations are triggered by a certain stimulus within the same modality (e.g. an auditory hallucination triggered by sound of certain music).

Further reading:

https://patient.info/doctor/hypnagogic-hallucinations

Question:

A 25-year-old man presents to A&E. He describes sharp right-sided chest pain which is worse when he takes a deep breath. The chest pain began suddenly whilst sitting down and is associated with some mild shortness of breath.

He is otherwise well, with no other medical conditions. He is a non-smoker, lives with his girlfriend and denies recreational drug use. He has no family history of respiratory conditions.

On inspection, he appears in slight discomfort during inspiration but looks otherwise well. On percussion the right side of his chest is hyper-resonant and there are reduced breath sounds on the right side on auscultation. There is no tracheal deviation or distension of the neck veins apparent. Vitals signs are unremarkable other than mild tachypnoea.

What is the most appropriate investigation to establish a diagnosis in this patient?

A. ECG

B. Chest X-ray

C. Echocardiogram

D. Arterial blood gas

E. CT scan of the thorax

Correct Answer:Chest X-ray

Explanation:

The most appropriate initial investigation to establish a diagnosis in this patient would be a chest X-ray. The patient has typical clinical features of a pneumothorax including shortness of breath, pleuritic chest pain, hyper-resonance on percussion and reduced breath sounds on auscultation. The absence of a history of trauma, tracheal deviation, distended neck veins and abnormal vital signs makes tension pneumothorax unlikely in this scenario. If tension pneumothorax is suspected, it should be managed immediately by decompression (e.g. needle inserted into the second intercostal space in the mid-clavicular line) rather than waiting for confirmation with chest X-ray due to its life-threatening nature.

Although you would want to perform an ECG to rule out other differential diagnoses of chest pain (e.g. pericarditis, myocardial infarction), this would not be the most useful investigation for confirming the likely diagnosis of pneumothorax.

A CT scan of the thorax would allow identification of a pneumothorax, however, this would not usually be performed before a chest X-ray. If a pneumothorax was confirmed on an X-ray, a CT scan may not be required unless there were concerns about other intra-thoracic pathology.

An echocardiogram would not be useful for confirming the likely diagnosis of pneumothorax. Echocardiograms are useful in the context of pericarditis

An arterial blood gas is useful for assessment of potential respiratory compromise but does not directly help to establish a specific diagnosis of pneumothorax.

Further reading:

https://patient.info/doctor/pneumothorax-pro

Question:

A 17-year-old woman with a known history of type 1 diabetes mellitus presents to A&E. She gives a 48-hour history of diarrhoea and vomiting, with reduced oral intake. She normally takes subcutaneous short-acting insulin with meals 3 times daily, and subcutaneous long-acting insulin once a day, but has not taken this today as she was worried about having a hypo because she’s not been eating.

On examination, she appears dehydrated and lethargic, and complains of severe thirst and nausea, but is maintaining a blood pressure of 115/85.

A venous blood gas is performed, the results of which are shown below:

Glucose: 26mmol/mol

pH: 7.1

Potassium: 5.5mmol/mol

Bicarbonate: 12mmol/L

Which of the following options is the most appropriate first step in the management of this patient?

A. Give 1L of IV normal saline over 1 hour

B. Give 500ml of IV 10% dextrose over 4 hours

C. Give 10 units subcutaneous short-acting insulin

D. Give 10 units subcutaneous long-acting insulin

E. Start an IV sodium bicarbonate infusion

Correct Answer:Give 1L of IV normal saline over 1 hour

Explanation:

This patient is suffering from diabetic ketoacidosis (DKA), due to reduced oral intake and lack of insulin. This is a triad of hyperglycaemia, ketosis, and acidosis. The average fluid deficit in DKA is 100ml/kg (i.e. 7L in a 70kg patient!). As such, the most important considerations are fluid replacement and administration of insulin.

‘There is universal agreement that the most important initial therapeutic intervention in DKA is appropriate fluid replacement, followed by insulin administration.’ - Joint British Diabetes Societies Inpatient Care Group

From the options given, administration of IV fluid in the form of 1L normal saline in the first hour is the most appropriate first management step. This is an acceptable and tolerable rate for most young and healthy patients, but care must be taken in vulnerable patient groups such as the elderly and those with congestive cardiac failure, in whom a slower rate may be appropriate. In addition to IV fluids, an IV insulin infusion, such as Actrapid, should be started alongside the IV fluids to suppress ketosis.

Subcutaneous short-acting insulin does not feature in the initial management of DKA, instead, patients should be started on a fixed rate IV insulin infusion – different hospitals will have local guidelines for the type of insulin and rate used, dependent on the patient’s weight, and you should always defer to local guidance, but 6units/hour of IV Actrapid would be a representative example.

The Joint British Diabetes Societies Inpatient Care Group guidelines are clear that ‘Adequate fluid and insulin therapy will resolve the acidosis in DKA and the use of bicarbonate is not indicated.’ In any case, sodium bicarbonate should not be considered without discussion with a senior, and management of the patient in a high-care area.

If a patient takes subcutaneous long-acting insulin, this should be continued at the normal dose and times alongside the short-acting insulin infusion, but this should not take precedence over adequate fluid replacement and commencement of an insulin infusion.

10% dextrose should be started when the patient’s blood glucose drops below 14mmol/L, in order to prevent hypoglycaemia, but would not be an initial consideration in this case, with a blood glucose of 26mmol/L and evidence of acidosis.

Further reading:

https://www.diabetes.org.uk/resources-s3/2017-09/Management-of-DKA-241013.pdf

Question:

A 25-year-old male presents to the surgical assessment unit (SAU) with a two-day history of abdominal pain, vomiting, and constipation. The abdominal pain was initially mild and epigastric but is now more severe and located in the right iliac fossa.

Admission observations are respiratory rate 15, SpO2 99% on room air, heart rate 80 bpm, blood pressure 140/80 mmHg and temperature 37.6οC.

Intravenous fluids, analgesia and an antiemetic are administered.

On examination, there is a tender mass palpated in the right iliac fossa. A CT abdomen-pelvis is ordered, which reveals a small appendiceal mass.

What is the optimum management plan for this patient?

A. Broad spectrum antibiotics +/- interval appendicectomy 6-8 weeks later

B. Right hemicolectomy

C. Discharge with analgesia

D. Urgent two-week wait referral

E. Urgent appendicectomy

Correct Answer:Broad spectrum antibiotics +/- interval appendicectomy 6-8 weeks later

Explanation:

An appendiceal mass can represent a range of pathologies including adherence of omentum or small bowel to the inflamed appendix, appendiceal phlegmon or an appendiceal abscess.

In cases of appendiceal mass, the most common management strategy is to prescribe a course of broad-spectrum antibiotics and perform an interval appendectomy 6-8 weeks later when the inflammation has settled. If an appendiceal abscess is large and well-defined, percutaneous drainage can be attempted.

A two-week wait referral should only be made if there is reasonable suspicion of malignancy. A right-sided colonic tumour is not likely in a patient of this age and with his current presentation.

Urgent appendectomy is not appropriate as most surgeons agree that it is preferable to wait until after a course of antibiotics to operate on appendicitis complicated by an appendiceal mass.

Discharge with analgesia is incorrect as it only addresses the patient's symptoms rather than the underlying pathology.

Right hemicolectomy is incorrect as it is unnecessary to perform such a large operation to tackle appendicitis.

Further reading:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4587501/

Question:

A 70-year-old man presents to the emergency department with a 12-hour history of severe crampy abdominal pain and vomiting.

On examination, he is of average build with a body mass index (BMI) of 24. His abdomen is generally distended with no focal tenderness or peritonism. There is a tender irreducible swelling in the right groin, which is located above and medial to the pubic tubercle.

What is the most likely diagnosis?

A. Inguinal hernia

B. Femoral hernia

C. Obturator hernia

D. Spigelian hernia

E. Richter's hernia

Correct Answer:Inguinal hernia

Explanation:

This patient has presented with cardinal features of small bowel obstruction and an irreducible groin swelling. The most likely diagnosis, in this case, is an obstructed inguinal hernia. Inguinal hernias pass through the inguinal canal into the groin. They run along the upper edge of the inguinal ligament and are typically located above and medial to the pubic tubercle. They are the commonest type of hernia and are much more likely to occur in men. They have a relatively low overall risk of obstruction or strangulation as the tissues around the neck of the hernia are quite soft. However, the high incidence of inguinal hernias in the population means that large numbers of patients will still develop complications requiring emergency surgery each year.

Femoral hernias are a less common type of groin hernia. They pass through the femoral canal into the upper medial thigh. They pass behind the inguinal ligament and are typically located below and lateral to the pubic tubercle. They are at very high risk of obstruction or strangulation, as the femoral canal is a narrow space bordered medially by the sharp edge of the lacunar ligament. Femoral hernias are much more likely to affect older women.

Obturator hernias are very rare. They pass through the obturator foramen of the bony pelvis into the upper medial thigh. They typically present with small bowel obstruction but are often impalpable on clinical examination due to their deep location within the tissues. They mostly occur in elderly women, especially those who are very thin or have had multiple pregnancies in the past.

Spigelian hernias are a type of anterior abdominal wall (or ventral) hernia. They pass through the Spigelian fascia lateral to the rectus sheath. They are usually very small and present with localised pain or a lump immediately lateral to the rectus abdominis muscle. They have a fairly high risk of obstruction or strangulation due to the tight fascial layers around the hernia neck.

A Richter’s hernia involves the partial herniation of one edge of the bowel wall as opposed to its whole circumference. This phenomenon can affect any type of hernia and may result in serious complications, as the herniated portion of the bowel wall can rapidly become strangulated and ischaemic. However, Richter’s hernias do not cause obstruction as the lumen of the bowel remains patent.

Further reading:

https://geekymedics.com/hernias/

Question:

A 52-year-old man is being reviewed on the ward-round having been admitted the previous day with community-acquired pneumonia. However, the patient now complains that he feels extremely agitated and describes waking up in the morning covered in sweat.

The patient goes on to explain that a few hours ago he noticed trembling across the right side of his body that he couldn’t control. He denies any low mood but comments that he now feels extremely restless. The patient is completely orientated and denies any hallucinations.

On further questioning, the patient explains that he typically drinks around 14-units of alcohol a day before his admission to the hospital. He comments that he hasn’t mentioned this so far to the hospital staff. His past medical history is otherwise unremarkable.

What is most appropriate for managing this patient’s symptoms?

A. Zopiclone

B. Risperidone

C. Propranolol

D. Sertraline

E. Chlordiazepoxide

Correct Answer:Chlordiazepoxide

Explanation:

Agitation, trembling and excessive sweating are symptoms of alcohol withdrawal that may present in patients who have abruptly stopped consuming alcohol due to their hospital admission. Management of this condition can include treatment with chlordiazepoxide, or commonly used benzodiazepines such as lorazepam.

Sertraline is a selective serotonin reuptake inhibitor (SSRI) commonly used in the treatment of depression. It is not used in the management of alcohol withdrawal, and SSRIs are associated with adverse outcomes when used in patients consuming alcohol. It would therefore be inappropriate to prescribe in this case.

Zopiclone is a sedative medication that is commonly used in the short-term treatment of insomnia. As this patient is not complaining of difficulty sleeping and his symptoms are likely due to alcohol withdrawal, it would be more appropriate to treat him with chlordiazepoxide instead.

Risperidone is a second-generation antipsychotic and is used to treat patients with schizophrenia. However, it is not used in the management of alcohol withdrawal and so is the incorrect answer here.

Patients suffering from panic attacks may benefit from being treated with propranolol. This is a beta antagonist that can help alleviate symptoms such as tremors and tachycardia. However, because this patient’s symptoms are secondary to alcohol withdrawal it is more appropriate to manage his symptoms with chlordiazepoxide.

Further reading:

https://bnf.nice.org.uk/treatment-summary/alcohol-dependence.html

Question:

A 25-year-old man is brought to the emergency department after a road traffic accident. He has had progressively worsening headaches, nausea and vomiting, and confusion since. His heart rate is 48 bpm, his blood pressure is 156/74 mmHg, his respiratory rate is 20 /min and irregular, his oxygen saturations are 97% on room air and his Glasgow coma score is 11 (E3V3M5).

A CT scan of the head is performed which demonstrates an intracranial haemorrhage with diffuse oedema.

What is the most appropriate initial step in this patient's management?

A. Decompressive craniectomy

B. Elevate the patient's head to 30º

C. Perform controlled hyperventilation

D. Perform lumbar puncture decompression

E. Prescribe IV mannitol

Correct Answer:Elevate the patient's head to 30º

Explanation:

Elevate the patient's head to 30º is correct. This patient has presented with features consistent with raised intracranial pressure (ICP), which can occur following head injuries if bleeding occurs. Progressively worsening headaches, nausea and vomiting, and changes in cognition should raise suspicion of ICP, and his decreased Glasgow coma scale supports this diagnosis. His observations demonstrate Cushing's reflex, which is seen in raised ICP and suggests potential imminent death, characterised by hypertension with a widened pulse pressure, bradycardia, and irregular breathing. This patient requires immediate resolution of their raised ICP, and one of the first and most simple steps in managing this is elevating the head of the bed to 30º. This increases the venous return and subsequently aids in reducing the ICP.

Decompressive craniectomy is incorrect. Although this can lead to a reduction of the ICP, this would take time to arrange and prepare for, consuming time that could be used in initial treatment measures, increasing the risk of complications (such as seizures, coma, or death).

Perform lumbar puncture decompression is incorrect. Lumbar punctures in cases of raised ICP are contraindicated unless under specialist guidance. This is because the relief of pressure at the spine can lead to brain herniation, which can be fatal.

Prescribe IV mannitol and perform controlled hyperventilation are incorrect. Mannitol is an osmotic diuretic which can be used in the initial treatment of raised ICP by reducing the amount of fluid in the brain. Controlled hyperventilation may be used in patients with raised ICP as it reduces the pCO2 leading to cerebral artery vasoconstriction, which lowers the ICP temporarily. A quicker, easier, yet effective initial management step would be to elevate the patient's head to 30º first, as this buys time for more definitive management to be arranged.

Further reading:

https://geekymedics.com/traumatic-head-injury-acute-management-abcde/

Question:

A 65-year-old woman presents to the emergency department following an episode of haemoptysis. She reports a history of longstanding cough that is productive of copious daily sputum. She is a non-smoker and drinks 10 units of alcohol a week.

She has a past medical history of rheumatoid arthritis, managed with methotrexate 7.5mg PO OW and 5mg PO OW.

On examination, her temperature is 38°C, pulse 87/min, RR 20, BP 150/82 mmHg and SpO2 92% on room air. On respiratory examination, there are coarse crackles throughout the lungs bilaterally and high-pitched squeaks heard on inspiration.

Which of the following investigations would be most useful in reaching a definitive diagnosis of the respiratory pathology?

A. High-resolution computed tomography

B. Chest X-ray

C. Pulmonary function tests

D. Anti-cyclic citrullinated peptide

E. Sweat chloride testing

Correct Answer:High-resolution computed tomography

Explanation:

The most likely diagnosis in this patient is bronchiectasis - a condition characterised by permanent dilation of bronchi due to destruction of the elastic and muscular components of the bronchial wall. This patient is likely suffering from an infective exacerbation of bronchiectasis secondary to an acute respiratory tract infection. The question stem asks how to diagnose the underlying condition. NICE guidelines recommend high-resolution computed tomography (HRCT) with thin section scanning to definitively establish the diagnosis of bronchiectasis. HRCT characteristically shows dilation of the bronchi ± airway thickening.

A chest X-ray (CXR) may form part of the initial workup in patients with bronchiectasis; however, findings are often non-specific and non-diagnostic. CXR may help to exclude other pathology initially and confirm the diagnosis in patients with severe bronchiectasis as the presence of thin-walled ring shadows, tram lines, and tubular or ovoid opacities are suggestive of progressive disease. However, NICE guidelines do not recommend CXR as a suitable modality to reach a definitive diagnosis; therefore, this is not the most appropriate answer.

NICE guidelines recommend testing for cystic fibrosis using sweat chloride or gene testing in patients with suspected bronchiectasis if they are less than 40 years old and have other suggestive clinical features (e.g. signs of pancreatic insufficiency). This patient is past the threshold age for testing and does not have any other suggestive features of cystic fibrosis; therefore, this would not be the most appropriate investigation and would not diagnose the respiratory pathology directly, but rather the underlying cause.

This patient has a past medical history of rheumatoid arthritis (RA); therefore, it is likely that anti-cyclic citrullinated peptide (anti-CCP) will be positive. While the prevalence of bronchiectasis is increased in patients with RA compared to the general population, anti-CCP levels cannot be used to diagnose bronchiectasis or predict a patient's individual risk. Testing anti-CCP may help confirm the underlying cause of bronchiectasis, but it is not diagnostic of bronchiectasis alone.

Pulmonary function tests (PFTs) may be abnormal in patients with bronchiectasis; however, PFTs are neither sensitive nor specific and cannot be used to make a definitive diagnosis in patients. However, it is important to note that PFTs may be recommended in the initial workup of patients with bronchiectasis.

Further reading:

https://cks.nice.org.uk/topics/bronchiectasis/management/suspected-bronchiectasis/#management

Question:

A 25-year-old male presents to general practice with agitation, confusion, and delusional thinking. His family reports that he has been isolating himself, neglecting personal hygiene, and talking to himself for the past few months. He has also become suspicious of other people, believing they can hear his thoughts. He has no past medical history of note and is not taking any medications.

On examination, he appears dishevelled and disoriented with a flat affect. He denies any suicidal or homicidal ideation.

What is the most likely diagnosis?

A. Schizophrenia

B. Substance-induced psychotic disorder

C. Major depressive disorder with psychotic features

D. Delirium

E. Bipolar disorder

Correct Answer:Schizophrenia

Explanation:

The most likely diagnosis for this patient is schizophrenia, given the classical triad of auditory hallucinations, delusions of control, and thought possession. The onset of schizophrenia typically occurs in late adolescence or early adulthood, and it can cause significant impairment in social and occupational functioning. The patient's other symptoms of isolation, neglect of personal hygiene, and flat affect are also consistent with the diagnosis.

Bipolar disorder can present with symptoms of agitation, confusion, and delusional thinking, but it is typically characterised by episodes of mania or hypomania, which are not present in this case. Additionally, the patient's symptoms have been ongoing for a few months, which is inconsistent with the episodic nature of bipolar disorder.

Major depressive disorder with psychotic features can present with similar symptoms, but the patient does not report any symptoms of depression, such as persistent low mood or anhedonia (loss of interest in activities). Additionally, the thought broadcasting described by the patient is more indicative of a diagnosis of schizophrenia.

Substance-induced psychotic disorder can present with symptoms of confusion, delusions, and hallucinations, but there is no history of substances in this case. Furthermore, symptoms of substance-induced psychotic disorder are usually more episodic, triggered when substances are taken and subsiding when the effects wear off.

Delirium can present with similar symptoms of confusion and disorientation, but it is typically a short-term condition that is caused by an underlying medical condition or medication use. This patient's symptoms have been ongoing for a few months, which is inconsistent with the acute onset of delirium.

Further reading:

https://cks.nice.org.uk/topics/psychosis-schizophrenia/

Question:

A 66-year-old man presenting to the emergency department with acute-onset abdominal pain has a plain abdominal X-ray which does not reveal any signs of small bowel obstruction. A doctor would like to know how likely this patient is to have small bowel obstruction despite the negative abdominal X-ray. The sensitivity of a plain abdominal X-ray for small bowel obstruction is roughly 93% and the specificity is 70%.

What is the likelihood ratio for a negative result on a plain abdominal X-ray?

A. 1

B. 93

C. 70

D. 0.1

E. 0.5

Correct Answer:0.1

Explanation:

The likelihood ratio for a negative result (LR-) is the probability that a negative result is a false negative versus a true negative, in other words, it is the probability of a patient who has tested negative having the disease versus not having the disease. For example, a negative likelihood ratio of 0.1 means that a patient with a negative result has 10-fold lower odds of having a condition than not.

The negative likelihood ratio can either be calculated directly from the raw data by dividing the proportion of patients with the disease who test negative by the proportion of patients without the disease who test negative or it can be calculated from the sensitivity and specificity using the formula below:

Here, as the sensitivity (93%) and specificity (70%) have both been provided, the negative likelihood ratio can be found by performing the calculation (1-0.93)/0.7 = 0.07/0.7, which gives a negative likelihood ratio of 0.1.

Further reading:

https://geekymedics.com/statistics-for-medical-students/

Question:

A 23-year-old man accompanied by his family attends the emergency department with a headache. He describes a unilateral headache focused around his right eye which is boring and throbbing in nature. He has been unable to do anything since the headache came on and cannot get comfortable. He tells you this is the worst headache he has ever experienced although he has had numerous similar episodes in the last 2 days. He also states that his eye has been going red and watering profusely when the headaches have come on and his mother comments that his right pupil has appeared 'really small' at times. He reports that the headaches have lasted anywhere between 25 and 90 minutes, and the current episode has been present for one hour. Other than the headaches which he has been describing he is usually fit and well and takes no regular medications.

On examination the patient appears uncomfortable but is alert and orientated. He is currently receiving high-flow oxygen which he reports is helping.

What is the most likely diagnosis?

A. Cluster headache

B. Migraine

C. Tension-type headache

D. Trigeminal neuralgia

E. Antisocial personality disorder

Correct Answer:Cluster headache

Explanation:

This is a classical example of cluster headache. Cluster headaches are unilateral and often felt around or above the eye or along the side of the face. They may be very severe and described as boring, burning, throbbing or sharp in nature. The eye ipsilateral to the pain may be injected with lacrimation or have swollen lids, the pupil may be constricted and partial ptosis can be present. Nasal congestion or rhinorrhea, as well as forehead and facial sweating, may also be present. Individual episodes last between 15 and 180 minutes and the disorder can be classified as episodic or chronic. Acute treatment with 100% oxygen at a flow rate of >12L/min has been shown to help with acute attacks as is suggested here.

Note that cluster headache is one of a group of headaches referred to as trigeminal autonomic cephalalgias. This group contains:

cluster headache (both episodic and chronic)

paroxysmal hemicranias (both episodic and chronic)

short-lasting unilateral neuralgiform headache with conjunctival injection and tearing (SUNCT)

short-lasting unilateral neuralgiform headache with cranial autonomic symptoms (SUNA)

Migraine may be similar but does not usually have autonomic features or come in clusters as is the case here. Trigeminal neuralgia is characterised by sharp, shooting pains but these occur in the distribution of a branch of the trigeminal nerve, are often triggered by touch or eating/drinking and also do not feature autonomic abnormalities. Tension-type headache is often bilateral, usually less severe and has none of the other extra-cranial features described above. There is nothing in the history given to suggest this patient has an antisocial personality disorder.

Further reading:

https://patient.info/doctor/cluster-headaches-pro

Question:

A 55-year-old woman presents with a 5-week history of anxiety and palpitations. She lost 5kg unexpectedly during this time and has had associated sweating and heat intolerance. Her last menstrual period was four years ago.

On examination, a fine tremor is noted when her hands are outstretched, and an irregular non-tender goitre is palpable. Nuclear scintigraphy demonstrates patchy uptake with multiple hot areas.

What is the most appropriate definitive management step?

A. Propylthiouracil

B. Thyroidectomy

C. Radioactive iodine

D. Carbimazole

E. Carbamazepine

Correct Answer:Radioactive iodine

Explanation:

Radioactive iodine is correct. This patient has signs and symptoms consistent with hyperthyroidism, characterised by her unexplained weight loss, heat intolerance, anxiety, and palpitations. In patients with hyperthyroidism, a fine tremor may be seen with outstretched hands. The presence of an irregular non-tender goitre suggests the underlying cause may be toxic multinodular goitre (TMNG). Patchy uptake with multiple hot areas on nuclear scintigraphy supports this diagnosis. The definitive management step for TMNG is radioactive iodine. Anti-thyroid drugs such as propylthiouracil may be used if radioactive iodine is contraindicated (e.g. pregnancy), however, there are no contraindications in this case.

Carbimazole and propylthiouracil are incorrect. These are anti-thyroid drugs which can be used to induce remission in Graves' disease or be used to manage patients with TMNG if there are contraindications to using radioactive iodine. Graves' disease would present with a smoothly enlarged goitre with diffuse uptake on nuclear scintigraphy instead

Carbamazepine is incorrect. This is an anti-epileptic drug and does not play a role in the management of TMNG.

Thyroidectomy is incorrect. This would be indicated if there is suspicion of cancer or problems with mass effect due to the goitre (e.g. choking or dyspnoea). Suspicious cold nodules on scintigraphy should raise suspicion of thyroid cancer. These would be characterised by 'cold nodules', which are paler areas of reduced uptake. It is important to remember that cold nodules represent non-hormone-producing nodules and may still be benign, but they should be observed more closely or excised.

Further reading:

https://geekymedics.com/thyrotoxicosis-and-hyperthyroidism/

Question:

A 63-year-old man was brought into the emergency department by an ambulance after his daughter noticed that he looked pale and clammy. ECG findings revealed an inferior ST-elevation myocardial infarction (STEMI). He was promptly treated with primary percutaneous coronary intervention and had recovered well on the cardiology ward before being discharged.

3 weeks later, he presented to the emergency department again with chest pain that was worse on lying down and on breathing in and out. ECG findings reveal a ‘saddle-shaped’ ST elevation on leads I, II, III, aVL, aVF, and V2-V6.

What is the most likely complication that this patient is suffering from?

A. Pulmonary embolism

B. Acute heart failure

C. Takotsubo cardiomyopathy

D. In-stent restenosis

E. Dressler’s syndrome

Correct Answer:Dressler’s syndrome

Explanation:

This patient is suffering from Dressler’s syndrome - a pericarditis that occurs in about 4% of patients post-MI. People typically present 2–4 weeks after an MI with a self-limiting febrile illness accompanied by pericardial or pleural pain. Pericarditis is evidenced by a characteristic ‘saddle-shaped’ ST elevation that is widespread on most leads.

Takotsubo cardiomyopathy, also known as broken heart syndrome, is stress-induced cardiomyopathy that could present with clinical features and ECG changes similar to a STEMI, except that the changes are widespread across all leads. This condition is often associated with significant emotional stress, and is typically reversible with supportive and pharmacological management.

Acute heart failure is a known complication following an MI. A patient with acute heart failure could present with clinical features of dyspnoea (including paroxysmal nocturnal dyspnoea and orthopnoea), decreased exercise tolerance, peripheral oedema, or fatigue. They could also present with left axis deviation on an ECG, significantly raised NT-proBNP or an echocardiogram showing reduced ejection fraction.

Pulmonary embolism would be an important differential diagnosis to consider as the patient had presented with pleuritic chest pain, However, this patient's ECG findings are not suggestive of a pulmonary embolism. The most common ECG changes associated with pulmonary embolism would be sinus tachycardia. Another classical ECG finding in pulmonary embolism would be the S1Q3T3 pattern - deep S wave in lead I, large Q wave in lead III, and an inverted T wave in lead III.

In-stent restenosis is a complication that involves a gradual re-narrowing of the stented artery. It typically occurs 3 to 12 months after the initial percutaneous coronary intervention and would present as recurrent angina symptoms.

Further reading:

https://cks.nice.org.uk/topics/mi-secondary-prevention/background-information/complications-prognosis/#:~:text=Dressler's%20syndrome%20%E2%80%94%20a%20pericarditis%20that,pain%20%5BGibson%2C%202003%5D

Question:

Noah Parker is a 23-year-old man has presented to the GP complaining of pain when urinating, eye discomfort and swelling and pain his right knee joint. These symptoms have developed over the last week and he has previously not experienced anything similar. He recently travelled to India and mentions several episodes of diarrhoeal illness over the last month of travelling. His bowels are now back to normal. He has a regular sexual partner and had a negative STI screen 3 months ago.

Clinical examination reveals a swollen and tender right knee joint, with a slightly decreased range of movement. There is also bilateral conjunctivitis. Examination of the genitals is unremarkable and other systems are unremarkable. Vital signs are normal.

Which of the following is the most likely diagnosis?

A. Urinary tract infection

B. Rheumatoid arthritis

C. Chlamydia

D. Reactive arthritis

E. Gastroenteritis

Correct Answer:Reactive arthritis

Explanation:

This patient describes Reiter's triad of urethritis, conjunctivitis and arthritis, a form of reactive arthritis. This condition is strongly associated with the HLA-B27 genotype.

Reactive arthritis can be subdivided into two subgroups:

Post-enteric (as is the case in this scenario): the three most commonly associated enteric pathogens are Campylobacter, Salmonella and Shigella species

Post-venereal: following Chlamydia trachomatis infection or with human immunodeficiency virus (HIV).

Reactive arthritis usually develops 2-4 weeks after the initial genitourinary or gastrointestinal infection. Common presenting features include fever, malaise, dysuria, eye discomfort and asymmetrical oligoarthritis.

Gastroenteritis alone does not explain this patient's current symptoms and given his bowel habit is now normal, this diagnosis seems unlikely (although he clearly did have gastroenteritis a few weeks ago).

Chlamydia can present with dysuria although it is asymptomatic in 50% of men and 70% of women. It can also cause chlamydial conjunctivitis. Chlamydia is a potential trigger for reactive arthritis, however, the recent normal STI screen and regular sexual partner make this diagnosis less likely.

A simple urinary tract infection would not cause joint swelling and pain or conjunctivitis and therefore is unlikely.

Rheumatoid arthritis would typically present with symmetrical joint swelling, involving multiple joints. The history of travel and diarrhoea, make the diagnosis of reactive arthritis more likely.

Further reading:

https://patient.info/doctor/reactive-arthritis-pro

Question:

A 35-year-old woman is referred to the general surgery clinic. She noticed a bulge on her abdominal wall during a recent pregnancy which has persisted since she gave birth. It tends to be more prominent when she is up and about but is otherwise asymptomatic. She had a forceps delivery but has had no previous abdominal surgery.

On examination with the patient standing, there is a soft diffuse swelling in the midline. The linea alba feels intact.

What is the most likely diagnosis?

A. Epigastric hernia

B. Divarication of the recti

C. Paraumbilical hernia

D. Incisional hernia

E. Spigelian hernia

Correct Answer:Divarication of the recti

Explanation:

The most likely diagnosis, in this case, is a divarication of the recti, which is also known as a rectus diastasis. This is a common and important differential diagnosis for a midline abdominal swelling. It occurs when the rectus abdominis muscles separate, stretching the linea alba to a width of more than 2cm. This results in a prominent midline bulge which can look quite striking on examination. However, it is not a hernia as there is no underlying fascial defect. It is associated with raised intra-abdominal pressure and commonly affects women during and after pregnancy. It is usually treated with physiotherapy and exercise programmes and rarely requires surgery.

Paraumbilical hernias are the most common type of ventral hernia. They pass through a fascial defect in the linea alba within 3cm of the umbilical ring. The majority are small and asymptomatic and can safely be managed conservatively. Paraumbilical hernias also are frequently diagnosed in pregnant women.

Epigastric hernias are a less common type of ventral hernia. They pass through the linea alba in the upper midline above the umbilical territory. They are often asymptomatic and have a low risk of obstruction or strangulation as they usually only contain extraperitoneal fat. Epigastric hernias are more likely to occur in men.

Spigelian hernias are a rare type of lateral ventral hernia. They pass through the Spigelian fascia lateral to the rectus sheath. They are usually very small and present with localised pain or a lump immediately lateral to the rectus abdominis muscle.

Incisional hernias are ventral hernias which pass through the site of a previous surgical incision. They occur because the fascial closure of the abdominal wall failed to heal properly. This patient had a forceps delivery, which usually involves an episiotomy incision in the perineum, but has not had any previous abdominal surgery.

Further reading:

https://geekymedics.com/hernias/

Question:

A 19-year-old is brought to A&E by their partner after he suffered severe burns to his chest whilst leaning over a hot hob during a 'Bake-Off' competition that they were having against one another. The patient has removed his T-shirt as it was loose and non-adherent to the site, and the burn is clearly visible in the upper chest region. There is an area of significant erythema which measures approximately 8cm across, with notable blistering. He is complaining of extreme pain.

The lesion feels relatively moist to the touch and blanches when pressure is applied. The doctor prescribes the patient analgesia, cleans the site, and applies a sterile dressing. The patient is concerned about the extent of his injuries and whether or not the lesion will scar.

Which degree of burn is the patient most likely to have suffered given the description in this scenario?

A. Superficial partial-thickness

B. First-degree/superficial

C. Deep partial-thickness

D. Full-thickness/third-degree

E. Fourth-degree

Correct Answer:Superficial partial-thickness

Explanation:

This patient has likely suffered a superficial partial-thickness burn; this means that the lesion extends through the epidermis into the superficial section of the dermis. These types of burn have several key characteristics:

Erythema and blistering

Moist appearance

Pain is reported by the patient

Lesion blanches under pressure

The prognosis for such burns is usually good, scarring is rare, and healing will normally occur within 1-3 weeks.

First-degree/superficial burns only involve the epidermis; these usually appear as a painful area of erythema alone - they will appear dry on inspection. Sunburn is a classic example. The burn described in this scenario appears to be more extensive than this, given the moist, blistering appearance.

Deep partial-thickness burns are more serious than that likely described in this scenario; these involve the deep structures within the dermis. These are often less painful and blanch less well, as the nerves and vessels that lie within this portion of the skin can be damaged and lose function.

Full-thickness/third-degree and fourth-degree burns are far more severe than those suffered in this scenario. These will both be painless and will not blanch, due to the destruction of nerves and vessels. The usual appearance is either a white or black area at the site; erythema will not be seen. The healing time will be much longer, and significant scarring is likely.

Further reading:

https://cks.nice.org.uk/topics/burns-scalds/management/first-aid-initial-management/

Question:

An 87-year-old man is admitted to hospital with severe community-acquired right lower lobe pneumonia. He has a history of prostate cancer, has a long-term urethral catheter, and has been admitted to hospital with urinary tract infections several times in the last 3 years. His pneumonia is treated empirically with co-amoxiclav 1.2g IV TDS and he improves over the first few days. However, he then deteriorates with rapidly progressive sepsis and worsening respiratory function. Blood cultures are sent which flag positive within 6 hours. Gram stain of the culture shows Gram-positive cocci in clumps. The clinical microbiologist reviews the patient and finds that his IV cannula site is inflamed with erythema tracking up his arm from the site. A repeat chest x-ray shows severe bilateral consolidation with cavitation. His cannula is removed and replaced.

What is the next best step in management with regard to this man’s antimicrobial therapy?

A. Continue the co-amoxiclav and add meropenem

B. Switch from co-amoxiclav to high dose flucloxacilin

C. Switch from co-amoxiclav to vancomycin with meropenem

D. Await the coagulase test result before reviewing the antibiotics

E. Double the dose of co-amoxiclav to 2.4g IV TDS

Correct Answer:Switch from co-amoxiclav to vancomycin with meropenem

Explanation:

The next best step in management with regard to this patient’s antimicrobial therapy is to switch from co-amoxiclav to vancomycin with meropenem. Although the patient presented with community-acquired pneumonia he now has an infected peripheral cannula site with ascending thrombophlebitis, and a severe bilateral pneumonia with cavitation. The fact that his pneumonia initially improved before getting worse suggests that he may now have a hospital-acquired pneumonia caused by a different organism. Common causes of hospital-acquired pneumonia include Gram negatives such as Klebsiella and Pseudomonas species; S. aureus; anaerobes; and standard causes of community-acquired pneumonia such as S. pneumoniae. Causes of a cavitatory pneumonia include S. aureus and Klebsiella. In this context, the organism that ties it all together is S. aureus, since this is also the most likely cause of his infected cannula site. Thus the most likely sequence of events is a S. aureus cannula infection leading to S. aureus bacteraemia and pneumonia. The patient is at risk of methicillin-resistant S. aureus (MRSA) colonisation (and therefore of MRSA invasive disease), especially given his background of multiple admissions to hospital and previous antibiotic exposure.

There is no role for doubling the dose of the co-amoxiclav to 2.4g IV TDS, as 1.2.g IV TDS is the usual adult dose in the absence of significant renal impairment.

Sepsis is a medical emergency and given this patient’s rapidly deteriorating clinical status, to await the coagulase test result before reviewing the antibiotics would underestimate the urgency of this situation. In this context it is highly likely that the staphylococcus isolated from the blood culture will turn out to be coagulase positive (i.e. S. aureus). The fact that the blood culture flagged positive within a few hours also suggests that there are large numbers of bacteria in the blood, making contamination with coagulase negative staphylococci less likely. Empiric treatment with vancomycin (to cover MRSA) and meropenem (to cover other causes of hospital-acquired infection e.g. Pseudomonas) should be initiated prior to obtaining the coagulase test results.

As this patient is septic, while waiting for definitive identification of his blood culture isolate it would be prudent to continue the co-amoxiclav and add meropenem which will cover him for other causes of hospital-acquired pneumonia including Pseudomonas. However he also appears to have developed S. aureus sepsis despite on-going treatment with co-amoxiclav which, although provides reasonably good cover against methicillin-sensitive S. aureus (MSSA), is ineffective against MRSA. Switching his treatment from co-amoxiclav to vancomycin with meropenem will cover for MRSA and Pseudomonas, respectively.

Although flucloxacillin is the treatment of choice for methicillin-sensitive S. aureus (MSSA) it is not effective against MRSA. Therefore, to switch from co-amoxiclav to high dose flucloxacillin would not be advisable as this patient is at risk of MRSA due to his multiple admissions to hospital and previous antibiotic exposure.

Further reading:

https://academic.oup.com/jacamr/article/3/1/dlaa114/6127118?guestAccessKey=20cf089c-ce33-4e54-bb62-b2131c25a137&login=false

Question:

A 5-year old boy is brought into A&E as he has developed a non-blanching rash on his trunk. He currently has no other systemic symptoms but did have a cold which resolved around 2 weeks ago. He is afebrile and appears well in himself. You note some bruising on his lower legs alongside a petechial purpuric rash on his trunk that does not blanch, but examination is otherwise unremarkable.

He has no known medical conditions and no allergies. He is up to date on his childhood vaccinations and has just started school. Nobody else is ill at home, and there have been no reports of infections in his class at school. The family have not travelled anywhere recently. There is no significant family history of any medical conditions.

Blood tests, including a blood film, are ordered. Platelet levels are 135x109/L and the blood film demonstrates a high proportion of megakaryocytes.

It is determined that the clinical picture and blood test results are supportive of a diagnosis of immune thrombocytopenic purpura (ITP).

What is the most appropriate management?

A. Manage at home with supportive care

B. IV hydrocortisone

C. Oral prednisolone

D. IV antibiotics

E. IV immunoglobulin

Correct Answer:Manage at home with supportive care

Explanation:

The most appropriate management of uncomplicated ITP presenting with no other complications other than a petechial purpuric rash and bruising is to manage at home with supportive management. ITP occurs when platelets are destroyed by anti-platelet IgG autoantibodies, resulting in an increased tendency to bleed and a compensatory increase in megakaryocytes (platelet precursors). It typically presents around 2 weeks following a viral infection, for example in this case, with a petechial purpuric rash and superficial bruising. 80% of ITP cases are benign self-limiting episodes that will typically resolve within 6-8 weeks. Admission is not usually necessary, and cases can be managed at home with supportive care. It is advisable to inform parents that children should avoid activities such as contact sports as any trauma will likely elicit bruising.

It would be incorrect to administer oral prednisolone; management of ITP should be conservative as the episode is self-limiting and likely to resolve by itself within 6-8 weeks. Oral corticosteroids such as prednisolone may be administered if there is major bleeding (e.g. intracranial or gastrointestinal bleeds) or persistent minor bleeding in ITP, but would not be administered at this stage. Oral corticosteroids may also be given in Henoch Schonlein purpura (another cause of a petechial purpuric rash) when there is extensive inflammation affecting renal function, but in general steroid use should be limited in children.

It would not be appropriate to administer IVIg in this case. IVIg may be considered if there is major bleeding or persistent minor bleeding in ITP, but in this case, there is only a rash and minor bruising, which would not warrant admission and IVIg administration.

ITP is not an infective process and given that there are no signs of systemic infection or concerns about sepsis, there is no indication for administering IV antibiotics.

It would also not be appropriate to administer IV hydrocortisone. If steroids were indicated due to major bleeding or persistent minor bleeding oral prednisolone would be the chosen steroid treatment. Other treatments for major or persistent minor bleeding in ITP may include IV anti-D and IVIg.

Further reading:

https://www.ouh.nhs.uk/patient-guide/leaflets/files/12388Pitp.pdf

Question:

A 41-year-old woman presents to her GP with tiredness, abdominal pain and weight loss. She regularly feels dizzy on standing and has noticed her skin darkening, particularly in her palmar creases. A diagnosis of adrenal insufficiency is suspected.

Which of the following clinical features is more suggestive of primary adrenal insufficiency than secondary or tertiary adrenal insufficiency?

A. Abdominal pain

B. Diarrhoea

C. Orthostatic hypotension

D. Weight loss

E. Skin hyperpigmentation

Correct Answer:Skin hyperpigmentation

Explanation:

Primary adrenal insufficiency is most commonly due to autoimmune adrenal destruction. This results in a reduction in the production of mineralocorticoid and glucocorticoids, which negatively feeds back to the pituitary gland. Pro-opiomelanocortin (POMC) is the precursor molecule to both adrenocorticotrophic hormone (ACTH) and melanocyte-stimulating hormone (MSH), and negative feedback causes both to be over-produced in primary adrenal insufficiency causing hyperpigmentation. This does not occur in secondary and tertiary hypoadrenalism. All the other symptoms and signs listed are general features of adrenal insufficiency.

Further reading:

https://pituitary.org/knowledge-base/disorders/adrenal-insuffieciency-addison-s-disease

Question:

Mr Jackson, a 67-year-old gentleman, presents to his local emergency department with a history of sudden-onset left-sided weakness and ataxia. His past medical history includes hypertension and ischaemic heart disease. The symptoms resolved within 12 hours of onset. A CT scan performed in A&E showed evidence of chronic vessel ischaemia, but no obvious acute intracranial pathology.

What would be the recommended treatment for Mr Jackson?

A. 300mg STAT of aspirin (and then once-daily - 14-day course in total), followed by 75mg of clopidogrel daily long-term

B. 300mg STAT of aspirin (and then once-daily - 14-day course in total), followed by 300mg of clopidogrel daily for 1 month

C. 75mg STAT of aspirin (and then once-daily - 14-day course in total), followed by 75mg of clopidogrel daily for 1 month

D. No pharmacological treatment necessary as the symptoms have resolved

E. 300mg STAT of clopidogrel (and then once-daily - 14-day course in total), followed by 75mg of aspirin daily long-term

Correct Answer:300mg STAT of aspirin (and then once-daily - 14-day course in total), followed by 75mg of clopidogrel daily long-term

Explanation:

This question assesses your ability to identify a transient ischaemic attack (TIA) and understand the pharmacological treatment(s) recommended for patients with TIA.

NICE guidelines recommend giving anti-platelets in the form of aspirin 300mg immediately in order to prevent further acute thrombotic events.

It is important to note that a high-dose of aspirin 300mg is recommended for 14-days - this is in contrast to the protocol for acute coronary syndrome (ACS) where a lower dose of 75mg aspirin is recommended (with the exception of the initial 300mg STAT dose).

Following 14-days of high dose aspirin, it is recommended to replace with 75mg of clopidogrel long-term in order to minimise the risk of future thrombotic events.

Not treating the patient with any medications would significantly increase the risk of a future thrombotic event (i.e. stroke) and would, therefore, be the most inappropriate response.

Further reading:

https://cks.nice.org.uk/stroke-and-tia#!scenario:1

Question:

Mr Johnson is a 62-year-old gentleman who presents to the GP complaining of shortness of breath. He first noticed the shortness of breath on exertion 6 months ago and it has become progressively worse since then. He also complains of waking up in the middle of the night "gasping for breath". He also feels that his shortness of breath is worse when lying flat.

On auscultation of the heart, there is a mid-diastolic murmur. It is heard loudest at the apex, with the bell of the stethoscope, when the patient lying on their left side.

What is the most likely underlying pathology?

A. Pulmonary stenosis

B. Mitral regurgitation

C. Aortic stenosis

D. Aortic regurgitation

E. Mitral stenosis

Correct Answer:Mitral stenosis

Explanation:

Mitral stenosis is a valvular heart disease, which can cause symptoms such as shortness of breath, orthopnoea and paroxysmal nocturnal dyspnoea. Typical clinical findings include malar flush, raised jugular venous pressure, a laterally displaced apex beat and a mid-diastolic murmur which is typically loudest at the apex and heard best with the bell of the stethoscope.

Rheumatic fever is the most common cause of mitral stenosis. Other causes include degenerative calcification of the valve (more common in elderly patients) and congenital mitral stenosis.

The cardinal sign of mitral regurgitation is a holosystolic (pansystolic) murmur, heard best at the apex with the diaphragm of the stethoscope

Further reading:

https://patient.info/doctor/mitral-stenosis-pro

Question:

Mrs Y is admitted with worsening confusion. She is an 88-year-old lady who is normally relatively well. She lives alone with QDS carers and has a diagnosis of mild Alzheimer's dementia. She is not oriented to time or place but does recognize her family members who have brought her in.

Her past medical history includes mild chronic obstructive pulmonary disease (COPD) for which she takes inhalers. She has recently been started on furosemide for ankle swelling by the GP which has been titrated up to 80mg BD. Her family report that she has been troubled for the past 3 days with diarrhoea and vomiting, which the GP felt was most likely viral in nature.

On examination, she looks dry, is peripherally cool and has a capillary refill time of 3 seconds. Her chest is clear on auscultation and heart sounds are normal. Abdomen is soft and non-tender. Calves are soft and non-tender with no ankle oedema.

Vital signs reveal a heart rate of 85bpm and blood pressure of 100/60 mmHg.

Blood tests reveal Hb 112, WCC 9.4, Na 126, K 5.0, Creat 137 (baseline 68), Ur 8.1. Urinary sodium is 29 and a random cortisol is within normal limits.

What is the most likely explanation for Mrs Y’s low sodium?

A. Diuretic excess

B. Fluid overload from heart failure

C. Recent diarrhoea and vomiting (D&V) viral illness

D. Syndrome of inappropriate antidiuretic hormone secretion (SIADH)

E. Addison's disease

Correct Answer:Diuretic excess

Explanation:

The correct answer is an excessive dose of furosemide.

This lady is hypovolaemic so SIADH and fluid overload can be excluded.

The normal random cortisol rules out an Addisonian picture.

In order to differentiate between diuretic excess and D&V causes, you will need to look at the urine sodium: because D&V causes hyponatraemia due to extra-renal losses, you would expect to find low urinary sodium (< 20). The lady has a urine sodium > 20 which implies there is loss of sodium through the kidneys – likely due to excess diuretics.

Further reading:

http://img.medscape.com/article/745/368/745368-fig4.jpg

Question:

A 75-year-old man presents to his GP with a lesion on the left side of his nose, which has been getting slowly larger.

He has no past medical history, and keeps fit and well having previously been in the army, with several overseas deployments.

An image of the lesion is shown below:

James Heilman, MD, CC BY 3.0

What is the most likely diagnosis?

A. Actinic keratosis

B. Basal cell carcinoma

C. Squamous cell carcinoma

D. Seborrhoeic keratosis

E. Malignant melanoma

Correct Answer:Basal cell carcinoma

Explanation:

Basal cell carcinoma is the most common form of skin cancer, typically presenting as a slow-growing tumour, most commonly of the head or neck. Nodular BCC is the most common subtype, presenting as a shiny nodule with associated telangiectasia, central ulceration and ‘pearly, rolled edges’. They are associated with a history of sun exposure, as implied in this patient’s overseas postings. They are also associated with a previous skin cancer history, and immunosuppression (e.g. transplant patients).

Malignant melanoma is a tumour of epidermal melanocytes. Superficial spreading melanoma is the most common subtype of melanoma, and more common in those with very fair skin, an increased number of pigmented naevi (‘moles’), or atypical naevi. It is most common on the trunk in men, and the legs in women (areas of intermittent, intense sun exposure). Superficial spreading melanoma typically presents as a slow-growing area of discoloured skin, often appearing like a mole initially.

Squamous cell carcinoma may be difficult to distinguish from BCC but typically presents as a keratinized (scaly, crusty) lesion that progressively enlarges over weeks-months. They are commonly found on sun-exposed areas such as the face, ears, arms and hands. They may be associated with tenderness or pain.

Actinic keratoses, or solar keratoses, are areas of dry/scaly, sun-damaged skin. As such, they commonly appear on areas of sun exposure such as the back of the hands, face, lips, ears, scalp and neck. They are important as they are considered precancerous for the development of squamous cell carcinoma.

Seborrhoeic keratoses are common, warty skin lesions with a ‘stuck on’ appearance. They tend to appear in older patients, with Dermnet stating that up to 90% of adults over age 60 have 1 or more. Many patients have multiple lesions, and they can occur on any area of skin except the palms and soles.

Further reading:

https://www.bad.org.uk/shared/get-file.ashx?itemtype=document&id=6595

Question:

A 92-year-old woman is admitted to the Medicine for the Elderly (MFE) ward after a syncopal fall and is now awaiting a package of care. Concerns are raised by nursing staff about ongoing low mood and lethargy. While normally cheerful, cognitively sharp and chatty, the patient has started to decline meals and cannot maintain a short conversation. The patient was started on oral antibiotics yesterday for a suspected urinary tract infection.

Past medical history includes stable angina and chronic obstructive pulmonary disease (COPD). There is no past psychiatric history.

On examination:

Lying quietly in bed, withdrawn and uncommunicative

Heart rate - 80 beats/min

Respiratory rate - 12 breaths/min

Blood pressure - 130/90 mmHg

Temperature - 37.5 oC

Mental state - monosyllabic speech, shrugs to questions regarding mood, flattened affect, inattentive, cannot recall current location or reason for attending

What is the most likely diagnosis?

A. Hypoactive delirium

B. Frontotemporal dementia

C. Depressive episode

D. Alzheimer's disease

E. Hyperactive delirium

Correct Answer:Hypoactive delirium

Explanation:

Delirium is an acute decline in cognition that is characterised by inattention, altered conscious level, and a fluctuating course of illness. In hypoactive delirium, patients become withdrawn, low in mood and anergic. This presentation mimics depression and some patients may become catatonic. It is in contrast to hyperactive delirium, where the patient may be agitated and restless with associated insomnia and hypervigilance behaviours. Delirium has a variety of precipitating factors: in this case, these may be acute illness (falls / UTI), medication changes (new oral antibiotics) or an acute change in surroundings (admission to hospital).

Depressive episodes present with low mood, anhedonia and anergia. While the patient displays some of these characteristics, the acute onset of symptoms along with cognitive impairment is more representative of delirium.

Alzheimer's disease and frontotemporal dementia are chronic neurodegenerative diseases which cause progressive cognitive decline. They are unlikely to be the cause of this patient's acute, fluctuating change in cognition.

Further reading:

https://cks.nice.org.uk/topics/delirium/background-information/precipitating-factors/

Question:

A 69-year-old gentleman attends the GP complaining of muscle aches that are preventing him from sleeping at night. He recently suffered an ST-elevation myocardial infarction whilst playing squash, and was admitted to hospital, where he was treated via primary percutaneous coronary intervention. After recovering from the procedure, he was started on a number of medications, including atorvastatin, and states that the cardiologist informed him that there was a risk of 'muscle pain' with the drug.

Due to the impact on his daily activities, the patient would like to stop atorvastatin and asks if there are any alternative medications that he can take. He is adamant that he no longer wants to take any form of statin. The GP prescribes him a different medication and explains to the patient that the drug acts by directly inhibiting cholesterol absorption from the gut, warning the patient that there is a risk of gastrointestinal side effects.

What medication is the GP likely to have prescribed in this scenario?

A. Cholestyramine

B. Fenofibrate

C. Ezetimibe

D. Acarbose

E. Niacin

Correct Answer:Ezetimibe

Explanation:

Ezetimibe is a drug that inhibits the NPC1L1 protein within the gastrointestinal tract, thus reducing the absorption of cholesterol. It is usually prescribed to those who cannot tolerate statins, or in whom statins are contraindicated. This patient appears to be suffering from myalgia as a result of his statin prescription; a frequently described side-effect, and the most common reason for non-adherence to therapy. Ezetimibe can also be used as an adjunct alongside statins for patients whose hypercholesterolemia is not controlled using statins alone. Its main side effects are gastrointestinal upset, including diarrhoea, nausea and abdominal pain.

Niacin (Vitamin B3) is sometimes given to treat hyperlipidemia; it can reduce lipid levels by reducing the synthesis of low-density lipoprotein (LDL). It does not work via the mechanism described in this scenario, however.

Fenofibrate is a drug within the fibrate class of medications; these are most effective at managing hypertriglyceridemia rather than hypercholesterolemia, although they may be prescribed to those with a mixed picture of elevated lipids. Fibrates do not reduce the absorption of cholesterol from the gut, rather they act to activate peroxisome proliferator-activated receptor-alpha, helping to eliminate triglyceride-rich particles from the plasma.

Cholestyramine can be given as part of the management of hypercholesterolemia but is rarely used. The drug is a bile acid sequestrant, that prevents the reabsorption of bile acids (a cholesterol-containing substance) rather than directly inhibiting cholesterol reabsorption. The drug is more commonly prescribed in the setting of bile acid diarrhoea or diseases such as primary sclerosing cholangitis.

Acarbose is not prescribed for the management of hypercholesterolemia. Rather, it is an inhibitor of glycoside hydrolases, preventing carbohydrates from being uptaken from the gut. It is used to assist with blood glucose control in patients with hard to manage type 2 diabetes mellitus.

Further reading:

https://patient.info/medicine/ezetimibe-tablets-ezetrol

Question:

A 35-year-old man presents with a severe sore throat, voice changes and feeling hot and cold. He is previously well with no regular medication. He received a full course of vaccinations as a child. He is unable to tolerate any oral intake at the moment.

Investigations:

Fine nasal endoscopy - swollen and erythematous epiglottis obscuring most of the view of the vocal cords. Pus evident on the mucosa of the epiglottis.

What is the most likely pathogen causing this presentation?

A. Staphylococcus aureus

B. Burkholderia cepacia

C. Haemophilus influenza B

D. Group A haemolytic streptococcus

E. Klebsiella pneumoniae

Correct Answer:Group A haemolytic streptococcus

Explanation:

Epiglottitis is a medical emergency with a high risk for airway compromise. Urgent review by anaesthetics and ENT is required. Since the introduction of a vaccine there has been a decrease in the number of cases of Haemophilus Influenza B epiglottitis. However, this remains a key differential as the vaccine does not cover all strains, and not everyone has been vaccinated.

We have now begun to see an increase in epiglottitis secondary to group A haemolytic streptococcus, particularly in the adult population. In this case, with the patient's vaccination history, this is the most likely pathogen. See the link below to a recent review on this.

Staphyloccocus aureus is another potential cause of epiglottitis, but this is less likely than group A haemolytic streptococcus.

Klebsiella pneumonia is a common pathogen in aspiration pneumonia, particularly in patients with alcohol dependence.

Burkholderia is seen in immunocompromised patients. In lung transplant patients this can lead to alveolitis obliterans.

Further reading:

https://www.researchgate.net/profile/Svante-Hugosson/publication/49634387\_Acute\_epiglottitis\_Epidemiology\_and\_Streptococcus\_pneumoniae\_serotype\_distribution\_in\_adults/links/57ac30dc08ae7a6420c15891/Ac

Question:

A 52-year-old woman presents to the emergency department with a two-hour history of sudden-onset shortness of breath and sharp, pleuritic left-sided chest pain. She describes unintentional weight loss and a dry cough over the past 6 months and has a 30 pack-year smoking history.

Respiratory and cardiovascular exams are unremarkable.

Her observations are:

Oxygen saturation: 95% on room air

Respiratory rate: 22/min

Heart rate: 115 bpm

Blood pressure: 132/89 mmHg

Temperature: 36.9 °C

An ECG reveals sinus tachycardia.

What is the most likely direct cause of her acute shortness of breath?

A. Pericarditis

B. Myocardial infarction

C. Lung cancer

D. Pneumothorax

E. Pulmonary embolism

Correct Answer:Pulmonary embolism

Explanation:

This patient is presenting with shortness of breath, pleuritic chest pain and sinus tachycardia, which point towards a diagnosis of a pulmonary embolism (PE). The additional 6-month history of a dry cough and unintentional weight loss suggests an underlying lung cancer may have provoked this PE, however, this is not the direct cause of her acute shortness of breath.

Although pericarditis typically presents with pleuritic left-sided chest pain, the lack of widespread saddle-shaped ST elevation and PR depression on the ECG makes this diagnosis unlikely.

Although myocardial infarction is an important differential in a patient presenting with left-sided chest pain, the pleuritic nature of the chest pain and lack of suggestive ECG changes make a myocardial infarction less likely.

A pneumothorax often presents with pleuritic chest pain and sudden-onset shortness of breath, however, the normal respiratory exam and the presence of a risk factor for PE make this diagnosis less likely.

Further reading:

https://geekymedics.com/pulmonary-embolism-pe-acute-management-abcde-approach/

Question:

A 26-year-old woman is admitted to A&E with severe shortness of breath. She has a history of brittle asthma with previous ITU admissions. On examination, she is taking rapid shallow breaths and has become confused.

Her ABG on 60% oxygen shows:

pH of 7.38

PCO2: 5.8

PO2: 11

BE: +1.0

Lactate: 1.6

What is the most important intervention?

A. Non-invasive ventilation (NIV)

B. Intubation and mechanical ventilation

C. Reduce her oxygen to 40% FiO2

D. CPAP

E. Put her on a 15L via a non-rebreathe mask

Correct Answer:Intubation and mechanical ventilation

Explanation:

This lady has a life-threatening exacerbation of her asthma with normocapnia and confusion. Her breathing pattern suggests she is becoming fatigued. She needs intensive care with mechanical ventilation.

NIV should only be used in asthmatics in critical care with expert supervision. Her oxygenation is adequate for now and she does not need more or less oxygen.

She should be on a 15L non-rebreathe mask, but since her oxygenation is adequate intubation is a more important intervention.

CPAP has no role in this situation. It is useful for increasing oxygenation, especially in pulmonary oedema.

Further reading:

https://pathways.nice.org.uk/pathways/asthma

Question:

An 87-year-old patient, Mrs Dolly McNab, was admitted to hospital 4 days ago with a history of reduced oral intake and increased confusion. Mrs McNab is now an inpatient on the elderly care ward. Her past medical history includes Alzheimer's dementia, osteoarthritis, hypertension and vaginal prolapse. Mrs McNab lives in a residential home, her mobility is poor with a zimmer frame, and she is dependant in her activities of daily living.

Her regular medications include aspirin, movicol, naproxen, omeprazole, enalapril and simvastatin. She has an allergy to penicillin.

You are asked to prepare Mrs McNab’s notes, including a review of her blood test results and vital signs in preparation for the consultant ward round.

The blood results are as follows:

Hb 125 g/L

WCC 8 x 109

Neut 4 x 109

CRP 70 mg/L

Na 125 mmol/L

K 6.8 mmol/L

Ur 35 mmol/L

Cr 117 μmol/ L

eGFR 35

The vital signs are as follows:

O2 95% on air

HR 90 bpm

RR 20

BP 95/60 mmHg

Temp 37.4 oC

What is the next most urgent management step to safely manage this patient?

Source: Dr. Michael-Joseph F. Agbayani and Dr. Eddieson Gonzales (Manila, Philippines) [CC BY 4.0]

A. Salbutamol nebulisers, insulin/dextrose and intravenous calcium

B. Intravenous fluid challenge

C. Supplemental oxygen

D. Aspirin (300mg), nitrates and low molecular weight heparin

E. Intravenous antibiotics

Correct Answer:Salbutamol nebulisers, insulin/dextrose and intravenous calcium

Explanation:

The most appropriate next management option is the urgent administration salbutamol nebulisers, insulin and intravenous calcium.

This patient has presented with a vague history of confusion, complicated by a plethora of comorbidities and polypharmacy. The most alarming investigation results are markedly raised potassium (hyperkalaemia) and associated ECG changes (tall t waves).

Hyperkalaemia is defined as a plasma potassium level of greater than 5.5 mmol/L. Hyperkalaemia can occasionally lead to life-threatening cardiac arrhythmias and therefore must be promptly managed. The European Resuscitation Council sub-categorises the severity of hyperkalaemia into mild (5.5-5.9 mmol/L), moderate (6.0-6.4 mmol/L) and severe (>6.5 mmol/L). This patient falls into the ‘severe’ category and presents with associated ECG changes, therefore she is at high risk of developing a life-threatening cardiac arrhythmia.

This patient would be assessed in an ‘ABCDE’ manner in the acute setting, and it is important to remember that hyperkalaemia is not an isolated problem but may be present in a patient with hypoxia, sepsis or cardio-renal failure. For this patient, supplemental oxygen is not immediately indicated, because she is maintaining saturations of greater than 94%, equally, although there is evidence of raised inflammatory markers (CRP), at present the patient is hemodynamically stable with no localised signs of infection and thus presently intravenous antibiotics are not the most appropriate management step.

An intravenous fluid challenge is not an unreasonable suggestion for a patient presenting with reduced oral intake, however, in this instance, the most urgent abnormality that requires correction is the hyperkalaemia. Moreover, fluids should be used judiciously in patients with chronic kidney disease.

Aspirin, nitrates and low molecular weight heparin are not indicated for this patient. The ECG changes demonstrated are secondary to the hyperkalaemia and do not indicate an ischaemic cardiac event.

It goes beyond the scope of this question to outline the causes and signs of hyperkalaemia, so make sure to check out the further reading link for more information.

Management of severe hyperkalaemia includes...

Driving potassium into cells and out of the serum:

Salbutamol nebulisers

IV glucose and insulin

Stabilising the myocardium to reduce the risk of arrhythmia:

IV calcium gluconate or calcium chloride

Identifying and correcting underlying causes of hyperkalaemia:

This patient would require her medications rationalising in the context of hyperkalaemia.

Enalapril limits renal potassium excretion, naproxen is a nephrotoxic drug and movicol contains potassium. These medications may need to be suspended in the acute phase of hyperkalaemia and then rationalised once the patient is stable.

Further reading:

https://lifeinthefastlane.com/hyperkalemia/

Question:

An 18-year-old woman with a known diagnosis of asthma presents to her GP with a 4-month history of worsening wheeze. She is currently using a salbutamol (short-acting beta-agonist) inhaler on an as-needed basis and has found that she is having to use up to 6 doses a week to control her symptoms. She has a good inhaler technique and does not note any difference in her symptoms whether she is at work or not. She is keen to achieve better symptom relief and enquires about additional therapy she could take.

What is the most appropriate next step in the management of this patient?

A. Add inhaled corticosteroid

B. Add short acting antimuscarinic

C. Add montelukast

D. Add inhaled long-acting beta agonist

E. Increase salbutamol to once daily on a regular basis

Correct Answer:Add inhaled corticosteroid

Explanation:

British Thoracic Society guidelines for the management of asthma in adults state that inhaled low dose corticosteroid should be considered as first-line preventer therapy if PRN short-acting beta-agonist such as salbutamol fails to provide symptom control. They recommend considering moving up the asthma treatment ladder if the patient is using 3 doses or more of a reliever a week.

Increasing salbutamol to regular rather than PRN does not feature in the guidelines for the management of asthma. PRN salbutamol should be continued as ‘reliever’ therapy, for use during acute attacks, with the addition of ‘preventer’ therapy, such as inhaled corticosteroid if PRN salbutamol alone is insufficient to provide adequate symptom control.

Adding inhaled long-acting beta-agonist such as formoterol should be considered as an initial add-on therapy for patients who fail to achieve symptom relief with inhaled steroid alone. Many combination devices exist, which combine inhaled long-acting beta-agonist and inhaled corticosteroid for ease of patient use.

Montelukast is a leukotriene receptor antagonist. It should be considered at step 4 of the asthma management ladder if there is a failure of control with previous treatments.

Short-acting antimuscarinics such as ipratropium are used in the management of mild-moderate COPD. They do not feature in the guidelines for the management of asthma.

Further reading:

https://www.brit-thoracic.org.uk/document-library/guidelines/asthma/btssign-asthma-guideline-quick-reference-guide-2019/

Question:

A 34-year-old woman presents with episodes of fatigue following minimal exercise or movements. She has noticed that when talking to her husband or eating for a long time she has to stop and rest. She also mentions occasional she double vision which resolves on its own. There is no history of weight loss and denies any low mood. She does not take any regular medication and has no significant past medical or family history. She also does not drink alcohol or smoke.

Neurological examination of all 4 limbs reveals normal tone, power, sensation and co-ordination. Cranial nerve examination reveals right-sided mild ptosis but nil else of note. When asked to count to 50, she begins to fatigue and her voice becomes nasal. Clinical examination of all other body systems is unremarkable.

What is the most likely diagnosis?

A. Lambert-Eaton syndrome

B. Pseudobulbar palsy

C. Myasthenia gravis

D. Amyotrophic lateral sclerosis (ALS)

E. Cerebrovascular event

Correct Answer:Myasthenia gravis

Explanation:

Myasthenia gravis is a disorder of neuromuscular transmission that occurs as a result of autoantibodies binding to components of the neuromuscular junction. These autoantibodies most commonly target the acetylcholine receptor. The end result is muscles that fatigue easily after minimal use.

The clinical presentation can vary significantly, from mild weakness of specific muscle groups to severe weakness of multiple muscle groups. Common initial symptoms can include ptosis and diplopia, due to weakness of the extraocular muscles. Other symptoms can include:

Hand/grip weakness

Bulbar muscle weakness - causing slurred/nasal sounding speech

Facial muscle weakness

Difficulty chewing - due to weakness of the involved muscles

Lambert-Eaton syndrome is a pre-junctional neuromuscular disease that occurs secondary to pre-synaptic autoantibodies binding to calcium channels This leads to fatigue that improves with exercise, as calcium release is stimulated.

Pseudobulbar palsy usually presents with upper motor neuron signs on examination of the cranial nerves such as paralysis of the tongue and facial muscles in a patient with dysphonia. Cranial nerve examination was otherwise unremarkable here.

Amyotrophic lateral sclerosis is a degenerative condition affecting motor neurons, specifically the anterior horn cells of the spinal cord and the motor cranial nuclei. It presents with lower and upper dysfunction, with lower motor neurone signs being the most predominant feature. This patient's symptoms are intermittent, resolving with rest, which does not fit with this progressively degenerative condition.

Further reading:

https://patient.info/doctor/motor-neurone-disease-pro

Question:

A 35-year-old pregnant woman attends an appointment with her obstetrician following first-trimester vaginal bleeding. She reports that the vaginal bleeding has occurred twice in the first trimester and is of low volume. Urine and blood samples are tested for hCG that are both positive. A pelvic ultrasound is completed which illustrates a ‘snowstorm’ appearance.

Which of the following is a RISK FACTOR for the likely condition described?

A. African ethnicity

B. Excessive exercise

C. Menarche occurring under 12 years

D. Age 20-30 years

E. Multiple pregnancy

Correct Answer:Multiple pregnancy

Explanation:

The condition described in this scenario is likely gestational trophoblastic disease (GTD). Multiple pregnancies are a risk factor for this condition.

Other risk factors for GTD include:

Being older than 45 years or less than 16 years old

History of previous molar pregnancy

Menstrual factors (including menarche at >12 years of age and a history combined oral contraceptive pill usage)

Asian ethnicity

GTD is classified into complete, partial or invasive hydatidiform mole. Hydatidiform mole may result in choriocarcinoma. Clinical features of this condition include 1st trimester vaginal bleeding, uterine evacuation of pregnancy at ~10 weeks and features of metastases (i.e. respiratory distress, neurological dysfunction). The only diagnostic investigation for this condition is the histological analysis of the products of conception.

Woman aged 20-30 years are not at increased risk of GTD. However, being >45 years and <16 years old increases one's risk of developing this disease.

Menarche occurring >12 years of age increases the risk of GTD, not <12 years.

Women of Asian descent are at an increased risk of GTD (not African origin).

Excessive exercise has no effect on the development of this condition.

Further reading:

https://patient.info/doctor/gestational-trophoblastic-disease#nav-3

Question:

An 18-year-old man attends general practice with heartburn. He describes discomfort in his throat at mealtimes, which is accompanied by difficulty swallowing. When questioned further, this dysphagia is attributed to discomfort rather than feelings of obstruction or acid reflux. It occurs with solids and liquids. This has been ongoing for 2-weeks.

The patient does not describe any nausea or vomiting, change in appetite, abdominal pain or constipation/diarrhoea. He has a past medical history of asthma which is managed with a brown preventer inhaler (budesonide + formoterol, one puff twice a day) and a blue reliever inhaler (salbutamol, two puffs as required). He seldom uses his blue inhaler and does not use a spacer.

On examination:

Appears well at rest with normal observations

Oral cavity - appears dry with small white/yellow plaques adherent to the oral mucosa; halitosis

Abdomen - soft and non-tender with normal bowel sounds

What is the most appropriate first step in management?

A. Lansoprazole 30 mg once daily

B. Nystatin mouthwash four times daily for 7 days

C. Hold preventer inhaler

D. Refer for urgent oesophago-gastro-duodenoscopy (OGD)

E. Amoxicillin 500 mg three times daily for 5 days

Correct Answer:Nystatin mouthwash four times daily for 7 days

Explanation:

A common side effect of inhaled corticosteroid therapy is oral and peri-oral candidiasis, which is the best explanation for this patient's symptoms. Prolonged inhaled corticosteroid use with sub-optimal inhaler technique (this patient does not use a spacer) causes accumulation of steroid molecules in the mouth and throat, suppressing the immune system and encouraging overgrowth of fungi such as Candida albicans. The treatment for (peri)oral candidiasis is a course of antifungal nystatin mouthwash which is swirled around the mouth and then swallowed. If this is unsuccessful, topical or oral antifungal agents such as miconazole can be trialled.

Oral amoxicillin is not an antifungal agent and is therefore unlikely to deal with this infection.

Oral lansoprazole is a proton pump inhibitor used in the treatment and prevention of gastro-oesophageal reflux disease (GORD). This patient has symptoms mimicking GORD but lansoprazole will not deal with the underlying infectious cause.

Holding the patient's preventer inhaler is not a sensible solution as this will likely result in a deterioration of the patient's asthma which is currently well controlled. Instead, better inhaler technique and the use of a spacer should be discussed to reduce the likelihood of candidiasis developing in the future.

OGD is not indicated here as the patient does not have alarm symptoms for upper gastrointestinal malignancy (e.g true dysphagia, resistant dyspepsia, weight loss, rectal bleeding etc.) or peptic ulcer disease.

Further reading:

https://bnf.nice.org.uk/drug-class/corticosteroids-inhaled.html

Question:

A 3-year-old girl is brought to the GP by her mother after being sent home from nursery. The mother explains that the nursery had noticed the girl was rubbing and scratching her head throughout the day. A nursery worker inspected the girl's head and thought she saw a couple of "insect-like creatures" crawling through her head.

The girl has no significant past medical history. The mother explains the nursery was on "high alert" because of a similar case last week.

On examination of the head, you notice small whitish spots close to the scalp, adherent to the hair shaft. You also identify a small, insect-like creature (3-4mm in length) at the nape of the neck.

What is the most likely diagnosis in this patient?

A. Lichen simplex chronicus

B. Scabies

C. Tinea capitis

D. Pediculosis pubis

E. Pediculosis capitis

Correct Answer:Pediculosis capitis

Explanation:

The most likely diagnosis in this patient is head lice (pediculosis capitis), a parasitic infestation of the hairs of the human head caused by Pediculus humanus capitis. The transmission of head lice requires head-to-head contact and is commonly seen in young children. Head lice infestation often presents with scalp pruritus but may be asymptomatic. The discovery of live lice is pathognomonic to the disease and essential for diagnosis; the presence of empty egg casings (white spot appearance) alone is not considered sufficient for the diagnosis of an active infestation. Other key features in this patient's presentation include a recent history of potential exposure to another case of head lice at nursery.

Scalp ringworm, also known as tinea capitis, is caused by dermatophytes, a group of fungi that infect keratinised tissue. Key features of ringworm include patches of erythematous scaly skin, brittle hair, tender or painful areas on the scalp and patchy alopecia. This patient does not have any clinical features to suggest this diagnosis.

Lichen simplex chronicus is a cutaneous disorder characterised by the development of erythematous patches and plaques of thickened lichenified skin, often on the neck and scalp. This patient does not have any clinical features to suggest this diagnosis.

Pubic lice, also known as pediculosis pubis, is a parasitic infestation of human pubic hair caused by Phthirus pubis. Clinical features of pediculosis pubis include genital pruritus, which is worse at night, and grey-blue or red papules, which typically develop at feeding sites. Furthermore, pubic lice only live on coarse human hair; therefore, they are not found in the hair on the head.

Scabies is caused by infestation with the parasite Sarcoptes scabiei, a mite that burrows through the outermost epidermal layer. Clinical features of scabies include intense pruritis, linear erythematous burrows and erythematous papules. Scabies predominantly affects the axilla or genital area; it rarely presents on the neck and scalp. Furthermore, unlike Pediculus humanus capitis, the parasite Sarcoptes scabiei is not visible without a microscope, as it measures approximately 0.3-0.5 mm.

Further reading:

https://cks.nice.org.uk/topics/head-lice/

Question:

A 64-year-old male presents to the emergency department with a cough, rapid breathing and fever. He has been vomiting for the past 3 days and is passing only small amounts of dark urine. On examination, he is euvolaemic with mild periorbital oedema. Auscultation of his chest reveals coarse crackles at the right lower base. He is started on intravenous antibiotics and has routine bloods taken which show the following:

Results Reference range

Na+ 129 mmol/L (133–146)

K+ 4.2 mmol/L (3.5–5.3)

Urea 3.2 mmol/L (2.5–7.8)

Creatinine 83 μmol/L (59–104)

Glucose 4.6 mmol/L (4-6)

pH 7.37 (7.35-7.45)

What is the most likely cause of his electrolyte disturbance?

A. Hypovolaemic hyponatremia

B. Syndrome of inappropriate ADH secretion (SIADH)

C. Conn’s syndrome

D. Hypovolaemic hypernatremia

E. Diabetes insipidus

Correct Answer:Syndrome of inappropriate ADH secretion (SIADH)

Explanation:

The most likely diagnosis in the above scenario is the syndrome of inappropriate antidiuretic hormone (SIADH) secretion secondary to pneumonia. Though this man has reduced urine output, he is still producing small volumes of concentrated urine which is likely due to water retention rather than hypovolaemia. The fact that his urea is normal is reassuring that clinically he is not dehydrated, in which case we might expect the urea to be raised. In any patient presenting with hyponatremia, volume status should be assessed to help ascertain the underlying cause. The fact this patient is euvolemic with moderate and asymptomatic hyponatremia (no history or examination findings of weakness, myalgia, confusion or ataxia) necessitates further investigations, including paired serum-urine osmolality (to exclude pseudo-hyponatremia – secondary to hyperlipidemia, hyperproteinaemia or hyperglycaemia), TFTs (to exclude hypothyroidism) and 9 am cortisol (to assess for adrenal insufficiency). Treatment of SIADH involves fluid restriction to approximately 2/3 of the patient’s normal maintenance output – often 800-1200 ml/day.

Conn’s syndrome arises via excess aldosterone secretion, often from adrenal hyperplasia or an aldosterone-secreting tumour of the adrenal cortex and typically presents with a metabolic alkalosis, hypernatremia and hypokalaemia.

Diabetes insipidus would cause a raised blood glucose level, polyuria (large volumes of volume urine) and polydipsia (excessive thirst) secondary to ADH dysfunction (insufficiency or renal insensitivity).

Hypovolaemic hypernatremia suggests biochemical evidence of dehydration, however, this patient’s sodium is 129 mmol/L making them hypo-rather than hypernatraemic, and they have normal urea, which is often inconsistent with dehydration.

Hypovolaemic hyponatremia is characterised by clinical and biochemical evidence of dehydration, which presents with fluid overload and usually requires diuretic therapy; this is incompatible with the history above, which states the patient is euvolaemic.

Further reading:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6297575/pdf/clinmed-17-3-263.pdf

Question:

A 91-year-old man is brought in from a care home as he has been complaining of lower abdominal pain. The patient has moderate dementia but is able to communicate that the pain came on suddenly and is intermittent. A member of staff explains that the patient hasn’t passed stool for 3 days, but that this is not abnormal for the patient as he is always constipated. Over the last few months, there have been a number of occasions in which the patient did not pass stool for this long. However, she noticed that his tummy was more swollen than normal and he was complaining of more pain so she brought him in. He has not had much of an appetite but this is not abnormal for him. He has been feeling sick and during the consultation has a bilious vomit. He complains that the pain is getting very bad and asks for painkillers.

On examination, the patient is frail and looks unwell, with significant abdominal distension and some voluntary guarding on palpation of the lower abdomen. His observations are stable except for a heart rate of 108 bpm. A rectal exam reveals an empty rectum. He is sent for an abdominal X-ray which is shown below. An erect chest X-ray is unremarkable.

What is the most likely diagnosis?

Source: By Mont4nha [CC0], from Wikimedia Commons

A. Constipation

B. Sigmoid volvulus

C. Bowel perforation

D. Caecal volvulus

E. Large bowel obstruction

Correct Answer:Sigmoid volvulus

Explanation:

The most likely diagnosis is a sigmoid volvulus. Whilst this is relatively uncommon, the history of constipation in an elderly man makes it more likely. Furthermore, the radiograph shows the ‘coffee bean sign’ which is associated with volvulus. This patient will need an urgent referral to the surgical team as a failure to treat volvulus can lead to perforation and faecal peritonitis.

The diagnosis is less likely to be caecal volvulus as this is more common in younger patients and the history would be more likely to include past abdominal surgery or presence of an abdominal mass. The radiograph suggests a sigmoid volvulus.

This is unlikely to be a bowel perforation given the normal erect chest X-ray. Usually, you would expect to see free air under the diaphragm on an erect chest X-ray in the context of bowel perforation.

Although this patient has been constipated in the past, the vomiting suggests bowel obstruction and the radiograph suggests a sigmoid volvulus. It would be dangerous to treat this patient with stimulant laxatives as this could precipitate bowel perforation.

Further reading:

https://patient.info/doctor/sigmoid-volvulus

Question:

A 25-year-old woman presents to the GP regarding her menstrual cycle. Her menstrual cycles are 28 days long and regular. Menstruation is heavy, typically lasting 6 days, with intermittent pelvic pain occurring from two days before until several days after. She also has occasional painful bowel movements and dyspareunia. She denies any intermenstrual bleeding or changes in her vaginal discharge. She is not currently trying to conceive.

On examination, there is tenderness in the posterior fornix with uterosacral ligament nodules. She has already tried paracetamol and ibuprofen with no success.

What is the next best step in her management?

A. Prescribe mefenamic acid

B. Prescribe clomifene

C. Refer to gynaecology for GnRH analogues

D. Prescribe combined oral contraceptive pill

E. Refer for laparoscopic excision

Correct Answer:Prescribe combined oral contraceptive pill

Explanation:

Prescribe combined oral contraceptive pill is correct. This patient has signs and symptoms consistent with endometriosis, a condition affecting up to 1 in 10 women. It is characterised by chronic cyclical pelvic pain and secondary dysmenorrhoea (pain starting before bleeding), along with other features such as dyspareunia, and painful bowel movements which are all present in this patient. Uterosacral ligament nodules are a common finding in endometriosis and represent deposits of endometrial tissue. The first-line treatment in endometriosis is offering paracetamol with or without an NSAID (such as mefenamic acid or ibuprofen). This patient has already trialled these without success, therefore necessitating the next management step, which involves trialling hormonal treatments such as the combined oral contraceptive pill. If these steps are ineffective, then referral to gynaecology should be considered.

Prescribe clomifene is incorrect. This does not play a role in the management of pain in endometriosis. It is used to induce ovulation in conditions such as polycystic ovary syndrome. Clomifene may be used in endometriosis under specialist guidance to manage infertility, however, this patient does not currently wish to conceive.

Prescribe mefenamic acid is incorrect. This patient has already trialled the first-line option (paracetamol with or without an NSAID) without success. As this is an NSAID, it would be inappropriate to offer this again if it has not already worked.

Refer to gynaecology for GnRH analogues is incorrect. These work by lowering oestrogen levels leading to a 'pseudo-menopause', which may help with chronic pelvic pain. This should be considered in patients that have already trialled the first- and second-line options without success. As this patient has only tried the first-line option, it would be more appropriate to offer the COCP first.

Refer for laparoscopic excision is incorrect. This may be considered further down the line, especially in cases of subfertility, however, there are many risks associated with it (e.g. infection and bleeding) and it would be more appropriate to trial less invasive options first.

Further reading:

https://geekymedics.com/endometriosis/

Question:

A 60-year-old man undergoes an elective open mesh repair of a left inguinal hernia. The operation note states that he was found to have a “pantaloon” type hernia involving both direct and indirect components.

What is the anatomical course of a direct inguinal hernia?

A. Exits through the deep ring and passes along the inguinal canal

B. Exits directly, bypassing the inguinal canal

C. Exits through a defect in the inguinal ligament and passes along the inguinal canal

D. Exits lateral to the deep ring and passes along the inguinal canal

E. Exits medial to the deep ring and passes along the inguinal canal

Correct Answer:Exits medial to the deep ring and passes along the inguinal canal

Explanation:

A direct inguinal hernia is caused by a weakness in the posterior wall of the inguinal canal in an area known as Hesselbach’s triangle, which is located medial to the deep ring. Abdominal contents are forced “directly” through this defect into the inguinal canal. A direct hernia exits the abdomen medial to the deep ring, passes along the inguinal canal and emerges via the superficial ring, as shown below. The fascial defect is located medial to the inferior epigastric vessels.

An indirect inguinal hernia follows a different trajectory. It exits the abdomen through the deep ring, passes along the length of the inguinal canal and emerges via the superficial ring, as shown below. The deep inguinal ring is located lateral to the inferior epigastric vessels.

The remaining three options are not anatomically feasible.

By definition any structure leaving the abdomen via the superficial ring must have entered the inguinal canal first – it is not possible for an inguinal hernia to bypass the inguinal canal.

The area lateral to the deep ring is reinforced by the layered abdominal flat muscles and does not contain an anatomical defect or space for abdominal contents to herniate into.

The inguinal ligament is a thick band of connective tissue created by the rolled-up lower edge of the external oblique aponeurosis. It forms the floor of the inguinal canal and represents the boundary between the anterior abdominal wall and the thigh. It is much stronger than the rest of the soft tissue structures around the inguinal canal and virtually always remains intact.

Further reading:

https://geekymedics.com/hernias/

Question:

Ms D is a 65-year-old female who has been referred to see you urgently in the gynaecology clinic by her GP. She has a 1-month history of post-menopausal bleeding which is unpredictable and varies from spotting to bleeding that requires her to wear a sanitary towel. Prior to this bleeding, her last menstrual period (LMP) was 15 years ago. She is para 2+0 (both normal vaginal deliveries) and smear tests are up to date and have always been normal. She has no post-coital bleeding or dyspareunia. She has no associated weight loss and is usually fit and well. She has no relevant past medical or family history and is on no regular medications.

A transvaginal ultrasound scan shows an endometrial thickness of 10mm with no obvious ovarian or tubal pathology.

What is the best initial management step?

A. Pipelle endometrial biopsy

B. Mirena coil insertion

C. Tranexamic acid

D. Cervical smear test

E. Watch and wait

Correct Answer:Pipelle endometrial biopsy

Explanation:

The correct answer here is to take a pipelle biopsy. This is a test that is quick and easy to do in a clinic room and will help you towards a tissue diagnosis.

A Mirena coil is the first line in NICE guidance for management for menorrhagia or dysmenorrhea. It is not used in the management of post-menopausal bleeding.

A cervical smear test is a screening test and as such can only be processed in line with the screening campaign timelines. You would, of course, need to perform a speculum examination and any abnormal appearance of the cervix would prompt further investigation through colposcopy.

In this situation, because there is a thickened endometrium, you would need to investigate further to rule out endometrial cancer. Post-menopausal endometrial thickness is normally less than 5mm.

Tranexamic acid is useful in the medical management of menorrhagia but this lady’s presentation raises suspicion of endometrial cancer and therefore requires further investigation.

Further reading:

https://patient.info/doctor/postmenopausal-bleeding

Question:

12-year-old Adah presents to the GP with pain in her left knee during and after sports. She is a keen runner and trampolinist but is having to stop early and skip some sessions due to the discomfort. She is generally fit and well, and is of average height and weight. She has no relevant family history and is taking no regular medication.

On examination, there is a full range of movement in both knees, with no evidence of erythema. There is a swelling which is mildly tender on palpation over the left tibial tubercle. Examination of the hip joints is unremarkable.

What is the most likely diagnosis in this case?

A. Coffin-Siris syndrome

B. Osgood-Schlatter disease

C. Chondrosarcoma

D. Ewing sarcoma

E. Culler-Jones syndrome

Correct Answer:Osgood-Schlatter disease

Explanation:

Osgood-Schlatter disease is common in active teenagers and presents with pain that worsens on activity and swelling below the knee joint. Pain is usually relieved by rest and exacerbated by activities that extend the knee against resistance, such as running or jumping.

The disease is thought to be caused by multiple small avulsion fractures of the tibial tubercle (apophysis) where the quadriceps tendon inserts.

Typical signs on clinical examination include tenderness and swelling at the tibial tuberosity. Pain may be worsened by knee extension against resistance.

Treatment for Osgood-Schlatter involves a reduction in levels of activity, letting the pain determine how much the person can tolerate. Physiotherapy to stretch the calf muscles can also be useful. The condition generally improves as children age, but pain can extend into adulthood.

Coffin-Siris syndrome is a genetic condition that causes learning disability, developmental delay, underdeveloped toe and fingernails and distinctive facial features.

Culler-Jones syndrome is a disease characterised by hypopituitarism, polydactyly and distinctive facial features.

Ewing sarcoma is a malignant bone tumour most commonly presenting in adolescents with pain and swelling at the site of the tumour. Pain from Ewing sarcoma is typically constant (i.e. not relieved by rest) and you would expect other systemic features such as fever, weight loss etc.

Chondrosarcoma is a rare bone tumour arising from cartilaginous tissue, presenting with a palpable mass and progressive pain. Osgood-Schlatter syndrome is much more likely in this scenario.

Further reading:

https://patient.info/doctor/osgood-schlatter-disease-pro#nav-2

Question:

A 5-year-old girl presents to the emergency department with increased restlessness and ear pain. She has a history of autism spectrum disorder and recurrent otitis media.

On examination, her left ear is anteriorly protruding, and she has a temperature of 38.3ºC. On otoscopy, she has a bulging tympanic membrane. She is subsequently diagnosed with mastoiditis.

What is a complication of this condition?

A. Parotitis

B. Meningitis

C. Croup

D. Sialolithiasis

E. Oculomotor nerve palsy

Correct Answer:Meningitis

Explanation:

Meningitis can be a complication of mastoiditis, the local spread of which puts the meninges at risk of infection. The most common causative pathogen of mastoiditis is Streptococcus pneumoniae. While this isn't a particularly common complication of mastoiditis, it is a serious one that clinicians should be wary of.

Croup is an upper respiratory tract infection typically caused by the parainfluenza virus. While this girl is within the typical age range of croup (6 months - 6 years), it is not a complication of mastoiditis.

Oculomotor nerve palsy can occur as complications of mastoiditis, but it tends to be the facial nerve (CN VII) that is affected. A facial nerve palsy would give a facial weakness that is ipsilateral to the infection. Oculomotor nerve (CN III) palsy is not associated with mastoiditis, which classically presents as a 'down and out' pupil.

Parotitis is a serious infection of the parotid gland which is almost exclusively found in the elderly, typically those with poor oral hygiene, dehydration, and malnourishment. It is not related to mastoiditis despite its nearby anatomy.

Sialolithiasis is the presence of calcified stones in the salivary glands, mostly found in the submandibular gland. They are not linked to mastoiditis and tend to form between the ages of 30 - 60 years old.

As an aside, mastoiditis is most common in young children (and twice as common in those with autism spectrum disorder). In this case, it is likely secondary to acute otitis media; again, this is more common with concurrent autism. Mastoiditis may also present with features such as fever, ear pulling (in children), and otalgia. In adults, it may present with headache, hearing loss, vertigo, and otorrhoea.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK560877/

Question:

A 3-year-old boy attends paediatric emergency department with his mother having been referred by his GP. The child has been experiencing stridor and appears to be in respiratory distress. He has developed intercostal recessions, flared nostrils and cyanosis at agitation. He had an upper respiratory tract infection 2-days ago. He has no other significant medical history, is fully vaccinated and is achieving his developmental milestones. The paedatric on call team makes a diagnosis of moderately severe croup and admits the child with a dose of dexamethasone and nebulised adrenaline as well as oxygen supplementation.

Given the diagnosis, what is the most likely causative agent to explain this presentation.

A. Measles

B. Bordetella pertussis

C. Corynebacterium diphtheriae

D. Respiratory syncytial virus

E. Parainfluenza virus

Correct Answer:Parainfluenza virus

Explanation:

The correct answer is parainfluenza virus. Croup is a common respiratory illness impacting the trachea, larynx and bronchi that can lead to a characteristic barking cough and inspiratory stridor. It is a mostly self limiting viral illness which may require hospitalisation if airway compromise occurs. Severity can be measured with the Westley score. Up to 75% of recorded cases in the US were found to be of parainfluenza origin (Johnson 2014).

Cornebacterium diptheriae can be a bacterial cause of croup, however given this child has had a complete vaccination history, this option is far less likely. By this logic, measles is also an incorrect answer.

Bordetella pertussis is the bacterial cause of whooping cough and therefore also incorrect. Again, due to the vaccination history of this patient this answer is less likely.

Respiratory syncytial virus is a common cause for broncholitis, a cause of respiratory distress in children <1 year old. Although RSV may cause croup, it is unlikely to be the cause in a 3 year old due to the high likelihood of acquired immunity by this age.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK431070/

Question:

A 73-year-old woman presents to her GP with a 2-month history of large amounts of vaginal discharge and passage of gas through the vagina. She denies any dysuria, passage of stool through the vagina or difficulty passing stool. She had an episode of diverticulitis complicated by a pericolic abscess two months ago and was managed with IV antibiotics and surgical drainage.

What is the most likely cause of her symptoms?

A. Transvaginal drainage of the abscess

B. Colovaginal fistula

C. Colonic stricture

D. Urinary tract infection

E. Colovesical fistula

Correct Answer:Colovaginal fistula

Explanation:

This woman is presenting with large amounts of vaginal discharge, the passage of gas through the vagina and a recent history of complicated diverticulitis. The most likely cause of her symptoms is a colovaginal fistula. Colovaginal fistulae most commonly form when a diverticular abscess ruptures into the vagina, resulting in an abnormal connection between the colon and vagina. This leads to the passage of flatus or occasionally faeces through the vagina. It can also cause copious vaginal discharge or recurrent vaginal infections.

A colovesical fistula is an abnormal connection between the colon and bladder, which can form after an episode of complicated diverticulitis. This typically presents with frequent urinary tract infections, foamy urine, or passage of feculent matter into the urine.

Pericolic abscesses are typically drained percutaneously and not transvaginally. Therefore, transvaginal drainage of the abscess is incorrect.

A colonic stricture is a potential complication of diverticulitis, however, it tends to present with obstructive symptoms such as constipation, vomiting, cramping abdominal pain, or complete bowel obstruction.

A urinary tract infection (UTI) typically presents with dysuria, urinary frequency, and urgency. UTIs can cause pneumaturia, however, they do not cause gas to be passed through the vagina.

Further reading:

https://teachmesurgery.com/general/large-bowel/diverticular-disease/

Question:

A 30-year-old woman is seen in general practice with a 6-month history of gradually worsening diplopia and a gritty sensation in her eyes. The patient describes "seeing double", particularly when looking upwards. Tilting her head initially improved symptoms, but this has ceased to be effective. There is no headache, episodes of visual loss, vertigo or sensory/motor neurological deficit.

Cranial nerve examination:

The patient has a visible proptosis

CN II - visual acuity 6/9 in both eyes, colour vision intact; no gross visual field defects; pupils equal and reactive to light (PEARL) and intact accommodation reflex; no gross optic disc or retinal defects on direct ophthalmoscopy

CN III, IV, VI - restricted abduction bilaterally; diplopia provoked by upgaze; no visible horizontal or vertical nystagmus

Which of the following is the most appropriate initial investigation?

A. Blood for thyroid function tests (TFTs)

B. Blood for serum cholesterol, HbA1c, FBC and coagulation screen

C. Non-contrast CT head

D. Nerve conduction study

E. Blood for post-synaptic ACh autoantibody titre

Correct Answer:Blood for thyroid function tests (TFTs)

Explanation:

This patient has a likely diagnosis of thyroid eye disease. This condition is also known as Graves ophthalmopathy, and 90% of cases occur in patients with underlying Graves disease (production of thyroid-stimulating autoantibodies causing hyperthyroidism). The underlying mechanism of disease is autoimmune destruction of the extra-ocular muscles, which causes symptoms relating to eye movement (e.g. diplopia, dizziness, falls), proptosis (bulging of the eyes) and more rarely visual loss via keratitis or optic neuropathy. Though symptoms of thyroid eye disease can be improved by treating the underlying cause, in severe sight threatening cases may require high dose steroids for management. Radioiodine treatment frequently worsens thyroid eye disease.

The most appropriate initial investigation is thyroid function tests (TFTs) to identify biochemical hyperthyroidism. TSH receptor autoantibody levels would also be checked to confirm a likely diagnosis of Graves disease.

The following are distractors, matched to their corresponding diagnoses:

Blood for serum cholesterol, HbA1c, FBC and coagulation screen; non-contrast CT head - stroke

Blood for post-synaptic ACh autoantibody titre - myasthenia gravis

Nerve conduction study - peripheral neuropathies

Further reading:

https://rarediseases.org/rare-diseases/thyroid-eye-disease/

Question:

A 65-year-old female presents with deteriorating vision and worsening colour vision, over the last few years. This initially started with difficulty reading but has now progressed to trouble watching the television. Occasionally at night time, she reports developing a “dark spot” around the middle of her visual field, lasting a few minutes. She reports no pain, but occasionally sees flickering in the periphery of her right eye. She has a past medical history of type 2 diabetes, well-controlled by metformin.

Visual acuity testing reveals a score of 6/12 in the left eye and 6/18 in the right eye. Fundoscopy shows the following appearance (image below). Slit-lamp biomicroscopy demonstrates geographic atrophy, no evidence of neovascularisation, and advanced depigmentation.

What is the next step in confirming the diagnosis?

National Eye Institute of the NIH

A. No further investigation is required

B. Colour fundus photography

C. Indocyanine green angiography

D. Fundus fluorescein angiography

E. Optical coherence tomography

Correct Answer:No further investigation is required

Explanation:

The presence of painless gradual blurring of central vision in a person aged 55 or over affecting their ability to read along with a black or grey patch affecting central vision (scotomata) is highly suggestive of age-related macular degeneration (AMD), specifically dry AMD. Although classically asymptomatic and detected during a routine eye examination, it can present with loss of vision, decreased ability to discern shades of colours (contrast sensitivity), flashing lights (photopsia), and rarely visual hallucinations (Charles Bonnet syndrome).

When investigating patients with AMD, it is important to differentiate between dry and wet AMD, as wet AMD can be treated if diagnosed early with anti-VEGF inhibitors (ranibizumab and aflibercept). Currently, there is no treatment for dry AMD. Wet AMD presents more commonly with sudden visual deterioration, central visual blurring, and distortion with reports of straight lines appearing wavy (metamorphopsia).

The fundoscopy image displays drusen, which are collections of lipid and protein material that collect beneath the retinal pigment epithelium (RPE) and within Bruch’s membrane. The slit-lamp biomicroscopy, confirms late dry AMD appearances (geographic atrophy, advanced depigmentation, along with the clinical visual acuity loss 6/18 in the right eye and drusen on fundoscopy). According to NICE guidance, this is sufficient to confirm the diagnosis, therefore no further investigation is required.

Optical coherence tomography (OCT) should be offered to people with suspected neovascular AMD for diagnosis and is used as part of monitoring the condition.

Fundus fluorescein angiography is offered to people with suspected neovascular AMD to confirm the diagnosis if OCT proves inconclusive and does not exclude neovascularisation.

Colour fundus photography can provide a record of the appearance of the macular retina.

Indocyanine green angiography is an alternative dye to fluorescein used to visualise the choroidal circulation, providing additional information to fluorescein angiography.

Further reading:

https://www.nice.org.uk/guidance/ng82/chapter/recommendations#classifying-age-related-macular-degeneration

Question:

A 91-year-old gentleman is brought in to the Emergency Department after being found lying on the floor at home by a warden. He lives in sheltered accommodation and has no relatives available, and is unable to give a past medical history as his speech is slurred and he appears confused. It is unclear how long he has been on the floor.

He is found to have a right-sided weakness as well as slurred speech. He is significantly malnourished. A CT head shows age-related involutional change only and he is admitted to the stroke unit.

Over the next few days, he is unable to eat without choking and is assessed by the Speech and Language Therapist (SALT) who find that he is unable to manage any solid food safely and recommend keeping him nil by mouth (NBM). His confusion improves and eventually, 6 days into his admission, he consents to NG tube insertion and feeding begins.

Routine blood tests are taken 3 days later which show the following:

Sodium = 148 mmol / L

Potassium = 2.9 mmol / L

Urea = 2.3 mmol / L

Creatinine = 46 umol / L

Magnesium = 0.48 mmol / L

Phosphate = 0.3 mmol / L

What is the most likely diagnosis?

A. Primary hyperaldosteronism

B. Refeeding syndrome

C. Addison's disease

D. Acute kidney injury

E. Cushing's disease

Correct Answer:Refeeding syndrome

Explanation:

This patient is significantly malnourished and has had a period of at least 6 days with minimal oral intake. His blood tests, taken several days after initiation of feeding, show hypokalaemia as well as severe hypophosphataemia and hypomagnesaemia. The underlying diagnosis is, therefore, refeeding syndrome. Refeeding syndrome is characterised by fluid and electrolyte shifts due to the introduction of feeding in 'at-risk' patients. People who are particularly at risk include malnourished patients, patients with nutritional deficiency such as due to alcohol excess, chronic pancreatitis or bowel disease, those with anorexia nervosa, elderly patients, and oncology or surgical patients. Feeding triggers a surge in glucose and subsequently insulin which leads to the intracellular shift of potassium and phosphate, amongst other complex fluid and electrolyte derangements. Management involves strict monitoring and replacement of electrolytes as needed and slowing of feed, and may require higher-level care. Identification of high-risk patients and prevention of refeeding syndrome is, however, vitally important.

There is no evidence of acute kidney injury on the blood tests shown, as the patient's urea and creatinine are not elevated. Primary hyperaldosteronism, or Conn's syndrome, causes hypernatraemia and hypokalaemia but is usually associated with hypertension and would not be a more likely presentation than refeeding syndrome in this case. Cushing's disease and Addison's disease are primary corticosteroid excess and deficiency respectively. Of the two, Cushing's disease can potentially cause hypokalaemia and hypernatraemia but again is not more likely than refeeding syndrome. In contrast, Addison's disease typically causes hyperkalaemia and hyponatraemia.

Further reading:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2440847/

Question:

A 10-year-old boy presents to his general practitioner with his father with a 2-day history of sore throat and rash. The father says that his son has had sporadic fevers over the last few days.

On examination, there is a maculopapular rash on the patient's trunk and face, with obvious perioral pallor. The patient's tongue appears bright red and there is mild cervical lymphadenopathy. His child's father is particularly concerned about the rash, which he describes as 'rough like sandpaper'. The abdomen is soft with no palpable organomegaly. No other positive findings are noted.

What is the most likely diagnosis?

A. Kawasaki disease

B. Scarlet fever

C. Measles

D. Slapped cheek syndrome

E. Infectious mononucleosis

Correct Answer:Scarlet fever

Explanation:

The correct answer is scarlet fever. Scarlet fever classically shows a maculopapular 'sandpaper rash' that feels very rough on palpation. The rash associated with scarlet fever classically spares the area around the mouth, giving the appearance of perioral pallor. The bright red 'strawberry tongue' is also a classical finding in scarlet fever.

Infectious mononucleosis is incorrect, as this does not fit with the clinical picture of this patient. Infectious mononucleosis, caused by the Epstein-Barr virus, is more uncommon in patients of this age, more commonly affecting the 15-24 age group. Infectious mononucleosis does not cause a sandpaper rash. Patients may have palpable hepatosplenomegaly on abdominal examination.

Kawasaki disease is incorrect, as the patient does not meet the diagnostic criteria. To diagnose Kawasaki disease, patients must have a fever for at least 5 days and 4/5 of the following:

Non-purulent conjunctival injection

Changes in the lips or oral cavity.

Polymorphous rash.

Cervical lymphadenopathy.

Changes in the peripheral extremities.

The duration of fevers is not specified, and the patient does not have conjunctival injection or changes in the peripheral extremities, meaning that Kawasaki disease cannot be diagnosed.

Measles is incorrect, as this would not cause the constellation of symptoms seen in this patient. Measles may cause an exanthematous rash, though it would not have the 'sandpaper' roughness that is characteristic of scarlet fever. Koplik spots in the buccal mucosa are pathognomonic of measles. Measles is not known to cause a bright red 'strawberry tongue' as is seen in this patient.

Slapped cheek syndrome is incorrect, as this does not cause a sandpaper rash. Affected children usually have few symptoms, so this child is likely too unwell to have slapped cheek syndrome. Slapped cheek syndrome is also known as 'fifth disease' and is caused by parvovirus B19.

Further reading:

https://dermnetnz.org/topics/scarlet-fever

Question:

A 71-year-old man is reviewed in the cardiology clinic. He is known to have aortic valve disease and is waiting to be considered for surgical intervention.

Which of the following clinical features would be most consistent with a diagnosis of aortic stenosis?

A. Neck vein distension

B. Wide pulse pressure

C. Diastolic heart murmur heard loudest over right sternal edge

D. Systolic heart murmur heard loudest over apex and radiating into axilla

E. Soft S2 heart sound

Correct Answer:Soft S2 heart sound

Explanation:

Aortic stenosis is commonly due to calcification of the aortic valve, causing narrowing of the valve lumen. This narrowing may cause softening of the second heart sound as the valve leaflets are not able to snap shut loudly against each other.

A wide pulse pressure is associated more typically with aortic regurgitation. The pulse pressure is narrow and the pulse is typically slow-rising in aortic stenosis.

The murmur heard in aortic stenosis typically radiates to the carotids and is heard loudest over the right sternal edge.

Venous distension in the neck is associated with right-sided heart failure/pulmonary hypertension, and more commonly seen with mitral stenosis.

Further reading:

https://patient.info/doctor/aortic-stenosis-pro

Question:

An adolescent male presents to his local GP surgery with a painless scrotal swelling on the left side. There is no history of trauma, and on examination, the swelling is irreducible with an absent cough impulse. There is no abnormal testicular lie and the mass does not transilluminate. On palpation, the swelling feels like a bag of worms. The patient is systemically well and has no other medical history of note.

Given the history and examination findings, what is the most likely diagnosis?

A. Hydrocele

B. Inguinal hernia

C. Haematocele

D. Varicocele

E. Testicular torsion

Correct Answer:Varicocele

Explanation:

The most likely diagnosis is a varicocele. A varicocele is an abnormal dilatation of the testicular veins in the pampiniform venous plexus, caused by venous reflux. They are important to identify as they can be associated with infertility and rarely renal cell carcinoma. Varicoceles most commonly occur on the left side but can be bilateral. They typically present as a painless swelling and are characteristically described as feeling like a ‘bag of worms’ on palpation.

A haematocele is a collection of blood in the tunica vaginalis around the testicle, that occurs after testicular trauma. It typically presents with a painful testicular lump after trauma.

A hydrocele is a collection of fluid within the tunica vaginalis. Typically this presents as a painless soft swelling of the scrotum that transilluminates on examination. It can often be difficult to palpate the testicles due to the excess fluid.

An inguinal hernia involves the protrusion of abdominal contents through both the abdominal wall and the internal inguinal ring. As a result, bowel and omentum can extend into the scrotum, presenting as a scrotal lump. Typically the swelling would be reducible and a cough reflex would be present.

Testicular torsion presents acutely with testicular pain. Typical clinical examination findings include abnormal testicular lie and pain on palpation of the testicle that is not relieved by testicular elevation.

Further reading:

https://patient.info/doctor/varicocele-pro

Question:

A 50-year-old hairdresser presents to her GP after noticing her skin appearing yellow. She has no significant past medical history of note. On examination, the GP notices scleral icterus, scratches along the patient’s arms, and yellow plaques around the eyelids. A diagnosis of primary biliary cirrhosis (PBC) is suspected.

Which of the following autoantibodies has the greatest specificity to PBC?

A. Anti-double-stranded DNA antibodies

B. Anti-mitochondrial antibodies

C. Anti-nuclear antibodies

D. Anti-smooth-muscle antibodies

E. Anti-liver/kidney microsomal antibodies

Correct Answer:Anti-mitochondrial antibodies

Explanation:

PBC is an autoimmune disease causing progressive destruction of the interlobular bile ducts. Over time, the resulting scarring can progress to cirrhosis of the liver. It typically affects females aged 45-55. The commonest symptoms of PBC include fatigue, pruritus and right upper quadrant pain. In later stages, patients may develop cholestatic jaundice, with pale stools and dark urine. They may have co-existing autoimmune illnesses, such as Sjogren’s syndrome or thyroid dysfunction.

The scratch marks in this patient indicate that she has pruritus, which is often severe and may precede other symptoms. The plaques around the eyes describe xanthelasma, which may also be seen in these patients due to increased cholesterol levels. Anti-mitochondrial antibodies are present in 95% of patients with PBC.

Though anti-smooth muscle antibodies may be found in patients with PBC, these are far less specific. They are more likely to be seen in patients with autoimmune hepatitis, as are anti-liver/kidney microsomal antibodies.

Antinuclear antibodies are seen in a range of conditions, including SLE and autoimmune hepatitis.

Anti-double-stranded DNA antibodies are highly specific for SLE.

Further reading:

https://patient.info/doctor/primary-biliary-cholangitis-pro

Question:

A 7-year-old girl presents with a new skin rash and low-grade fever. The girl was born in Lebanon and immigrated to the UK at five years old. The girl’s father says the rash began on the child’s face and rapidly spread down her body.

Physical examination reveals tender bilateral postauricular lymphadenopathy, as well as a fine, generalised, pink-coloured maculopapular rash.

What is the most likely diagnosis?

A. Rubella

B. Varicella zoster

C. Measles

D. Roseola

E. Erythema infectiosum

Correct Answer:Rubella

Explanation:

Some immigrants to the United Kingdom may not have completed the vaccine regimen according to the UK Immunisation Schedule. It is likely this young girl was not vaccinated against measles, mumps and rubella (MMR) at 12 months old. Among the acute viral exanthems, measles and rubella are both characterised by a maculopapular rash that begins on the face and spreads to the trunk and extremities. However, the rash associated with rubella typically spreads more quickly, and neither darkens nor coalesces. Moreover, postauricular and occipital lymphadenopathy is particularly common with rubella, making this the most likely diagnosis in this patient.

While measles may also produce a maculopapular rash that begins on the face and spreads to the trunk and extremities, it is less commonly associated with postauricular lymphadenopathy and tenderness than rubella.

Erythema infectiosum is characterised by initial redness of the cheeks (“slapped-cheek” appearance) followed by a maculopapular rash on the extremities and trunk. Postauricular tenderness is also not a common association.

Varicella zoster infection most commonly produces the classic chickenpox rash, a maculopapular rash that starts on the trunk and spreads centrifugally to involve both the face and extremities.

Roseola (HHV-6) causes roseola infantum, which is characterised by a transient maculopapular rash that appears for a few days on the trunk and chest once the patient’s fever subsides. This infection is also most common in children between the ages of 6-15 month,s making it a less likely cause of this patient’s illness.

Further reading:

https://www.futuremedicine.com/doi/10.2217/fmb-2016-0147

Question:

A 4-year-old boy is brought to the GP by his mother due to concerns about his development. The parent explains that her son continues to speak in sentences of only one or two words in length, despite having a good range of vocabulary.

The mother explains that he is also uninterested in playing with other children, and spends most of his day on his own. He gets extremely upset if his food isn’t laid out in a particular order, and insists on a set routine when washing his hands. The mother explains that this behaviour has been noticeable for the last 12 months.

Which of the following is the most likely diagnosis?

A. Cystic fibrosis

B. Attention deficit hyperactivity disorder (ADHD)

C. Obsessive-compulsive disorder (OCD)

D. Autism spectrum disorder (ASD)

E. Otitis media with effusion

Correct Answer:Autism spectrum disorder (ASD)

Explanation:

The presence of abnormal social interaction and communication alongside restrictive, repetitive behaviours is indicative of a diagnosis of autism spectrum disorder (ASD). It is a life-long, neurodevelopmental disorder. The clinical features of ASD usually begin to present at around 3 years of age, but many diagnoses are not made until later in life.

Attention deficit hyperactivity disorder (ADHD) is a neurodevelopmental condition characterised by impulsivity, inattention and hyperreactivity present in at least two environments. ADHD is not associated with a delay in speech and language development.

While the presence of a specific routine is associated with obsessive-compulsive disorder (OCD), the other features of this history suggest an alternative diagnosis. OCD is not associated with delays in speech development or abnormal social interaction. It is also extremely rare in young children.

Cystic fibrosis is a congenital disease that mainly affects the respiratory and gastrointestinal systems. It does not affect speech and language skills. Cystic fibrosis is commonly screened for through newborn screening, and symptoms typically start in early infancy.

Otitis media with effusion describes a condition where fluid is persistently present in the middle ear. It is a common cause of hearing loss in children and can lead to delays in the development of speech and language skills. However, this diagnosis would not account for the restrictive, repetitive behaviours described in this child’s history.

Further reading:

https://geekymedics.com/autism-spectrum-disorder-asd/

Question:

A 9-year-old boy has been referred to haematology with a history of prolonged bleeding after a tonsillectomy. A coagulation profile shows a prolonged activated partial thromboplastin time (APTT) and a normal prothrombin time (PT). Clotting factor tests demonstrate factor VIII levels to be 8% of normal.

What is the best initial management step?

A. Factor VIII

B. Tranexamic acid

C. Cryoprecipitate

D. Fresh frozen plasma

E. Desmopressin

Correct Answer:Desmopressin

Explanation:

Desmopressin is a synthetic analogue of vasopressin which acts on the endothelium to induce the release of von Willebrand factor. Von Willebrand factor acts as a carrier protein for factor VIII, preventing degradation of VIII in the plasma. Desmopressin therapy alone in many cases can be used in the treatment of mild (FVIII 5-50%) to moderate (FVIII 1-5%) haemophilia A. This avoids the potential risks of blood products. In more severe cases (FVIII <1%) Factor VIII is the treatment of choice. In this case, both the history and FVIII levels suggest mild to moderate disease.

Other blood products, such as cryoprecipitate and fresh frozen plasma, should only be used in emergency situations where clotting factor concentrates are not available.

Tranexamic acid may be used for skin and mucosal bleeds, for example during dental extractions.

Further reading:

https://geekymedics.com/haemophilia/

Question:

An 18-year-old female is brought to A&E after being kicked in the side of the head during a martial arts competition. She initially lost consciousness but regained consciousness within 30 seconds. She has progressively worsening confusion and disorientation.

She has a blood pressure of 160/95mmHg, heart rate of 65bpm and her GCS is currently 14/15. She has bruising and laceration of the right temple. Neurological examination reveals anisocoria but her pupils are reactive to light.

An urgent CT head is requested, which demonstrates a large lens-shaped mass between the cranium and the outer dura mater, and there is evidence of mass effect with obvious midline shift.

What is the most appropriate definitive management option for this patient?

A. Monitor observations closely and consider surgical intervention if there is further deterioration

B. Administer prophylactic anticonvulsants and conduct MRI

C. Refer to the neurosurgical team for burr hole craniotomy

D. Raise the head and give mannitol

E. Administer prophylactic anticonvulsants and repeat CT scan

Correct Answer:Refer to the neurosurgical team for burr hole craniotomy

Explanation:

The most appropriate definitive management in this patient is to refer to the neurosurgical team for burr hole craniotomy. This history and examination are suggestive of an extradural haemorrhage, which typically occurs due to rupture of the middle meningeal artery that lies in the temporal region beneath the pterion. This is a region of the skull at which the frontal, parietal, sphenoid and temporal bones merge. Fracture of this region following head trauma can lead to an extradural haemorrhage in which blood accumulates between the cranium and outer dura mater. As the bleed is arterial, blood quickly accumulates in the potential space lying beneath the cranium and can cause ‘mass effect’ – leading to midline shift and possibly brainstem herniation if the bleed is not evacuated urgently. This is a large extradural haemorrhage and there is evidence of mass effect and hence surgical input is urgently required.

It is incorrect to monitor observations closely and consider surgical intervention if there is further deterioration. The CT head already shows that there is a large bleed with evidence of a mass effect, and surgical input is required urgently.

It is incorrect to raise the head and give mannitol, as this conservative management to lower intracranial pressure is not definitive; for large bleeds with midline shift, surgical management is required.

It is incorrect to administer prophylactic anticonvulsants and repeat CT scan as although prophylactic anticonvulsants would likely be given prior to surgery to prevent seizures, a repeat CT scan would not be required at this point as it would be unlikely to change management prior to neurosurgical input.

It is incorrect to administer prophylactic anticonvulsants and conduct MRI as an MRI is unlikely to provide any further useful information that would alter management at this stage prior to neurosurgical input.

Further reading:

https://geekymedics.com/extradural-haematoma-overview/

Question:

A 47-year-old man presents to A&E with left-sided weakness. He was witnessed to have a generalised tonic-clonic seizure that lasted 15 minutes and was terminated by the administration of rectal diazepam. In A&E he has a GCS of 8 (E2, V1 M 5) but is not moving the left side of his body.

What is the most likely cause for his weakness?

A. Basilar artery infarct

B. Right middle cerebral artery infarct

C. Left middle cerebral artery infarct

D. Todd’s paresis

E. Weber’s syndrome

Correct Answer:Todd’s paresis

Explanation:

This man most likely has Todd’s paresis following on from his seizure.

Todd's paresis involves focal weakness in a part or all of the body after a seizure. This weakness typically affects appendages and is localised to either the left or right side of the body. It usually subsides completely within 48 hours.

The patient's reduced GCS can be explained by a mixture of being post ictal and the recent administration of benzodiazepines. He is very unlikely to have had a stroke. If his symptoms persist they could be investigated with a CT and/or MRI brain.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK532238/

Question:

You see a 43-year-old man who is complaining of lower back pain. He says the pain started approximately six weeks ago but for the last few days, it has begun to radiate down his right leg. He can’t remember anything that specifically caused the pain. He is normally very fit and exercises regularly. The back pain is now less severe than the leg pain which is stopping him going to the gym.

The pain extends down from his buttock down the back of his leg and into his foot. He occasionally has a tingling sensation down the back of his leg which is associated with the pain. He is normally fit and well, with no relevant past medical history. He has a normal BMI.

You examine the patient and doing a straight leg raise test provokes the symptom. The examination is otherwise normal and he has no red flag symptoms.

You think this patient has sciatica and discuss self-management advice, exercises to do and analgesia.

Which statement below should be included in your advice?

A. If the pain does not resolve in six weeks to return for a prescription of morphine

B. Avoid any physical activity as this will make things worse

C. Cold compresses may relieve pain and muscle spasm

D. Keeping as active as possible and exercising regularly is important to reduce the risk of recurrence

E. The patient should be pain free before returning to work and their normal activities

Correct Answer:Keeping as active as possible and exercising regularly is important to reduce the risk of recurrence

Explanation:

Sciatica is the term for symptoms of pain, tingling, and numbness which arise from nerve root compression or irritation in the lumbosacral spine.

Symptoms of sciatica typically extend to below the knee — from the buttocks, across the back of the thigh, to the outer calf, and often to the foot and toes.

Nerve root compression may be caused by:

A herniated intervertebral disc — in about 90% of cases.

Spondylolisthesis.

Spinal stenosis.

Management of sciatica involves:

Checking for red flag symptoms and signs which may indicate a serious underlying cause such as cauda equina syndrome, spinal fracture, cancer, or infection. If present, admission or urgent referral should be arranged depending on clinical judgement.

Assessing the person's risk of back pain disability using a risk stratification tool.

Providing adequate analgesia (an NSAID first-line, or codeine with or without paracetamol if an NSAID is contraindicated or not tolerated). If analgesia is not effective, drugs to treat neuropathic pain can be prescribed.

Providing information about its expected time course, self-help measures, advice about staying active, resuming normal activities, and returning to work as soon as possible.

Offering people at higher risk of back pain disability referral for group exercise, and/or cognitive behavioural therapy, and/or physiotherapy.

Further reading:

https://cks.nice.org.uk/sciatica-lumbar-radiculopathy

Question:

A clinical trial testing a new chemotherapy drug for lung cancer is undertaken to determine if it reduces mortality in lung cancer patients. Additional data are also collected regarding side effects and symptom severity. During the study, several patients from the treatment arm decide to withdraw from the study, as the side effects were not tolerable. There are no drop-outs from the control arm.

What form of bias is most likely to be present in this study?

A. Measurement bias

B. Misclassification bias

C. Attrition bias

D. Observer bias

E. Procedure bias

Correct Answer:Attrition bias

Explanation:

The withdrawal of several patients from the treatment arm of the trial may skew results, particularly as they have dropped out due to intolerable side effects. This form of bias is called attrition bias, and it occurs when different rates of loss to follow-up occur in the treatment and control arm of a trial.

Measurement bias is the bias that arises from an inaccuracy in the way in which the variable is being measured, for example using an inaccurate measuring tool.

Observer bias is the bias that arises due to a researcher’s expectations or preconceptions affecting the way they perceive and record a variable.

Procedure bias is the bias that arises from the conditions in which a study is undertaken, for example not giving participants enough time to complete a questionnaire or interviewing participants in a non-private room.

Misclassification bias is the bias that arises from incorrectly classifying a study participant.

Further reading:

https://geekymedics.com/statistics-for-medical-students/

Question:

A 28-year-old female presents to the GP with secondary amenorrhoea, lactation and headache. On questioning, you find this has been progressing over 7 months, she is not sexually active and has never been pregnant. Her past medical history is notable for recurrent peptic ulcer disease due to Zollinger-Ellison syndrome and a recent renal calculi. On examination, there is bitemporal hemianopia and breast examination reveals both breasts are lactating. You suspect a prolactinoma and are suspicious there may be an overarching malignant endocrine syndrome.

What electrolyte abnormality is most likely to be found in this patient?

A. Hypokalaemia

B. Hypernatraemia

C. Hyperkalaemia

D. Hypercalcaemia

E. Hypocalcaemia

Correct Answer:Hypercalcaemia

Explanation:

This patient is likely to have multiple endocrine neoplasia type I (MEN1) due to the presence of a gastrinoma (Zollinger-Ellison syndrome) and a likely prolactinoma. MEN1 consists of endocrine tumours in the parathyroid gland (hypercalcaemia), pancreas (gastrinoma, insulinoma, VIPoma) and pituitary gland (prolactinoma, acromegaly). The recent history of a renal calculus suggests the patient likely has hypercalcaemia secondary to parathyroid malignancy.

Hypokalaemia is possible if a VIPoma is present but for the patient to become hypokalaemic due to increased vasoactive intestinal peptide (VIP), they would have to have severe, watery diarrhoea. VIPomas are much rarer than hyperparathyroidism and so hypokalaemia is not the most likely abnormality here.

Each of the other electrolyte abnormalities is not found in MEN1.

Further reading:

https://patient.info/doctor/multiple-endocrine-neoplasia-type-1-men1

Question:

Which mechanism most accurately outlines the pathogenesis of acute pancreatitis?

A. Excess free fatty acids inducing free radical formation, inflammation, necrosis and oedema

B. Cytotoxic accumulation of toxic metabolites leading to inflammation, necrosis and oedema

C. Supression of protease inhibitors resulting in inflammation, necrosis and oedema

D. Autodigestion by pancreatic enzymes leading to inflammation, necrosis and oedema

E. Outflow obstruction leading to congestion, inflammation, necrosis and oedema

Correct Answer:Autodigestion by pancreatic enzymes leading to inflammation, necrosis and oedema

Explanation:

Autodigestion by pancreatic enzymes leading to inflammation, necrosis and oedema is the correct answer. This process underlies the pathogenesis of acute pancreatitis as a result of any cause. Other answers relate to the specific triggers and contributing mechanisms.

Outflow obstruction leading to congestion, inflammation, necrosis and oedema most commonly results from gallstone obstruction of the pancreatic ducts. This results in excess levels of proteolytic enzymes within the pancreas, resulting in autodigestion, inflammation, necrosis and oedema.

Suppression of protease inhibitors resulting in inflammation, necrosis and oedema can result from alcohol excess. Alteration in the balance between pancreatic enzymes and protease inhibitors results in excess levels of proteolytic enzymes within the pancreas, resulting in autodigestion, inflammation, necrosis and oedema.

Cytotoxic accumulation of toxic metabolites leading to inflammation, necrosis and oedema can result from drug-induced pancreatic injury. Drugs can cause pancreatitis by accumulation within the pancreatic vasculature and direct cytotoxic effects, pancreatic duct constriction resulting in obstruction, and excess levels of triglycerides and other metabolites, which can all induce autodigestion, inflammation, necrosis and oedema.

Excess free fatty acids inducing free radical formation, inflammation, necrosis and oedema result from excess triglyceride levels, another important cause of pancreatitis. Free radicals cause direct cytotoxic effects to pancreatic cells, altering the balance between proteolytic enzymes and protease inhibitors, resulting in autodigestion, inflammation, necrosis and oedema.

Further reading:

https://www.nice.org.uk/guidance/ng104/chapter/Recommendations

Question:

A 34-year-old woman presents to the sexual health clinic concerned about her recent vaginal discharge. This has developed over the last few days, and she has noticed an unpleasant smell 'down below'; frequently washing the area does not seem to help this. She is in a monogamous relationship with her husband and, therefore, cannot understand why these symptoms have developed.

Investigations carried out in the clinic reveal a vaginal pH of 6, and wet mount microscopy allows for the visualisation of clue cells.

Based on the likely diagnosis, what criteria can be used to aid confirmation?

A. Centor criteria

B. CASPAR criteria

C. Duke criteria

D. Jones criteria

E. Amsel criteria

Correct Answer:Amsel criteria

Explanation:

This patient is unlikely to have a sexually transmitted infection; rather, she likely has bacterial vaginosis. The condition arises due to a disruption to the normal vaginal flora, usually caused by excessive vaginal douching. This allows for colonisation with anaerobic organisms such as Gardnerella vaginalis, the proliferation of which can lead to a characteristic 'fishy' odour.

Clue cells visualised on wet-mount microscopy are a characteristic feature of bacterial vaginosis; these are included in the Amsel criteria, a set of four features sometimes used in diagnosing the condition. The other components of this criteria are:

A thin, white, yellow, homogeneous discharge,

A vaginal fluid pH of over 4.5 when placing the discharge on litmus paper

The release of fishy odour when potassium hydroxide is added - sometimes referred to as the 'whiff test'

The presence of 3 or more of these criteria is sufficient to make a diagnosis of bacterial vaginosis. The treatment of choice is a short course of oral metronidazole.

The Centor criteria are often used in a GP setting to determine the likelihood of an episode of pharyngitis being due to streptococcal infection, thus allowing for a decision to be made as to whether a patient is likely to benefit from antibiotics.

The CASPAR criteria (ClASsification criteria for Psoriatic ARthritis) may be used in helping to make a diagnosis of psoriatic arthritis; a disease that can be challenging to separate from other similar arthropathies.

The Jones criteria are a group of major and minor features that help to make a diagnosis of acute rheumatic fever. The major criteria included are carditis, migratory arthritis, the presence of erythema marginatum, subcutaneous nodules and chorea.

The Duke criteria may be used to help make a diagnosis of infective endocarditis, rather than in the setting of suspected bacterial vaginosis.

Further reading:

https://cks.nice.org.uk/topics/bacterial-vaginosis/

Question:

A 59-year-old male presents to the emergency department after several episodes of vomiting bright red blood. He has presented to the same hospital in the past for alcohol intoxication and spontaneous bacterial peritonitis.

He undergoes a gastroscopy where several oesophageal varices are visualised.

Which class of medication should be prescribed to this patient in order to reduce his probability of future variceal haemorrhage?

A. Tranexamic acid

B. Third generation cephalosporin

C. Non-specific beta-blocker

D. Carbapenem

E. Histamine–2 (H2) receptor antagonist

Correct Answer:Non-specific beta-blocker

Explanation:

This question focuses on the secondary prophylaxis for variceal haemorrhage. Non-specific beta-blockers such as propranolol lead to a reduction in portal inflow and reduce further episodes of variceal bleeding. These drugs should be initiated at the lowest dose possible and titrated to reach a target heart rate of 55-60 beats per minute.

Third-generation cephalosporins like ceftriaxone are prescribed to patients with variceal bleeding to prevent infection. However, they are not indicated for the prevention of further variceal haemorrhage.

Tranexamic acid does not have a role in the routine prophylaxis of oesophageal variceal bleeding

H2 receptor antagonists such as ranitidine, cimetidine and famotidine can be used as alternatives to proton pump inhibitors in some patients with peptic ulcer disease but do not have a role in prophylaxis of oesophageal variceal bleeding.

Carbapenems are broad-spectrum, potent antibiotics used in the treatment of life-threatening infections. They have no role in the prevention of variceal bleeding.

Further reading:

https://patient.info/doctor/oesophageal-varices

Question:

A 25-year-old man with known stable asthma attends the respiratory clinic for routine follow-up. He has had no recent exacerbations in the past 12 months, and spirometry was last carried out two years ago. Spirometry is requested.

His predicted spirometry results are:

FEV1: 4.19 L

FVC: 5.04 L

FEV1/FVC: 82.9%

What are the most likely repeat spirometry findings?

A. FEV1 3.3L | FVC 3.8L | FEV1/FVC 87%

B. FEV1 2.1L | FVC 2.4L | FEV1/FVC 88%

C. FEV1 3.1L | FVC 4.9L | FEV1/FVC 63%

D. FEV1 1.2L | FVC 4.5L | FEV1/FVC 27%

E. FEV1 4.3L | FVC 5.2L | FEV1/FVC 83%

Correct Answer:FEV1 4.3L | FVC 5.2L | FEV1/FVC 83%

Explanation:

In a patient with stable asthma, spirometry findings are typically normal. Spirometry measures three elements:

Forced expiratory volume in 1s (FEV1): the volume exhaled in the first second after deep inspiration and forced expiration, similar to PEFR.

Forced vital capacity (FVC): the total volume of air that the patient can forcibly exhale in one breath.

FEV1/FVC: the ratio of FEV1 to FVC expressed as a percentage.

The FEV1/FVC ratio can be used to differentiate between obstructive or restrictive pathology.

FEV1 4.3L | FVC 5.2L | FEV1/FVC 83% is close to the predicted values, and so is the most likely finding in this case.

Obstructive

Obstructive pathology is characterised by the following:

Reduced FEV1 (<80% of the predicted normal)

Reduced FVC (but to a lesser extent than FEV1)

FEV1/FVC ratio reduced (<0.7)

FEV1 3.1L | FVC 4.9L | FEV1/FVC 63% and FEV1 1.2L | FVC 4.5L | FEV1/FVC 27% are both examples of obstructive pathology.

Obstructive pathologies include acute asthma, chronic obstructive pulmonary disease and bronchiectasis.

Restrictive

Restrictive pathology is characterised by the following:

Reduced FEV1 (<80% of the predicted normal)

Reduced FVC (<80% of the predicted normal)

FEV1/FVC ratio normal (>0.7)

FEV1 3.3L | FVC 3.8L | FEV1/FVC 87% and FEV1 2.1L | FVC 2.4L | FEV1/FVC 88% are both examples of restrictive pathology.

Restrictive pathologies include pulmonary fibrosis, pulmonary oedema, and neuromuscular diseases, e.g. motor neuron disease and Guillain-Barre syndrome.

Further reading:

https://geekymedics.com/spirometry-interpretation/

Question:

You are asked to review a patient on the ward. They have been found by nursing staff to have a new right-sided weakness. On review you find them to have an expressive dysphasia, power 3/5 right upper and lower limbs with power 5/5 on the left side and a right homonymous hemianopia. They were last seen with no symptoms 30 minutes ago.

The patient was initially admitted for an elective below-knee amputation for peripheral vascular disease but this has been postponed due to a cancelled operating list. Their past medical history also includes previous myocardial infarction (MI) and previous coronary artery bypass graft (CABG). They are a smoker with a 40-pack-year history. The patient's regular medications include multiple antihypertensives, 80mg OD atorvastatin and 75mg OD aspirin. They have already been given all of their morning medications.

What is the most appropriate initial management?

A. 300mg aspirin (oral)

B. IV alteplase

C. Repeat neurological examination in 1 hour

D. Urgent CT head

E. 225mg aspirin (oral)

Correct Answer:Urgent CT head

Explanation:

The correct answer is to obtain an urgent CT head. This patient has had a cerebrovascular event and in stroke medicine, the saying is “time is brain”. The first thing to rule out is a haemorrhagic stroke, after which management will depend on your discussion with the stroke consultant on-call. This patient is well within the thrombolysis window but the decision as to whether to thrombolyse would be made by a consultant after considering the patient's unique context.

If there is no bleed and thrombolysis is not thought to be appropriate then the patient would be given high dose aspirin. They have already had 75mg today, hence the optional answer of 225mg.

It would be inappropriate to just review the neurological examination in one hour as the patient may suffer serious long-lasting neurological impairment if you do not act quickly. The extent of neurology means this cannot be a transient ischaemic attack (TIA).

Further reading:

https://www.nice.org.uk/guidance/ng128

Question:

An 18-year-old man presents with a 2-day history of fever, cough, shortness of breath, and associated chest pain. He has a past medical history of sickle cell disease. Observations are recorded: temperature 38.5ºC, HR 118 bpm regular, BP 110/75 mmHg, RR 25 /min, and SpO2 95% on 4L nasal cannulae.

Blood tests demonstrate the following:

Investigation Result Reference range

Haemoglobin 60 g/L (130 – 180)

Platelets 125 x 109/L (140 – 400)

White cell count 4.0 x 109/L (3.6 – 11.0)

Reticulocytes 3% (0.2 - 2%)

A chest x-ray reveals bilateral pulmonary infiltrates.

What is the next best step in his management?

A. Blood transfusion, analgesia, and antibiotics

B. Blood transfusion and splenectomy

C. Bone marrow transplant

D. Blood transfusion and hydroxyurea

E. Blood transfusion and IV corticosteroids

Correct Answer:Blood transfusion, analgesia, and antibiotics

Explanation:

Blood transfusion, analgesia, and antibiotics is correct. This patient has signs and symptoms consistent with acute chest syndrome (a complication of sickle cell disease), characterised by his fever, shortness of breath, chest pain, hypoxia, and bilateral pulmonary infiltrates on a chest x-ray. This is a vaso-occlusive crisis of the pulmonary vasculature which requires urgent supportive treatment. The reticulocyte count is high due to the bone marrow attempting to compensate for the reduced circulating red blood cells as they have all occluded and built up in the pulmonary vasculature. There is no definitive management for acute chest syndrome, so treatment is supportive through blood transfusions, analgesia, and antibiotic prophylaxis.

Bone marrow transplant is incorrect. While this is the only known cure for sickle cell disease, this is a definitive management step and is inappropriate for the scenario at hand. This patient requires supportive management for their acute chest syndrome first, then a bone marrow transplant may be considered. Bone marrow transplants are difficult and time-consuming to obtain due to specific typing being necessary.

Blood transfusion and hydroxyurea is incorrect. Although hydroxyurea is used in managing sickle cell disease by increasing the amounts of foetal haemoglobin, it does not play a role in the management of acute chest syndrome. This patient requires treatment for this acute episode first and then may be offered hydroxyurea as a long-term management option for their sickle cell disease.

Blood transfusion and IV corticosteroids is incorrect. Corticosteroids play no role in the management of acute chest syndrome.

Blood transfusion and splenectomy is incorrect. This would be considered if the patient was experiencing a splenic sequestration crisis, which is characterised by painful splenomegaly, severe anaemia, and haemodynamic instability. This patient's features are more consistent with acute chest syndrome, which is a vaso-occlusive crisis of the vasculature in the lungs. It would be inappropriate to remove the spleen if it is not causing problems, as the patient would be subjected to the unnecessary risks associated with the procedure (such as infection and bleeding) and the increased risk of infection post-splenectomy.

Further reading:

https://geekymedics.com/sickle-cell-anaemia/

Question:

A 27-year-old man is brought into the emergency department by paramedics following a high-speed road traffic collision. He is complaining of neck pain and can’t move his legs. There is no evidence of any other injuries. His heart rate is 70 beats per minute, and his blood pressure is 82/45 mmHg.

What is the most likely explanation for his hypotension?

A. Obstructive shock

B. Cardiogenic shock

C. Spinal shock

D. Hypovolaemic shock

E. Neurogenic shock

Correct Answer:Neurogenic shock

Explanation:

This man most likely has neurogenic shock due to a traumatic spinal cord injury. Neurogenic shock classically presents with hypotension without tachycardia.

Hypotension post-trauma should always raise concerns regarding bleeding and subsequent hypovolaemic shock, but would more commonly be associated with tachycardia.

A cardiac tamponade could cause an obstructive shock, but this is more likely to occur following penetrating trauma to the chest. The apparent isolated neck injury and lack of tachycardia point towards neurogenic shock rather than hypovolaemic shock or obstructive shock.

Spinal shock is a misnomer. It isn’t a true shock, but rather spinal “stunning” with a temporary loss of power, sensation and reflexes below the level of injury.

Cardiogenic shock is related to impaired cardiac output, which can be secondary to impaired contractility, valvular dysfunction and arrhythmias. This is typically seen following an acute myocardial infarction or severe heart failure.

Further reading:

https://litfl.com/shock/

Question:

A 7-year-old girl is brought to the GP by her mother, who is worried about a rash that she has developed over the past few weeks. It initially started as a small area of redness over the anterior aspect of the girl's arm but has since spread to involve the entirety of the elbow crease on both arms. The patient states that it is extremely itchy, and is affecting her sleep and ability to focus at school. On examination, there are areas of poorly demarcated erythema on both flexural surfaces of the upper limb, with notable excoriations and areas of thickened skin in this area. The skin appears especially dry, with some areas of cracking and fissuring.

The GP suspects a diagnosis of atopic eczema and prescribes a topical steroid and an emollient cream. However, 4 weeks later the patient returns; the rash has worsened despite the treatment regime, it is now affecting the entirety of the flexural aspect of the arm, and is more erythematous. Due to the failure of traditional therapy, the girl is referred to dermatology, where a skin biopsy is taken to confirm the underlying diagnosis. Histology confirms that eczema is the cause of the symptoms, and higher potency steroids are prescribed.

Which of the following histological features is likely to have been seen on biopsy?

A. Metaplasia

B. Keratinisation

C. Hyperkeratosis

D. Colloid bodies

E. Spongiosis

Correct Answer:Spongiosis

Explanation:

The most likely diagnosis, in this case, is atopic eczema; a very common inflammatory skin dermatosis. It falls under the heading of atopic conditions along with asthma and allergic rhinitis - all three are thought to involve an underlying type 1 hypersensitivity reaction. Whilst this hypersensitivity is thought to play a role in this disease, the exact pathophysiology is more complex. Skin barrier dysfunction is thought to play a significant role, with strong links being drawn to the filaggrin gene, mutated in approximately 50% of those with eczema. This mutation can disrupt the normal skin barrier, allowing for the entry of irritants and other pathogens that can then drive the hypersensitivity reaction and worsen symptoms. This disruption of the skin barrier can result in spongiosis being seen histologically; this refers to the abnormal accumulation of fluid within the epidermis, resulting in increasing space between adjacent squamous cells.

Colloid bodies may be seen histologically in the setting of lichen planus; a common skin condition that can give pruritic, raised, violaceous lesions, most commonly over the wrists or trunk.

Hyperkeratosis is the abnormal thickening of the stratum corneum; this is not seen in eczema, but may be present in diseases such as psoriasis or keratosis pilaris.

Metaplasia refers to the transformation of one differentiated cell type to another differentiated cell type. This often occurs in the setting of trauma being placed upon the cells and can increase the risk of dysplastic or neoplastic change. Barrett's oesophagus (a change in the oesophageal mucosa from squamous to columnar cells) is an important example; metaplasia occurs due to cellular trauma from acid reflux.

Keratinisation refers to the production of keratin, most commonly carried out by squamous cells. An excessive level of keratinisation may be seen on biopsy in the setting of squamous cell carcinoma.

Further reading:

https://dermnetnz.org/topics/dermatopathology/

Question:

A 56-year-old woman presents with a six-month history of worsening urinary incontinence. She involuntarily passes urine when coughing, sneezing or laughing. She denies dysuria or haematuria. Past medical history includes anorexia nervosa (aged 20), treated Chlamydia infection (aged 25) and four spontaneous vaginal deliveries. She currently takes amlodipine for hypertension and has previously used the combined oral contraceptive pill. Urinalysis is unremarkable.

Based on the likely diagnosis, what is the strongest risk factor for the condition?

A. Spontaneous vaginal deliveries

B. Chlamydia infection

C. Amlodipine

D. Anorexia nervosa

E. Combined oral contraceptive pill use

Correct Answer:Spontaneous vaginal deliveries

Explanation:

The correct answer is four previous spontaneous vaginal deliveries. The symptoms described in this question are consistent with a diagnosis of stress incontinence. Pregnancy and vaginal delivery can cause the weakening of the pelvic floor muscles and may damage the pudendal nerve. Increased parity is associated with an increased risk of developing stress incontinence. Other risk factors include obesity, chronic constipation, a family history of urinary incontinence, and smoking.

Obesity is associated with the development of stress incontinence, as excess tissue and fat put pressure on the pelvis. This can lead to the weakening of the pelvic muscles and predispose to the development of stress incontinence. There is no known link between anorexia nervosa and stress incontinence.

Amlodipine is a calcium channel blocker (CCB); the use of CCBs is not known to be a risk factor for the development of stress incontinence. However, treatment of hypertension with angiotensin-converting enzyme inhibitors (ACE inhibitors) can cause a dry cough which may exacerbate stress incontinence.

There is no known association between previous chlamydia infection and the development of stress incontinence. However, untreated chlamydia can lead to an acutely irritated bladder and cause transient incontinence during the infection.

There is no known association between the use of hormonal contraceptive methods and the development of stress incontinence. Some studies have indicated that oestrogen-containing contraceptives are protective against the development of stress incontinence as they maintain urethral secretions.

Further reading:

https://cks.nice.org.uk/topics/incontinence-urinary-in-women/background-information/causes-contributing-factors/

Question:

An 82-year-old is found collapsed at home by her relatives and brought into hospital. They are unsure how long she was on the floor, but became worried when they had not heard from the patient for 3 days and went round to check on her. They report that she was previously independent, and was able to organise her own shopping and cooking - however, the family were beginning to have concerns surrounding her mobility. The patient is unable to provide any form of history; whilst she is conscious, she appears very confused and increasingly lethargic.

On examination, the patient has bruising on her arms, but no signs of focal tenderness or fracture. A brief neurological examination reveals no abnormalities in tone or reflexes. The patient is not shivering, and a tympanic thermometer gives a reading of 36 degrees. Notably, the patient has a pulse rate of 38, and her blood pressure is recorded at 90/48. The admitting doctor is extremely concerned about the patient's presentation and orders further investigations, including a low-reading thermometer measurement, ECG, and blood tests.

Given the most likely diagnosis, which of the following investigation results is most likely to be seen?

A. Abnormally low creatine kinase

B. J waves on ECG

C. Shortened PR interval on ECG

D. Thrombocytosis on full blood count

E. Alkalosis on blood gas analysis

Correct Answer:J waves on ECG

Explanation:

This patient has presented with a history of a long lie; there is no way of determining exactly how long she was on the ground, but there is a chance that she may have been immobile for as long as 3 days. In any patient who has been immobile for such a time, it is crucial to consider the potential for severe hypothermia, especially in elderly individuals, whose ability to regulate their body temperature may be impaired. Bradycardia, hypotension, confusion and lethargy are all possible symptoms of this condition.

In this case, both the lack of shivering and low-grade temperature drop detected on the thermometer may be falsely reassuring. Regular tympanic thermometers can often fail to register extremely low temperatures; therefore, in any patient who records a temperature below 36.5 degrees, it is essential to use a rectal, low-reading thermometer to ascertain the exact temperature. At very low temperatures, the shivering mechanism will often fail; thus, the lack of shivering in combination with a recorded temperature of 36 degrees (a temperature that would normally cause shivering) should be worrying rather than reassuring.

Severe hypothermia can cause a number of abnormalities seen on further investigations; most classically, the presence of J waves on ECG. These are positive deflections at the J-point of the QRS complex; the pathophysiology behind their development is not known, but the finding is the most specific ECG change in the setting of a reduced core body temperature.

Creatine kinase levels are often ordered in patients with a long lie; muscle breakdown due to the prolonged time on the floor can lead to a rise in levels, and an extremely high value may point towards a seizure as the cause of the fall. An abnormally low level is unlikely to be present in this scenario.

Thrombocytosis can arise due to a number of causes; a reactive rise in platelets may be seen in anaemia, infection, or inflammation. In hypothermia, the platelet count is often low and does not rise above the normal range.

A shortened PR interval on ECG may be seen in the setting of pre-excitation syndromes, where there is an abnormal connection between the atria and ventricles. Wolff-Parkinson-White syndrome is one such example; this finding is unlikely to be seen in hypothermia.

Blood gas samples taken from hypothermic patients will often have abnormally low (acidic) pH values, and will usually need correcting based on the temperature. Alkalosis would be an unlikely finding in this setting.

Further reading:

https://patient.info/doctor/hypothermia-pro

Question:

A 35-year-old man presents to the emergency department with a sudden vision loss in his left eye. He was sitting working on the computer when he experienced a shower of sparks and floaters in his vision. This was quickly followed by the sensation of a ‘curtain falling down’. He had no pain or any other symptoms associated with the event. He is concerned as he has never experienced anything like this before.

His past medical history is significant for Marfan syndrome and myopia, which is corrected with glasses. He takes no medications.

On examination, there is reduced visual acuity and visual fields in the left eye only. Further neurological examination and vital signs are all within normal limits.

What is the single most appropriate initial management step for this patient?

A. Arrange a referral to a stroke physician

B. Arrange a routine referral to ophthalmology

C. Arrange urgent referral to an ophthalmologist to be seen within 24 hours

D. Discharge with a follow up by the community optometrist

E. Arrange immediate referral to an ophthalmologist to be seen on the same day

Correct Answer:Arrange immediate referral to an ophthalmologist to be seen on the same day

Explanation:

The most likely diagnosis is retinal detachment - a cause of sudden and painless visual loss due to the separation of the retina from the underlying retinal pigment epithelium. In keeping with NICE guidance, as this patient has presented with both visual field loss and changes to visual acuity, he must be referred immediately to an ophthalmologist for review on the same day (within 12 hours).

A patient should only be referred to an opthalmologist to be seen within 24 hours if there are no changes to visual acuity or visual field loss.

A routine referral to ophthalmology would not be appropriate for this patient. Retinal detachment is a preventable cause of permanent visual loss and should be recognised and managed promptly.

Untreated retinal detachment results in poor visual outcomes; therefore, discharge of this patient would not be suitable as retinal detachment is suspected. A community optometrist will likely be involved in the follow-up of this patient.

A referral to a stroke physician is not appropriate for this patient. The patient does not have any features of a cerebrovascular accident: he has a normal neurological examination and is not FAST positive.

Further reading:

https://cks.nice.org.uk/topics/retinal-detachment/management/management-of-suspected-retinal-detachment/

Question:

A 46-year-old woman presents to her GP with a lump in her right breast. Following triple assessment, she is diagnosed with breast cancer. She began her periods at age 13 and is still having regular periods. She gave birth to her son at the age of 25 and did not breastfeed him. She has never taken hormonal contraception, however, she has been using the copper intrauterine device (IUD) for the past 20 years. She does not smoke or drink alcohol.

Which aspect of this patient’s history is most likely to be a risk factor for her diagnosis?

A. Age of pregnancy

B. Age of menarche

C. Copper IUD use

D. Previous pregnancy

E. Lack of breastfeeding

Correct Answer:Lack of breastfeeding

Explanation:

The only aspect of the history provided that is a risk factor for breast cancer is her lack of breastfeeding. An age of first pregnancy beyond 35 years is a risk factor for breast cancer, therefore, this patient’s early age of pregnancy is not a risk factor. Nulliparity is a risk factor for breast cancer; previous pregnancy is not. The use of the combined oral contraceptive pill increases the risk of breast cancer, however, copper IUD use does not. An early age of menarche would be a risk factor for breast cancer, however, this patient started her periods at a normal age.

There are many risk factors for breast cancer to remember, and it can be useful to group them into those that are common to all cancers and those that are specific to breast cancer.

Common to all cancers:

Older age

Smoking

Alcohol

Irradiation (specifically mantle irradiation)

Specific to breast cancer:

Previous breast cancer

Family history of breast cancer or genetic predisposition

Uninterrupted oestrogen exposure

Early menarche, late menopause or nulliparity

First pregnancy after age 35

Not breastfeeding

Obesity

COCP (combined oral contraceptive pill) use

HRT (hormone replacement therapy) use

Further reading:

https://www.cancer.net/cancer-types/breast-cancer/risk-factors-and-prevention

Question:

A 37-year-old woman presents to the emergency department with sudden-onset retrosternal chest pain that is worse on inspiration and lying down, and improves when leaning forward. She has a past medical history of rheumatoid arthritis and hypercholesterolemia. She takes methotrexate, folic acid, atorvastatin, and the combined oral contraceptive pill. Her mother had a DVT aged 66 years old, and her father died following a myocardial infarction aged 59 years old.

Her temperature is 37 ºC, her heart rate is 94 bpm, her blood pressure is 125/76 mmHg, her respiratory rate is 18 /min, and her oxygen saturations are 97% on room air. On auscultation, a scratching noise is heard over the left sternal border.

An ECG is performed, which shows saddle-shaped global ST elevation with PR depression, and echocardiography demonstrates a 0.7cm effusion.

What is the greater risk factor for the likely diagnosis?

A. Hypercholesterolaemia

B. Family history of ischaemic heart disease

C. Combined oral contraceptive pill

D. Family history of venous thromboembolism

E. Rheumatoid arthritis

Correct Answer:Rheumatoid arthritis

Explanation:

Rheumatoid arthritis is correct. This patient has acute-onset chest pain that is worse on inspiration (pleuritic) and when lying down, and improves when leaning forward. This is a typical presentation of acute pericarditis, and the ECG findings of a global ST elevation and PR depression (often described as saddle-shaped ST elevation) are commonly seen. The scratching noise heard on auscultation is known as a pericardial rub, and is pathognomonic of pericarditis. Effusions on echocardiography can be seen in acute pericarditis. Pericarditis is the most common cardiac manifestation of rheumatoid arthritis and is associated with similar systemic inflammatory conditions such as systemic lupus erythematosus. Its pathophysiology is currently not entirely understood, however, the epidemiological evidence demonstrates this association.

Combined oral contraceptive pill and family history of venous thromboembolism are incorrect. These would apply if the patient had a pulmonary embolism (PE). Although a PE is characterised by acute onset pleuritic chest pain, it is not known to be affected by posture. As well as this, the most common ECG finding in a PE is sinus tachycardia, and a diagnosis of PE would not explain the ST elevation and PR depression, nor would it explain the slight pericardial effusion.

Hypercholesterolaemia and family history of ischaemic heart disease are incorrect. These would apply if the patient was suffering from a myocardial infarction. Although there is ST elevation present, the symptom profile along with the ECG findings suggest acute pericarditis. It is unlikely that an occlusion would lead to ST elevation in all leads.

Further reading:

https://geekymedics.com/pericarditis/

Question:

A 28-year-old female presents to her general practitioner (GP) with a lesion on her right leg. She has noticed it gradually enlarging over the last few days. It is not painful or itchy and hasn’t bled. She has also felt generally tired over a similar time and thinks she has had several high temperatures.

She had a recent holiday in the countryside where she sustained multiple insect bites, including one from a ‘particularly large bug’, but is quick to point out that the lesion on her leg is some distance from where any of the bites were.

She is usually fit and well with no other medical problems and takes no regular medications. She is allergic to penicillin.

On examination, she has a flat 5cm erythematous lesion on her right thigh, in keeping with erythema migrans.

Which antibiotic would be most appropriate for this patient?

A. Trimethoprim

B. Amoxicillin

C. Clarithromycin

D. Doxycycline

E. Cefuroxime

Correct Answer:Doxycycline

Explanation:

The most likely diagnosis is Lyme disease, characterised by an erythema migrans rash (‘target lesion’) and exposure to tick bites. NICE has recently made available updated guidance on the treatment of Lyme disease, stating that patients with erythema migrans should be treated with antibiotics based on clinical judgement without the need for laboratory testing. Doxycycline is the antibiotic of choice and should be taken for 2-3 weeks.

Amoxicillin is an appropriate alternative, however, this patient has a penicillin allergy.

Cefuroxime is the second-line treatment if neither doxycycline nor amoxicillin is tolerated.

Trimethoprim is typically used for urinary tract infections and clarithromycin in the treatment of atypical pneumoniae, for example.

Further reading:

https://patient.info/doctor/lyme-disease-pro

Question:

A 45-year-old female presents to A&E complaining of tingling hands. She describes feeling generally weak over the last few weeks and has noted also that she is passing larger volumes of urine more frequently. There are no significant clinical findings of note. Her vital signs are RR 18, HR 80 bpm, Temp 36.9 oC and BP 180/90 mmHg. She has no relevant past medical and is not on any regular medications.

She has the following investigations performed:

Hb 131

WBC 4.1

Platelets 212

Sodium 145

Potassium 3.2

Calcium 2.4

Magnesium 0.89

Urea 5.3

Creatinine 59

Urinalysis: Negative

What is the next most important test to help diagnose the patient?

A. Dexamethasone suppression test

B. Renal ultrasound scan

C. Aldosterone/renin ratio

D. Urinary sodium

E. Renal biopsy

Correct Answer:Aldosterone/renin ratio

Explanation:

The most likely diagnosis in this scenario is Conn’s syndrome. The patient is presenting with symptoms of hypokalaemia (paraesthesia, muscle weakness and polyuria), which is confirmed by the lab tests. She also has hypertension. This is a typical presentation of Conn’s syndrome.

The most definitive test in this scenario is the aldosterone to renin ratio. If this ratio is elevated, then the most likely diagnosis is Conn’s syndrome. If it is low, then it excludes primary hyperaldosteronism as a possible diagnosis.

Urinary sodium would be useful in the workup of a patient with deranged sodium levels, as it can assist in the diagnosis of SIADH. The patient's serum sodium is normal, so checking urinary sodium would be unhelpful in this case.

There are no indications for a renal biopsy at this stage. There is no suspicion of renal injury or insult (such as acute nephritis or renal cell carcinoma) that would warrant such an investigation.

A dexamethasone suppression test would be useful to investigate concomitant autonomous adrenal overproduction of cortisol. This would be the case if serum cortisol failed to suppress to <2 micrograms/100 mL, accompanied by a low basal (pre-dexamethasone) ACTH. It would not help diagnose this patient.

A renal ultrasound scan will help investigate if the patient has renal artery stenosis (which also presents with hypertension and hypokalaemia). However, it would not be the first-line investigation, especially given that renal artery stenosis is a less likely diagnosis due to the absence of any risk factors (e.g. smoking, diabetes, dyslipidaemia) and no kidney dysfunction. Furthermore, checking the aldosterone-to-renin ratio will help differentiate between renal artery stenosis and Conn’s syndrome (i.e. a ratio of <20 would exclude primary hyperaldosteronism).

Further reading:

https://patient.info/doctor/hyperaldosteronism

Question:

A 4-year-old boy is brought to the GP by his mother, who is very concerned about a rash that he has developed. She states that he has just recovered from a 'nasty cold', but has now been complaining of abdominal pain and pain in his ankles and his knees. She had initially assumed that that the symptoms were due to a reaction to something he had eaten, but this morning, she noticed a purple rash, mainly sited over his legs.

On examination, the boy is shy but appears interested in the train set in the corner of the room and plays happily when invited to by the GP. On examination, a non-blanching purpuric rash is clearly visible on the flexural aspect of his lower limb, this is notably palpable. Observations reveal the following:

Temperature - 37.2 degrees

Pulse rate - 120

Respiratory rate - 26

Capillary refill time - 2 seconds

Considering the likely diagnosis, which of the following is likely to be included as part of the management plan?

A. Oral phenoxymethylpenicillin

B. Tacrolimus

C. Regular blood pressure monitoring

D. Rituximab

E. IV methylprednisolone

Correct Answer:Regular blood pressure monitoring

Explanation:

The likely diagnosis is IgA vasculitis (previously referred to as Henoch-Schonlein purpura); a small vessel vasculitis most commonly affecting children. It frequently follows an upper respiratory tract infection; it is thought that this may trigger IgA deposition within vessel walls, resulting in the symptoms of the condition. The condition is sometimes described as a triad, with the three cardinal features being:

Purpuric rash (classically over the buttocks and lower limb)

Abdominal pain

Arthralgia

The diagnosis is usually made clinically and will normally be self-limiting. The most important complication of the disease is renal involvement; there is significant overlap between the condition and IgA nephropathy; the underlying pathology is thought to be identical, and the two conditions can often coexist in the same patient. Patients with IgA vasculitis will be followed up with regular blood pressure monitoring and urinalysis, to screen for the development of glomerulonephritis.

Tacrolimus is a calcineurin inhibitor, used to suppress the immune system in patients who have undergone organ transplant, as well as in severe inflammatory eczema. Immunosuppressants are not routinely used in the management of IgA vasculitis as it is most commonly self-limiting.

Oral phenoxymethylpenicillin is a treatment often given to treat streptococcal infections. Whilst infections can be a trigger for IgA vasculitis, there does not appear to be an ongoing infection in this case, and therefore antibiotics are not likely to be of benefit.

Rituximab is a monoclonal antibody that targets CD20, a receptor found specifically on B cells. It is used in a number of B-cell mediated conditions, including autoimmune haemolytic anaemia, immune thrombocytopenic purpura and as part of the RCHOP chemotherapy regime for Non-Hodgkin's lymphoma. As IgA vasculitis is not thought to mediated by B cells, rituximab is not given as part of the treatment.

Steroids are not routinely given for IgA vasculitis, as the condition is usually self-limiting. They may be given if the abdominal pain is severe, or if there is significant renal involvement. IV methylprednisolone would only be indicated in the presence of severe renal disease, and would only be started by a specialist.

Further reading:

https://patient.info/doctor/henoch-schonlein-purpura-pro

Question:

A 67-year-old male attends his GP complaining of bilateral knee pain. He explains that the pain is brought on by walking and is especially severe when climbing stairs. The patient also comments that his knees feel stiff for the first 30 minutes in the morning, as well as after doing any physical activity. He explains that his symptoms have gradually worsened over the last 6 months and that no other joints are involved. He denies any trauma, recent infections or further symptoms.

His past medical history is unremarkable, and he previously worked as a labourer on a farm.

On examination, the knees appear normal and are not hot. Knee flexion and extension shows a limited range of movement, and crepitus is elicited. His vital signs are normal.

Which of the following is the most likely diagnosis?

A. Septic arthritis

B. Reactive arthritis

C. Rheumatoid arthritis

D. Osteoarthritis

E. Gout

Correct Answer:Osteoarthritis

Explanation:

The presence of joint pain, stiffness made worse by exercise and a limited range of motion in an older patient is suggestive of osteoarthritis. Osteoarthritis is a degenerative joint disorder that typically affects the knees, hands and hips. Symptoms can be either unilateral or bilateral, and patients may also present with morning stiffness that lasts less than 30 minutes. Previous physically demanding activity is a strong risk factor for developing osteoarthritis.

Rheumatoid arthritis is an autoimmune disease characterised by joint pain and stiffness that improves with exercise. It usually affects multiple, asymmetrical joints and presents with morning stiffness that lasts longer than 30 minutes. On examination, the affected joints are likely to be hot and swollen. Rheumatoid arthritis is more common in women and has a peak age of onset in middle age.

Septic arthritis describes an infection of the joint. The features of septic arthritis include an acutely hot, swollen and painful joint. The patient may be systemically unwell with a fever. Risk factors for septic arthritis include intravenous drug use, immunosuppression, and the presence of prosthetic joints.

Gout is a crystal arthropathy caused by the deposition of urate crystals. It most commonly affects the first metatarsophalangeal joint, but can more rarely affect any joint in the body. Symptoms usually develop suddenly and include an extremely painful, hot and swollen joint.

Reactive arthritis refers to joint inflammation that follows an infection and is particularly associated with recent genitourinary or gastrointestinal infections. In patients with reactive arthritis, joint inflammation is often accompanied by conjunctivitis and urethritis.

Further reading:

https://patient.info/doctor/osteoarthritis-pro

Question:

A 3-year-old boy presents to the emergency department with vomiting and diarrhoea. He has passed large quantities of loose stool, 7-8 times each day for the past two days. This is associated with a reduced number of wet nappies. He has no prior medical history, and his development is unremarkable. He weighs 13Kg.

On examination, he is alert, afebrile and has sunken eyes. He has a heart rate of 158bpm; capillary refill time <2 seconds and blood pressure of 100/80mmHg. He has a 5% fluid deficit.

What is this patient's total fluid requirement for the next 24-hour period?

A. 150ml/h

B. 50ml/h

C. 100ml/h

D. 125ml/h

E. 75ml/h

Correct Answer:75ml/h

Explanation:

The patient in the vignette is likely suffering from acute gastroenteritis and unable to maintain his hydration status orally as he is losing large volumes of fluids and vomiting. On examination, the patient is in compensated shock; although he is tachycardic, he maintains his blood pressure and is described to be alert with good peripheral perfusion (capillary refill time <2 seconds). As this patient is not in shock, he will not require urgent fluid resuscitation with boluses.

The patient weighs 13kg and is assessed to have a fluid deficit of 5%. Therefore, the total fluid requirement for the next day = routine maintenance fluids (100 ml/kg/day for the first 10kg of weight + 50 ml/kg/day for the next 3kg of weight) + fluid deficit correction (percentage dehydration x 10 x patient's weight) = ( (100 x 10) + (50 x 3)) + (5 x 10 x 13) = 1800ml. As the options are in ml/h, this will need to be divided by 24. Therefore the correct answer is 75ml/h.

50ml/h may be sufficient for correcting the routine maintenance fluids alone ( (100 x 10) + (50 x 3))/24 = 47.92ml/h. However, this will not be adequate for this patient as they have a 5% fluid deficit which must be corrected.

100ml/h, 125ml/h, and 150ml/h are all fluid rates that exceed this patient's total fluid requirement for the next 24 hours. Care must be taken when prescribing fluids, especially in children, as overcorrection/overprescription may result in fluid overload or cerebral oedema.

Further reading:

https://geekymedics.com/intravenous-iv-fluid-prescribing-in-paediatrics/

Question:

A 67-year-old patient presents to the emergency department with dyspnoea and confusion. He has a history of chronic obstructive pulmonary disease (COPD), type 2 diabetes mellitus and hypertension. He smokes 20 cigarettes a day and has done so for 50 years.

On examination, RR 27/min, SaO2 75% on air, HR 117/min, BP 132/89 mmHg and temperature 38.1°C. An arterial blood gas is carried out, which is shown below.

Result Reference

pH 7.27 7.35-7.45

pO2 7.3 11 - 13 kPa

pCO2 14.6 4.7 - 6.0 kPa

HCO3 31 22 - 26 mmol/L

Base excess +12 -2 to +2 mmol/L

What do the blood results demonstrate?

A. Respiratory alkalosis with partial metabolic compensation

B. Metabolic alkalosis with complete respiratory compensation

C. Metabolic acidosis with partial respiratory compensation

D. Respiratory acidosis with partial metabolic compensation

E. Respiratory acidosis with complete metabolic compensation

Correct Answer:Respiratory acidosis with partial metabolic compensation

Explanation:

This case demonstrates an acute infective exacerbation of chronic obstructive pulmonary disease (COPD). The arterial blood gas demonstrates respiratory acidosis with partial metabolic compensation. With a pH <7.35, this indicates acidosis. Ventilatory failure in this COPD exacerbation leads to an accumulation of CO2, which is the cause of the acidosis. This patient is likely chronically acidotic with a long-term metabolic compensation, whereby the kidneys retain excess bicarbonate to normalise the pH. This acute exacerbation has led to a further increase in CO2 and a subsequent decrease in pH, which the kidneys cannot rapidly compensate for. However, there remains some degree of compensation with the increased bicarbonate, therefore this is classified as partial metabolic compensation.

Respiratory alkalosis is more commonly caused by hyperventilation, whereby excess CO2 is blown off, increasing the pH.

Metabolic acidosis can occur as a result of increased acid production or acid ingestion, decreased acid excretion or rate of gastrointestinal and renal HCO3 loss (e.g. diabetic ketoacidosis, lactic acidosis, diarrhoea, Addison's disease). The anion gap can be calculated to help identify the underlying cause.

Metabolic alkalosis is more commonly caused by gastrointestinal or renal H+ ion loss, e.g. vomiting/diarrhoea, loop and thiazide diuretics.

Further reading:

https://geekymedics.com/abg-interpretation/

Question:

A 25-year-old female has arrived at the Early Pregnancy Assessment Clinic with some vaginal bleeding and abdominal pain. She has lost a small amount of blood which started this morning around the same times as her pain began which she describes as a dull ache in her lower abdomen which comes and goes. She is 14 weeks pregnant and is very worried as she has had two previous pregnancies, both of which ended with miscarriages. There have been no other complications during this pregnancy and she is clinically stable. On examination, transvaginal ultrasound shows a gestational sac and fetal heart activity. Speculum examination confirms the cervical os is open.

What is the most likely diagnosis?

A. Incomplete miscarriage

B. Complete miscarriage

C. Inevitable miscarriage

D. Missed miscarriage

E. Threatened miscarriage

Correct Answer:Inevitable miscarriage

Explanation:

The most likely diagnosis is an inevitable miscarriage however the presence of vaginal bleeding and/or abdominal pain alone are not enough to identify the type of miscarriage. Miscarriages can be categorised depending on whether they present with the cervical os open or closed and then by the results of transvaginal ultrasound (TVS). This patient most likely presents with an inevitable miscarriage as the cervical os is open and the fetus is still alive confirming that the products of conception (POC) are not in the process of being passed.

An incomplete miscarriage would also have an open os but the POC are present in the canal. I remember these as inevitable and incomplete both begin with vowels (I) as does the word open (O).

If the os was closed it would either be a complete, threatened or missed miscarriage. On TVS a complete miscarriage shows an empty uterus, a threatened miscarriage shows a viable intrauterine pregnancy and a missed miscarriage shows a non-viable (no heart activity) intrauterine pregnancy.

Further reading:

https://patient.info/doctor/miscarriage-pro

Question:

A 72-year-old man is admitted to hospital with weight loss and a chronic cough. An admission chest x-ray shows a left-sided opacity. His admission bloods are notable for Na 129, K 4.6, Urea 7.5, Creatinine 91 and normal inflammatory markers. His regular medications include atorvastatin 20mg, amlodipine 5mg and metformin 500mg once daily. He has started no new medications recently and has smoked 30 cigarettes per day for the last 40 years. He is clinically euvolaemic and asymptomatic of his hyponatraemia.

Given the likely underlying cause of his electrolyte disturbance, which of the following is the best initial management of the hyponatraemia?

A. Fluid restriction to 1.5L per day

B. Suspending atorvastatin

C. Oral furosemide 40mg once daily

D. Demeclocycline

E. 1L hypertonic saline over 2 hours

Correct Answer:Fluid restriction to 1.5L per day

Explanation:

In the absence of other investigations such as urine and serum osmolality, the most likely cause of this gentleman’s hyponatraemia is syndrome of inappropriate anti-diuretic hormone secretion (SIADH) secondary to lung cancer. The best initial therapy of SIADH in this instance, with asymptomatic hyponatraemia, would be fluid restriction. The overall best management strategy would be the removal of the underlying cause, which in this case would be treatment of the cancer.

Aggressive treatment with hypertonic saline may be dangerous especially in chronically hyponatraemic patients and may yield a risk of central pontine myelinolysis.

Atorvastatin is not a drug typically associated with SIADH – commonly implicated agents include carbamazepine and SSRIs.

Loop diuretics may contribute to hyponatraemia and demeclocycline functions as an ADH antagonist but is rarely indicated first-line without expert endocrinology involvement.

Further reading:

https://patient.info/doctor/hyponatraemia-pro

Question:

A 65-year-old African American man undergoes a digital rectal examination which reveals a 3cm rock hard nodule on the lateral surface of the prostate. He has no other findings on physical examination and he has no current medical complaints. His past medical history is only significant for hypertension. His medications include lisinopril and bendroflumethiazide.

What is the most likely diagnosis?

A. Cystitis

B. Prostate cancer

C. Renal cell carcinoma

D. Benign prostatic hypertrophy

E. Prostate haematoma

Correct Answer:Prostate cancer

Explanation:

Prostate cancer is the most common type of cancer in men. It usually presents in men aged fifty and over. Prostate cancer is commonly found in the peripheral regions of the prostate. Prostate cancer is less likely than benign prostatic hypertrophy (BPH) to cause urinary obstruction at the level of the prostatic urethra. Although prostate cancer is the most common cancer, it is not the most common cancer-related death in males. This is due to the slow-growing nature of the cancer and the unlikelihood of metastatic disease. When prostate cancer does rarely metastasise, it tenders to affect the spine. A “rock hard” mass on digital rectal examination (DRE) should always raise concern for a carcinoma. Prostate cancers are often described as “hard” and “craggy” masses in exams.

A spontaneous prostate haematoma is a rare diagnosis and does not correlate to the DRE findings.

Cystitis is pretty uncommon in healthy men, and furthermore, it would be unlikely to create the findings of a “rock hard” prostate mass. Prostate masses that lie centrally and are uniformly larger with a “rubbery” texture, such as those found in benign prostatic hypertrophy (BPH), can cause urinary outflow tract obstruction at the prostatic urethra, and this can predispose to cystitis.

Benign prostatic hypertrophy (BPH) is also common in men aged fifty and over. Physical examination findings usually include a uniform mass with a rubbery texture. These masses are usually larger than those found in prostatic cancer, and they often lie centrally rather than peripherally (as in prostate cancer).

Patients with renal cell carcinoma present with an array of symptoms due to the tumour itself (i.e. pain), invasion into the urinary tract (i.e. haematuria), or from distant metastases (e.g. bony pain). This clinical vignette does not correlate with such a disease.

Further reading:

https://patient.info/doctor/prostate-cancer-pro

Question:

A 24-year-old woman who is 30 weeks pregnant presents to the GP after receiving a positive result for trichomoniasis using a self-test kit. She is concerned about the potential complications of trichomoniasis.

What is a potential complication of the infection?

A. Prolonged labour

B. Increased risk of vulvar cancer

C. Premature labour

D. Increased risk of endometrial cancer

E. Macrosomia

Correct Answer:Premature labour

Explanation:

There are many complications of untreated trichomoniasis during pregnancy, such as premature labour and birth (before 37 weeks), premature rupture of membranes and low-birth weight of the baby. Trichomoniasis can also cause complications for non-pregnant women, such as increasing the risk of pelvic inflammatory disease, HIV, cervical cancer and infertility.

Macrosomia is when an infant's weight is greater than the average expected weight and it is not a potential complication of trichomoniasis. In contrast, a potential complication of trichomoniasis is a low birth weight of the baby.

Increased risk of vulvar cancer is not a potential complication of trichomoniasis, although trichomoniasis can cause irritation and soreness of the vulva.

Prolonged labour is not a potential complication of trichomoniasis. The opposite is true and trichomoniasis can cause premature labour and pre-term delivery.

Increased risk of endometrial cancer is not a potential complication of trichomoniasis. However, a potential complication of trichomoniasis is an increased risk of cervical cancer.

Further reading:

https://cks.nice.org.uk/topics/trichomoniasis/background-information/complications/

Question:

Esther is a 9-month-old baby girl, brought to A&E by her parents as she is struggling to breathe. They report she has been grunting, is not sleeping well and is only taking in about half her normal milk requirement. Esther has previously been fit and well, with an uncomplicated pregnancy and birth. She has no known medical conditions and is not on any medications. She is up to date with her vaccinations.

On examination, you see that there is increased work of breathing, with subcostal and intercostal recession and tracheal tug. During auscultation of the chest, you hear equal air entry, with wheezes and crackles throughout her chest. There is no dullness to percussion. Observations reveal a respiratory rate of 62, a heart rate of 168 and SaO2 of 94% on room air.

What is the most likely causative organism in this illness?

A. Mycoplasma tuberculosis

B. Haemophilus influenzae type B

C. Rotavirus

D. Respiratory syncytial virus

E. Streptococcus pneumoniae

Correct Answer:Respiratory syncytial virus

Explanation:

This baby has bronchiolitis, which is most commonly caused by respiratory syncytial virus (RSV). Other potential causes of bronchiolitis include parainfluenza virus and human metapneumovirus.

The key points suggesting a diagnosis of bronchiolitis, in this case, are age (children are generally affected in their first or second year), the increased work of breathing and the absence of any signs of consolidation (i.e. air entry throughout, no focal crackles, no dullness to percussion).

Mycoplasma tuberculosis causes tuberculosis (TB), which would present in this age with chronic cough, faltering growth and possibly low oxygen saturations.

Haemophilus influenzae is a cause of epiglottitis and pneumonia, as well as meningitis and a few other conditions. As Esther is up to date with her vaccinations, it is very unlikely to be the cause of her illness.

Rotavirus is a cause of gastroenteritis.

Streptococcus pneumoniae would cause pneumonia. As a result, you would expect a productive cough of purulent sputum and more focal signs on clinical examination, including an isolated area of coarse crackles, reduced air entry and potentially dullness to percussion.

Further reading:

https://patient.info/doctor/bronchiolitis-pro

Question:

A 24-year-old male with known asthma presents to the GP with left-sided chest pain and shortness of breath for the last 8 hours. The pain began suddenly and is worse on inspiration. He has not experienced anything like this before, and is normally fit and well. On examination he is apyrexial, has a respiratory rate of 26, his chest sounds are decreased in the left lower zone and he complains of pain on palpation of the 6th and 7th intercostal spaces on the left.

What is the most likely diagnosis?

A. Acute exacerbation of asthma

B. Costochondritis

C. Pneumothorax

D. Myocardial infarction

E. Viral upper respiratory tract infection

Correct Answer:Pneumothorax

Explanation:

This patient demonstrates a typical textbook case of a pneumothorax – a young male with sudden chest pain and dyspnoea, therefore, this is the most likely diagnosis. Although he has presented with left-sided chest pain, myocardial infarction in his age group is very unlikely.

Whilst he has a history of asthma, sudden chest pain is not typical of an exacerbation and you would expect other features such as a cough, wheeze and chest tightness.

An upper respiratory tract infection (URTI) is usually associated with a cough, pyrexia and perhaps discoloured phlegm and is therefore also less likely. The chest did not sound wheezy or have any additional sounds which makes asthma exacerbation and URTI less likely again.

Costochondritis is more likely than some of the other options, particularly as there is pain on direct palpation of the patient’s chest wall. However, it is less likely than a pneumothorax, given the sudden onset of the pain.

Further reading:

https://patient.info/doctor/chest-pain-pro

Question:

A 73-year-old man presents to the emergency department with a 2-day history of vomiting, reporting that he can no longer keep any food or liquids down. His past medical history is significant for hypertension, gout, and type 2 diabetes mellitus. His regular medications include allopurinol, metformin and indapamide.

The patient's examination findings are significant for dry mucous membranes and decreased skin turgor. His blood pressure is 115/76 mmHg.

His urine output is 0.4 mL/kg/hour in the last 24 hours.

Results Value Reference range

Na+ 130 mmol/L (135 - 145)

K+ 4.9 mmol/L (3.5 - 5.0)

Bicarbonate 28 mmol/L (22 - 29)

Urea 9.2 mmol/L (2.0 - 7.0)

Creatinine 153 µmol/L (55 - 120)

Given this information, what is the most appropriate next step in the patient's management?

A. Admit patient for IV fluids and withhold indapamide

B. Prescribe cyclizine and discharge with safety netting advice

C. Admit patient for IV fluids and stop allopurinol

D. Encourage oral intake and discharge with safety netting advice

E. Refer for urgent haemodialysis

Correct Answer:Admit patient for IV fluids and withhold indapamide

Explanation:

The correct answer is to admit the patient for IV fluids and withhold indapamide. This patient has had an acute kidney injury, indicated by their oliguric urine output of 0.4 mL/kg/hour in the last 24 hours, likely of prerenal aetiology given the history of vomiting. A urine output of less than 0.5 mL/kg/hour over 24 hours indicate an acute kidney injury. Diuretics may worsen AKI and should be withheld until the patient clinically improves.

It would be incorrect to encourage oral intake and discharge with safety netting advice, as this patient's vomiting and subsequent hypovolemia have caused an acute kidney injury, indicated by their urine output of only 0.4 mL/kg/hour. The patient requires IV fluids to address the prerenal cause of their AKI and indapamide should be withheld.

Admitting the patient for IV fluids and stopping allopurinol may improve their AKI, though it would be more appropriate to withhold indapamide, a thiazide-like diuretic, than allopurinol. Allopurinol does not need to be routinely withheld in AKI.

The patient does not need to be referred for urgent haemodialysis. Indications for haemodialysis include refractory hyperkalemia, refractory fluid overload, severe metabolic acidosis, and uraemic encephalopathy.

As the patient has an AKI due to ongoing vomiting it would be inappropriate to prescribe cyclizine and discharge with safety netting advice. This patient should be admitted for fluid resuscitation and their renal function should be monitored to ensure that their acute kidney injury is resolving. Indapamide should also be stopped as this may worsen AKI.

Further reading:

https://geekymedics.com/acute-kidney-injury-aki/

Question:

A 45-year-old female has a four-month history of fatigue, nausea and vague right upper quadrant pain. She is under investigation for autoimmune hepatitis.

Which of the following autoantibody screens would be most likely to aid diagnosis?

A. Antinuclear antibody (ANA), anti-smooth muscle antibody (ASMA) and anti-liver-kidney microsomal-1 (anti-LKM-1) antibody

B. Antimitochondrial antibody (AMA)

C. Antinuclear antibody (ANA), double-stranded DNA antibody (anti-ds DNA) and extractable nuclear antigen antibodies (ENA)

D. Antinuclear antibody (ANA), cyclic citrullinated peptide antibody (anti-CCP) and rheumatoid factor

E. Tissue transglutaminase (TTG) and IgA level

Correct Answer:Antinuclear antibody (ANA), anti-smooth muscle antibody (ASMA) and anti-liver-kidney microsomal-1 (anti-LKM-1) antibody

Explanation:

Antinuclear antibody (ANA), anti-smooth muscle antibody (ASMA) and anti-liver-kidney microsomal-1 (anti-KLM-1) antibody may all be positive in autoimmune hepatitis (AIH). Type 1 AIH is associated with ANA or ASMA, and type 2 AIH is associated with anti-KLM-1 antibodies. The other autoantibodies listed here are less appropriate to test in this patient:

Antimitochondrial antibody (AMA) is typically associated with primary biliary cirrhosis although may be seen in some AIH

Tissue transglutaminase (TTG) and IgA levels are useful in investigating for coeliac disease

Antinuclear antibody (ANA), cyclic citrullinated peptide antibody (anti-CCP) and rheumatoid factor are associated with rheumatoid arthritis

Antinuclear antibody (ANA), double-stranded DNA antibody (anti-ds DNA) and extractable nuclear antigen antibodies (ENA) are associated with systemic lupus erythematosus (SLE)

Further reading:

https://patient.info/doctor/autoimmune-hepatitis-pro

Question:

An obese 42-year-old patient presents to the GP with persistent abdominal pain after eating. He describes a burning sensation under his ribs, with this sometimes travelling up towards his throat; this is particularly severe with large meals. Recently, he has suffered from recurrent bouts of hiccups; these can last a number of minutes and be distressing. The patient reports that he has sought advice for his symptoms previously, with a previous doctor informing him that reflux is the most likely explanation. However, treatment with omeprazole and over-the-counter Gaviscon recommended has not resulted in any improvement.

The patient reports a 3 stone weight loss over the past 6 months, although he has been attending a weight loss class during this time, with the aim of becoming a more healthy weight. He denies changes in appetite, changes in bowel habit or passing blood in his stools. Abdominal examination reveals no tenderness or masses on palpation. There is no lymphadenopathy elicited.

Given the patient's non-response to PPI therapy, the GP makes a hospital referral. Endoscopy reveals generalised erythema within the oesophagus, but no abnormalities within the stomach or proximal duodenum. However, the registrar reports visualising abnormal anatomy during the procedure, the gastro-oesophageal junction in particular.

Considering the most likely diagnosis, which of the following investigations would be most beneficial to confirm the cause of the patient's symptoms?

A. Chest X-ray

B. Colonoscopy

C. Abdominal X-ray

D. Rapid urease test

E. Full blood count

Correct Answer:Chest X-ray

Explanation:

The most likely diagnosis, in this case, is a hiatus hernia; a displacement of a portion of the stomach above the diaphragm. This most commonly involves the gastro-oesophageal junction (a sliding hiatus hernia), with the fundus of the stomach implicated in some cases (a rolling hiatus hernia). The condition may remain asymptomatic or can present with persistent reflux symptoms, as the proximal location of the stomach results in an increased chance of acid coming into contact with the oesophagus (this explains the erythema detected on imaging). Hiccups are another feature that points towards a hiatus hernia as a likely diagnosis; these can arise due to diaphragmatic irritation. The condition is far more common in obese patients, as the increased BMI causes an increase in abdominal pressure.

Oesophagogastroduodenoscopy (OGD) is not traditionally the first-line investigation for hiatus hernia but has been carried out in this scenario in order to rule out peptic ulceration and malignant disease. Migration of the gastro-oesophageal junction is often detectable via this investigation. A chest X-ray is often used to make the diagnosis, and would be the most appropriate choice to assist in confirming the diagnosis in this scenario; this can demonstrate a retrocardiac air bubble in larger hernias (this patient is likely to have a larger defect, given his extensive symptoms).

A full blood count is an important investigation to screen for anaemia if occult bleeding from the GI tract is suspected; however, given that OGD revealed no signs of stomach or oesophageal pathology, this is a less important investigation. Additionally, whilst the presence of anaemia may increase suspicions of a malignant lesion, it would not allow for a diagnosis in its own right.

This patient has not presented with symptoms that indicate a need for a colonoscopy; reflux and hiccupping indicate that upper GI pathology is more likely.

A rapid urease test can be used to test for the presence of H. pylori infection, a common cause of gastrointestinal ulceration. Given that no ulceration was detected, this is a less appropriate test in this case.

Abdominal X-ray is normally used if there is suspicion of bowel obstruction or toxic megacolon; it is unlikely to provide any useful findings in this scenario.

Further reading:

https://patient.info/doctor/hiatus-hernia-pro

Question:

A 7-year-old boy is brought to the emergency department by his mother with a 2-day history of abdominal pain. The boy describes the pain as persistent and most severe in the right lower quadrant. He has not vomited but explains that he has had 2 episodes of non-bloody diarrhoea since his symptoms started.

His mother comments that her child has recently recovered from an upper respiratory tract infection 3 days ago. The boy met all his developmental milestones on time and had an appendectomy 1 year ago.

On abdominal palpation, there is moderate tenderness in the right lower quadrant. The patient’s temperature is recorded at 38.0°C.

Which of the following is the most likely diagnosis?

A. Meckel’s diverticulum

B. Mesenteric adenitis

C. Intussusception

D. Necrotising enterocolitis

E. Hirschsprung’s disease

Correct Answer:Mesenteric adenitis

Explanation:

The presence of right lower quadrant abdominal pain following a recent upper respiratory tract infection in a child is highly suggestive of mesenteric adenitis. This condition describes the inflammation of mesenteric lymph nodes that follows an infection and is a common cause of abdominal pain in children. If the patient still has an appendix present an ultrasound scan should be used to confirm the diagnosis as the presentation is very similar to acute appendicitis.

Hirschsprung’s disease is a congenital condition caused by the absence of ganglion cells in the rectum. It usually presents in the first year of life and is associated with a failure to thrive, abdominal distention, and constipation which may be followed by episodes of diarrhoea.

Meckel’s diverticulum is a common congenital abnormality of the bowel. The majority of patients remain asymptomatic throughout their life, and most of the patient group that does develop symptoms does so before two years of age. Presentations typically include haematochezia as well as symptoms of bowel obstruction such as vomiting and constipation.

Necrotising enterocolitis refers to a paediatric emergency that usually affects premature infants in the first few weeks after birth. Signs of necrotising enterocolitis include bilious vomiting, abdominal distension, and the passage of blood per rectum.

Intussusception describes a process where a portion of the bowel invaginates into an adjacent portion and leads to intestinal obstruction. It mostly affects children under 1 year of age and is associated with vomiting, colicky abdominal pain and bloody diarrhoea.

Further reading:

https://patient.info/doctor/recurrent-abdominal-pain-in-children-pro

Question:

Margaret James is an 82-year-old lady who has come in for a diabetic review. Over the past few weeks, she has become increasingly clumsy and fallen over several times in her home. Upon further questioning, she complains of her feet feeling ‘heavy’ and a ‘tingling discomfort’ in her toes. Her diabetic control has been poor for a number of months and she is now taking biphasic insulin twice daily. She has a past medical history of hypertension for which she is currently taking amlodipine and polymyalgia rheumatica for which she is on prednisolone.

On examination, she has a lying-standing BP of 142/91 mmHg and 131/82 mmHg respectively. Examination of the lower limbs reveals loss of pain and light touch bilaterally up to the mid-tibial region. Power is rated 4/5 in all movements. The ankle reflex is absent and knee jerk is sluggish.

What would be the most appropriate initial management?

A. Tramadol

B. Venlafaxine

C. Duloxetine

D. Urgent spinal MRI scan

E. Fludrocortisone

Correct Answer:Duloxetine

Explanation:

The correct answer is duloxetine. The patient is describing peripheral neuropathy and the clinical findings reveal a typical glove and stocking sensory loss. The sensory arc of the reflex pathways has also been affected. The best first-line treatment for neuropathic-type pain is a choice of amitriptyline, gabapentin, pregabalin or duloxetine. Traditionally duloxetine has been preferred for diabetic neuropathy. A reduction in power can be attributed firstly to her age and secondly to long-term steroid use causing a degree of myopathy.

A spinal MRI is not indicated as she is unlikely to have a cord compression or cauda equina syndrome – there are no features of sphincter disturbance, no saddle anaesthesia and power is not significantly reduced.

Fludrocortisone is incorrect as she does not have postural hypotension – her BP has not dropped by 20mmHg systolic or 10mmHg diastolic.

Tramadol should only be used as rescue medication for acute severe neuropathic pain.

Further reading:

https://www.nice.org.uk/guidance/cg173/chapter/1-Recommendations

Question:

A 15 month-old boy is brought in by his parents as he has been inconsolable for 4 hours. They describe a 12-hour history of vomiting, abdominal distension and poor feeding. They also mention a 3-month history of intermittent groin bulging when he cries, which they have seen their GP about.

On examination, he has sunken fontanelles and increased capillary refill time. His abdomen is distended and there is an irreducible, non-fluctuant bulge in the right groin that is tender and erythematous. His nappy contains blood-stained stools.

What is the most likely diagnosis?

A. Meckel’s diverticulum

B. Strangulated inguinal hernia

C. Incarcerated inguinal hernia

D. Retractile testes

E. Lymphadenitis

Correct Answer:Strangulated inguinal hernia

Explanation:

The most likely diagnosis is a strangulated inguinal hernia.

An indirect inguinal hernia is a congenital abnormality from the failure of the processus vaginalis to close. The processus vaginalis is an outpouching of peritoneum that, along with the gubernaculum, guides the testes in their descent through the inguinal ring into the scrotum. In females, the canal of Nuck (which is functionally similar to the processus Vaginalis) terminates in the labia majora and assists in guiding the ovaries to their final location in the pelvis. The processus vaginalis and canal of Nuck both close between 36-40 weeks of gestation.

The left testis descends before the right and usually closes first, resulting in a higher incidence of right-sided inguinal hernias.

Most inguinal hernias are asymptomatic and are often found during a routine examination or by parents who have noticed an intermittent bulging in the groin, scrotum, or labia, often with straining.

An incarcerated hernia presents as an irreducible non-fluctuant bulge that is tender and may or may not be erythematous. The child is usually inconsolable and may have obstructive symptoms such as nausea and vomiting, constipation, and abdominal distention.

If incarceration progresses to strangulation, the child may have peritonitis, bloody stools, and haemodynamic instability.

Other conditions may be confused for an incarcerated hernia, such as a retractile testis, lymphadenopathy, and hydrocele.

Meckel’s diverticulum

A true diverticulum that results from the failure of the vitelline duct to obliterate during the fifth week of fetal development. The diverticulum often contains heterotropic mucosa (gastric or pancreatic). Meckel’s diverticulum is often asymptomatic, however, patients can present with symptoms of obstruction and painless passage of bright red blood (due to diverticula containing heterotopic gastric mucosa that secretes acid which causes ileal mucosal ulceration beside the diverticulum). This is not to be confused with intussusception which can also present with obstruction and red currant jelly stools.

Lymphadenitis

Lymphadenitis is caused by inflamed and enlarged lymph nodes usually secondary to infection. Symptoms include painful lymphadenopathy with erythema. Lymphadenitis would not present with symptoms of obstruction.

Retractile testes

In most males, the testicles can move in and out of the scrotum at different times due to changes in temperature etc. Retractile testes do not need any treatment but do need close follow-up until puberty, as they can become ascendant. Retractile testes are usually painless and would not present with symptoms of obstruction like the case in question.

Further reading:

https://patient.info/doctor/abdominal-wall-hernias

Question:

A 62-year-old female is referred to the gastroenterologist after an incidental finding of raised ALT of 106. She is completely asymptomatic. She drinks approximately a bottle of wine per week and has a past medical history of depression, obesity (BMI 34), diet-controlled type 2 diabetes mellitus and hypertension.

She undergoes a non-invasive liver screen (HBV and HCV serology, serum iron and total iron-binding capacity, serum caeruloplasmin levels, serum protein electrophoresis), which is all negative. She also undergoes a liver ultrasound scan, which shows increased echogenicity.

What is the next most appropriate step in her management?

A. MRI abdomen

B. Discharge with no follow-up

C. Lifestyle advice

D. CT abdomen

E. Liver biopsy

Correct Answer:Lifestyle advice

Explanation:

The underlying condition is most likely to be non-alcoholic fatty liver disease (NAFLD). Patients with this condition are usually asymptomatic and it is commonly detected following an incidental finding of abnormal liver function tests, as in this case. It is commonly found in association with features of the metabolic syndrome. If NAFLD is suspected then a non-invasive liver screen and a liver ultrasound scan are usually performed. The liver ultrasound scan usually shows the non-specific feature of increased echogenicity. The combination of the clinical history and the USS findings, in this case, are sufficient to make this diagnosis.

Lifestyle modification through diet changes and increased exercise are the cornerstone of managing NAFLD and all patients should be given advice on this. Patients who also drink excessively should be given advice to cut down. If patients LFTs do not improve with diet modification then medical treatments or further investigations may be considered.

Liver biopsies can be used in cases where the diagnosis of NAFLD is uncertain but are not done in routine cases such as this as they are invasive.

Discharge with no follow-up would not be appropriate since the patient would need monitoring of her LFTs to see if any improvements are made with lifestyle modifications

CT scan and MRI scan would both show fatty infiltration of the liver, however they are not used as a first-line investigation in a scenario such as this. They would only be considered in more complex cases or when the diagnosis is less certain.

Further reading:

https://patient.info/doctor/steatohepatitis-and-steatosis-fatty-liver

Question:

A 30-year-old woman presents with a 1-week history of blurred vision in her right eye, and pain during eye movement. She also gives a history of intermittent tingling in her upper limbs about a year ago, which lasted approximately 4 weeks before resolving spontaneously; she did not seek medical attention at the time. She notes that it returns intermittently if she has a hot bath, or does exercise.

Clinical examination reveals a relative afferent pupillary defect.

A series of investigations are arranged, in order to investigate her symptoms.

Of the below, which is the most likely investigation finding?

A. Vitamin B12 deficiency

B. Nerve conduction studies showing peripheral demyelination

C. CSF oligoclonal bands

D. Serum free light chains

E. CSF lymphocyte count of 110 cells/µL

Correct Answer:CSF oligoclonal bands

Explanation:

This patient is suffering from multiple sclerosis. Of the options given, the most likely investigation finding in this case is the presence of oligoclonal bands in the CSF. In multiple sclerosis, the expected finding would be oligoclonal bands of IgG in CSF that are not present in serum, indicating that the antibodies are being produced in the CNS rather than peripherally. In terms of additional investigations, MRI of brain and spinal cord is important to identify areas of demyelination and rule out other diagnoses; and evoked potentials (such as visual evoked potentials) should be considered, which will demonstrate prolonged conduction.

Multiple sclerosis is a central nervous system disorder. As such, nerve conduction studies would not be expected to show peripheral demyelination.

Vitamin B12 deficiency would be expected to present with symptoms of anaemia such as fatigue, neurological symptoms such as paraesthesia and peripheral neuropathy (compared to MS which is a central nervous system disorder), and cognitive symptoms such as mood changes and memory loss.

Serum free light chains are associated with myeloma and other haematological disorders, they would not be expected in multiple sclerosis.

While CSF lymphocytes may be mildly elevated, a CSF lymphocyte count of greater than 110 would not be expected in multiple sclerosis, and should prompt consideration of other diagnoses such as meningitis, or lymphoma.

Further reading:

https://patient.info/doctor/multiple-sclerosis-pro

Question:

A 62-year-old male presents to A&E with abdominal pain. He is visibly distressed and describes severe epigastric pain that radiates to his back. Otherwise, he has not vomited and has had no changes in his bowel habit. His past medical history includes type 2 diabetes, hypercholesterolemia and hypertension.

His vital signs are as follows:

Temperature 37.1 oC

Heart rate 118bpm

BP 92/71 mmHg

Respiratory rate 23

SpO2 95% on air

On examination, he is visibly pale with dry mucous membranes and a capillary refill of 4 seconds. Abdominal examination reveals generalised tenderness worst in the epigastric region. An expansile mass is palpable in the centre of the abdomen. As you are examining the patient they suddenly become unresponsive. The nurse repeating his observations finds a heart rate of 130bpm and an unrecordable blood pressure.

Given the most likely diagnosis, which of the following is the most important definitive management option?

A. Emergency vascular surgery

B. 500ml 0.9% NaCl over 15 minutes

C. Immediate CT abdomen

D. Activate major haemorrhage protocol

E. Abdominal ultrasound scan

Correct Answer:Emergency vascular surgery

Explanation:

The most important management option is immediate vascular surgery as this patient has a suspected ruptured abdominal aortic aneurysm (AAA) and has become unresponsive due to haemodynamic instability.

The most important management for this patient is emergency vascular surgery to repair the aneurysm, either via endovascular or open methods.

Activating the major haemorrhage protocol is appropriate and something that would be done alongside arranging emergency surgery, however, it would not fix the underlying problem of a ruptured AAA.

Fluid resuscitation also has a place here given his BP is low, however, care needs to be taken in ruptured AAA to avoid aggressive fluid replacement as it can cause several problems. Firstly it can precipitate a dilutional and hypothermic coagulopathy. Secondly by over-correcting the BP you can increase the blood flow to the aneurysm area and exacerbate the bleed. Patients with ruptured AAA ideally need blood products rather than aggressive fluids.

In this scenario there is no time for imaging as the patient is unstable so is not suitable for a CT scan. In an unruptured, stable AAA a CT scan would be appropriate to measure the size of the aneurysm.

Further reading:

https://patient.info/doctor/ruptured-aortic-aneurysm#nav-4

Question:

A 68-year-old man presents with sudden onset pleuritic chest pain and shortness of breath. He has had 2 episodes of haemoptysis He has a past medical history of deep vein thrombosis following a knee replacement six years ago, but is otherwise well and doesn’t take any regular medication.

He is apyrexial, his heart rate is 96 beats per minute, blood pressure 142/85 mmHg, respiratory rate is 24 breaths per minute and his pulse oximetry is 94% in room air. Clinical examination is unremarkable.

His chest X-ray is normal and his electrocardiogram shows a normal sinus rhythm. His blood tests show a total white cell count of 12.7 x 109/L, a troponin-T of 0.08 µg/L and a C-reactive protein of 48mg/L.

What is the most likely diagnosis?

A. Pulmonary embolism

B. Lung cancer

C. Pneumothorax

D. Acute coronary syndrome

E. Lower respiratory tract infection

Correct Answer:Pulmonary embolism

Explanation:

Sudden onset chest pain and shortness of breath, with associated haemoptysis and a history of previous deep vein thrombosis, make pulmonary embolism the most likely diagnosis. His Wells score is 4.5, making a pulmonary embolism likely and he should proceed to imaging with a computed tomography scan without measuring his D-dimer level.

His chest pain does not sound cardiac and he has no risk factors for ischaemic heart disease and so acute coronary syndrome is unlikely, his elevated troponin is probably due to his pulmonary embolism.

A normal chest X-ray and unremarkable examination make a diagnosis of pneumothorax unlikely.

Although haemoptysis raises the possibility of lung cancer, it is not the most likely diagnosis given he is a non-smoker and the sudden onset of his symptoms.

The history is not one of a lower respiratory tract infection, pulmonary embolism can cause a raised white cell count and C-reactive protein.

Further reading:

https://www.nice.org.uk/guidance/ng158

Question:

A 38-year-old woman (gravida 3, para 2) presents to the GP with a six-month history of incontinence. She explains that whenever she coughs or sneezes, she lets out a bit of urine. She is very embarrassed by the problem, and it is now affecting her ability to socialise.

She has no features of dysuria or frequency. An abdominal and bimanual examination is normal.

She has a past medical history of migraine.

What is the most appropriate initial management step?

A. Oxybutynin

B. Pelvic floor muscle training

C. Urgent referral (suspected cancer pathway)

D. Routine referral to urology

E. Duloxetine

Correct Answer:Pelvic floor muscle training

Explanation:

The most likely diagnosis is stress incontinence - a form of involuntary urinary leakage on effort or exertion or sneezing or coughing. Patients with stress incontinence experience this leakage because intra-abdominal pressure exceeds the urethral pressure. NICE guidelines suggest the most appropriate initial management is a three-month trial of pelvic floor muscle training (PFMT). This is often paired with lifestyle advice regarding caffeine intake, fluid intake and weight loss if this is appropriate.

NICE guidelines recommend an urgent referral using a suspected cancer pathway for women aged 45 years and over with unexplained visible haematuria without urinary tract infection or visible haematuria after successful treatment of a urinary tract infection. This patient does not have any red flags for bladder cancer or meet the referral criteria; therefore, an urgent referral would not be indicated at this time.

NICE guidelines only recommend a referral to urology if strict criteria are met. As this patient had a normal abdominal and bimanual examination and there is no suspected neurological cause, surgical history or history of recurrent urinary tract infections, it would not be indicated to refer her to specialist services at this time.

Duloxetine is considered a second-line treatment for stress incontinence and is only recommended if a patient does not want or is not suitable for surgical treatment.

Oxybutynin is an antimuscarinic drug that is often used in the management of urgency incontinence, however, it is not indicated for use in stress incontinence.

Further reading:

https://cks.nice.org.uk/topics/incontinence-urinary-in-women/

Question:

A 19-year-old man presents to his GP feeling generally unwell with a new lump in his neck. The lump has been there for two days, and he has a mild headache.

He is a university student who is usually fit and well. He is unsure of his vaccination history. On examination, he has swollen parotid glands and a temperature of 37.9°C. He has no rash.

What is the most likely diagnosis?

A. Hyperthyroidism

B. Lymphoma

C. Mumps

D. Parotid tumour

E. Measles

Correct Answer:Mumps

Explanation:

Individuals with mumps usually first feel unwell with nonspecific symptoms like headache, loss of appetite, and low-grade fever. The most well-known sign of mumps is parotitis. Parotitis (swelling of the parotid glands) develops in 95% of symptomatic cases of mumps and usually lasts three to four days, although can last up to ten. The MMR vaccine is a safe and effective combined vaccine. It protects against 3 serious illnesses - measles, mumps and rubella.

A parotid tumour would typically grow at a slower rate and may present with numbness, burning or prickling sensations in the face, or a loss of facial movement.

Measles is a highly contagious respiratory viral infection. Clinical features include high-grade fever, cough, coryza and conjunctivitis. On examination, you may see Koplik’s spots and an erythematous maculopapular rash.

Lymphoma is a haematological malignancy. The most common symptom is painless, rubbery, enlarged lymph nodes, typically in the cervical or supraclavicular region.

Hyperthyroidism can cause a neck swelling called a goitre which is an enlarged thyroid gland. Other symptoms may include sensitivity to heat, anxiety, tremor or palpitations.

Further reading:

https://geekymedics.com/mumps/

Question:

A 38-year-old man presents with new-onset progressive jaundice, which started one week ago. He has previously attended the emergency department with minor injuries but takes no regular medication. He drinks three litres of strong cider most days and smokes 20 cigarettes per day.

He is alert, orientated and apyrexial. On examination, he is thin and obviously jaundiced with spider naevi over his chest. His abdomen is soft and non-tender, his liver edge is palpable 4cm below the costal margin.

Blood tests are requested:

Test Result Reference range

Urea 12 mmol/L (2.5 - 7.8)

Creatinine 84 μmol/ L (59–104)

Bilirubin 245 μmol/L (<21)

Alanine aminotransferase (ALT) 92 U/L (<41)

Alkaline phosphatase (ALP) 127 U/L (30–130)

Amylase 187 U/dL (28–100)

Prothrombin time (PT) 27 seconds (10 – 14)

With regards to the most likely diagnosis, what scoring system is most useful in determining his prognosis?

A. Glasgow-Imrie Criteria

B. Maddrey’s discriminant function

C. Rockall score

D. Lille score

E. Glasgow-Blatchford score

Correct Answer:Maddrey’s discriminant function

Explanation:

The most likely diagnosis, in this case, is alcohol hepatitis. Maddrey’s discriminant function is used to prognosticate. The Maddrey score is calculated using the bilirubin and prothrombin time. A score greater than or equal to 32 correlates with a poor prognosis and identifies patients that may benefit from treatment with steroids. Although these patients are at very high risk of death from sepsis, and often steroids aren’t given.

The Lille score is used to calculate the response to steroid treatment in alcoholic hepatitis.

The Glasgow-Blatchford score is used to predict the need for medical intervention in upper gastrointestinal bleeding.

The Rockall score is used to risk assess for re-bleeding and death after endoscopy in upper gastrointestinal bleeding.

The Glasgow-Imrie score is used in acute pancreatitis to calculate the risk for severe pancreatitis.

Further reading:

https://www.journal-of-hepatology.eu/article/S0168-8278(18)30214-9/pdf

Question:

A 39-year-old female is admitted to the acute medical ward with worsening confusion over a 2 week period. Earlier that afternoon she had a generalized tonic-clonic seizure. Her past medical history is significant for being HIV positive and she has missed her last 2 routine clinic appointments. Her last recorded CD4+ count 2 years previously was 205. A CT head shows multiple ring-enhancing lesions.

What is the most likely causative agent?

A. Cryptosporidium

B. Herpes simplex virus

C. Toxoplasma gondii

D. Cryptococcus

E. Cytomegalovirus

Correct Answer:Toxoplasma gondii

Explanation:

This patient has presented with slowly progressive neurological symptoms and a seizure, in the context of known significant immunosuppression. Cerebral toxoplasmosis classically presents with a general neurological decline, either acute or over a period of days to weeks, alongside focal symptoms. CT head typically shows ring-enhancing lesions, and the differential diagnosis may include CNS lymphoma.

All of the listed organisms can cause a variety of presentations. CMV often causes retinitis, hepatitis or colitis. HSV can cause chronic ulcers as well as specific organ involvement such as bronchitis or oesophagitis. Cryptococcosis may present as meningitis in the immunocompromised. Cryptosporidium classically causes watery diarrhoea.

Further reading:

https://patient.info/doctor/toxoplasmosis-pro

Question:

A study is conducted investigating whether adverse childhood events are linked to higher rates of metabolic syndrome. 30 participants are asked to complete a survey containing questions about their medical history and different forms of adverse childhood events they may have experienced. The participants are offered a £20 payment for their time for completing the survey and, as a result, many participants reported trying to complete the survey as quickly as possible.

What form of bias is most likely to be present in this study?

A. Observer bias

B. Central tendency bias

C. Confounding bias

D. Procedure bias

E. Misclassification bias

Correct Answer:Procedure bias

Explanation:

Offering money for completing a survey may introduce procedure bias. This is the bias that arises from the conditions in which a study is undertaken, for example offering money to complete the survey may cause participants to rush through the survey and therefore responses may be incomplete, lacking in detail or inaccurate.

Observer bias is the bias that arises due to a researcher’s expectations or preconceptions affecting the way they perceive and record a variable.

Misclassification bias is the bias that arises from incorrectly classifying a study participant.

Central tendency bias is the bias that arises from people’s tendency to rate items towards the middle of a scale.

Confounding bias is the bias that arises when an additional factor is independently associated with both the exposure and the outcome. This leads to an apparent correlation between the exposure and outcome.

Further reading:

https://geekymedics.com/statistics-for-medical-students/

Question:

A 57-year-old female with no past medical history presents to the emergency department with a 3-day history of worsening lower back pain. She also has pain radiating down both of her legs. The pain is worse at night and has been interrupting her sleep. She has only tried ibuprofen for analgesia which has provided limited relief. No history of trauma is reported. There are no complaints of bladder or bowel dysfunction.

Physical examination reveals decreased knee reflexes bilaterally and reduced strength in her legs bilaterally. A rectal examination is significant for reduced anal sphincter tone.

What is the most appropriate next step in management?

A. Computerized tomography (CT) of kidney, ureter and bladder (KUB)

B. Magnetic resonance imaging (MRI) of lumbar spine

C. Serum c-reactive protein (CRP)

D. Bone scan

E. Lumbar spine radiograph

Correct Answer:Magnetic resonance imaging (MRI) of lumbar spine

Explanation:

The above patient has presented with acute onset low back pain with several red flags (reduced knee reflexes, weakness, poor anal tone and night pain). This clinical presentation is consistent with cauda equina syndrome (CES) – compression of the spinal cord below the level of L1 where the lumbosacral nerve roots form the ‘cauda equina’. CES typically presents with progressively worsening low back pain, lower limb weakness (usually symmetric in nature), paraesthesia below the level of the lesion and ataxia. Bladder and bowel dysfunction is typically a late finding in the context of CES. Imaging of the thecal sac with an MRI of the lumbar spine is an important diagnostic step in confirming CES and should be completed urgently.

Plain films are required if bony pathologies such as fractures or osteoarthritis are thought to be the cause of the patient’s symptoms. The above patient has clinical features consistent with CES – a medical emergency that requires an urgent MRI.

CT KUB would be important in the context of renal stones. Renal stones typically present with colicky pain that radiates to the groin and urinary symptoms which this patient does not have.

Bone scans are an important investigation in the context of metastatic disease from an underlying malignancy. Although metastatic disease from underlying malignancy can cause CES, an urgent MRI is more appropriate as the next step in the above scenario.

Serum inflammatory markers like CRP are rarely diagnostic. Although the CRP is likely to be elevated in the above patient, an urgent MRI is more likely to be diagnostic.

Further reading:

https://cks.nice.org.uk/sciatica-lumbar-radiculopathy#!diagnosisSub:1

Question:

A 70-year-old man is brought to the emergency department with sudden-onset weakness. He has a history of type 2 diabetes mellitus, hypertension, and hypercholesterolaemia. His current medications include ramipril, metformin, empagliflozin, and atorvastatin. He smokes 10 cigarettes daily.

On examination, he has 1/5 strength in the left upper limb and 3/5 strength in the left lower limb, with impaired sensation in both. The right upper and lower limbs are both 5/5 in strength, and sensation is intact. Visual field testing demonstrates left homonymous hemianopia. He is plethoric, and splenomegaly is noted.

Initial blood tests are performed:

Test Result Reference range

Haemoglobin 198 g/L (130 – 180)

Platelets 450 x 109/L (140 – 400)

White cell count 13.2 x 109/L (3.6 – 11.0)

Haematocrit 0.71 L/L (0.40 – 0.54)

Glucose 5.9 mmol/l (4.4 – 7.8)

Sodium 140 mmol/L (133 – 146)

Potassium 4.2 mmol/L (3.5 – 5.3)

Urea 4.5 mmol/L (2.5 – 7.8)

Creatinine 70 μmol/L (59 – 104)

What is the most likely diagnosis?

A. Chronic myeloid leukaemia

B. Acute myeloid leukaemia

C. Essential thrombocytosis

D. Diabetes mellitus

E. Polycythaemia vera

Correct Answer:Polycythaemia vera

Explanation:

Polycythaemia vera is correct. This patient has presented with sudden-onset focal neurological deficits, making stroke a likely diagnosis. From the history, we can see that he is plethoric in appearance and has splenomegaly, and blood tests show increased haemoglobin, platelets, white cells, and haematocrit. This pattern of features suggests that there is an underlying haematological condition which is likely to have increased his blood's viscosity and predisposed him to a stroke. The most likely diagnosis is polycythaemia vera (PV). One of the complications of PV is thrombotic events due to the increased number of circulating cells. This is likely to be his first presentation, as patients with PV are given prophylactic aspirin after diagnosis to reduce the incidence of thrombotic events. Typical blood findings in PV are increased haemoglobin, increased white cells (particularly neutrophils and basophils), and increased platelets. Further testing may reveal the presence of a JAK2 mutation.

Although chronic myeloid leukaemia (CML) can present very similarly with splenomegaly, thrombotic events are much less common in CML than in PV. As well as this, CML tends to present with anaemia, rather than polycythaemia. Patients may also have constitutional symptoms such as weight loss and sweating, which do not apply in this case.

Essential thrombocytosis can also increase the risk of thrombosis, however, patients do not typically appear plethoric, and splenomegaly is much less common. As well as this, only the platelets are raised, and haemoglobin and white cell counts are usually normal.

Although acute myeloid leukaemia can present with splenomegaly, patients usually have reduced haemoglobin and thrombocytopenia instead. It is important to note that PV can progress to acute myeloid leukaemia.

Further reading:

https://geekymedics.com/polycythaemia-vera/

Question:

A 62-year-old woman presents to her GP with an 18-month history of increasing dyspnoea on exertion. She sometimes wakes up at night struggling for breath, however, her dyspnoea is improved when sleeping upright in bed or chair.

On examination, a rumbling mid-diastolic murmur with an opening click is audible.

Based on the likely diagnosis, what is the most likely cause?

A. Marfan syndrome

B. Papillary muscle rupture

C. Rheumatic fever

D. Congenital bicuspid valve

E. Systemic lupus erythematosus

Correct Answer:Rheumatic fever

Explanation:

This case demonstrates mitral stenosis, of which rheumatic fever is the most common cause. It commonly presents with exertional dyspnoea, orthopnoea and paroxysmal nocturnal dyspnoea. Chest pain and atrial fibrillation may also be seen. Other rarer causes of mitral stenosis include:

Autoimmune disease, e.g. rheumatoid arthritis and systemic lupus erythematosus

Connective tissue disorders, e.g. Marfan syndrome

Left atrial myxoma

Mucopolysaccharidosis

Carcinoid syndrome

Papillary muscle rupture commonly leads to mitral regurgitation.

A congenital bicuspid valve is a cause of aortic stenosis.

Further reading:

https://geekymedics.com/heart-murmurs/

Question:

A 39-year-old woman presents to the emergency department with sharp, severe right upper quadrant pain. This started 6 hours ago after eating fish and chips. She has vomited twice and complains of nausea. The pain is not relieved on leaning forward. She reports several episodes of similar abdominal pain over the last 6-months, with no fever. On examination, she has a temperature of 38.2oC and a BMI of 39kg/m². She is tender in the right upper quadrant, and there is no evidence of jaundice.

What is the most likely diagnosis?

A. Biliary colic

B. Acute pancreatitis

C. Acute cholecystitis

D. Ascending cholangitis

E. Peptic ulcer

Correct Answer:Acute cholecystitis

Explanation:

This patient has several risk factors for gallstones, including obesity, being middle-aged and having a high BMI. Acute cholecystitis is characterised by right upper quadrant pain (RUQ) and fever without jaundice. Cholecystitis is even more likely with a history of biliary colic.

Ascending cholangitis is a combination of biliary outflow obstruction and bacterial infection of the biliary tree. It presents with Charcot's triad of right upper quadrant pain, fever and jaundice.

Acute pancreatitis is characterised by epigastric pain, which radiates to the back and is relieved by leaning forward. The most common causes are gallstones and ERCP.

Peptic ulcers commonly present with epigastric pain, dyspepsia and nausea. Fever is not a common feature.

Biliary colic presents with sharp, intermittent RUQ pain caused by gallstones irritating the bile ducts. Fever is not typically present.

Further reading:

https://cks.nice.org.uk/topics/cholecystitis-acute/

Question:

A 48-year-old man is brought to the emergency department by ambulance, accompanied by his family. The paramedics report that they have been to the patient's house several times in recent months due to falls, but until today he has declined to come to the hospital.

The patient's family report that he has been drinking around one large bottle of vodka per day since losing his job 2 years ago. They called for an ambulance today after his abdomen appeared to swell up and became painful, and they noted his skin was changing colour.

On examination, the patient looks unkempt and has a strong smell of alcohol. He looks unwell and there is jaundice present. He also has tender hepatomegaly and ascites.

What is the most likely diagnosis?

A. Cholecystitis

B. Hepatitis C

C. Autoimmune hepatitis

D. Alcoholic hepatitis

E. Ascending cholangitis

Correct Answer:Alcoholic hepatitis

Explanation:

Alcoholic liver disease has three stages of liver injury, each with distinct histological appearance: fatty liver, alcoholic hepatitis and alcoholic liver cirrhosis. The patient's history of alcohol excess and presentation with jaundice, ascites and tender hepatomegaly should raise suspicion of alcoholic hepatitis. The presentation of alcoholic hepatitis can be wide-ranging and may present from mild illness to fulminant hepatic failure.

There is nothing in this patient's history to suggest the presence of risk factors for hepatitis C. Hepatitis C is transmitted via blood and so major risk factors include intravenous drug use and needlestick injuries, although vertical transmission and transmission through sexual contact are also possible. It may cause a flu-like illness, joint pains and jaundice with or without tender hepatomegaly although in many cases symptoms are non-specific.

The triad of right upper quadrant pain, fever and jaundice is seen in ascending cholangitis. This is a possibility here but less likely than alcoholic hepatitis given the clear history of alcohol excess and presence of ascites. Likewise, cholecystitis is possible but uncomplicated cholecystitis alone would not cause jaundice and ascites.

Autoimmune hepatitis can also present with liver failure and should be considered but is more commonly seen in female patients with a history of other autoimmune conditions. It should be screened for but alcoholic hepatitis is more likely in this patient.

Further reading:

https://patient.info/doctor/alcohol-related-problems

Question:

Whilst working as the obstetrics SHO on-call you are asked to review a patient on the day unit. Mrs T is a primigravida who is 34/40 gestation. She has come in complaining of headaches for the past week. On examination she looks well, there are good fetal movements and a CTG is reassuring. Her observations show: HR 85; BP 165/90 mmHg; Sats 99% (room air); Temp 36.3; RR 14. Her abdomen is soft with a palpable gravid uterus in keeping with her dates.

Blood tests reveal Hb 120, Plts 220, Creat 90. A coagulation screen is normal. Urine dip reveals protein 3+, you send this to the lab to calculate PCR which is reported as 75. Several repeat blood pressure measurements reveal a sustained systolic blood pressure of between 160-170 mmHg.

What is the most appropriate management?

A. Commence labetalol, admit to the ward until delivery, regardless of blood pressure stabilisation

B. Deliver her immediately

C. Discharge home on oral antihypertensives with regular BP checks in the community

D. Discharge home on oral antihypertensives and review if her headaches don’t settle

E. Commence labetalol, admit to the ward and consider discharge home once BP stabilises

Correct Answer:Commence labetalol, admit to the ward and consider discharge home once BP stabilises

Explanation:

This lady has pre-eclampsia (BP > 140/90 and PCR > 30) and requires admission for interventions and surveillance given the presence of a sustained systolic blood pressure of greater than 160 mmHg. If interventions, such as the introduction of labetalol, control the patient's blood pressure and they remain otherwise stable (e.g. LFTs, platelets, U&Es), discharge with outpatient monitoring would be appropriate.

Relevant NICE guidance

"Carry out a full clinical assessment at each antenatal appointment for women with pre-eclampsia, and offer admission to hospital for surveillance and any interventions needed if there are concerns for the wellbeing of the woman or baby. Concerns could include any of the following: sustained systolic blood pressure of 160 mmHg or higher any maternal biochemical or haematological investigations that cause concern, for example, a new and persistent: rise in creatinine (90 micromol/litre or more, 1 mg/100 ml or more) or rise in alanine transaminase (over 70 IU/litre, or twice upper limit of normal range) or fall in platelet count (under 150,000 cells/microlitre) signs of impending eclampsia signs of impending pulmonary oedema other signs of severe pre-eclampsia suspected fetal compromise any other clinical signs that cause concern."

This lady is 34 weeks pregnant with no evidence of fetal distress. It is in the best interests of her unborn child to continue the pregnancy as long as possible to avoid the risks of premature delivery so immediate delivery would be inappropriate given the information in the question.

Keeping the patient in hospital until delivery, regardless of her clinical response to interventions, is not required. Patients can be managed in the community if stable, with regular blood pressure monitoring and urinalysis. The patient would continue to receive their antihypertensive medication in the community.

Discharging this lady home immediately, even with antihypertensives, would not be appropriate in this scenario given the presence of a sustained systolic blood pressure of greater than 160 mmHg.

Further reading:

https://www.nice.org.uk/guidance/ng133

Question:

A 5-year-old girl is brought to the GP by her mother after being sent home by the school nurse. The mother explains that the girl's teacher had noticed she was scratching her head a lot during the morning classes. The school nurse then inspected the girl's head and neck and reported she thought she saw two, 3-4mm long "insect-like creatures" crawling through her head.

The girl has no significant past medical history. Her mother does not know if anyone else in the class has similar symptoms.

On examination of the head, you notice small whitish spots close to the scalp, adherent to the hair shaft. You do not identify anything else in the hair.

Which of the following investigations is considered most accurate in confirming the diagnosis in this patient?

A. Tissue biopsy

B. Dry detection combing

C. Clinical diagnosis only

D. Swab and culture of scalp

E. Wet detection combing

Correct Answer:Wet detection combing

Explanation:

The most likely diagnosis in this patient is head lice, also known as pediculus humanus capitis, a parasitic infestation of the hairs of the human head. The transmission of head lice requires head-to-head contact and is commonly seen in young children. NICE guidelines suggest that wet combing with a fine-toothed comb is the most reliable way to confirm the presence of head lice. The wet detection combing method involves systematically combing the hair with a fine-toothed (0.2-0.3mm) head lice detection comb whilst the hair is wet. This process takes approximately 15-20 minutes.

Detection combing may be performed on either wet hair or dry hair. While less preparation is needed to comb through dry hair, NICE guidelines suggest that wet combing is preferable, as the presence of moisture on the hair helps to prevent the lice from moving; therefore, increasing the detection rate and aiding accurate diagnosis.

NICE guidelines suggest that an itching scalp alone is insufficient to make a diagnosis of an active head lice infestation. In order to confirm a diagnosis of head lice, a live louse must be found using an appropriate detection method, preferably via wet detection combing.

The most likely diagnosis in this patient is head lice, a condition that can be easily identified through non-invasive techniques. A tissue biopsy would not be indicated in this patient and would not help confirm the underlying diagnosis, as no characteristic changes would be identified.

The head louse (pediculus humanus capitis) is an obligate ectoparasite of humans; therefore, a swab and culture is not a suitable identification technique for making this diagnosis.

Further reading:

https://cks.nice.org.uk/topics/head-lice/

Question:

A 29-year-old patient, Mr Curtis Brown, attends his GP complaining of pain when passing urine. Mr Brown reports that the pain has been present for several weeks. He has also noticed perianal pruritus and offensive smelling urethral discharge.

Mr Brown has a past medical history of asthma, anterior cruciate ligament injury and previously treated chlamydia.

He is concerned that he might have contracted another infection whilst having unprotected sexual intercourse. He takes no regular medication and he has no known drug allergies.

On examination, Mr Brown looks well perfused and alert. Abdominal and genital examinations are largely unremarkable other than the presence of urethral discharge.

Vital signs are as follows:

O2 99% on air

HR 80 bpm

RR 15

BP 125/76 mmHg

Temp 36.9 oC

The GP takes a genital swab sample for gram stain and the sample reveals gram-negative diplococci.

Which of the following is the most appropriate management option for this patient?

A. Doxycycline 100mg (PO) – OD for 7 days

B. Ceftriaxone 1g (IM) - single dose

C. Metronidazole 500mg (PO) - OD 7 days

D. Fluconazole 150mg (PO) – single dose

E. Azithromycin 1g (PO) - single dose

Correct Answer:Ceftriaxone 1g (IM) - single dose

Explanation:

The most appropriate treatment would be a single dose of ceftriaxone 1g (IM).

The patient has presented with symptoms in keeping with a sexually transmitted infection, such as dysuria, urethral discharge and rectal pruritis. The gram stain findings, in this case, are diagnostic for Neisseria Gonorrhoeae. The first-line treatment for confirmed, non-resistant, uncomplicated gonorrhoea is a single dose of 1g ceftriaxone IM (local guidelines may vary and resistant strains may require alternative treatment).

Chlamydia is a reasonable differential diagnosis for this patient. Patients with chlamydia are usually asymptomatic, but in males, dysuria, urethral discharge and testicular pain are common presenting symptoms. The first-line treatment for uncomplicated genital chlamydia is a 7-day course of doxycycline or alternatively a 3-day course of azithromycin. For this patient, the diagnosis of gonorrhoea is the most likely cause of the patient’s symptoms because of the gram stain results. NICE advises that patients should also be screened for other sexually transmitted infections due to high rates of co-infection.

Trichomoniasis is another reasonable differential diagnosis for this patient. Trichomoniasis is a flagellated protozoan that is most commonly transmitted via sexual intercourse. Patients are often asymptomatic. Females may present with dysuria, altered vaginal discharge and vulvar itching. Males may present with urethral discharge. Metronidazole is the first-line treatment for trichomoniasis. Diagnosis of trichomoniasis is usually made via a urethral specimen or urine sample, which is then sent for nucleic acid amplification testing (NAAT). For this patient, the diagnosis of gonorrhoea is the most likely cause of the patient’s symptoms because of the gram stain results, however, the patient should also be screened for other sexually transmitted infections.

Candidiasis (genital thrush) is a symptomatic inflammation of the genitals caused by a superficial fungal infection. Most commonly caused by candida albicans. Thrush is more common in females and typical symptoms include vulva itching, vulval soreness, vaginal discharge, superficial dyspareunia and dysuria. Oral antifungals such as fluconazole are first-line for uncomplicated genital thrush. Genital thrush is a less likely differential for this patient, because of his gender, his urethral discharge, and the gram stain results.

Further reading:

https://www.bashh.org/guidelines

Question:

A 53-year-old male presents to the emergency department with sub-acute worsening of upper abdominal pain and vomiting. The pain is similar to that he has experienced over the past 5 years but is much worse and more persistent than usual. He has no past medical history and is on no regular medications. He is a smoker of a 20 pack-year history and currently drinks approximately 30 units of alcohol per week.

The vomiting began whilst already experiencing moderate pain. He describes the appearance as being very dark and granulated. He stated there has been no blood.

On examination, there is tenderness over the epigastrium with localised, voluntary guarding. The abdomen is otherwise soft and non-tender with no rebound tenderness.

His observations are as follows: temperature 36.4, HR 112bpm, BP 125/80, saturations 98% on air, RR 16.

Which of the following is the most likely diagnosis?

A. Bleeding peptic ulcer

B. Mild gastritis

C. Bowel perforation

D. Boerhaave syndrome

E. Mallory-Weiss tear

Correct Answer:Bleeding peptic ulcer

Explanation:

The history described is that of an upper gastrointestinal bleed with typical epigastric pain and ‘coffee ground’ vomit. The patient most likely has a background of undiagnosed peptic ulcer disease given the 5-year history of epigastric pain and the presence of significant risk factors (smoking, excess alcohol). Therefore, an upper gastrointestinal bleed caused by a bleeding peptic ulcer is the most likely diagnosis.

Bleeding peptic ulcers typically present with epigastric pain, melaena (dark sticky stools due to the presence of digested blood) and 'coffee ground' vomit (partially digested blood). If the bleeding is significant, the patient may have signs of haemodynamic instability such as tachycardia and hypotension. Laboratory tests typically reveal anaemia with a raised urea level (due to absorption of protein from the digested blood). Microcytosis may be present in the context of chronic bleeding due to iron deficiency.

Bowel perforation is less likely given the sub-acute history of abdominal pain and the absence of peritonism on examination.

Boerhaave syndrome and a Mallory-Weiss tear can both be caused by prolonged retching or vomiting. Their typical history is that of excess vomiting followed by pain, in this case, the symptoms are the other way around. A patient with a Mallory-Weiss tear would describe fresh red blood in their vomit. Boerhaave syndrome is an oesophageal rupture caused by vomiting, such patients would be very unwell with hypotension, tachycardia, tachypnoea and dyspnoea due to rupture often leaking oesophageal contents into the mediastinum. Boerhaave syndrome also typically presents with pain that extends retrosternally, as opposed to being localised in the epigastrium.

Mild gastritis could account for the patient's history of pain and it is likely that chronic gastritis has lead to the development of a peptic ulcer. However, the presence of ‘coffee ground’ vomit is not a typical feature of mild gastritis and suggests active bleeding from a peptic ulcer.

Further reading:

https://patient.info/doctor/upper-gastrointestinal-bleeding-includes-rockall-score

Question:

A 22-year-old man presents to the emergency department complaining of severe right upper quadrant abdominal pain. He described it coming on yesterday evening suddenly after having a takeaway for dinner and has not settled since. He describes it as a dull ache, with intermittent episodes of sharp stabbing discomfort, that radiates to his right shoulder. He has not had any associated fever, nausea, vomiting or diarrhoea. His medical history was unremarkable, and he had no relevant family history. He is a non-smoker, does not drink alcohol or use recreational drugs.

A routine set of observations carried out were within the normal range. Clinical examination revealed scleral icterus and a positive Murphy’s sign. Findings on the remainder of the physical examination were normal. Bloods tests reveal the following: haemoglobin – 10.3 g/dL; white cell count, 9 x 109/L; mean corpuscular volume, 77.9 fL; mean corpuscular haemoglobin concentration, 42.1 g/dL; reticulocyte percentage, 6.00%; absolute reticulocyte count, 200 x 109/L; alkaline phosphatase, 150 IU/L; alanine transaminase, 35; aspartate aminotransferase, 15; total bilirubin, 4.6mg/dL.

The patient was admitted and treated with IV fluids and antibiotics. The next day a repeat haemoglobin measurement showed a decrease to 7.4g/dL, for which the patient was transfused. Further bloods including vitamin B12, folate and ferritin were taken and shown to be in normal range. A peripheral blood smear was performed (as shown) and a direct antibody (Coomb’s) test performed was negative.

Which of the following tests would most likely help confirm the diagnosis?

Source: Prof. Osaro Erhabor.

A. Eosin-5-maleimide (EMA) binding dye test by flow cytometry

B. Bone marrow biopsy

C. Haemoglobin electrophoresis

D. Glucose-6-phosphate-dehydrogenase (G6PD) levels

E. Osmotic fragility test

Correct Answer:Eosin-5-maleimide (EMA) binding dye test by flow cytometry

Explanation:

When a patient presents with premature gallstones, one should consider whether they may be due to pigment gallstones from chronic haemolysis causing indirect hyperbilirubinemia. The presence of micro-spherocytes on a peripheral blood film, along with anaemia, jaundice and splenomegaly, is consistent with a diagnosis of hereditary spherocytosis (HS). HS is an inherited disease most commonly found in northern European and Japanese populations. It is caused by a number of defects in the genes coding for red blood cells, resulting in a spherical shape as apposed to the normal biconcave disc. These misshapen spherocytes are removed from circulation and broken down in the spleen (extravascular haemolysis), causing the signs described.

The British Committee for Standards in Haematology recommend that EMA binding be used as a screening test if the diagnosis is equivocal. This uses flow cytometry to determine the amount of fluorescence derived from red blood cells.

The osmotic fragility test is no longer performed due to a lack of both sensitivity (normal results may occur in 10-20% of HS) and specificity (its inability to differentiate between immune and non-immune causes of spherocytosis).

Glucose-6-phosphate-dehydrogenase (G6PD) levels would indicate if G6PD deficiency were present. However, this inherited enzyme deficiency is typically triggered by certain foods (fava beans classically) or medications (e.g. quinines). Also, classical appearance on blood film is the presence of Heinz bodies or bite cells.

Haemoglobin electrophoresis would help in diagnosing thalassaemia or a haemoglobinopathy; however, these conditions do not manifest with micro-spherocytes on the peripheral blood film.

There is no indication for a bone marrow biopsy since the reticulocyte response is appropriate and no other cytopenias are apparent.

Further reading:

https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1365-2141.2011.08921.x

Question:

Bobby Charles, a 6-year-old boy, is brought into the GP by his mother who states that he has some excessive bruising on his legs and arms. Bobby's mother reports that she first noticed the first bruise around 24 hours ago and that he also had a nose bleed earlier this morning. Prior to this Bobby had a flu-like illness 2 weeks ago. Otherwise, he has no significant past medical history or family history.

On examination, he appears well in himself and has multiple petechiae over his legs and arms. Routine blood tests have been carried out which come back with no abnormalities other than a platelet count of 43.

What is the most likely diagnosis?

A. Immune thrombocytopenic purpura (ITP)

B. Meningococcal septicaemia

C. Thrombotic thrombocytopenic purpura (TTP)

D. Acute lymphoblastic leukaemia (ALL)

E. Henoch-Schonlein purpura (HSP)

Correct Answer:Immune thrombocytopenic purpura (ITP)

Explanation:

The most likely diagnosis is immune thrombocytopenic purpura (ITP). ITP is an autoimmune disorder in which the number of circulating platelets is reduced. The reduction in platelets occurs due to increased destruction and sometimes reduced production as a result of the binding of antibodies to platelet antigens.

The destruction of platelets in isolation is known as primary ITP, whereas the destruction of platelets in association with other conditions is known as secondary ITP (i.e. antiphospholipid antibody syndrome, HIV, lymphoproliferative disorders).

Primary ITP is defined as a platelet count <100 x 109/L in the absence of other causes or disorders associated with thrombocytopenia.

ITP in children commonly occurs following a viral infection. Many children with ITP will have no symptoms, however as the platelet count falls, the likelihood of symptoms increases. The most common presenting symptoms are petechiae, bruising and epistaxis. Haematuria, gastrointestinal and intracranial bleeding are much less common but can occur.

Management in most cases involves monitoring for worsening of symptoms, as most cases of primary ITP will resolve spontaneously within 6-8 weeks. If the condition is worsening, specialist input from haematology is required, who may commence prednisolone, IVIG or intravenous anti-D immunoglobulin in rhesus-positive children.

Thrombotic thrombocytopenic purpura (TTP) is a form of thrombotic microangiopathy characterised by haemolysis, thrombocytopenia, fever, renal dysfunction and neurological abnormalities. TTP is a medical emergency, with a mortality of over 90% without prompt treatment with plasma exchange.

Acute lymphoblastic leukaemia (ALL) is a possibility and is certainly something you would want to rule out in a child of this age, however, given that the child is systemically well with no B symptoms and otherwise normal blood results, this diagnosis is less likely. ALL typically affects children and is caused by the rapid production of immature lymphocytes. ALL usually presents with fatigue, pallor, bleeding and/or bruising and lymphadenopathy.

Henoch-Schonlein purpura (HSP) is less likely, as it is not usually associated with low platelets. HSP is a vasculitis often develops 2-3 weeks after a viral illness. Typical presenting features of HSP include a tetrad of a palpable purpuric rash (often on the back of the legs/buttocks), joint pains, gastrointestinal disturbance (i.e. abdominal pain +/- bloody diarrhoea) and renal involvement (i.e. acute kidney injury).

Meningococcal septicaemia is less likely in this scenario given the child is systemically well, with no history of fever, otherwise normal vital signs and a largely unremarkable clinical examination. However, it would be an important differential diagnosis to consider.

Further reading:

https://patient.info/doctor/immune-thrombocytopenia-pro

Question:

A 56-year-old female presents to A&E with a severe sudden onset occipital headache and vomiting. The patient describes the headache as the worst she has ever had. Her previous history includes polycystic kidney disease.

Which of the following is the most appropriate initial investigation?

A. Chest X-ray

B. Lumbar puncture (LP)

C. MRI head

D. CT head

E. Digital subtraction angiography (DSA)

Correct Answer:CT head

Explanation:

A history of sudden onset ‘thunderclap’ headache with vomiting points toward a diagnosis of subarachnoid haemorrhage (SAH). Polycystic kidney disease can be associated with aneurysms of the cerebral vessels, predisposing affected individuals to SAH.

A CT scan of the head is the mainstay primary investigation performed in suspected SAH, with a sensitivity of over 98%. If positive this will demonstrate increased density in the CSF spaces (i.e basal cisterns, sylvan fissure) and may even demonstrate intraventricular and/or intraparenchymal haemorrhage.

Whilst MRI head is also sensitive in detecting acute SAH, availability, cost and the length of time the scan takes means CT remains the favoured initial investigation.

DSA is the gold standard investigation for characterisation of underlying vascular abnormalities such as aneurysms which may be the underlying cause of spontaneous SAH.

If the initial imaging is negative or equivocal then a lumbar puncture may be undertaken. This should be performed at least 6 hours post headache. CSF samples are assessed for the presence of oxyhaemoglobin and bilirubin.

Chest X-ray is not indicated as an initial investigation in this case.

Further reading:

https://radiopaedia.org/articles/subarachnoid-haemorrhage

Question:

A 54-year-old woman presents with constipation. She has been struggling to open her bowels for several weeks and has not passed faeces for five days, though she has been passing flatus. She is otherwise well and denies any nausea or vomiting. She was recently discharged from hospital following an uncomplicated total knee replacement. Her medications include omeprazole, metformin hydrochloride, co-codamol, allopurinol and ibuprofen.

Which of her medications is most likely to be contributing to her constipation?

A. Omeprazole

B. Co-codamol

C. Ibuprofen

D. Metformin hydrochloride

E. Allopurinol

Correct Answer:Co-codamol

Explanation:

The correct answer is co-codamol. This medication contains a mixture of paracetamol and codeine, an opiate medication. Opiates are a common cause of constipation in elderly patients and post-surgically and should be co-prescribed with a laxative to prevent constipation. Other medications that commonly cause constipation include anti-depressants, iron replacement and anti-epileptics.

Omeprazole is a type of proton pump inhibitor (PPI); PPIs are more likely to cause diarrhoea as a side effect.

Metformin hydrochloride is not known to cause constipation and is more likely to cause diarrhoea – this is a common reason for poor adherence to the medication.

Allopurinol is not known to cause constipation and is not listed as a side effect in the BNF.

Ibuprofen does not cause constipation and is more likely to lead to diarrhoea as a rare side effect.

Further reading:

https://bnf.nice.org.uk/drugs/co-codamol/#side-effects

Question:

A 52-year-old male presents to the emergency department following an overdose. He is unconscious and cannot be roused. On examination, he has a palpable bladder and his pupils are dilated. He has some superficial cuts to his left forearm and he smells of alcohol. He has a past medical history of depression and chronic liver disease.

Which of the following drugs is he most likely to have overdosed on?

A. Amitriptyline

B. Paracetamol

C. Citalopram

D. Mirtazapine

E. Fluoxetine

Correct Answer:Amitriptyline

Explanation:

Amitriptyline is a tricyclic antidepressant (TCA) and is highly dangerous in overdose due to the risk of cardiotoxicity. Overdose of tricyclic antidepressants can lead to coma and anticholinergic side effects such as urinary retention and dilated pupils. The patient is known to have depression and has these clinical features making amitriptyline overdose the most likely diagnosis.

Fluoxetine and citalopram are selective serotonin reuptake inhibitors (SSRIs). In overdose, they typically cause milder symptoms such as nausea and vomiting.

Mirtazapine is a presynaptic alpha 2 adrenoreceptor antagonist and presents with depression of the central nervous system with disorientation and prolonged sedation, together with tachycardia and mild hyper- or hypotension.

Paracetamol overdose does not cause anticholinergic side effects and would only lead to coma in late-stage overdose. Paracetamol overdose is often asymptomatic in the early stages. If left untreated, it can lead to acute hepatic failure with encephalopathy.

Further reading:

https://en.wikipedia.org/wiki/Tricyclic\_antidepressant\_overdose

Question:

Mabel Smith, a 73-year-old lady comes to the GP complaining of right knee pain. She notices the pain in her knee when walking but it settles with rest. She is otherwise well.

She has no significant past medical history, has a BMI of 23 and takes regular paracetamol for the pain. No other regular medications.

On examination of the joint, she is tender on palpation of the right patella however patella tap and sweep test are both negative. The knee joints look of equal size and temperature. Examination of the skin and ligaments are unremarkable. On passive movement you feel crepitus in the right knee and note she has restricted range of movement.

You decide to order an X-ray of her knee, which of the following features is most likely to be present on her radiograph?

A. Periarticular erosions

B. Subluxation

C. Loss of joint space

D. Joint effusion

E. Fracture of patella

Correct Answer:Loss of joint space

Explanation:

Mabel’s presentation is in keeping with osteoarthritis of the knee. A typical presentation of osteoarthritis can include palpable bony enlargement, varus deformity, morning stiffness and crepitus on passive movement in a patient with chronic knee pain. Intermittent joint effusion, restricted movement and muscle wasting may also be present.

Loss of joint space is a common osteoarthritic finding on radiographs. Other features can include: osteophytes, subchondral sclerosis and subchondral cysts.

Subluxation and periarticular erosions are more likely to be seen in rheumatoid arthritis. Rheumatoid arthritis is more likely to present as bilateral swollen painful hands and/or feet.

There is nothing in Mabel’s history to suggest injury that would fracture her patella (commonly a dashboard injury in road accidents).

Joint effusion is more likely to be caused by septic arthritis or crystal arthropathies. As the joint was not hot and swollen and she is otherwise well, this diagnosis is unlikely.

Further reading:

https://cks.nice.org.uk/osteoarthritis

Question:

A 40-year-old female presents to the rheumatology outpatient department with pain and stiffness in the wrists, elbows and small joints of both hands for the last 6 weeks. X-rays of the hands reveal juxta-articular osteopenia, soft tissue swelling and a few bony erosions. She is found to be anti-CCP and rheumatoid factor positive and is diagnosed with rheumatoid arthritis.

Which of the following would be the most appropriate first-line treatment?

A. Methotrexate

B. Rituximab

C. Naproxen

D. Etanercept

E. Gold

Correct Answer:Methotrexate

Explanation:

Recommended first-line management options for active rheumatoid arthritis include any one of the following as monotherapy:

Oral methotrexate

Leflunomide

Sulfasalazine

Hydroxychloroquine (only if mild or palindromic disease)

First-line treatment should ideally be commenced within 3 months of the onset of persistent symptoms.

Short-term bridging treatment using steroids (e.g. prednisolone) is sometimes used whilst the patient is established on conventional disease-modifying anti-rheumatic drugs (DMARDs).

Gold is another DMARD on the list but is falling out of favour due to its high side effect profile.

Naproxen is an NSAID and is useful in addition to DMARD therapy for those without contraindications (e.g. upper gastrointestinal bleeding).

Etanercept and rituximab are both biological agents which can be used to treat rheumatoid arthritis which does not respond to DMARD therapy.

Further reading:

https://www.nice.org.uk/guidance/ng100/chapter/Recommendations#initial-pharmacological-management

Question:

A 44-year-old woman presents to the GP complaining of an uncomfortable sensation in her left thigh; she reports that this came on approximately 2 days ago, and has worsened since then. She describes a low-level pain that is more of an 'annoyance' than anything else and reports that the outside of her left thigh now has a constant, burning sensation.

The patient has little past medical history of note, although she admits to having put on a significant amount of weight over the recent COVID-19 lockdowns. She describes a previous episode of eye pain that came on during the cinema, and that was treated surgically in hospital. She takes no regular medication, however, and describes herself as fit and well.

A full neurological examination reveals normal tone, power and reflexes, with a well-demarcated area of reduced sensation over the lateral aspect of the left lower limb. No other abnormalities were detected.

Which of the following is most likely to be the cause of the patient's symptoms?

A. Multiple sclerosis

B. L5-S1 disc herniation

C. Cervical spondylosis

D. Peripheral nerve sheath tumour

E. Meralgia paraesthetica

Correct Answer:Meralgia paraesthetica

Explanation:

Meralgia paraesthetica is a condition that classically arises due to compression of the lateral cutaneous nerve of the thigh; the reason for this is often not detected, although it is more common in those with recent weight gain, as this can make clothing tighten on the area through which the nerve runs. Occupations that involve wearing tight belts or harnesses can also carry greater risk.

The usual presentation is of burning, tingling, numbness or pain, affecting the outer side of the thigh; this may radiate to the groin in some cases. The exact presentation can vary between individuals, with some complaining of itch and discomfort rather than acute pain. The condition is frequently self-limiting, with modification of clothing often recommended; analgesia may be given to relieve the pain.

Multiple sclerosis (MS) is another important diagnosis to consider in this case, however, there is no past medical history that would make this the most probable cause. The patient's description of her ocular symptoms is more likely indicative of acute angle-closure glaucoma treated via peripheral iridotomy, rather than optic neuritis that would make multiple sclerosis the most probable cause of her symptoms. Whilst this could be the first presentation of disease, this is less common than meralgia paraesthetica. There are no features of an upper motor neuron lesion on examination that would point towards a diagnosis of MS.

L5-S1 disc herniation does not fit with the clinical picture in this scenario. This can present in a number of ways, depending on whether the disc herniates centrally or laterally. A central disc herniation may present with features of cauda equina syndrome, whilst a lateral protrusion of the disc would affect the structures supplied by the L5-S1 nerve root. The lateral aspect of the thigh is supplied mainly by L2 and does not involve these nerve roots.

Cervical spondylosis refers to degenerative disease of the cervical spine that can cause neurological symptoms, particularly in the elderly. This is unlikely to be the cause in this case, as the condition would cause predominantly upper limb symptoms.

Peripheral nerve sheath tumours are a rare form of sarcoma that are often malignant. They are extremely uncommon; meralgia paraesthetica is a far more likely diagnosis in this scenario.

Further reading:

https://patient.info/brain-nerves/meralgia-paraesthetica-leaflet

Question:

An unconscious 25-year-old female is brought to the emergency department after being kicked in the head by a horse. Witnesses confirmed that she sustained no other injuries and that she had appeared to regain consciousness prior to the ambulance crew’s arrival but has deteriorated again since. A primary survey is remarkable for an evident head injury, with a boggy right-sided scalp haematoma and blood-streaked clear fluid from the right ear. The right pupil measures 6mm, the left 3mm. She does not open her eyes, verbalise sounds or move at all to verbal or tactile stimuli (GCS 3/15).

Which of the following physiological observations would raise the greatest concern for impending terminal event?

A. Regular respiratory rate, tachycardia, hypotension

B. Irregular respiratory rate, bradycardia, hypertension

C. Regular respiratory rate, bradycardia, hypotension

D. Irregular respiratory rate, bradycardia, normotension

E. Irregular respiratory rate, bradycardia, hypotension

Correct Answer:Irregular respiratory rate, bradycardia, hypertension

Explanation:

This patient appears to have sustained a skull base fracture with critically raised intracranial pressure as evidenced by the cerebrospinal fluid otorrhoea and fixed, dilated (‘blown’) pupil. This is caused by compression of the third cranial (oculomotor) nerve between the uncus of the temporal lobe and the tentorium cerebelli or the sharp edge of the petrous temporal bone. The parasympathetic fibres responsible for pupillary constriction are found around the periphery of the oculomotor nerve and are thus compressed first, resulting in unopposed sympathetic action and a blown ipsilateral pupil. Temporising medical management to lower intracranial pressure may be beneficial but the presence of a newly blown pupil signifies a narrow window for neurosurgical intervention and, left untreated, may be terminal. Further increases in intracranial pressure may cause the cerebellar tonsils to herniate through the foramen magnum in a process referred to as coning, whereby progressive compression of the brainstem against the rim of the foramen magnum results in failure of the cardiorespiratory centres and death. This disruption to the cardiorespiratory centres manifests clinically as Cushing’s reflex of irregular breathing, bradycardia and hypertension.

Source: Brain\_herniation\_types.svg: User:Delldotderivative work: RupertMillard / CC BY-SA

Further reading:

http://www.nice.org.uk/guidance/CG176

Question:

A 35-year-old lady presents to the neurology clinic after being referred by her GP. She has been experiencing problems with her muscles which have developed over the last few days, and has previously been treated for optic neuritis. You suspect she may have multiple sclerosis. On examination, you find marked weakness on her left side, along with other neurological findings.

Which of the following clinical signs is considered an upper motor neuron sign?

A. Downgoing plantar reflex

B. Hypo-reflexia

C. Hypotonia

D. Romberg’s test positive

E. Hoffman’s sign positive on one side

Correct Answer:Hoffman’s sign positive on one side

Explanation:

Hoffman’s sign is elicited by loosely holding the hand and flicking the nail of the middle finger downwards. It is positive when the thumb flexes and adducts. This is considered by some as the Babinski test of the upper limb, although not as reliable for upper motor neuron (UMN) lesions because it is positive in a proportion of healthy people. Healthy people tend to be Hoffman’s positive in both right and left hands, so it is more likely to be pathological if it is unilateral.

In UMN lesions you would expect hypertonia rather than hypotonia and hyperreflexia rather than hyporeflexia.

The plantar reflex would be expected to be up-going in the context of upper motor neuron pathology.

Romberg’s test assesses peripheral proprioception, so is not relevant to motor neurons.

Further reading:

https://en.wikipedia.org/wiki/Hoffmann%27s\_reflex

Question:

A 50-year-old woman presents with a painful and swollen right leg. Over the last month, she describes feeling more fatigued with increasing leg swelling bilaterally. She has a past medical history of type 2 diabetes and a miscarriage aged 34 years.

Her heart rate is 85 bpm, blood pressure 167/110 mmHg, and respiratory rate 16/min. There is mild generalised oedema, and her eyes appear puffy. The right calf is swollen, tender, and erythematous compared to the left. A urine dipstick is positive for protein.

Blood tests demonstrate the following:

Test Result Reference range

Platelets 250 x 109/L (140 – 400)

Sodium 140 mmol/L (135-145)

Potassium 4.8 mmol/L (3.0 - 5.0)

Urea 8.9 mmol/L (2.0 - 7.0)

Creatinine 180 μmol/L (55- 120)

Albumin 25 g/L (35–50)

D-dimer 1264 ng/mL (< 500)

A proximal limb venous ultrasound demonstrates a non-compressible venous segment with absent spontaneous flow.

What is the most likely underlying cause of this patient's presentation?

A. Factor V Leiden

B. Protein S deficiency

C. Antiphospholipid syndrome

D. Protein C deficiency

E. Antithrombin III deficiency

Correct Answer:Antithrombin III deficiency

Explanation:

Antithrombin III deficiency is correct. This patient has signs and symptoms of deep vein thrombosis (DVT) due to her swollen, erythematous, and tender right lower leg, which is confirmed by the doppler ultrasound scan. This patient has had preceding fatigue and generalised oedema, along with deranged renal function, proteinuria, and hypoalbuminaemia. The triad of proteinuria, hypoalbuminaemia and oedema, along with deranged renal function, should suggest the presence of nephrotic syndrome, which can predispose patients to venous thromboembolism (VTE). Antithrombin III is lost via the kidneys in nephrotic syndrome, which leads to a hypercoagulable state.

Factor V Leiden, protein C deficiency, and protein S deficiency are all possible inherited thrombophilias which can predispose to VTE, however, these diagnoses would not explain the generalised oedema, proteinuria, hypoalbuminaemia, and deranged renal function. It is also unlikely for this patient to have gone 50 years without a previous VTE, and there is no family history.

Antiphospholipid syndrome (APS) can predispose one to VTE and is associated with miscarriage, however, this patient has had a singular miscarriage, whereas, in APS, miscarriages are recurrent. As well as this, patients with APS present with thrombocytopenia, which is not seen here. A diagnosis of APS would not explain the generalised oedema, proteinuria, hypoalbuminaemia, and deranged renal function.

Further reading:

https://geekymedics.com/nephrotic-vs-nephritic-syndrome/

Question:

A 27-year-old woman visits her GP with multiple new pruritic and well-demarcated, erythematous scaly plaques. These are most predominantly on her knees and elbows. Scaly and flaky plaques are also present on her scalp around her ears.

What is the most appropriate initial management?

A. Phototherapy

B. Coal tar preparation

C. Emollients

D. Topical betamethasone valerate and topical vitamin D

E. Topical betamethasone valerate alone

Correct Answer:Topical betamethasone valerate and topical vitamin D

Explanation:

This is chronic plaque psoriasis (CPP). CCP presents as well-demarcated, scaly plaques on the extensor surfaces of the body. Psoriasis may also be found on the scalp, face, or flexural regions. NICE CKS recommends a stepwise approach, with a potent topical corticosteroid plus a topical vitamin D preparation (both applied once a day - but at different times of day) the first line. Topical corticosteroids alone are not recommended.

Whilst an emollient should be prescribed for use alongside the topical corticosteroid and vitamin D regime; alone it is not the most appropriate treatment.

Phototherapy is considered for extensive psoriasis; however, topical treatments should be tried first.

A topical coal tar preparation is recommended if no improvement is seen within 8-12 weeks of using the topical corticosteroid and topical vitamin D preparation.

Further reading:

https://cks.nice.org.uk/topics/psoriasis/

Question:

A 52-year-old man is admitted to A&E by paramedics after reporting feeling very unwell at the airport. He had recently returned from a year-long stay in Vietnam, where he was visiting family members. He denies having any vaccinations before travelling to the country and did not have unprotected sexual intercourse during his stay. He reports that he has had a prolonged fever, which began 6 days previously, and has over the last few days developed severe abdominal pain, slightly loose stools and a headache.

Observations reveal a temperature of 38.9 degrees, a pulse rate of 67 and a respiratory rate of 22. Abdominal examination reveals generalised discomfort without guarding or rigidity. The patient has a large area of small blanching maculopapular lesions mainly over the trunk, which he states developed at a similar time to the fever.

Investigations carried out in A&E include a rapid malaria diagnostic test, dengue virus PCR and a COVID-19 swab, all of which are negative. Based on the history, and observations, blood cultures are taken. Based on the organism isolated, Public Health England is notified by the laboratory, and the patient is started on antibiotics.

Which of the following organisms is most likely to be responsible for this patient's presentation?

A. Salmonella typhi

B. Plasmodium falciparum

C. Bacillus cereus

D. Treponema pallidum

E. Giardia lamblia

Correct Answer:Salmonella typhi

Explanation:

This patient has presented with a history indicative of typhoid, sometimes referred to as enteric fever - this is caused most frequently by the bacteria Salmonella typhi. Typhoid is endemic in South East Asia, including countries such as Vietnam that this patient has travelled to. There is a vaccination available for individuals travelling to these countries, but the patient states that they did not uptake this.

Typhoid classically presents with prolonged fever in a very similar manner to other tropical diseases such as malaria and dengue; it is important to consider these and order the relevant investigations. It can also give vague gastrointestinal symptoms, including abdominal pain and diarrhoea, although these are usually less severe than infections with other forms of salmonella species that classically cause gastroenteritis. Relative bradycardia (a lack of a tachycardic response to fever) and 'rose spots' (small blanching maculopapular lesions) are two other features that may be seen in the condition; this patient has presented with both.

Blood cultures are the diagnostic test of choice for typhoid; these will often reveal the presence of Salmonella typhi. Antibiotic therapy is then used to treat the condition; ciprofloxacin or ceftriaxone are possible options. As with many tropical diseases, in the UK it is mandatory to notify Public Health England about any confirmed cases of typhoid.

Giardia lamblia is a protozoal infection that can be acquired through the consumption of contaminated water sources. The disease may be asymptomatic, but can frequently give the passage of profuse fatty stools; the diarrhoea can be prolonged and is usually the main feature of the condition, which is not the case in this patient. Giardiasis is not commonly associated with a rash and would require stool cultures for diagnosis.

Plasmodium falciparum is the most common organism implicated in malaria. Rapid diagnostic testing was negative in this scenario, and whilst a blood film may also be useful to confirm this, malaria is not the most likely diagnosis in this case.

Bacillus cereus is an infection that can cause rapid-onset diarrhoea after the consumption of contaminated rice. It does not usually cause a prolonged fever.

Treponema pallidum is the spirochaete responsible for causing syphilis. Whilst primary syphilis may give systemic symptoms and the second stage can result in a rash, the patient's presentation is far more classical of typhoid. The progression from primary to secondary disease syphilis takes between two and ten weeks, and there is no history of unprotected sexual intercourse that would have allowed the disease to be acquired.

Further reading:

https://patient.info/doctor/typhoid-and-paratyphoid-fever-pro

Question:

A 4-day-old baby boy, born at 39+1 weeks, has been brought to paediatric A&E as his parents are concerned his skin looks a little yellow. The family are distressed as they have not long left the hospital and thought everything was going well at home with the mother regularly breastfeeding their child. They first noticed the colour change yesterday but it was more noticeable this morning which prompted the visit to the hospital. On examination, the baby appears well. Observations are normal, the capillary refill time is less than 2 seconds and his fontanelle is normal. Blood tests reveal an unconjugated serum bilirubin level of 80 µmol/L (cut off limit for a term baby is 350 µmol/L)

Given the most likely cause of jaundice, what is the most appropriate initial management?

A. Change to bottle feeds and begin phototherapy

B. Continue breastfeeding

C. Change to bottle feeds

D. Continue breastfeeding and begin exchange transfusion

E. Continue breastfeeding and begin phototherapy

Correct Answer:Continue breastfeeding

Explanation:

To begin with, it is important to identify the type of neonatal jaundice being discussed. Jaundice during days 2-14 of life is common and usually physiological. The rest of vignette goes on to describe a well-baby, who is not dehydrated and has a serum bilirubin of 80 µmol/L which in any newborn (irrespective of whether they are term or not) is below the level for phototherapy. I don’t think it’s realistic to know the bilirubin cut off line for phototherapy for every gestational age but for a term baby it is 350 µmol/L which this example is clearly well below. NICE guidelines state that no treatment is needed for well babies with physiological jaundice with bilirubin levels that fall below the treatment threshold. Although we don’t know whether this physiological jaundice is due to breast milk or breastfeeding jaundice, recommendations state that breastfeeding should be encouraged and that advice may be given to improve the quality of feeds.

It is therefore unusual to need to change to bottle feeds and although phototherapy can be used for physiological jaundice, it is unlikely, (let alone exchange transfusion which is used for even higher bilirubin levels) to be used at the bilirubin level stated.

Further reading:

https://cks.nice.org.uk/jaundice-in-the-newborn#!scenario

Question:

A 2-day-old female baby is examined by the paediatric registrar. The examination is normal throughout, except a loud holosystolic murmur is clearly audible in the lower left parasternal area. There is no evidence of cardiac failure, she is not cyanotic and there is no finger clubbing.

Basic observations reveal a heart rate of 150bpm, respiratory rate of 40bpm and blood pressure of 85/60mmHg, and the baby is afebrile.

She was born by elective C-section at 40 weeks, with no complications during pregnancy or delivery. Upon questioning her parents, her father’s brother had a heart defect that was corrected when he was a baby. The baby has no other diagnosed syndromes.

The baby is referred to the cardiology team, and they investigate with an echocardiogram which confirms the diagnosis and demonstrates a clear left-right shunt of blood on Doppler imaging.

What is the most likely diagnosis?

A. Tetralogy of Fallot

B. Patent ductus arteriosus (PDA)

C. Atrial septal defect (ASD)

D. Mitral regurgitation

E. Ventricular septal defect (VSD)

Correct Answer:Ventricular septal defect (VSD)

Explanation:

The most likely diagnosis in this baby is a ventricular septal defect (VSD). This is when there is a hole in the septum between the left and right ventricle, which results in shunting of blood - usually from the left to the right, as the left side of the heart is higher pressure than the right. They will typically present in childhood, usually by the detection of an asymptomatic murmur on routine physical examinations in newborns – as in this case. The murmur is typically holosystolic and best heard in the lower left parasternal region. It should be noted that the larger the VSD, the quieter the murmur. If medium to large defects are not detected, the shunt of blood to the right side of the heart can result in pulmonary hypertension, in which case the pulmonic component of the second heart sound may be louder and symptoms of cardiac failure may become evident such as a faltering growth and shortness of breath. Smaller defects will typically close spontaneously without intervention by around 2 years of age, whilst larger defects may require surgical intervention to close. Echocardiography is useful for demonstrating shunts and monitoring cardiac function, as well as classifying structural defects by size and location to inform management.

Whilst an atrial septal defect (ASD) is an important differential to consider (as it also typically presents in an asymptomatic newborn with a heart murmur), the murmur usually occurs at the beginning or middle of systole (i.e. it is usually ejection systolic or mid-systolic) rather than occurring throughout systole as is described in this case. The location where the murmur is loudest also differs – whilst in VSDs the murmur is usually loudest in the lower left parasternal region, ASDs tend to be loudest higher up in the left parasternal region.

A patent ductus arteriosus produces a characteristic continuous ‘machine-like’ murmur that continues throughout systole and diastole, as opposed to just occurring throughout systole as in this case. This murmur is loudest at the base of the heart, as this is the level at which the ductus arteriosus sits, connecting the pulmonary artery to the aorta. After birth, the duct should close to form the ligamentum arteriosum, but can remain open, particularly in premature babies and may require surgical repair or administration of an NSAID such as indomethacin for closure.

Babies with complex congenital heart problems such as Tetralogy of Fallot are much more likely to be symptomatic and demonstrate signs on examination such as tachypnoea and cyanosis. Tetralogy of Fallot is a combination of four congenital abnormalities; a VSD, pulmonary valve stenosis, right ventricular hypertrophy and an overriding aorta which sits above both the left and right ventricle. Although echocardiography would pick up the VSD, the other abnormalities would also be apparent on imaging. In addition, the murmur audible on examination would typically be ejection systolic rather than holosystolic.

Mitral regurgitation also produces a holosystolic murmur on examination but would be best heard in the mitral area rather than the left parasternal region. Echocardiography would demonstrate posterior motion of valve leaflets during systole, with blood regurgitating back into the atrium from the ventricle, rather than a left-right shunt typical of VSDs.

Further reading:

https://mrcpch.paediatrics.co.uk/cardiovascular/ventricular-septal-defect-vsd/

Question:

A 65-year-old man presents to his GP with a 24-hour history of chest pain and fever. The patient recently had an ST-elevation myocardial infarction (STEMI) 2 weeks ago, for which he was successfully treated with primary percutaneous coronary intervention (PPCI). On examination, the pain is worse when the patient breathes in. He also has a low-grade fever, and a pericardial rub is heard on auscultation. ECG findings reveal global ST elevation and T wave inversion.

What is the most likely diagnosis?

A. Cardiac tamponade

B. Dressler's syndrome

C. Pulmonary embolism

D. Stable angina

E. Pneumonia

Correct Answer:Dressler's syndrome

Explanation:

Dressler's syndrome is characterised by pleuritic chest pain, low-grade fever and pericardial friction rub on auscultation 2-3 weeks after a myocardial infarction (MI). ECG will show global ST elevation and T wave inversion. Occasionally, patients may also present with features of pericardial effusion (can be seen on echocardiogram). Patients presenting with features of pericarditis immediately following a MI are not classed as having Dressler's syndrome.

Stable angina is characterised by intermittent, stable chest pain with three classical features: exertion as a precipitant, a constricting discomfort of the anterior chest, and relief brought on by rest or the use of a GTN spray. ECG is often normal in patients with stable angina.

Pulmonary embolism is typically characterised by sudden onset pleuritic chest pain, shortness of breath, and, less commonly, haemoptysis. On examination, patients will often have a raised respiratory rate. ECG findings most commonly show sinus tachycardia. Patients may also have concurrent signs of a deep vein thrombosis, such as unilateral leg swelling, tenderness around the deep veins and dilated superficial veins. In practice, a difference of 3 cm or more between the size of both calves 10cm below the tibial tuberosity is seen as significant.

Cardiac tamponade is commonly characterised by Beck's triad (hypotension, muffled heart sounds, and a raised JVP). On examination, patients may also elicit pulses paradoxus (a large drop in blood pressure with inspiration) and tachycardia. ECG findings usually show tachycardia and electrical alternans.

Pneumonia can present with symptoms such as pleuritic chest pain, fever, productive cough, and shortness of breath. Characteristic chest signs of pneumonia to be aware of are dullness to percussion, bronchial breath sounds, and coarse crackles. Patients may also present with pathogen-specific features, e.g. "currant jelly sputum" due to Klebsiella pneumoniae. ECG is usually not required except to rule out any differential diagnoses.

Further reading:

https://patient.info/doctor/dresslers-syndrome

Question:

A 32-year-old African-American female presents to the rheumatology outpatient department with a 4-month history of generalised joint pains, photosensitive blistering rash and patchy hair loss. On further questioning, she reports an episode of intermittent, sharp inspiratory chest pain occurring 3 weeks ago which resolved with NSAIDs. She denies any significant sicca symptoms.

Examination is grossly unremarkable other than for a few discrete areas of complete hair loss on the scalp. Blood tests are performed, including an auto-antibody screen, which demonstrates positive anti-Sm and anti-Ro antibody.

What is the most likely diagnosis?

A. Dermatomyositis

B. Discoid lupus erythematosus

C. Systemic sclerosis

D. Systemic lupus erythematosus

E. Primary Sjögren’s syndrome

Correct Answer:Systemic lupus erythematosus

Explanation:

Systemic lupus erythematosus (SLE) is an autoimmune, inflammatory disorder of connective tissue. Risk factors present here for SLE include age (15-45 years old), African/Caribbean descent and female gender (although, being female is a risk factor for all of the above conditions). Photosensitivity and hair loss may be presenting features. The history of pleuritic chest pain in a patient with SLE should also prompt consideration of pulmonary embolism in the context of associated antiphospholipid syndrome. The response to NSAIDs and the fact that the episode must have been mild enough to not require emergency treatment makes pleuritis more likely in this case. Anti-Sm (anti-Smith) antibodies are a highly specific marker for SLE, as are anti-dsDNA antibodies.

Photosensitivity is common in dermatomyositis but the lack of muscle weakness in the history and the antibodies present here are more supportive of SLE.

The inclusion of joint pains and the probable episode of pleuritis are systemic features and therefore make discoid lupus erythematosus (DLE) less likely (cutaneous involvement only; 6% may go on to develop SLE).

Although anti-Ro antibodies are associated with primary Sjögren’s syndrome (pSS), the absence of significant sicca symptoms (dry mucous membranes) and the presentation with photosensitive rash make pSS less likely. 50% of patients with SLE also have anti-Ro antibodies.

Patients with systemic sclerosis typically present with Raynaud’s phenomenon and skin tightening.

Further reading:

https://patient.info/doctor/systemic-lupus-erythematosus-pro

Question:

A 58-year-old man presents with abdominal pain. He has been unwell for 2 days with worsening left lower quadrant abdominal pain associated with diarrhoea and some bleeding per rectum. He is previously fit and well, on no regular medication. He weighs 83kg. His temperature is 38.5, heart rate 132 beats per minute, blood pressure 72/31 mmHg, respiratory rate 28 breaths per minute, pulse oximetry 94% in room air. On examination, he has severe left lower quadrant tenderness with guarding.

He has been treated with intravenous co-amoxiclav and 3000ml of Hartmann’s solution. Despite this, his blood pressure is 71/30 mm Hg.

Blood tests show urea 16.9 mmol/L, creatinine 174 μmol/L, C-reactive protein 382 mg/L, lactate 5.2 mmol/L, white cell count of 24.2 x 109/L and haemoglobin 78 g/L.

What is the most appropriate next intervention?

A. Give 500ml of intravenous Hartmann's solution

B. Transfuse 2 units of packed red blood cells

C. Start dobutamine as an inotrope

D. Start noradrenaline as a vasopressor

E. Give 100mg intravenous hydrocortisone

Correct Answer:Start noradrenaline as a vasopressor

Explanation:

The most likely diagnosis here is septic shock due to diverticular disease. He has been adequately fluid resuscitated, the 2021 surviving sepsis guidelines recommend at least 30ml/kg of intravenous crystalloid within the first three hours, which he has received. The most appropriate next intervention would be to start an intravenous vasopressor, specifically noradrenaline.

If a patient with sepsis had significant cardiac dysfunction with persistent hypoperfusion despite adequate volume status as vasopressor it would be reasonable to start an inotrope, such as dobutamine or adrenaline. He does not require a blood transfusion, the surviving sepsis guidelines recommend a restrictive transfusion protocol aiming to maintain haemoglobin above 70 g/L.

Intravenous colloids are not recommended by the surviving sepsis guidelines due to studies showing no significant benefit and significant risk of harm including renal injury and anaphylaxis.

Intravenous hydrocortisone, specifically 200mg per day, is recommended for adults with persistent septic shock despite adequate fluid resuscitation and moderate doses of noradrenaline.

Further reading:

https://journals.lww.com/ccmjournal/Fulltext/2021/11000/Executive\_Summary\_\_Surviving\_Sepsis\_Campaign\_.14.aspx

Question:

A 24-year-old male is brought to A&E by his parents after they received a call from his partner stating that he had locked himself in the bathroom and threatened to end his own life. Fortunately, they were able to talk to the patient and persuade him to seek medical help before any attempts to harm himself were made.

The patient's parents inform you that this is not the first such episode that has occurred with their son; he has had a number of relationships over the past few years, and in each seems extremely happy - on multiple occasions he has confided in them that she believes that she is likely to be married to this new partner in the future. However, these relationships appear to quickly break down; he often lists faults with others, often criticising things that he previously appeared content with. There are two previous instances on record of the patient self-harming due to relationship concerns.

The parents also describe that their son has always acted spontaneously, often making unwise decisions that 'get him into trouble', and that his self-esteem and perceived self-worth appears to greatly fluctuate. Given the patient's past medical history, the admitting doctor is concerned about the possibility of an underlying personality disorder.

Given the likely personality disorder present in this patient, which of the following is likely to be an appropriate management option?

A. Dialectical behavioural therapy

B. Amitriptyline

C. Gabapentin

D. Trauma-focussed cognitive behavioural therapy

E. Eye movement desensitization and reprocessing

Correct Answer:Dialectical behavioural therapy

Explanation:

Personality disorders are ingrained and enduring behaviour patterns seen in individuals. These deviate from the norms of an average patient and can lead to distress and problems with social performance.

Patients with emotionally unstable personality disorder exhibit a tendency to act impulsively and without any consideration of the consequences. These individuals can often have swift changes in opinion and frequently result in conflict. Problems with maintaining interpersonal relationships are common, along with disturbances in self-image and perceptions of others, and self-destructive behaviour is frequently seen. The relationship issues described by the patient's parents and the previous episodes of self-harm make this diagnosis the most likely. This condition is referred to as 'borderline personality disorder' by the DSM V criteria.

Dialectical behavioural therapy is a specific form of cognitive behavioural therapy (CBT) that is frequently used in those with emotionally unstable personality disorder; it is particularly targeted at those who experience emotions very intensely. The method involves some of the conventional aspects of CBT, including strategising more helpful ways of thinking about problems/troublesome scenarios but also focuses on helping the individual to accept themselves for who they are. Those with an emotionally unstable personality disorder often have problems with self-worth, which can trigger suicidal behaviour; this aspect of dialectical behavioural therapy can help to address this.

Eye movement desensitization and reprocessing and trauma-focussed cognitive behavioural therapy are treatment options most commonly used in the setting of post-traumatic stress disorder. Whilst effective for this condition, they are not frequently used in the management of personality disorders. There is no evidence in the history to suggest that a single traumatic event is to blame for the patient's symptoms or behaviour.

Antidepressants can sometimes play a role in managing those with emotionally unstable personality disorders; however, extreme care needs to be taken due to the impulsive behaviour of the individuals. There is a significant risk of the patient overdosing on medication with the intent to harm themselves. For this reason, amitryptiline would not be a suitable choice, tricyclic antidepressant overdose can be life-threatening due to the potential for arrhythmias. If anti-depressants are to be given, SSRI's such as sertraline are usually the drugs given.

Gabapentin is sometimes used as a third-line medication in those with anxiety; however, it is not used as part of the management of emotionally unstable personality disorder. The drug is now classified as a 'controlled substance' due to the potential for its misuse. It would therefore not be appropriate to prescribe this to a patient who already has a history of impulsive behaviour, such as in this scenario.

Further reading:

https://patient.info/doctor/emotionally-unstable-personality-disorder

Question:

A 60-year-old man presents to the GP practice complaining of an ulcer on his leg. He denies any significant past medical history and takes no regular medication.

On examination, there is an 8cm shallow ulcer, with an irregular border and sloping edges. It is located over the medial aspect of the ankle and is slightly painful to palpation. The surrounding skin is erythematous and looks of a red-brown in colour. You also note several dilated tortuous superficial veins on both lower legs.

What is the most likely diagnosis?

A. Squamous cell carcinoma

B. Basal cell carcinoma

C. Venous ulcer

D. Arterial ulcer

E. Neuropathic ulcer

Correct Answer:Venous ulcer

Explanation:

The most likely diagnosis is a venous ulcer, given the location and description of the lesion.

Venous ulcers are wounds that are thought to occur due to improper functioning of venous valves. They are the major cause of chronic wounds. Venous ulcers typically develop along the medial distal leg.

A venous ulcer can be defined as a full-thickness defect of the skin, most frequently in the ankle region, that fails to heal spontaneously and is sustained by chronic venous disease.

Venous ulcers present with the following clinical characteristics:

Large, irregular border with sloping edges

Shallow in depth

Often located over the medial aspect of the ankle (referred to as the gaiter region)

Associated with mild pain

Arterial ulcers, on the other hand, are often smaller, deeper, punched out, with more well-defined borders and are usually very painful.

Squamous cell carcinoma (SCC) can present as an indurated nodular keratinising tumour with a central area of ulceration. The lesion therefore often has hard raised edges. There may be local lymphadenopathy in the context of metastasis. SCCs typically appear on the skin of the head and neck.

Neuropathic ulcers occur as a result of the loss of sensation in the region they affect. They are common in patients with diabetic neuropathy, often occurring on the feet due to poorly fitting footwear that causes local trauma. Patients are usually unaware of the ulcer because of the lack of sensation. This patient describes discomfort from the ulcer and does not have any significant past medical history, making this diagnosis unlikely.

Basal cell carcinomas (BCC) typically occur on the head and neck (80%) and initially present as translucent raised lesions with telangiectasia. Some BCCs develop into the classic "rodent ulcer" involving a lesion with an indurated edge and ulcerated centre.

Further reading:

https://patient.info/doctor/venous-leg-ulcers-pro

Question:

A 59-year-old man presents to the emergency department with lower abdominal pain. It developed gradually over the last 12 hours, becoming more severe. He also complains of lower back pain that "shoots" down both legs and bilateral leg weakness. He has not urinated for 24 hours. He has no past medical history and takes no regular medications.

On examination, the bladder is palpable. Plantar flexion is weak in both feet, and ankle reflexes are absent bilaterally. There is also sensory loss in the perineal area.

What is the most likely diagnosis?

A. Spinal stenosis

B. Syringomyelia

C. Transverse myelitis

D. Multiple sclerosis

E. Cauda equina

Correct Answer:Cauda equina

Explanation:

Cauda equina is the correct answer. This man is suffering from acute urinary retention due to cauda equina syndrome (CES) caused by lumbar disc herniation. CES is the compression of several nerve roots which exit from the distal end of the spinal cord and involves L1-L5. These nerves have several functions, such as motor and sensory to the legs, perineum and bladder. Features that point towards CES include acute urinary retention, radiating lower back pain, weakness in muscles of the lower leg and decreased sensation in the perineum. They are "red-flag" symptoms that should always prompt investigation, as the damage caused by CES can be irreversible.

Multiple sclerosis (MS) is an autoimmune disease of the central nervous system, characterised by focal inflammation and neuron demyelination. Although urinary retention is a common feature of MS, it is not the most likely answer. Firstly, it classically presents between the ages of 20-40 years old and is more common in females. Furthermore, symptoms of MS are separated in space and time. Patients report different symptoms which come and go over several years and typically begin in young adulthood. While MS could explain urinary retention, muscle weakness or sensory loss in isolation, the combination of these symptoms with lower back pain are red-flag symptoms requiring further investigation for CES.

Transverse myelitis is an inflammatory disorder affecting the spinal cord, resulting in rapid onset weakness, sensory deficits and bowel or bladder dysfunction. Although it can present with urinary retention, transverse myelitis often occurs secondary to infectious or inflammatory syndromes and typically occurs in patients under 40 years old. It also presents with a rapidly progressive paraparesis, as the inflammation affects the whole level of the spinal cord affected and prevents transmission downward. Although it can present with back pain and similar symptoms to CES, it is much rarer.

Spinal stenosis is the narrowing of the spinal canal and results in spinal cord compression. It is caused by hypertrophy of the ligaments or joints surrounding the spinal canal or herniation of the intervertebral discs. However, it typically presents with neurogenic claudication, which is caused by intermittent spinal cord compression and presents with cramping pain in the legs when walking or exercising. However, this pain is also positional and improves with sitting or leaning forwards, differing it from true vascular claudication. Although it can cause sensory and motor disturbance, the presence of other more concerning features means it is not the most likely diagnosis.

Syringomyelia is the presence of a fluid-filled cavity within the central canal of the spinal cord, and the expansion of this cavity leads to compression of the spinal cord tracts. It most commonly presents with loss of pain and temperature sensation, through the compression of the spinothalamic tracts decussating at the anterior white commissure – touch and vibration sense transmitted by the dorsal column are persevered. They are commonly located in the upper thoracic region and typically affect the arms. They rarely progress to involve the corticospinal tracts and motor dysfunction, as they are located further from the central canal. Due to the loss of touch sensation in this patient and motor dysfunction, it is not the most likely answer.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK537200/

Question:

A 74-year-old man presents with a 6-month history of progressive exertional dyspnoea and a dry cough. He denies weight loss, fevers, skin changes or arthralgia. Past medical history includes hypertension, for which he takes amlodipine. On further questioning, he has never smoked and drinks minimal alcohol. On examination, finger clubbing is present and bibasal fine end-inspiratory crepitations are audible on chest auscultation.

A chest x-ray is requested, which demonstrates bilateral interstitial shadowing predominantly in the lower zones.

What is the most likely aetiology?

A. Idiopathic pulmonary fibrosis

B. Silicosis

C. Tuberculosis

D. Hypersensitivity pneumonitis

E. Coal worker’s pneumoconiosis

Correct Answer:Idiopathic pulmonary fibrosis

Explanation:

This case demonstrates pulmonary fibrosis. It is characterised by progressive exertional dyspnoea, a dry cough and bibasal fine end-inspiratory crepitations. Finger clubbing is commonly seen on examination. Idiopathic pulmonary fibrosis is the most likely cause in this case, as it results predominantly in lower zone interstitial shadowing. The other options all result in predominantly upper zone interstitial shadowing.

Cause of predominantly upper zone interstitial shadowing can be remembered as CHARTS:

Coal worker’s pneumoconiosis

Hypersensitivity pneumonitis

Ankylosing spondylitis

Radiation

Tuberculosis

Silicosis/sarcoidosis

Other causes of predominantly lower zone interstitial shadowing include systemic lupus erythematosus, asbestosis and drug-induced pulmonary fibrosis.

Further reading:

https://patient.info/doctor/pulmonary-fibrosis

Question:

A 17-year-old woman of Afro-Caribbean ethnicity attends her GP after family members expressed concerns about her weight. She explains that she has become increasingly more concerned about her body image over the past year, and the thought of appearing overweight causes her significant anxiety.

The patient mentions that as a result she tries to eat very small portions, and exercises vigorously most days to try to burn further calories. She denies intentionally making herself vomit. On further questioning, the patient explains that she does not view herself as being underweight despite others around her telling her so.

Her past medical history is unremarkable, and the GP is aware that she lives in an area of high socioeconomic deprivation. Social history reveals that the patient has recently immigrated to the U.K last year and is currently unemployed.

The GP records the patient’s BMI at 14.7 kg/m2

Which feature of the patient’s presentation is the strongest risk factor for the likely diagnosis?

A. Afro-Caribbean ethnicity

B. Immigrant status

C. Unemployment

D. Adolescence

E. Socioeconomic deprivation

Correct Answer:Adolescence

Explanation:

This patient is presenting with anorexia nervosa, an eating disorder characterised by an intense concern over body image and associated with behaviours such as restricting calorie intake and excessively exercising. While it is important to note that eating disorders such as anorexia nervosa can affect any individual, it is recognised that this condition is particularly common during adolescence.

Many mental health disorders such as depression and anxiety are associated with unemployment. However, unemployment is not generally considered to be a risk factor for developing anorexia nervosa.

Socioeconomic deprivation is not considered to be a risk factor for developing anorexia nervosa. The role of socioeconomic status in eating disorders is controversial, and opinion is beginning to move away from the historic association between middle-class status and eating disorders.

Afro-Caribbean ethnicity is not considered to be a risk factor for developing anorexia nervosa. As with socioeconomic status, some controversy exists over the role of ethnicity in the development of eating disorders. However, contemporary opinion increasingly acknowledges the prevalence of eating disorders across a diversity of ethnic backgrounds.

While immigrant status is associated with the development of schizophrenia, it is not considered to be a risk factor for developing anorexia nervosa.

Further reading:

https://patient.info/doctor/anorexia-nervosa-pro

Question:

A 50-year-old woman is being investigated for four months of worsening lateral right hip pain, particularly when she lies on the affected side. There is no history of trauma, weight loss, night sweats, or involvement of other joints. She has tried ice packs, paracetamol, and ibuprofen, which have provided minimal relief.

Examination reveals no restriction in the range of motion of the affected hip. The pain is reproduced on palpation of the lateral aspect of the greater trochanter of the right femur. There is no erythema or swelling.

What is the next best step in this patient's management?

A. Oral pregabalin

B. Oral prednisolone

C. Bursa injection

D. Oral dicloxacillin and aspiration of the bursa

E. Surgical bursectomy

Correct Answer:Bursa injection

Explanation:

The patient in the vignette has features of trochanteric bursitis (pain in the lateral thigh, typically observed in women in the 4th to 6th decade, associated with lateral hip pain, aggravated on palpation and lying down on the affected side). As her pain has not responded to conservative strategies (rest, ice-packs, simple analgesia including paracetamol and NSAIDs), the next best step in the management is bursa injection (lidocaine + methylprednisolone). Corticosteroid injection of the bursa helps settle local inflammation and is associated with good outcomes in patients with troublesome trochanteric bursitis.

Oral prednisolone may be considered for patients with an acute flare of a systemic inflammatory arthropathy (e.g. rheumatoid arthritis). The patient in the vignette presents with a chronic, single, painful hip joint with no systemic illness. Although this patient may benefit from systemic steroids, they are associated with more side effects and would not be the best choice for her presentation. A corticosteroid bursa injection will deliver the steroid to the bursa locally, minimising the risk of systemic side effects of steroids (fluid retention, hypertension, weight gain, mood fluctuation).

Surgical bursectomy is reserved for refractory cases of trochanteric bursitis that have failed to respond to initial treatment. Surgery is more invasive and is associated with greater risks. Therefore, it would be more sensible to give the patient in the vignette a steroid injection and assess the response first.

Oral dicloxacillin and aspiration of the bursa may be considered if there is suspicion of a septic joint effusion. The patient in the vignette is unlikely to have septic bursitis, as her symptoms are more chronic; there is no mention of a fever or evidence of sepsis or restriction in joint movement.

Oral pregabalin may be considered for patients with neuropathic pain (e.g. discogenic back pain). Discogenic back pain may present with radicular leg pain (shooting pains down the back of the leg), which changes in position may aggravate. the patient in the vignette has features that are more suspicious of trochanteric bursitis (lateral hip pain aggravated by lying on the affected side and palpation of the lateral aspect of the greater trochanter). In cases of discogenic back pain, physiotherapy may also be considered before trialling neuropathic pain agents due to their unpleasant side-effect profile.

Further reading:

https://www.physio-pedia.com/Trochanteric\_Bursitis

Question:

A 4-year-old boy is brought to the GP by his mother, who is worried about recent symptoms that he has developed. He was sent home from school 6 days ago, as he complained of feeling hot; his temperature was taken by the teacher, and he was noted to have a fever. A COVID-19 test was taken as recommended but this was negative. He has been unable to return to school, as his temperature has remained high; he has now developed a rash over his trunk, and his mother reports that he is frequently rubbing his eyes and complaining that they are painful.

The GP carries out an examination of the child, who appears quiet and teary. The rash is visible over the entirety of the trunk and limbs, this is maculopapular and blanches with pressure. His temperature is taken, with a reading of 38.6, with pulse rate, respiratory rate and capillary refill time all being normal. No obvious sources of infection are identified, although there is significant lymphadenopathy in the left anterior cervical chain, with several lymph nodes exceeding 2cm in diameter. The boy's eyes appear painful and red.

The GP is concerned about the child and makes a hospital referral so that further investigations can be carried out. He explains to the boy's mother that blood tests will likely be taken and that he thinks it likely that an ultrasound of the heart may be necessary.

What is the most likely diagnosis in this case?

A. Acute myeloid leukaemia

B. Castleman's disease

C. Roseola infantum

D. Kikuchi-Fujimoto disease

E. Kawasaki's disease

Correct Answer:Kawasaki's disease

Explanation:

The most likely diagnosis in this child is Kawasaki's disease, a vasculitis affecting medium-sized vessels that can give a number of systemic features. A prolonged fever (greater than 5 days) is a common manifestation of the disease; a prolonged fever of unknown origin as is present in this child should warrant further consideration. Whilst infective causes are still the most common culprit, it is worth thinking about inflammatory disorders (such as vasculitis in this case), autoimmune conditions such as juvenile idiopathic arthritis (the acute-onset form of this condition is another worthwhile differential in this boy) and malignancy.

Symptoms of Kawasaki's disease can vary, but a diffuse maculopapular or morbilliform rash, conjunctivitis (an explanation for the sore eyes described by the child) and lymphadenopathy are all frequently seen. Desquamation of the palms and soles may also arise, and the classical 'strawberry tongue' (also seen in scarlet fever) may be noted. A useful mnemonic to remember the important features of the condition is 'CRASH and BURN ('Burn' referring to the prolonged fever):

Conjunctivitis

Rash

Adenopathy

Strawberry tongue

Hand and foot desquamation

The diagnosis of Kawasaki's disease is made clinically, although raised inflammatory markers can aid the diagnostic process. The most important complication of the condition is the development of coronary artery aneurysms; an echocardiogram will usually be ordered to rule this out. Management is via intravenous immunoglobulin (IVIG) and high dose aspirin (usually totally contraindicated in children due to the risk of Reye's syndrome; Kawasaki's is largely the only exception), with most children recovering well after receiving this therapy.

Roseola infantum (also referred to as 'Sixth's disease') is a self-limiting condition caused by human herpesvirus 6 (HHV-6 - the same causative agent as in Kaposi's sarcoma). The classic presentation is of a maculopapular rash that develops after the resolution of an initial fever. The boy in the vignette has presented with a rash similar to that seen in the condition, but the other symptoms described are not in keeping with a diagnosis of roseola.

Acute myeloid leukaemia could present with prolonged fever and can give dermatological features (referred to as leukaemia cutis). However, the condition is rare in this age group (ALL being far more common), and the child would likely be far more clinically unwell.

Castleman's disease is a rare cause of lymphadenopathy; it is a form of lymphoproliferative disorder that usually affects a single lymph node, causing it to become enlarged. It would not explain the other symptoms that this child has presented with.

Kikuchi-Fujimoto disease can cause children to develop both a fever and lymphadenopathy; it is often mistaken for lymphoma. However, it would not explain the eye symptoms, and is extremely rare, with only a handful of documented cases. It is therefore not the most likely diagnosis.

Further reading:

https://dermnetnz.org/topics/kawasaki-disease/

Question:

A 36-year-old woman presents to the GP with vaginal itching and dyspareunia over the last week. On further questioning, her vaginal discharge has changed and appears thicker and white in colour. She denies any odour, pelvic pain, or vaginal bleeding. There is slight discomfort on a bimanual examination, however, the cervix appears normal. She takes the combined oral contraceptive pill and has a single long-term sexual partner, and does not use barrier contraception. This is her fifth presentation this year with the same set of symptoms.

Given the likely diagnosis, what would be the most useful test to investigate for a potential underlying cause of this patient's presentation?

A. Nucleic acid amplification tests

B. High vaginal swab

C. HbA1c

D. CD4+ T-cell count

E. Full blood count

Correct Answer:HbA1c

Explanation:

HbA1c is correct. This patient has signs and symptoms consistent with vaginal candidiasis, as she has dyspareunia, vaginal itching, and thicker, white, and malodorous discharge (often compared to cottage cheese). She has had 5 previous episodes of the same condition, which should raise questions about the presence of a predisposing factor. The British Association for Sexual Health and HIV (BASHH) guidelines define recurrent vaginal candidiasis as 4 or more episodes per year, and this patient has had 5, therefore, testing for a predisposing condition should be considered. BASHH recommends that blood glucose testing be carried out in patients with recurrent vaginal candidiasis, as diabetes mellitus is a common predisposing factor. Glycosuria can increase one's susceptibility to a candidal infection as the yeast feeds on the increased glucose in the genital area.

CD4+ T-cell count is incorrect. While HIV is another important predisposing condition to recurrent vaginal candidiasis, the first-line investigation would not be CD4+ T-cell counts but HIV antibody and antigen testing.

Full blood count is incorrect. This may be useful in assessing a patient's white cell count and may identify low white cells, but this is not used first-line. Instead, more direct tests are recommended, such as blood glucose testing in suspected diabetes or HIV testing in suspected HIV.

High vaginal swab is incorrect. BASHH does recommend the use of a high vaginal swab to confirm the diagnosis of vaginal candidiasis in patients who have recurrent episodes, however, this would only confirm the diagnosis in this scenario and would not help with identifying a potential underlying cause leading to recurrent episodes.

Nucleic acid amplification tests is incorrect. These tests are used in the diagnosis of chlamydia and gonorrhoea and do not play a role in the diagnosis of vaginal candidiasis. In most cases, the diagnosis is clinical and does not require further testing, unless the diagnosis is unclear or the patient has recurrent episodes.

Further reading:

https://patient.info/doctor/vaginal-and-vulval-candidiasis

Question:

A 30-year-old man was involved in a traffic collision and sustained multiple injuries. He required emergency surgery for internal bleeding, during which he received four units of blood. Imaging also revealed a fractured femur and a vertebral fracture at T5 resulting in a spinal cord injury. He is stabilised during surgery and has been recovering on the ward. He is taking regular morphine for pain relief.

On day three post-operatively he complains of feeling unwell with a severe headache. He is agitated and his face appears flushed. During an A-E assessment, his vital signs are noted: RR 21/min, HR 40 bpm, BP 210/175 mmHg, temp 37.8°C, and GCS 15/15.

What is the most likely underlying cause for his deterioration?

A. Transfusion related circulatory overload (TACO)

B. Anaphylaxis

C. Opioid overdose

D. Fat embolus

E. Constipation

Correct Answer:Constipation

Explanation:

The correct answer is constipation. Autonomic dysreflexia is a clinical syndrome seen in patients who have had a spinal cord injury at or above T6. It results in hypertension, bradycardia, and flushing and sweating above the level of injury. It can be triggered by any pain or discomfort below the injury, examples include constipation, urinary retention and skin injuries. These stimuli result in a sympathetic afferent which raises blood pressure. Normally, this is counteracted by a centrally-mediated parasympathetic signal. However, in patients with a spinal cord injury above T6, this parasympathetic signal is unable to travel below the injury, resulting in an unopposed sympathetic increase in blood pressure. In this case, the constipation is likely an adverse effect of opioid analgesia.

Transfusion-related circulatory overload (TACO) is incorrect as this typically occurs soon after receiving blood products. TACO is a transfusion reaction which occurs as a result of the volume of the transfused component causing hypervolaemia. This would occur within 12 hours of the transfusion being administered. You would also expect to see tachycardia as opposed to bradycardia.

Anaphylaxis is incorrect. An anaphylactic reaction could be caused by a medication or blood product. You would expect to see hypotension and tachycardia.

Opioid overdose would present with drowsiness, respiratory depression and miosis. It is worth being mindful of an overdose in patients on any opioid analgesic, particularly if they have not had an opioid before.

Fat embolus is not correct. The typical presentation of a fat embolus would be shortness of breath, petechial rash and confusion. It is associated with long bone fractures and tends to occur 1-2 days after injury.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK482434/

Question:

A 44-year-old man presents to the GP, concerned about recent symptoms. He feels he has become increasingly clumsy over the past few weeks which has led to him struggling to ride his bike to work, having a few near misses. He reports becoming increasingly sweaty and has a persistent headache; he wonders if he is working too hard in his job as a banker.

On further questioning, he mentions that he is struggling in his relationship with his partner; she has been complaining that he has begun to snore extremely loudly at night, which is preventing her from sleeping. She blames him for doing this purposefully, as he has never snored in the past. He now consistently wakes up with a headache in the morning, which he attributes to excessive worrying about whether or not he is snoring.

The patient has been otherwise well up until this point, with his only past medical history being a recent diagnosis of type 2 diabetes; this came as a surprise to him, as he believes he keeps to a healthy diet. Examination reveals generally clamminess of the hands, with a normal pulse rate is normal and no tremor. On palpation of the abdomen, the doctor notices masses in both the left and right subcostal regions. There are no abnormalities on examination of the head and neck; the thyroid gland appears a normal size.

The GP is worried about the presence of a brain tumour and makes a hospital referral for an urgent MRI. Which of the following investigations may also be useful alongside this imaging to help make the diagnosis?

A. Water deprivation test

B. Thyroid function tests

C. Inferior petrosal sinus sampling

D. IGF-1 levels

E. Dexamethasone suppression test

Correct Answer:IGF-1 levels

Explanation:

The most likely diagnosis, in this case, is a pituitary tumour; more specifically a somatotroph adenoma producing excessive amounts of growth hormone, causing acromegaly. A persistent headache, worse in the morning, is relatively classic of any form of raised intracranial pressure, and the clumsiness described by the patient may indicate the presence of a visual field defect. The pituitary gland is closely situated to the optic chiasm, and therefore tumours may compress the fibres that run through this area, causing bitemporal hemianopia.

Whilst the patient may lack the classically described appearance changes seen in acromegaly such as increased coarseness of facial features and increasing size of hand and feet, these may not always be noticed by the patient as they can develop slowly over a prolonged period. The patient does have a number of signs and symptoms of growth hormone excess, however, hyperhidrosis, obstructive sleep apnoea (usually due to macroglossia) and hyperglycaemia leading to type 2 diabetes are all frequently seen in those with acromegaly. Organomegaly on examination (both spleen and liver being enlarged) is also in keeping with the diagnosis.

An MRI will allow for imaging of the tumour, but in order for the type of mass to be classified in terms of any hormones being produced, further investigations will be required. Acromegaly is usually diagnosed using IGF-1 levels; this produced from the liver in response to growth hormone; levels will be abnormally elevated in the condition. An oral glucose tolerance test is another possibility, although this will be less useful in this case, as the patient has diabetes mellitus, which could lead to a false-positive result.

A water deprivation test may be used in making a diagnosis of diabetes insipidus. The patient lacks the classic production of excessive amounts of dilute urine seen in this condition, making it much less likely to be present in this scenario.

Both a dexamethasone suppression test and inferior petrosal sinus sampling may be used to locate the site of disease in suspected Cushing's syndrome. Whilst the condition can arise due to a pituitary tumour and could present similarly in terms of a morning headache, visual field defect, and hyperglycaemia, it would not lead to organomegaly, nor hyperhidrosis. Therefore, these are less appropriate investigations in this scenario.

Thyroid function tests may be useful to rule out hyperthyroidism, which could give some similar features to acromegaly; however, alone, these will not help to make the diagnosis.

Further reading:

https://patient.info/doctor/acromegaly-pro

Question:

A 56-year-old man presents to his GP with exertional leg pain. Over the last four months, he has developed cramping pain in his calves whilst walking. He says both legs are affected, but it is worse on the left. The pain is quickly relieved by stopping to rest.

His past medical history is significant for hypertension and hypercholesterolaemia. He currently takes amlodipine 10mg, valsartan 80mg and simvastatin 40mg. He has a 25-pack-year tobacco history.

On examination, the leg appears normal.

What is the most appropriate initial management step?

A. Angioplasty

B. No intervention required

C. Bypass surgery

D. Naftidrofuryl oxalate

E. Supervised exercise programme

Correct Answer:Supervised exercise programme

Explanation:

This patient has a presentation of intermittent claudication. NICE guidelines for managing peripheral arterial disease recommend that all patients with intermittent claudication should be offered a supervised exercise programme as the first-line management option. This typically involves two hours of supervised exercise a week for three months, encouraging lifestyle changes and pushing patients to the point of maximal pain.

This patient has intermittent claudication, a sign of peripheral arterial disease. At an absolute minimum, NICE guidelines suggest exercise and lifestyle advice for patients. Therefore, no intervention is not the most appropriate option.

NICE recommends that naftidrofuryl oxalate, a 5HT2 receptor antagonist, should only be considered in patients if a supervised exercise programme has not led to a satisfactory improvement in symptoms and the patient does not want to be considered for surgery.

NICE recommends referring patients for consideration of angioplasty or bypass surgery when appropriate risk factor modification and supervised exercise programme have not led to a satisfactory improvement in claudication symptoms. Therefore, they would not be considered as the initial management option in this patient without first making lifestyle changes.

Further reading:

https://cks.nice.org.uk/topics/peripheral-arterial-disease/

Question:

A 26-year-old African-American male attends his GP with a painless lump on the left side of his neck. He first noticed the lump 2 weeks ago and it has grown rapidly to its current size. He has not noticed any others. In association with the lump, he has been very tired and gone off his food. This, he thinks, has contributed to a weight loss of 10kg over the past month.

He reports no other medical conditions and takes no medical or recreational drugs. He is a non-smoker. The only other time he has been unwell was a period where he missed 2 months of school at age 12 because of a viral infection. No one else in his family has similar symptoms. He travelled to Thailand 3 months ago but was not unwell during the trip.

On examination, there is an enlarged lymph node (3x2 cm) located in the left lower anterior cervical chain. The lump feels rubbery and smooth. There is no supra/infraclavicular lymphadenopathy. The patient does not have a temperature.

What is the most likely diagnosis?

A. Sarcoidosis

B. Hodgkin’s lymphoma

C. HIV

D. Reactive lymph node

E. Metastatic malignancy

Correct Answer:Hodgkin’s lymphoma

Explanation:

This question is looking at the differential diagnosis of cervical lymphadenopathy. This can be split into reactive, malignant and other.

The correct answer is Hodgkin’s lymphoma (HL). A history of painless cervical lymphadenopathy with weight loss should prompt you to consider malignancy. Significant weight loss is defined as a loss of more than 10% over 6 months. B symptoms refer to systemic symptoms of fever, night sweats, and weight loss which can be associated with both Hodgkin's lymphoma and non-Hodgkin's lymphoma. B symptoms are only present in 25% of patients with Hodgkin's lymphoma. Lymph node pain on drinking alcohol is specific, but only present in 10% of HL cases. The period of missed school due to a viral illness is suggestive of Epstein Barr virus (EBV), which is associated with HL.

Reactive lymph nodes are typically caused by viral or bacterial upper respiratory tract infections (not mentioned in this scenario). These lymph nodes are often tender and not associated with systemic symptoms such as weight loss, as is the case in this scenario.

Infectious mononucleosis (Glandular fever) also causes reactive cervical lymph nodes and is a reasonable differential diagnosis as EBV can cause weight loss, fatigue, fever and night sweats (all similar to HL). However, this is less likely in this scenario given the absence of painful lymphadenopathy, fever and exudative pharyngitis.

HIV can also present with widespread lymphadenopathy. The history, although not comprehensive, does not suggest any significant risk factors for HIV (e.g. unprotected sexual intercourse, intravenous drug use).

Sarcoidosis can cause fever, night sweats, malaise, fatigue and weight loss all similar to HL. However, sarcoidosis is less likely as there is no history of shortness of breath (90% of patients), erythema nodosum, anterior uveitis or arthralgia.

Metastatic malignancy is not correct in this case. Although the history is suggestive of malignancy (weight loss, anorexia) the clinical examination findings are not. Enlarged lymph nodes associated with metastases are commonly described as stony hard or “craggy”. Metastases to the cervical nodes are often from head and neck cancers, this patient is young and a non-smoker, which makes this less likely.

Further reading:

https://patient.info/doctor/hodgkins-lymphoma-pro

Question:

You are a GP on a home visit to see Mrs G, an 80y/o nursing home resident. She has a history of a rash which started 6 days ago and is intensely itchy, worst at night.

On examination you find her to have an erythematous papular rash over her wrists and hands, as well as burrows in the finger webs. She has recently been started on trimethoprim for UTI.

What is the most appropriate management?

A. Prescribe Mrs G permethrin 5% cream and recommend all close contacts are also treated with the same

B. Prescribe chlorphenamine 4mg PRN QDS for symptomatic relief

C. Stop trimethoprim

D. Prescribe topical hydrocortisone and aqueous cream

E. Prescribe permethrin 5% cream for Mrs G, only treat symptomatic close contacts

Correct Answer:Prescribe Mrs G permethrin 5% cream and recommend all close contacts are also treated with the same

Explanation:

The correct answer is to prescribe Mrs G permethrin 5% cream and recommend all close contacts are also treated with the same. This is a classical description of the rash of scabies (intensely itchy, worse at night with burrowing in the finger webs and wrists). Scabies is extremely contagious and especially in a nursing home, failure to contain it quickly can result in an outbreak. Because of this, all close contacts must be treated, even if asymptomatic.

This is unlikely to be a drug reaction given the localised nature of the rash so it would not be correct to stop trimethoprim.

Topical steroid and emollient would possibly be appropriate as the first-line trial of treatment if the history did not so clearly suggest scabies.

Chlorphenamine is a sedative antihistamine and can be useful for pruritis (more for its sedative side effects than antihistamine properties). Prescribing this alone would not treat the underlying cause though.

Further reading:

https://cks.nice.org.uk/scabies

Question:

A 21-year-old medical student presents to the GP after discovering a lump in her right breast when showering; she appears visibly distressed. She frequently checks her breasts as recommended, and has not previously noticed any masses. She denies any changes in the skin around her breasts or her nipples and has not noticed any masses anywhere else, nor any nipple discharge.

The patient has no other relevant past medical history, and nobody in her family has previously had breast cancer. She began menstruating at age 14, and takes the combined oral contraceptive pill for primary dysmenorrhoea, although this was only started 6 months previously. She does not smoke or drink alcohol.

Examination of the breast reveals a single, well-defined mass in the inferior outer quadrant of the right breast. This is motile within the breast and feels rubbery to the touch. There are no nipple or skin changes visible, and axillary examination reveals no lymphadenopathy.

What is the most likely diagnosis in this case?

A. Simple breast cyst

B. Phyllodes tumour

C. Fibroadenoma

D. Intraductal papilloma

E. Fibrocystic breast disease

Correct Answer:Fibroadenoma

Explanation:

The most likely diagnosis, in this case, is a fibroadenoma, a benign breast lesion most common in women aged 15-35. The usual presentation is of a motile, well-defined, smooth mass within the breast; there will be an absence of other worrying features such as lymphadenopathy. The exact pathophysiology of these lesions is unknown, although there appears to be a relationship with hormonal changes such as starting the combined oral contraceptive pill.

NICE recommends a 2-week wait referral for women aged 30 years and over with an unexplained breast lump with or without pain; there is a low threshold for suspecting breast cancer. However, in this patient, and other patients under 30 with a mass likely to indicate a fibroadenoma, a non-urgent referral to a breast clinic is more appropriate; fibroadenomas almost never undergo malignant change. Imaging may be used to confirm the diagnosis, and simple observation is usually adequate.

Fibrocystic breast disease is a disease of unknown aetiology that most frequently affects women as they approach menopause. It is thought to be a normal response to hormonal changes (similar to fibroadenoma). The breasts often begin to feel 'lumpy' and patients complain of cyclical mastalgia (breast pain), usually around the time of menstruation. There may be localised areas of nodularity, which may mimic a tumour. Imaging can be used to confirm the diagnosis, and a well-fitting bra and simple analgesia are appropriate management options.

Breast cysts can arise as part of fibrocystic breast disease, or in isolation. These would have a similar presentation to that described in this case, with a well-localised mass. However, these are more likely to be fluctuant as they are fluid-filled, and would not have the rubbery texture of a fibroadenoma.

A Phyllodes tumour is a relatively rare benign mass that can present similarly to a fibroadenoma in terms of giving a discrete mass without other features of neoplastic disease. However, it more commonly affects slightly older patients (around the age of 40), and given its uncommon nature, is less likely to be the diagnosis in this scenario. The tumour has a small risk of malignant transformation compared to a fibroadenoma and is therefore often surgically removed.

An intraductal papilloma is a benign tumour developing from the epithelium of the breast ducts themselves. This may present with a palpable lump behind the nipple, as well as bloody discharge. The presentation is often worrying for patients, but the lesion only has a small risk of malignant transformation. The affected duct will usually be surgically excised.

Further reading:

https://patient.info/doctor/benign-breast-disease

Question:

A 50-year-old man with severe obesity presents to A&E with a one-day history of abdominal pain. His symptoms started about an hour after eating a large fish and chips. While the pain was diffuse at first, it is now localised to the upper right quadrant of his abdomen. He experienced an episode similar to this six months ago, but it was self-limited.

He has a fever (38.3oC), but all other vital signs are normal. On examination, he has some mild tenderness in the right upper quadrant but no other abnormalities.

Blood tests reveal the following:

WCC - 16 x 109

ALP - 180 U/L

Amylase - normal

Lipase - normal

Other LFTs normal

Ultrasound reveals cholelithiasis and a thickened gallbladder wall.

What is the most likely diagnosis?

A. Cholangitis

B. Gallstone pancreatitis

C. Cholangiocarcinoma

D. Cholecystitis

E. Choledocholithiasis

Correct Answer:Cholecystitis

Explanation:

This patient is most likely suffering from acute cholecystitis. Acute cholecystitis is characterised by inflammation of the gallbladder most commonly caused by obstruction of the cystic duct by a gallstone. Acute cholecystitis typically presents with right upper quadrant (RUQ) pain, nausea, vomiting, fever and anorexia. Leukocytosis and mildly deranged LFTs are commonly seen in patients with uncomplicated acute cholecystitis. Ultrasound findings include a thickened gallbladder wall and the presence of pericholecystic fluid. There is usually evidence of cholelithiasis (gallstones) in the gallbladder. This patient’s RUQ pain, blood results and ultrasound findings make cholecystitis the most likely diagnosis.

Cholangitis is an ascending bacterial infection of the common bile duct. It is a common complication of choledocholithiasis. Cholangitis should be suspected in cases where the patient presents with Charcot’s triad of right upper quadrant pain, jaundice, and fever. Cholangitis is treated with antibiotics and decompression of the bile duct (usually with ERCP). While the symptoms of acute cholecystitis and cholangitis can overlap, laboratory analysis of patients with cholangitis most commonly show significantly elevated serum alkaline phosphatase, GGT, and bilirubin. The absence of these laboratory findings makes cholangitis less likely in this patient.

Cholangiocarcinoma is a form of cancer that affects the biliary ducts. Patients typically present with jaundice, pruritus, and weight loss. The patient does not have any of these symptoms. In addition, his ultrasound findings indicate cholelithiasis, making cholecystitis a more likely diagnosis.

Choledocholithiasis is a specific subset of cholelithiasis in which gallstones are found in the common bile duct. Patients with choledocholithiasis typically present with right upper quadrant pain, jaundice, nausea, and vomiting. Laboratory analysis typically reveals elevated serum ALT and AST (early) and elevated bilirubin, alkaline phosphatase, and GGT (late). This patient’s normal ALT, AST, bilirubin and GGT make choledocholithiasis unlikely.

Gallstone pancreatitis is a complication of cholelithiasis that is caused by gallstones that obstruct the common bile duct distal to the pancreas. Symptoms include severe epigastric abdominal pain, nausea, and vomiting. Serum amylase and lipase (which is more specific) are often elevated in patients with pancreatitis. Given the normal serum lipase in this patient, pancreatitis is unlikely.

Further reading:

https://patient.info/doctor/gallstones-and-cholecystitis

Question:

A 53-year-old man presents to the emergency department with acute chest pain that began 1 hour ago. This chest pain is crushing in nature and radiates to the jaw and down the left arm. He complains of feeling generally unwell and he looks pale. He has not had any previous episodes of chest pain. ECG findings reveal a 2mm ST elevation in leads II, III, and aVF.

What is the most significant risk factor for this patient?

A. Family history of early myocardial infarction

B. High alcohol intake

C. Acute kidney injury

D. Pescatarian diet

E. Family history of rheumatoid arthritis

Correct Answer:Family history of early myocardial infarction

Explanation:

The ECG findings of this patient strongly suggests an inferior ST-elevation myocardial infarction.

The most significant risk factor is a family history of early myocardial infarction (MI). Any family history of premature coronary artery disease (CAD) would increase a patient’s risk of also developing CAD. Using QRISK3, it is defined as a first-degree relative who has CAD before the age of 60.

QRISK3 is an algorithm that accounts for many CAD risk factors and calculates a patient’s risk of developing cardiovascular disease over the next 10 years. A score of over 10% is considered high and lifestyle advice and statins are offered to these patients.

Acute kidney injury is not a risk factor for CAD; however, chronic kidney disease is and this has been included in the QRISK3 algorithm.

A family history of rheumatoid arthritis is not a risk factor for CAD, but rheumatoid arthritis itself and this has been included in the QRISK3 algorithm.

A high alcohol intake is not known to be a risk factor for CAD and is not accounted for in the QRISK3 algorithm.

A pescatarian diet is a diet consisting of high fibre and fish. This is not a risk factor and has even been shown to be good for cardiovascular health. A high-fat, high-salt diet is a known risk factor for CAD.

Further reading:

https://qrisk.org/three/

Question:

A 62-year-old man presents to his GP for his annual diabetes review. He has a past medical history of type 2 diabetes mellitus (T2DM), chronic kidney disease (CKD), and hypertension. His regular medications include metformin, simvastatin, ramipril, amlodipine, and gliclazide. Some of his recent blood tests are shown below:

Hb 101 g/L Male: (135-180)

Platelets 234 \* 109/L (150 - 400)

WBC 5.4 \* 109/L (4.0 - 11.0)

Na+ 141 mmol/L (135 - 145)

K+ 3.8 mmol/L (3.5 - 5.0)

eGFR 27 ml/min/1.73m2 (> 90)

Which of his medications is now contraindicated?

A. Amlodipine

B. Metformin

C. Gliclazide

D. Simvastatin

E. Ramipril

Correct Answer:Metformin

Explanation:

The correct answer is metformin. This patient has T2DM, CKD, and hypertension. On his most recent blood tests, his eGFR has fallen below 30ml/min/1.73m2, meaning that his metformin is now contraindicated.

Amlodipine is a calcium-channel blocker used to treat hypertension. It is safe to continue in renal impairment.

Gliclazide is a sulphonylurea used in the management of T2DM. It is mainly metabolised in the liver and so is safe to continue in renal impairment.

Ramipril is an angiotensin-converting enzyme inhibitor used in the management of hypertension. The dose may need reviewing now that his eGFR has fallen below 30ml/min/1.73m2 but it is not immediately contraindicated.

Simvastatin is a statin used in the prevention of cardiovascular disease. They are generally safe to continue in CKD.

Further reading:

https://bnf.nice.org.uk/guidance/prescribing-in-renal-impairment.html

Question:

A 24-year-old-man presents with a 5-week history of severe pain on passing stool. He describes the pain as ‘like passing glass’ with each bowel movement and he has an increasing reluctance to defecate as a result. On further questioning, a history of blood on the surface of the stool is elicited, but no fresh PR bleeding or mucus is noted. He refuses to consent to PR examination, due to fear of associated pain. He has no significant past medical history, takes no regular medications, and is otherwise systemically well.

What is the most likely diagnosis?

A. Anal fissure

B. Anorectal abscess

C. Anal fistula

D. Haemorrhoids

E. Crohn's disease

Correct Answer:Anal fissure

Explanation:

Anal fissures are splits in the mucosa of the anal canal, leading to severe pain on defecation. This pain usually settles between bowel motions, unlike some other causes of anorectal pain such as abscesses. Fissures may be primary, or secondary to another condition such as constipation, inflammatory bowel disease, or malignancy. The diagnosis can be made on clinical examination, with further investigation only required if an underlying cause is suspected.

An anal fistula is an abnormal connection/tract between the anal canal and the perianal skin. It may present with perianal pain or leakage of blood or pus. They are very commonly associated with previous perianal abscesses, conditions such as inflammatory bowel disease, and malignancy.

Haemorrhoids most commonly present with bright red, painless rectal bleeding on defecation, commonly in the context of constipation or straining at stool. Patients may describe a feeling of incomplete evacuation (‘tenesmus’) or an external mass. This patient’s young age, and the severity of pain on defecation, make haemorrhoids a less likely option here.

Anorectal ­abscesses are seen commonly in patients with a history of conditions such as Crohn’s disease or anal fistulae. The intermittent nature of the pain in this case, and its association with defecation rather than persistent anorectal pain, makes anorectal abscess less likely here. In addition, anorectal abscess would be expected to be associated with more systemic upset, such as low-grade fever, which is not seen here.

Crohn’s disease is an inflammatory bowel disease associated with inflammation in the gastrointestinal tract, anywhere from the mouth to anus. It commonly presents with a history of diarrhoea, abdominal pain, and systemic features such as fever and malaise.

Further reading:

https://patient.info/doctor/anal-fissure-pro

Question:

A 30-year-old male patient with known hepatitis C presents to the hepatobiliary clinic. His primary complaint is right upper quadrant pain. He reports that the pain started three months ago and has become progressively worse.

On examination, the gentleman has yellow sclera, excoriation marks all over his arms from itching, tenderness in the right upper quadrant, hepatosplenomegaly and shifting dullness. Serum alpha-fetoprotein is raised.

What is the potentially curative management of this patient’s condition?

A. Liver resection

B. Transarterial embolisation

C. Liver transplantation

D. Supportive care

E. Chemotherapy

Correct Answer:Liver resection

Explanation:

This patient is likely suffering from hepatocellular carcinoma (HCC). Curative treatments for this condition include liver resection, liver transplantation (although disease may recur post-transplant active hepatitis C infection - and thus, in this case, contra-indicated) and radiofrequency ablation. The main risk factor for the development of HCC is liver cirrhosis secondary to chronic hepatitis B and C. Other risk factors for the development of HCC include: inherited liver diseases (e.g. haemochromatosis), alcohol abuse and male gender. This condition may be asymptomatic if caught early; however, late features include right upper quadrant pain, hepatosplenomegaly, jaundice, pruritus and ascites. The main differential diagnosis, in this case, is decompensated liver cirrhosis, but the raised alpha-fetoprotein makes this less likely.

Liver transplantation may indeed be curative in certain cases of HCC. However, this management option is contraindicated in hepatitis C.

Chemotherapy is commonly used in the management of HCC. This treatment only improves survival and does not cure HCC.

Transarterial embolisation is used in the management of HCC but does not cure the condition. This treatment option is used in the management of unresectable liver tumours.

Supportive care is used in the management of palliative patients with HCC and does not provide a cure.

Further reading:

https://patient.info/doctor/primary-liver-cancer-pro

Question:

A 32-year-old lady presents with a 5-day history of bloody diarrhoea, abdominal cramps, fever and headache. She is opening her bowels around 10 times a day and she describes the diarrhoea as profuse. As she is a nurse, she has not been able to work and feels bad as she knows the ward is always very busy. She does not recall exposure to any patients with norovirus at work. She denies any recent changes to her diet, although she ate a Chinese takeaway three days before the diarrhoea started. She has no significant past medical history.

On examination, she appears unwell and has a temperature of 38.4 oC. Her abdomen is globally tender on palpation and she is clinically dehydrated.

What is the most likely cause of her diarrhoea?

A. Inflammatory bowel disease

B. Escherichia coli

C. Norovirus

D. Shigella

E. Campylobacter jejuni

Correct Answer:Campylobacter jejuni

Explanation:

Campylobacter jejuni is the most likely cause of this lady’s diarrhoea. It is the most common bacterial cause of diarrhoea in the developed world and is associated with raw or undercooked poultry, which this lady may have been exposed to in her Chinese takeaway.

The disease has an incubation period of between 2-5 days and typically begins with a prodrome of fever, headache and myalgia. Patients then develop abdominal cramps and profuse diarrhoea, which is often watery and bloody. Examination typically reveals a globally tender abdomen and evidence of dehydration secondary to diarrhoea.

Norovirus is unlikely in this lady due to the history of a longer period of illness; patients with norovirus would usually recover within 2 days. Furthermore, you would usually expect a shorter incubation period and no blood in the stool.

E. coli is another common bacterial cause of diarrhoea but is not as common as Campylobacter jejuni, and less associated with contaminated poultry. Patients experience similar symptoms – an incubation period of 1-10 days, bloody diarrhoea and a 5-10 day illness.

Shigella is more commonly seen in young children in childcare settings and schools. Shigella is usually acquired after eating contaminated salad and raw vegetables. It would present with similar symptoms.

Inflammatory bowel disease is possible, however, the short duration of symptoms, absence of chronic weight loss and the prodromal features all point towards an infective cause.

Further reading:

https://patient.info/doctor/campylobacter-enteritis#nav-2

Question:

A 17-year-old girl presents to A&E after taking an overdose of paracetamol. She reports she took 20 tablets 4 hours ago, stemming from an emotional family argument. No other tablets or medications were taken. She feels nauseous and regrets taking the overdose. She has no other symptoms.

After checking the patient's plasma-paracetamol concentration, it is determined that treatment should be commenced.

What treatment is indicated in this case?

A. Sodium bicarbonate

B. Naloxone

C. Flumazenil

D. Desferrioxamine

E. IV N-acetylcysteine

Correct Answer:IV N-acetylcysteine

Explanation:

IV N-acetylcysteine is given in cases of paracetamol toxicity to protect the liver, via replenishing the body's stores of glutathione. It is given as 3 infusions over 21 hours.

Naloxone is a competitive opioid receptor antagonist and reverses the effects of opioid toxicity.

Flumazenil is a competitive benzodiazepine receptor antagonist that can be used as an antidote in benzodiazepine overdose.

Desferrioxamine chelates iron and can be administered in patients after an iron overdose.

Sodium bicarbonate can be administered in patients with suspected tricyclic antidepressant poisoning with a prolonged QRS.

Further reading:

https://bnf.nice.org.uk/treatment-summary/poisoning-emergency-treatment.html

Question:

A 32-year-old woman presents with a 1-week history of blurred vision in her right eye, and pain during eye movement. She also gives a history of intermittent tingling in her upper limbs about a year ago, which lasted approximately 4 weeks before resolving spontaneously; she did not seek medical attention at the time. She notes that it returns intermittently if she has a hot bath or does exercise.

Examination reveals a relative afferent pupillary defect.

What is the most likely diagnosis?

A. Peripheral neuropathy

B. Multiple sclerosis

C. Amyotrophic lateral sclerosis

D. Vitamin B12 deficiency

E. Guillain Barre syndrome

Correct Answer:Multiple sclerosis

Explanation:

This patient is suffering from multiple sclerosis, characterised by plaques of central nervous system demyelination, separated in space and time. She is suffering from acute optic neuritis, explaining her eye symptoms. The most common pattern of disease is relapsing-remitting multiple sclerosis, in which periods of worsening symptoms (relapses) are followed by periods of recovery (remission). Over time, this recovery becomes less complete, with progressive disability (secondary progressive). A proportion of patients will suffer progression of disease from the outset, without periods of recovery (primary progressive). Investigations to confirm the diagnosis would include an MRI of the brain and spinal cord to examine for demyelination, a lumbar puncture to examine for CSF oligoclonal bands, and evoked potentials (such as visual evoked potentials) which would be expected to show delayed conduction. Diagnosis is confirmed via criteria such as McDonald Criteria.

Multiple sclerosis is a central nervous system disorder, as opposed to peripheral neuropathy. Peripheral neuropathies are motor and/or sensory disorders of multiple nerves, often widespread and symmetrical, and maximal in severity distally (i.e. ‘glove and stocking distribution). If the autonomic nervous system is involved, symptoms may include bowel disturbance, sweating disorders, and orthostatic hypotension. There are a large number of causes of peripheral neuropathies including chronic alcohol intake, diabetes mellitus, vitamin deficiency, and Charcot-Marie-Tooth disease.

Vitamin B12 deficiency is associated with symptoms of (megaloblastic) anaemia, paraesthesia, and peripheral neuropathy. Examine for loss of joint position and vibration sense, which may be affected first. There may also be neuropsychiatric features such as mood changes and dementia.

Guillain Barre syndrome is an acute, inflammatory, polyneuropathy. It is characterised by asymmetrical, ascending weakness; in most cases, this occurs weeks after an infection such as Campylobacter or viral illness. A significant proportion, up to 30%, will develop respiratory muscle involvement and require ventilation. Despite this, the overall prognosis is good, with 85% of patients making a full recovery.

Amyotrophic lateral sclerosis is a form of motor neuron disease, associated with the loss of neurons in the motor cortex and the anterior horn of the spinal cord. It is thus characterised by both upper and lower motor neuron signs and symptoms.

Further reading:

https://geekymedics.com/multiple-sclerosis/

Question:

A 26-year-old woman presents to the emergency department complaining of crampy abdominal pain, which started suddenly earlier today. She has not opened her bowels in 6 days and has passed minimal flatus. Since the onset of her pain this morning, she has vomited five times.

She has a past medical history of hyperthyroidism and has previously been treated surgically for an ectopic pregnancy. She has no recent travel history, no infectious contacts and no previous history of similar episodes.

On examination, her abdomen is distended with generalised tenderness on palpation. There is no guarding and no palpable masses. She is apyrexial with a heart rate of 80bpm, blood pressure of 110/90 mmHg and respiratory rate of 19bpm.

An abdominal X-ray is requested:

Geeky Medics [LINK]

What is the most likely diagnosis?

A. Abdominal perforation

B. Toxic megacolon

C. Large bowel obstruction

D. Small bowel obstruction

E. Bowel stricture

Correct Answer:Small bowel obstruction

Explanation:

The most likely diagnosis is small bowel obstruction. In this case, the patient has clinical symptoms consistent with obstruction (no passage of stool or flatus), and in addition, she has previously undergone surgery for an ectopic pregnancy – 75% of small bowel obstruction cases are caused by adhesions formed following surgical intervention, and hence a past surgical history is a key risk factor for small bowel obstruction. The abdominal X-ray demonstrates dilatation of the small bowel, which can be distinguished from the large bowel by the presence of the prominent valvulae conniventes traversing the width of the bowel wall (the haustra of the large bowel do not typically traverse the whole width) to create a ‘coiled-spring’ appearance. The small bowel is defined as dilated when it is >3cm in width. The dilated bowel is also situated more centrally than peripherally, which helps to distinguish it from the large bowel. It should be noted that although adhesions are the most common cause of small bowel obstruction, other causes include abdominal hernias and compression by tumours or masses. It is often useful to inspect the inguinal regions on the abdominal X-ray of a patient with suspected small bowel obstruction, as hernias are common in this location and may be the cause of obstruction if they become strangulated.

Large bowel obstruction is not the most likely diagnosis in this patient. The abdominal X-ray demonstrates dilatation of the small bowel rather than the large bowel, as prominent valvulae conniventes are traversing the width of the bowel wall and the dilated bowel is located more centrally (large bowel lies peripheral to central small bowel on an abdominal X-ray). Also, the symptoms of vomiting and past surgical history are more suggestive of small rather than large bowel obstruction.

Although a bowel stricture can cause small bowel obstruction, this is not the most likely underlying pathology in this case. Bowel strictures are more common in patients with chronic inflammatory bowel disease such as Crohn’s disease, in which inflammation can progress to the extent that the bowel lumen narrows and obstructs. In this patient, the past surgical history is more suggestive of adhesions as an underlying cause of the obstruction (and adhesions contribute to 75% of small bowel obstruction cases). It is, therefore, more appropriate to select the overarching general diagnosis of small bowel obstruction in this case, given that adhesions are not an answer option. Similarly, toxic megacolon is more consistent with a past medical history of inflammatory bowel disease, but it is defined as dilatation of the large bowel without obstruction. It is therefore incorrect in this case.

Although small bowel obstruction can result in abdominal perforation if it is not managed, it is not the most likely diagnosis in this case. The patient is currently stable with observations of 110/90mmHg and a heart rate of 80bpm, and their clinical examination does not demonstrate peritonitis or other features of abdominal perforation. Also, the abdominal X-ray demonstrates small bowel dilatation proximal to the obstruction but does not demonstrate X-ray findings of pneumoperitoneum (free air under the diaphragm) or Rigler’s sign (when both sides of the bowel wall are visible as intra-abdominal air provides additional contrast) that are typically associated with abdominal perforation.

Further reading:

https://geekymedics.com/abdominal-x-ray-interpretation/

Question:

A 74-year-old left-handed gentleman presents to his GP with a history of tremor. It has gradually become noticeable in his left hand over the last 6 months, mostly at rest but worse when he is stressed. He is a non-smoker and the only medications he takes are occasional laxatives when required.

Which finding is most likely to be present on examination relating to the underlying condition?

A. Postural instability

B. Relative afferent pupillary defect

C. Reduced pinprick sensation on both feet

D. Extensor plantar response

E. Finger-nose ataxia

Correct Answer:Postural instability

Explanation:

The likely underlying diagnosis is Parkinson’s disease. There is nothing in the history to suggest vascular or drug-induced Parkinsonism or any other rarer causes of this syndrome. Common examination findings in Parkinson’s disease include resting tremor, bradykinesia, rigidity and postural instability. There is no sensory disturbance, pupillary disturbance or signs of upper motor neurone lesion such as extensor plantars. Ataxia is not present in Parkinson’s disease and, if present alongside Parkinsonism, may point to a more uncommon disorder such as multiple systems atrophy (MSA).

Further reading:

https://jnnp.bmj.com/content/79/4/368?utm\_source=TrendMD&utm\_medium=cpc&utm\_campaign=J\_Neurol\_Neurosurg\_Psychiatry\_TrendMD\_1

Question:

A 30-year-old man presents to his GP complaining of polyuria and polydipsia. He says that over the last few months he has been passing urine more often. Furthermore, in the last two weeks, he has needed to get up during the night to urinate. His urine is always light in colour, despite the fact that he feels dehydrated. His past medical history is significant for coeliac disease, anxiety, and bipolar disorder. On examination, there is reduced skin turgor, and the mucous membranes are dry. He is tachycardic but all other vital signs are within normal limits. The GP orders a random serum glucose and urine dip the results of which are shown below:

Random serum glucose = 5.6 mmol/l

Urine dip = low specific gravity

Given the most likely diagnosis, what is the most useful initial investigation?

A. HbA1c

B. Pituitary MRI

C. Paired urine and serum osmolalities

D. 9am cortisol

E. Renal tract USS

Correct Answer:Paired urine and serum osmolalities

Explanation:

Polyuria, nocturia, and polydipsia, in the absence of biochemical evidence of diabetes mellitus, points towards diabetes insipidus (DI) and, therefore, the most useful initial investigation is paired urine and serum osmolalities.

DI is caused by insensitivity to or hyposecretion of antidiuretic hormone (ADH) resulting in low urine osmolality, due to the inability to concentrate urine in the distal renal tubules, and subsequent high serum osmolarity secondary to dehydration.

A renal tract USS is useful in investigating complications of chronic bladder dilation caused by diabetes insipidus but would not be appropriate at this stage.

Pituitary MRI can be used to help diagnose a craniogenic cause of diabetes insipidus but is not an appropriate initial investigation.

HbA1c is unlikely to be of use as this patient had a normal random plasma glucose and urine dip did not detect abnormal glucose levels.

9 am cortisol is a useful initial investigation in Cushing’s disease but not diabetes insipidus.

Further reading:

https://patient.info/doctor/diabetes-insipidus-pro

Question:

A 22-year-old student presents to the GP, concerned about a rash that he has developed. The lesions first appeared on his hands and the bottoms of his feet, but have now spread to cover his trunk. He has now noticed wart-like lesions around his genitals which are painless, but are making him feel self-conscious; he is concerned that he may have a sexually transmitted infection.

He has felt unwell for a few days, with non-specific symptoms including fever and headache, and is hoping for some form of treatment to relieve his symptoms. Upon further questioning, he reveals that he has had casual unprotected sexual intercourse with numerous partners in the last few months, most being individuals met on nights out. He has been treated for a chlamydia infection 6 months previously and reveals that he also believes he had a more recent STI; he developed a painless ulcerated lesion on his penis, which forced him to abstain from sex due to the embarrassment. He did not seek medical advice for this and was relieved that it simply resolved on its own.

The GP, like the patient, is concerned about the presence of a sexually transmitted infection. He counsels the patient about the practice of protected sex and refers him to the nearby sexual health clinic. He informs the patient that he will likely require further investigations, and antibiotic treatment is likely necessary.

Given the likely diagnosis, which of the following pieces of advice is most important to provide the patient about the treatment he will receive?

A. Starting treatment may lead to a rapid onset of fever, headache and sweating

B. That the treatment must be taken at the same time every day

C. The patient should not combine the treatment with statins, at it will increase the risk of myalgia

D. There is a risk of Achilles tendon rupture with the treatment he will be given

E. He must report any new-onset fever, as there is a risk of agranulocytosis

Correct Answer:Starting treatment may lead to a rapid onset of fever, headache and sweating

Explanation:

This patient is exhibiting signs of secondary syphilis; a sexually transmitted infection caused by the spirochaete Treponema pallidum. Syphilis can present with a wide range of symptoms, with the presentation described in stages; different symptoms develop depending on the length of the time the disease has gone untreated.

The main feature of primary syphilis is the development of a chancre; a solitary painless ulcer on the genitals; the patient's description of this makes the diagnosis very likely. If untreated, secondary syphilis can develop, most commonly 4-12 weeks after the initial chancre. Symptoms of this stage are largely systemic flu-like symptoms and dermatological features. A widespread maculopapular rash is common, and condyloma lata (wart-like lesions) can also be present.

The main treatment for syphilis is usually via intramuscular benzylpenicillin; this is usually effective at eliminating the infection. However, due to the release of endotoxins secondary to the elimination of the bacteria, over half of the patients receiving treatment for syphilis may suffer what is referred to as the 'Jarisch Herxheimer reaction'. This usually presents with fever, headache, sweating and myalgia arising around 2-3 hours after the first dose is given; however, the reaction is usually self-limiting.

Whilst penicillins can cause agranulocytosis in extremely rare cases, given the low frequency of such events, and the number of conditions that penicillins are given for, it is not necessary to inform him to report any new-onset fever. This would be more appropriate for drugs such as carbimazole or carbamazepine that have a greater risk of this complication.

Certain drugs should not be combined with statins, as they will increase the risk of myalgia. Drugs that inhibit the CYP450 enzyme system can prevent statins from being metabolised and result in increased side effects (myalgia being the most prevalent). However, penicillins do not frequently have this interaction, so this is not an issue in this scenario; this advice would be more appropriate for a patient taking macrolide antibiotics such as clarithromycin.

Syphilis is treated most commonly using a one-off injection of benzylpenicillin; it does not require tablets to be taken at the same time every day

Achilles tendon rupture is a recognised complication of ciprofloxacin; one of the fluoroquinolones. These are not usually used in the treatment of syphilis.

Further reading:

https://cks.nice.org.uk/topics/syphilis/

Question:

A 64-year-old man attends the emergency department complaining of back pain and leg weakness. He explains that the pain has gradually developed over the past few days and now radiates down through both his legs. The patient denies any trauma and comments that he has been unable to pass any urine for the last 12 hours.

His past medical history includes ongoing metastatic prostate cancer, as well as type II diabetes for which he takes metformin.

Examination reveals localised spinal tenderness at the L3 level, as well as an absence of anal tone. Motor examination shows bilateral lower limb weakness. Cranial nerve examination is normal, and his vital signs are within normal limits.

Given the likely diagnosis, which of the following investigations is it most important to perform?

A. CT head

B. CT whole spine

C. Blood glucose levels

D. MRI whole spine

E. MRI lumbar spine

Correct Answer:MRI whole spine

Explanation:

This patient is presenting with cauda equina syndrome secondary to compression by metastatic tumour spread. It is an oncological emergency, and the most important investigation to perform is an MRI whole spine. Metastatic spinal cord compression can occur with a wide variety of primary carcinoma locations, however, it is most common in patients with breast, lung and prostate cancer.

A CT head would be the most important investigation if a stroke or traumatic head injury is suspected as a cause of the patient’s symptoms. However, this patient denies trauma and the neurological exam suggests that a stroke is unlikely.

MRI is the preferred imaging modality here, as it is a more accurate imaging tool for cancerous tissue. A CT whole spine is less useful, and would generally only be performed in this situation if MRI was unavailable.

While assessing blood glucose levels is good practice in acutely unwell patients with a background of diabetes mellitus, the clinical picture here does not fit a derangement in blood glucose levels. There is a role in monitoring blood glucose levels in patients with spinal cord compression, as the steroid treatment for the condition can precipitate hyperglycaemia. However, this is of minor importance compared to spinal imaging.

An MRI lumbar spine is not appropriate for this patient, as metastatic compression of the spinal cord can occur at multiple sites. Therefore full spinal imaging is more important in this case to avoid missing any pathology.

Further reading:

https://pathways.nice.org.uk/pathways/metastatic-spinal-cord-compression

Question:

A 75-year-old man presents to the GP with a 2-month history of increased urinary frequency and urgency. Each time he attempts to pass urine, there is a weak stream and hesitancy, and he remains with a feeling of incomplete emptying. He denies any dysuria, haematuria, or suprapubic tenderness.

A rectal examination is performed, which demonstrates an enlarged prostate that is irregular and asymmetrical in texture. There is no blood or mucus.

A blood test is performed later:

Test Result Reference range

Haemoglobin 167 g/L (130 – 180)

Platelets 190 x 109/L (140 – 400)

White cell count 7.5 x 109/L (3.6 – 11.0)

Prostate-specific antigen 5.3 ng/mL (<4.0)

Urea 3.4 mmol/L (2.5 – 7.8)

Creatinine 75 μmol/L (59–104)

A prostate biopsy is taken.

What is the most likely histological finding?

A. Transitional cell carcinoma

B. Adenocarcinoma

C. Squamous cell carcinoma

D. Urothelial carcinoma

E. Benign prostatic tissue

Correct Answer:Adenocarcinoma

Explanation:

Adenocarcinoma is correct. This patient is presenting with lower urinary tract symptoms (symptoms suggestive of obstruction to outflow, in this case, incomplete voiding, weak stream, and hesitation) and an enlarged prostate. Since the enlargement of the prostate is asymmetrical and it is irregular in texture, this should raise suspicion of prostate cancer. The elevated prostate-specific antigen (PSA) supports this diagnosis. Of the types of prostate cancer, adenocarcinoma is the most common and constitutes around 95% of prostate cancers.

Benign prostatic tissue is incorrect. Although prostate cancer can present similarly to benign prostatic hyperplasia, the rectal examination would commonly show a smooth and uniform enlargement of the prostate, and the PSA value would typically be normal.

Squamous cell carcinoma, transitional cell carcinoma, and urothelial carcinoma are incorrect. Of the histological types mentioned, adenocarcinoma forms 95% of prostate cancers, followed by squamous cell carcinoma. Transitional cell carcinoma is commonly seen in the bladder but is extremely rare in prostate cancer. Urothelial carcinoma is also very rare.

Further reading:

https://patient.info/doctor/prostate-cancer-pro

Question:

A four-year-old girl is brought into the emergency department by her Mum. She has had a runny nose and a strange noisy cough for a few days. But this evening her Mum became more worried as she her breathing became more laboured.

She has a respiratory rate of 35/min, SpO2 of 96% on room air, a pulse of 95 bpm and a temperature of 37.7 oC.

On examination, there is mild intercostal recession and mildly reduced air entry on auscultation.

What is the most appropriate initial management?

A. Obtain intravenous access

B. Nebulised adrenaline

C. Penicillin V

D. Nebulised salbutamol

E. Oral dexamethasone

Correct Answer:Oral dexamethasone

Explanation:

The most likely diagnosis is croup. Croup is a common childhood illness that typically presents with coryza, harsh barking cough, hoarse voice and sometimes inspiratory stridor. It is caused by a viral infection which results in inflammation of the upper airways. It most commonly affects children aged six months to six years.

First-line management options include trying to keep the child calm, ensuring adequate fluid intake, paracetamol and oxygen therapy if SaO2 is less than 93%. Steroids have been shown to be effective at easing symptoms within a few hours and therefore they would be appropriate to use in this scenario. The most common steroid used is dexamethasone 150 micrograms/kg by mouth or injection. Other options include prednisolone or a budesonide nebuliser.

Nebulised adrenaline is reserved for severe cases of croup that do not respond to steroid therapy.

Obtaining intravenous access is not necessary at this stage and is likely to distress the child and further exacerbate her symptoms.

Croup is usually caused by a viral infection, therefore, penicillin V is of no use.

Nebulised salbutamol can be used to manage acute asthma and viral-induced wheeze but is not indicated in croup.

Further reading:

https://patient.info/doctor/croup-pro

Question:

A 36-year-old Afro-Caribbean woman presents to her GP with worsening heavy menstrual bleeding. She bleeds for eight days every 28 days with no intermenstrual bleeding. She often experiences clots and flooding. She is nulliparous and has been trying to conceive for 15 months with no success despite regular sexual intercourse. She has a BMI of 29 and is otherwise fit and well.

On examination of her abdomen, the uterus is enlarged and knobbly. Per speculum, her cervix appears normal. The results of her STI screen from the sexual health clinic are also normal. She is anaemic with a Hb of 96 g/L, and she has recently been commenced on oral iron supplementation. A transvaginal ultrasound demonstrates multiple intramural and submucosal fibroids, the largest of which is 35mm.

What is the most appropriate initial treatment for her heavy menstrual bleeding?

A. Tranexamic acid

B. Levonorgestrel-releasing intra-uterine system (LNG-IUS)

C. Myomectomy

D. Combined oral contraceptive pill (COCP)

E. Progestogen subdermal implant

Correct Answer:Tranexamic acid

Explanation:

The patient has two concerns: heavy menstrual bleeding (HMB) due to fibroids and subfertility. As she has been trying to conceive for less than two years, she should continue expectant management of subfertility with regular intercourse and lifestyle changes, but this will affect her choice of treatment for HMB. As an initial management step, tranexamic acid is the most appropriate option as it has no contraceptive properties and is non-invasive. Tranexamic acid is an oral antifibrinolytic. It works by blocking lysine binding sites on plasminogen molecules, thereby preventing plasmin formation and fibrinolysis. It is contraindicated in women with a high risk of thrombosis.

Fibroids, also known as leiomyomata, are benign tumours of the myometrium. They are most common near the menopause, in Afro-Caribbean women and those with a family history. Fibroids may be submucosal projecting into the uterine cavity, intramural contained within the wall of the uterus or subserosal projecting outwards from the surface of the uterus.

50% of fibroids are asymptomatic. The most common symptom is HMB (30%). Large fibroids may have pressure effects, including pelvic pain and urinary frequency. Fibroids blocking the tubal ostia may impair fertility; additionally, submucosal fibroids may prevent implantation.

The NICE guidance advises that the LNG-IUS is the first-line treatment of HMB when there is no identified pathology, or there are fibroids less than 3cm in size, or there is suspected/confirmed adenomyosis. This is also a form of contraception; therefore, it is not suitable for this patient. If the LNG-IUS is not appropriate, the patient can be offered: pharmacological (non-hormonal or hormonal options), uterine artery embolisation or surgical treatment.

The COCP and progestogen subdermal implant are contraceptives and therefore, not appropriate in this case.

Uterine artery embolisation is an alternative to surgery which is performed by radiologists. It aims to reduce fibroid volume by 30-50%. It may improve fertility, but its effects are inferior to myomectomy.

Myomectomy can be performed open or laparoscopically if medical treatment has failed in a woman wishing to preserve her reproductive function. Other surgical options include hysteroscopic resection of fibroids or hysterectomy.

Further reading:

https://www.nice.org.uk/guidance/ng88/chapter/Recommendations#management-of-hmb

Question:

A 69 year old man attends A&E with “excruciating” back pain. He says his pain started around 4 weeks ago but has escalated in the past week. He tells you he saw his GP 2 weeks ago who gave him some new painkillers but they have only made things worse. He has no neurology in his legs and is passing urine but tells you he has not opened his bowels in 2 weeks. He has brought a list of his current medication with him; which of the following medications is most likely to have caused his constipation?

A. Paracetamol

B. Codeine

C. Citalopram

D. Ibuprofen

E. Lansoprazole

Correct Answer:Codeine

Explanation:

Codeine, as with all opiates, can be very constipating and should be used with caution in older people. It is likely that by giving this patient codeine to help his back pain, the GP inadvertently made it worse by causing constipation which can present with back pain. Patients should always be made aware of the constipating effects of codeine and if needed, prescribed a laxative to use alongside the medication.

Common side effects of the other drugs are listed below:

Paracetamol - has very few side effects unless taken in overdose (in which case patients develop nausea, vomiting, abdominal pain, jaundice, liver failure)

Citalopram - drowsiness, insomnia, gastrointestinal disturbance, weight change

Ibuprofen - gastritis, exacerbation of asthma

Lansoprazole - diarrhoea, low magnesium

Further reading:

https://www.bmj.com/rapid-response/2011/10/30/thinking-ahead-prevent-codeine-side-effects

Question:

You are a junior doctor working in the acute medical unit. You are asked to assess a 53-year-old male complaining of a headache. The headache is localized to the left parietal region of his head and is 10 out of 10 severity. He reports that it is associated with weakness of his right forearm and hand. He is alert and orientated.

Which feature in the patient's history, when taken in isolation, would be most suggestive of the need to consider a CT brain?

A. Age over 50 years

B. Localization to left parietal region

C. Weakness of right forearm and hand

D. Being alert and orientated

E. 10 out of 10 severity

Correct Answer:Weakness of right forearm and hand

Explanation:

The new-onset right-sided forearm and hand weakness would warrant CT scanning to exclude a sinister cause of the headache such as haemorrhage or tumour. A full neurological examination would also be required to corroborate the history and confirm the weakness.

Being over 50 years old is not significant alone and being alert and orientated would not be an indication for CT brain scanning.

10 out of 10 severity alone does not warrant CT scanning. It is important not to confuse severe headache with thunderclap headache; the definition of a thunderclap headache is specifically 'sudden onset headache reaching maximum intensity within 5 minutes'.

Localization to the left parietal region could be in keeping with arm weakness on the contralateral side and the two in combination may suggest a sinister pathology. However, localization of pain alone is not an indication to perform head imaging as many causes of headache such as migraine or temporal arteritis may present with focal headache without radiological findings.

It is useful when given a focused history in an acute area to begin thinking about important symptoms and signs relevant to potentially serious underlying conditions. In practice, these are known as red flags, and focal neurological deficit as seen here is a red flag in a headache presentation.

Further reading:

https://www.nice.org.uk/guidance/cg150/chapter/Recommendations

Question:

A 17-year-old boy was rushed to A&E with difficulty breathing and swelling of the lips and eyes. He was having dinner at a restaurant when this occurred.

His heart rate was 110 bpm, and his blood pressure was 84/60 mmHg. Anaphylaxis was suspected, and the boy was managed with IM adrenaline.

What investigation can be carried out to confirm the diagnosis of anaphylaxis?

A. Serum histamine levels

B. Skin patch testing

C. Serum IgG levels

D. Serum IgE to recognised allergens

E. Serum tryptase levels

Correct Answer:Serum tryptase levels

Explanation:

Serum tryptase levels can be used to confirm the diagnosis of anaphylaxis. Tryptase is released from mast cells during degranulation. A normal tryptase level does not exclude anaphylaxis, however.

Serum histamine levels are not suitable, due to histamines shorter half-life.

Serum IgE to recognised allergens is not useful in the acute setting but can be used to determine the cause of the anaphylaxis following the event.

Skin patch testing would not aid in confirming the diagnosis of anaphylaxis.

Serum IgG levels would not aid in confirming the diagnosis of anaphylaxis.

Further reading:

https://patient.info/doctor/anaphylaxis-and-its-treatment

Question:

You are a junior doctor reviewing a patient with a penetrating arm injury in the emergency department. Upon examination of their upper limb, you discover that they are unable to flex their arm at the elbow.

Which peripheral nerve is most likely to have been damaged?

A. Musculocutaneous nerve

B. Ulnar nerve

C. Axillary nerve

D. Radial nerve

E. Median nerve

Correct Answer:Musculocutaneous nerve

Explanation:

The musculocutaneous nerve is formed from the C5/C6 nerve roots and arises from the lateral cord of the brachial plexus. It innervates the biceps muscle to facilitate flexion at the elbow. It is, therefore, most likely that this nerve has been injured.

The radial nerve innervates the triceps, extensor digitorum and abductor pollicis longus, facilitating extension at the elbow and fingers and abduction at the thumb.

The axillary nerve comes from the posterior cord of the brachial plexus and innervates the deltoid, providing abduction of the arm. It also facilitates sensation to the 'regimental badge patch' on the lateral aspect of the upper limb.

The median nerve allows flexion and abduction of the wrist, flexion of the distal phalanx of the thumb, flexion of the distal phalanx of the index and middle fingers, pronation of the forearm and opposition of the thumb.

The ulnar nerve innervates flexor carpi ulnaris, the first dorsal and second palmar interosseous, adductor pollicis and the ulnar aspect of flexor digitorum profundus. It facilitates abduction of the pinky finger and index finger, adduction of the index finger and adduction of the thumb. It also flexes the distal phalanx of the ring and pinky fingers.

Further reading:

https://patient.info/doctor/neurological-examination-of-the-upper-limbs

Question:

A 50-year-old man presents with an 8-week history of an abdominal bulge. He is obese, but was otherwise previously fit and well. On examination, the bulge is in the midline centred 4 cm superior to his umbilicus, and measures ~3 cm in diameter. On coughing, the bulge grows transiently larger and transmits an impulse.

Which of the following best describes the indications for surgical intervention?

A. Surgery should be considered if an abdominal x-ray shows distended bowel loops

B. Surgery should be considered if the bulge is irreducible and tender

C. Surgery should be considered in all cases

D. Surgery should be considered if the bulge is interfering with the patient’s quality of life

E. Surgery should be considered if the bulge is irreducible

Correct Answer:Surgery should be considered in all cases

Explanation:

The bulge described in this question is most likely an epigastric hernia, which results from a defect in the linea alba superior to the umbilicus. This type of hernia should always be repaired surgically even if it is asymptomatic, as it is associated with a high risk of bowel strangulation.

Irreducible bulges probably contain incarcerated sections of bowel. If an abdominal X-ray also shows dilated bowel loops, then the hernia is also causing bowel obstruction. If the hernia is also tender, it is likely that the blood supply to the bowel inside the hernia has become compromised; this bowel is then said to be strangulated within the hernia. Irreducibility, obstruction, and strangulation are always indications for urgent surgical referral for all types of hernias.

Inguinal hernias are common, and if there are no signs of incarceration/obstruction/strangulation then they can be left (in adults only), or repaired if the patient feels it is interfering with their quality of life.

Further reading:

https://patient.info/doctor/abdominal-wall-hernias

Question:

A 2-year-old boy is brought to see the general practitioner by his mother with a two-day history of ear pain with ear discharge.

The tympanic membrane is red and inflamed; the cone of light is absent. A small perforation is visible in the central portion of the membrane.

Which of the following complications is most likely to be associated with the probable cause of this patient's symptoms?

A. Pott's puffy tumour

B. Labyrinthitis

C. Sensorineural hearing loss

D. Encephalitis

E. Auricular haematoma

Correct Answer:Labyrinthitis

Explanation:

The most likely diagnosis, in this scenario, is acute otitis media, given the classic history of ear pain with tympanic membrane rupture and otorrhoea. Otitis externa is an important differential; this would be less likely to cause a perforation, and the erythema would be expected to be localised to the external auditory meatus, rather than the tympanic membrane. Acute otitis media classically affects younger children and those with underlying risk factors such as craniofacial abnormalities, exposure to cigarette smoke, and allergies.

There are a number of complications of acute otitis media that can develop in a minority of cases:

Mastoiditis - this is the most severe complication to be aware of and can present with swelling over the mastoid process and displacement of the pinna

Otitis media with effusion - this is a possible cause of conductive hearing loss in young children (acute otitis media is very unlikely to lead to a sensorineural hearing loss)

Labyrinthitis - the infection can spread to cause inflammation of the inner ear

Tympanic membrane perforation

Pott's puffy tumour is a rare form of osteomyelitis of the frontal bone; it can develop from untreated sinus disease rather than from otitis media

An auricular haematoma ('cauliflower ear') usually arises due to significant trauma to the pinna - rugby being a classic example. It is not a complication of otitis media.

In exceptionally rare cases, otitis media infection can spread through the tegmen tympani (the roof of the middle ear) to allow for cerebral involvement. This can cause meningitis or brain abscess development, but is unlikely to result in encephalitis; inflammation of the brain parenchyma alone, which is most commonly due to viral infection.

Further reading:

https://cks.nice.org.uk/topics/otitis-media-acute/background-information/complications/

Question:

Meig’s syndrome is a triad of pleural effusion (usually right-sided), ascites and a benign ovarian tumour.

Which benign ovarian tumour is commonly associated with Meig’s syndrome?

A. Teratoma

B. Mucinous cystadenoma

C. Sex-cord tumour

D. Functional cyst

E. Fibroma

Correct Answer:Fibroma

Explanation:

Meigs' syndrome involves a triad of:

A benign ovarian tumour (fibroma).

Ascites

Pleural effusion

Common presenting symptoms of Meigs' syndrome include:

Shortness of breath (due to pleural effusion)

Abdominal swelling

Fatigue

Pelvic discomfort and bloating

Non-productive cough

Functional cysts are the most common type of ovarian tumour. These tend to regress after 3 ovulation cycles and therefore rarely require treatment unless there is evidence of ovarian torsion.

Teratomas are a germ cell tumour with low-grade malignancy potential.

Sex-cord tumours have a low-grade malignancy potential and secrete oestrogens or androgens.

Mucinous cystadenoma is a benign cystic tumour lined by a mucinous epithelium. Mucinous cystadenomas make up 15–20% of all ovarian tumours. They often become very large and can extend up into the abdomen. Benign mucinous cystadenomas compose 80% of mucinous ovarian tumours.

Further reading:

https://patient.info/doctor/meigs-syndrome

Question:

A 7-year-old girl presents with a worsening cough at night. She has a previous diagnosis of asthma which was well-controlled with inhaled salbutamol PRN and a daily low-dose inhaled corticosteroid. When she does exercise at school, she has been getting out of breath despite taking her salbutamol inhaler. She also suffers from eczema which is well-controlled with daily use of topical emollients.

On examination, she appears well with no abnormal breath sounds. Inhaler technique is adequate.

What is the most appropriate next step in her management plan, according to the British Thoracic Society guidelines?

A. Increase the dose of inhaled corticosteroid

B. Refer to a specialist

C. Increase the dose of inhaled salbutamol

D. Add a long-acting beta agonist

E. Add a leukotriene receptor antagonist

Correct Answer:Add a long-acting beta agonist

Explanation:

A long-acting beta-agonist (LABA) is the most appropriate next step according to British Thoracic Society (BTS) guidelines.

An important and simple initial step not to forget when managing patients with asthma is to check their inhaler technique. Devices can be used in primary care to check the correct degree of inhalation for the specific inhaler. Ensuring correct inhaler technique could reduce the need for unnecessary extra medications which can cause unwanted side effects.

Adding a leukotriene receptor antagonist (LRTA) is recommended if the LABA is not effective. In contrast BTS guidelines, NICE advocated a trial of an LRTA before the introduction of a LABA.

Increasing the dose of inhaled corticosteroid (ICS) may help in this patient, however, this is not the recommended next step in management according to NICE guidance. Moderate dose ICS is used earlier in the management of asthma in under 5s.

Increasing the dose of inhaled salbutamol is unlikely to prevent this patient’s symptoms, which is the aim of management at this stage.

It would be inappropriate to refer to a specialist at this early stage of management; this would be recommended if the LTRA and LABA both failed to control this patient’s symptoms.

Further reading:

https://www.brit-thoracic.org.uk/news/2019/btssign-british-guideline-on-the-management-of-asthma-2019/

Question:

A 72-year-old man presents with a pearly, ulcerated lesion on his nose which has been slowly growing over previous months.

A clinical diagnosis is made of basal cell carcinoma.

What is the most appropriate next step in the management of this patient?

A. Cryotherapy

B. Imiquimod cream

C. Fluorouracil cream

D. Surgical excision

E. Photodynamic therapy

Correct Answer:Surgical excision

Explanation:

The standard treatment for basal cell carcinoma, where the patient is suitable for surgery, is surgical excision. This is the treatment option with the highest chance of long-term cure and lowest failure rate. The site of this patient’s lesion, on the central face, places him at higher risk of recurrence, making this a 'high-risk' lesion. Mohs micrographic surgery involves surgical removal, with subsequent microscopic examination of the excised sample, and further excision if there is residual BCC (and so on, until all the BCC is excised). This may be undertaken for high-risk facial lesions such as in this case, or for lesions in cosmetically challenging areas where simple surgery is inappropriate.

Imiquimod is a topical therapy that acts as an immune modulator. It has a role in the treatment of primary, small, superficial BCC. Efficacy may be limited by patient tolerability of the prolonged course and the inflammatory reaction imiquimod induces.

Like imiquimod, fluorouracil is a prolonged course topical therapy that can be considered for the treatment of superficial BCC where the patient has declined, or would not be suitable for, surgery or other treatment such as cryotherapy. It has a direct effect on cancer cells, acting as an anti-metabolite, and inducing an inflammatory reaction at the site of application. Treated skin should be carefully protected from the sun. It is less effective than fluorouracil, and recurrence is common.

Cryotherapy is a therapeutic option for low-risk BCC, and generally gives poorer cosmetic results than excision. Other disadvantages include difficulty in assessing recurrence, and a lack of histological specimen to determine complete excision.

Photodynamic therapy involves the application of photosensitizing cream to the lesion, followed by the application of light of a specific wavelength to the sensitized lesion. It is effective for low-risk, superficial BCC, but not recommended for other BCC subtypes.

Further reading:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4873942/

Question:

A 6-month-old baby is brought to the emergency department by their mother, who is worried about new bruising. The patient is crying excessively, and Mum is upset as well. The baby was born vaginally at term (40 weeks), and there have been no developmental concerns. Vaccinations are up-to-date. Mum did not drink or smoke during the pregnancy, which is her first. The patient is cared for by Mum and her partner, who occasionally looks after the baby unsupervised.

On examination, the baby has linear, circumferential bruises on the anterior chest wall at nipple level, which extend around the flanks to the axillae bilaterally. There are no skin rashes. There are no demonstrable neurological signs such as altered muscle tone, altered reflexes or abnormal pupillary responses.

What is the most appropriate initial investigation?

A. Swab for herpes zoster infection

B. CT head scan

C. Full skeletal survey and CT head scan

D. Full skeletal survey

E. Coagulation screen

Correct Answer:Full skeletal survey and CT head scan

Explanation:

Everyone working with paediatric patients must have a low threshold for suspecting and non-accidental injury (NAI). These concerns must be investigated and, if appropriate, taken forward with the Child Protection team to ensure the health and wellbeing of children and young people is protected. New bruising in a young person has a range of benign and concerning explanations. Differential diagnoses include misadventure (accidental falls and bumps), coagulation disorders such as haemophilia and von Willebrand disease, haematological malignancy or non-accidental injury.

These bruises are consistent with a baby who has been shaken. In the emergency department, any baby <1-year-old with suspected non-accidental injury should receive a full skeletal survey (whole-body radiographs to exclude bony fractures) and a CT head scan to exclude traumatic brain injury.

Coagulation screening could be considered by the paediatric team if a child has repeat episodes of unexplained bruising or there is a family history of clotting / bleeding disorders.

Swab for herpes zoster is a distractor answer because one may mistake the description of this bruising for the dermatomal rash seen in shingles. This is a very unlikely diagnosis in a 6-month-old baby and shingles is diagnosed clinically.

Further reading:

https://geekymedics.com/non-accidental-injury-nai/

Question:

Stephanie is a 42-year-old nulliparous woman who presents with a short history of nipple discharge. She states that the discharge from her left nipple is usually clear but she has noticed that it can be occasionally blood-stained.

She is otherwise well and takes no regular medication. There is no family history of breast disease. On inspection of the breast, you do not note any obvious skin changes or nipple deformity. On examination, you do not detect any palpable lumps.

What is the most likely diagnosis?

A. Intraductal papilloma

B. Fibroadenoma

C. Breast abscess

D. Paget’s disease of the nipple

E. Duct ectasia

Correct Answer:Intraductal papilloma

Explanation:

Stephanie has presented with a likely diagnosis of intraductal papilloma. This is a benign condition where a papilloma grows inside the breast ducts. The bloody discharge is due to twisting of the papilloma. While intraductal papillomas do not increase the risk of breast cancer, women who present with multiple papillomas may choose to have them excised.

A breast abscess would typically present with lactational mastitis. Examination usually reveals a tender fluctuant mass. They do not cause nipple discharge.

Duct ectasia usually presents in women over 50 with thick green nipple discharge due to dilatation of multiple breast ducts.

Fibroadenomas are common in young women, they are non-tender mobile lumps. They do not cause nipple discharge.

Paget’s disease of the nipple is associated with underlying breast malignancy. It would feature eczematoid changes on the nipple/areola.

Further reading:

https://patient.info/doctor/benign-breast-disease

Question:

An 8-year-old boy presented five days ago with bilateral facial swelling and was diagnosed with mumps. His Mother has brought him back to see you today because he is more unwell. She says that he has become feverish, sweaty and is experiencing scrotal pain. This began during the night.

You examine the scrotum. On inspection, the scrotum is swollen and oedematous, you cannot palpate either testis.

What is the most likely diagnosis?

A. Hydrocele

B. Varicocele

C. Orchitis

D. Epididymal cyst

E. Haematocele

Correct Answer:Orchitis

Explanation:

The most likely diagnosis is orchitis. Orchitis may occur several days following the onset of parotiditis. It presents with local testicular pain and features of systemic illness such as swinging fever, chills and headaches.

Mumps is an acute viral infection caused by a paramyxovirus and spread by direct contact with saliva. Mumps classically presents with parotitis and non-specific systemic features such as fever, headache and malaise. Other possible manifestations include orchitis and oophoritis in women.

A haematocele classically occurs following trauma to the scrotum and presents either suddenly or chronically with painful scrotal swelling. Chronic haematocele can be associated with testicular cancer.

A varicocele is caused by varicosities of the pampiniform plexus. Varicocele typically presents as a painless scrotal swelling with the consistency of a ‘bag of worms’. Some patients may experience an uncomfortable dragging sensation associated with the condition.

A hydrocele can occur acutely or chronically. It presents as a painless scrotal swelling that on the examination will transilluminate.

An epididymal cyst is another differential of chronic painless scrotal swelling. Unlike a hydrocele, it will not transilluminate.

Further reading:

https://patient.info/doctor/mumps-pro

Question:

A 20-year-old man presents to the emergency department with a four-hour history of neck stiffness and a non-blanching rash. He is mumbling incoherently and shies away from your pen torch during your attempt to assess his pupils.

You check his blood glucose and lumbar puncture, which show:

Test Result Normal range

Plasma glucose 5.2 mmol/L (4 - 6)

CSF glucose 1.0 mmol/L (2 - 4)

The CSF is very cloudy with no signs of a fibrin web.

Based on the likely diagnosis, what is the most likely causative pathogen?

A. Cryptococcus neoformans

B. Streptococcus pneumoniae

C. Cocksackie B virus

D. Cocksackie A virus

E. Mycobacterium tuberculosis

Correct Answer:Streptococcus pneumoniae

Explanation:

The clinical picture of meningitis is suggested by the history of photophobia (in the stem the patient shies away from a pen torch), neck stiffness, and a non-blanching rash. Streptococcus pneumoniae is a common cause of bacterial meningitis, which is differentiated from other pathogens from the fact this man's CSF glucose is less than half of his plasma glucose. Bacteria consume glucose for respiration in the CSF, hence the discrepancy from his lumbar puncture.

Cocksackie A virus is an enterovirus, which is a group of viruses that commonly cause meningitis. Viral meningitis does not give low CSF glucose and usually presents less severely, although if there is any doubt the management would be to assume a bacterial cause and treat accordingly.

Cocksackie B virus is, again, an enterovirus and would usually present with normal CSF glucose of around 60-80% of the plasma level.

Cryptococcus neoformans is a fungus and a potential cause of fungal meningitis, which is a much rarer form of the disease. Fungal meningitis can lower CSF glucose, but it is usually seen in the immunocompromised and generally has a more chronic onset. There is no indication he is immunocompromised, so a bacterial cause is much more likely.

Mycobacterium tuberculosis is a bacterium, so it could give rise to low CSF glucose. However, it is much less common than streptococcus pneumoniae as a cause of meningitis. Infection with mycobacterium is usually associated with travel and meningeal tuberculosis is associated with immunosuppression, which there is no indication of. Furthermore, tuberculosis tends to give a fibrin web in the CSF fluid; it is stated in the stem that there is no fibrin web, making streptococcus pneumoniae more likely.

Further reading:

https://patient.info/doctor/meningitis-pro

Question:

A 42-year-old woman presents to the A&E department with a 12-hour history of persistent, severe right upper quadrant (RUQ) pain and associated nausea/vomiting. She is usually fit and well, albeit has been experiencing intermittent bouts of a similar pain for the past week which have resolved after a few hours.

She has a temperature of 38.7° and a heart rate of 112bpm, but the rest of her vital signs are within normal limits.

On examination, she is not clinically jaundiced and her chest is clear. When palpating in the RUQ at the costal margin, taking a deep breath causes sharp pain and a halt in inspiration. This does not happen on the left side.

Blood tests reveal a raised WCC (14.4 x 109/L), but LFTs, U&Es and amylase are all within normal limits.

What is the most likely diagnosis?

A. Right lower lobe pneumonia

B. Biliary Colic

C. Acute pancreatitis

D. Acute cholecystitis

E. Acute cholangitis

Correct Answer:Acute cholecystitis

Explanation:

The most likely diagnosis here is acute cholecystitis – inflammation of the gallbladder typically due to the presence of a gallstone in the cystic duct causing outflow obstruction. Symptoms include RUQ pain, fever, nausea/vomiting and often a history of previous biliary colic or confirmed gallstones on ultrasound. Murphy’s sign is positive here due to the inflamed gallbladder descending on inspiration and making contact with the palpating hand. An urgent ultrasound would be a useful next step.

Acute cholangitis can present in a similar way to acute cholecystitis, but often with signs of obstructive jaundice. This is due to a gallstone (or other obstruction such as cancer of the pancreatic head) obstructing the common bile duct, which blocks the gallbladder and liver outflow leading to inflammation/infection of the whole biliary system. Blood tests would likely show a derangement in LFTs with a rise in bilirubin. Remember Charcot’s triad of fever, RUQ pain and jaundice.

Acute pancreatitis typically presents with epigastric pain radiating through to the back, but can also radiate to the RUQ if caused by gallstones. Typical blood test results include a raised serum amylase/lipase usually 3 times the upper limit of normal and often deranged LFTs.

Biliary colic pain usually lasts less than 6 hours and is not associated with infective symptoms or a positive Murphy’s sign. It is due to the gallbladder contracting and pushing gallstones temporarily into the cystic duct causing an intermittent obstruction. Common risk factors for gallstones can be remembered using the “5 F’s”: Fat, Female, Fertile, Forty and Family history.

Right lower lobe pneumonia can present with RUQ pain and fever but is less likely here due to the lack of other respiratory symptoms, a clear chest examination, normal oxygen saturation and respiratory rate. A chest X-ray would be a useful investigation to rule out signs of consolidation.

Further reading:

https://patient.info/doctor/gallstones-and-cholecystitis

Question:

A 38-year-old woman with a history of multiple sclerosis presents to her GP with a 2-week history of gradual onset double vision. She describes this as two images positioned side by side.

On examination, her left eye is deviated nasally and is unable to abduct.

Palsy of which cranial nerve most likely explains this patient’s double vision?

A. Sixth cranial nerve

B. Fourth nerve palsy

C. Seventh cranial nerve

D. Third cranial nerve

E. Ophthalmic branch of the fifth cranial nerve

Correct Answer:Sixth cranial nerve

Explanation:

The sixth cranial nerve innervates the lateral rectus muscle, which is responsible for the abduction of the eye. Therefore, a sixth nerve palsy results in an eye that is deviated nasally and is unable to abduct.

The third cranial nerve innervates the superior rectus, inferior rectus, medial rectus, inferior oblique muscles, as well as the levator palpebrae superioris and ciliary muscles. A third nerve palsy results in an eye that is deviated down and out.

The fourth cranial nerve innervates the superior oblique muscle, which depresses and abducts the eye. A fourth nerve palsy results in an eye that is deviated up and out.

The ophthalmic branch of the fifth cranial nerve is a sensory nerve of the face. It does not innervate the ocular muscles.

The seventh cranial nerve innervates the muscles of facial expression, lacrimal glands, salivary glands and anterior two-thirds of the tongue. It does not innervate the ocular muscles.

Further reading:

https://geekymedics.com/the-abducens-nerve-vi/

Question:

A 23-year-old man presents to the GP with a 1-week history of a painful, hot and swollen left knee and elbow. He reports the joints are also stiffer in the morning.

The patient received treatment with single-dose azithromycin for chlamydia approximately 6-weeks ago following an episode of dysuria. He has no other past medical history.

On examination, the joints have a limited range of movement and appear red and swollen. There is also notable conjunctival redness. All other vital signs are normal.

What is the most likely diagnosis?

A. Psoriatic arthritis

B. Septic arthritis

C. Post-viral arthritis

D. Reactive arthritis

E. Rheumatoid arthritis

Correct Answer:Reactive arthritis

Explanation:

The most likely diagnosis in this patient is reactive arthritis (ReA), formerly known as Reiter's syndrome. ReA is a form of inflammatory arthritis that belongs to the seronegative spondyloarthropathies and occurs after exposure to certain gastrointestinal or genitourinary infections. This patient has a recent history of infection with C. trachomatis. Typically, ReA presents with peripheral or axial arthritis, enthesitis, conjunctivitis and skin lesions, and systemic symptoms of fever and malaise. The classic triad, formerly known as Reiter's triad, includes post-infectious arthritis, non-gonococcal urethritis, and conjunctivitis; however, it is not required for diagnosis and is only seen entirely in a minority of cases.

Rheumatoid arthritis classically presents with a symmetrical polyarthritis, primarily affecting the small joints of the hands and feet. Rheumatoid arthritis also usually affects women aged 50 or older.

Classically, septic arthritis affects a single joint. The affected joint in septic arthritis is swollen, erythematous and warm; additionally, the patient usually has fevers ± rigors. The absence of systemic features in this patient and the involvement of two joints make this diagnosis less likely. Additionally, the presence of conjunctival redness is not a feature of septic arthritis.

Psoriatic arthritis also falls into the spectrum of seronegative spondyloarthropathies. Similarly to ReA, psoriatic arthritis presents in a pattern of oligoarticular joint involvement that is typically asymmetric. However, the additional key findings in psoriatic arthritis include a personal history or family history of psoriasis. The absence of psoriasis in this patient makes this diagnosis less likely.

Patients with post-viral arthritis present with arthralgias following an influenza-like illness, typically a parvovirus B19 infection. Unlike ReA, post-viral arthritis classically presents with symmetrical, small joint polyarthritis and is associated with a maculopapular rash. This patient has recently been treated for a genitourinary bacterial infection and has an asymmetrical oligoarthritis; therefore, this is a less likely option.

Further reading:

https://patient.info/doctor/reactive-arthritis-pro

Question:

A 65-year-old female develops pain in her right leg during the middle of the night, four days after an elective right hemicolectomy for caecal cancer. On examination, there is tenderness to palpation along the deep venous system of the calf and the patient's DVT Wells score is 3.

A D-dimer blood test reveals a level of 1200 ng/mL. The on-call doctor requests a proximal leg ultrasound scan to be performed the following day and prescribes rivaroxaban as empirical treatment for deep vein thrombosis in the interim.

The ultrasound scan the following day is negative.

Which of the following is the most appropriate next step in management for this patient?

A. Stop rivaroxaban and repeat the USS 6-8 days later

B. Continue rivaroxaban for 3 months

C. Continue rivaroxaban for 6 months

D. Stop rivaroxaban and consider alternative diagnosis

E. Continue rivaroxaban and repeat the USS 6-8 days later

Correct Answer:Stop rivaroxaban and repeat the USS 6-8 days later

Explanation:

This patient has presented with signs and symptoms of deep vein thrombosis (DVT). Her 2-level DVT Wells score is 3, therefore, the appropriate management options include:

Proximal leg vein USS within 4 hours (this was not possible due to the patient developing symptoms out of hours)

D-Dimer + interim therapeutic anticoagulation + proximal leg vein USS within 24 hours

NICE guidelines state that if the USS is negative, but the D-Dimer is positive, anticoagulation should be stopped and the scan repeated in 6-8 days.

Further reading:

https://www.nice.org.uk/guidance/ng158/resources/visual-summary-pdf-8709091453

Question:

A 71-year-old man presents to the emergency department with worsening shortness of breath and leg swelling. This started two days ago and has become progressively worse. Past medical history includes hypertension, for which he takes amlodipine. He has no known allergies.

On examination, RR 29/min, HR 93/min, BP 146/93mmHg, SaO2 89% on air, and he is afebrile. The JVP is raised at 5cm. Bibasal crackles are audible on chest auscultation, and pitting oedema is seen extending above the knees.

What is the most appropriate initial management option?

A. Furosemide PO

B. Amoxicillin PO

C. Furosemide IV

D. Piperacillin/tazobactam IV

E. Bendroflumethiazide PO

Correct Answer:Furosemide IV

Explanation:

This case demonstrates acute pulmonary oedema, secondary to cardiac failure. There is evidence of both right-sided heart failure (peripheral oedema and raised JVP) and left-sided heart failure (dyspnoea and chest crepitations). Pulmonary oedema involves the accumulation of fluid in the parenchyma and air spaces of the lungs and requires urgent treatment. Loop diuretics are used in the initial management of acute heart failure, with IV furosemide preferred over oral furosemide in the acute setting.

Bendroflumethiazide is a thiazide diuretic used more commonly in the management of hypertension. It has no role in managing acute heart failure, where furosemide is superior.

Infection is less likely in this patient, as she is afebrile, and the clinical features point more towards acute pulmonary oedema. Therefore, antibiotics are not needed immediately. However, further investigations (such as blood tests) are necessary to exclude infection, as this may be the potential cause of the acute heart failure. Despite this, IV furosemide is required initially to provide symptomatic relief.

Further reading:

https://geekymedics.com/management-of-acute-pulmonary-oedema/

Question:

A 50-year-old woman complains of pain in her right elbow. This has been present for the past four weeks and is maximal around 4-5cm distal from the lateral aspect of the elbow joint. The pain is made worse by extending the elbow and pronating the forearm.

What is the most likely diagnosis?

A. Radial tunnel syndrome

B. Cubital tunnel syndrome

C. Lateral epicondylitis

D. De Quervain’s tenosynovitis

E. Medial epicondylitis

Correct Answer:Lateral epicondylitis

Explanation:

Lateral epicondylitis, also known as tennis elbow, is the most common overuse syndrome in the elbow. It is an injury involving the extensor muscles of the forearm. These muscles originate on the lateral epicondylar region of the distal humerus.

Cubital tunnel syndrome and medial epicondylitis affect the medial aspect of the elbow joint.

De Quervain’s tenosynovitis does not affect the elbow, instead, it affects the 1st extensor compartment of the wrist.

Radial tunnel syndrome symptoms are very similar, however, the diagnosis is rare.

Further reading:

https://www.physio-pedia.com/Lateral\_Epicondylitis

Question:

Harry Harling is a 60-year-old gentlemen presenting to A&E with episodic vertigo and hearing problems. He describes a history of progressive hearing loss and episodic vertigo over the last 12 months. He has also become aware of a low volume ringing sound that is most apparent when he lies in bed at night. A cranial nerve examination reveals an absent corneal reflex and sensorineural hearing loss on the left.

Which investigation would give you the definitive diagnosis for the condition that this patient is most likely presenting with?

A. Fundoscopy

B. Chest X-ray

C. Dix-Hallpike test

D. MRI head

E. Otoscopy

Correct Answer:MRI head

Explanation:

The most likely diagnosis in this patient is an acoustic neuroma, given the history of episodic vertigo, tinnitus and unilateral hearing loss. The gold standard diagnostic investigation for acoustic neuroma is an MRI head.

Acoustic neuroma is a benign tumour in the brain that causes problems due to the nerves it compresses as it slowly grows. Initially, it starts in the internal auditory canal and internal acoustic meatus compressing cranial nerves V, VII and VIII. Symptoms include unilateral sensorineural hearing loss and vertigo (due to compression of CN VIII) and loss of the corneal reflex (due to compression of CN V). Tinnitus is also a common symptom of the condition.

CXR and fundoscopy are not relevant in this scenario.

The Dix-Hallpike test is a diagnostic manoeuvre used to identify benign paroxysmal positional vertigo (BPPV). BPPV can present with episodic vertigo, however, it would not cause unilateral sensorineural hearing loss, vertigo or loss of the corneal reflex.

It would be appropriate to perform otoscopy in this context, to rule out any other cause for the hearing impairment (i.e. obstruction of the canal, tympanic membrane perforation), however, the question asks for the investigation most likely to provide a definitive diagnosis for the likely condition which is an acoustic neuroma.

Further reading:

https://patient.info/doctor/acoustic-neuromas

Question:

A 32-year-old man presents to an ophthalmology clinic complaining of double vision when walking down the stairs.

He gives a history of a recent mountain biking accident that required attendance to the emergency department. He has since recovered but mentions he suffered a hard blow frontally to his head against a tree.

On examination, his left eye is slightly elevated when compared to the right, and he is noticed to have a right head tilt.

Which cranial nerve is most likely damaged in this patient?

A. CN VI

B. CN IV

C. CN II

D. CN V

E. CN III

Correct Answer:CN IV

Explanation:

CN IV is correct. The trochlear nerve (CN IV) innervates one muscle: the superior oblique. This is responsible for internally rotating (intorting), depressing and weakly abducting the eye. Therefore, a palsy of this nerve would lead to the other extraocular muscles overpowering the defunct superior oblique muscle, causing the affected eye to rest in an elevated, extorted (externally rotated) position. As a result, a patient with a trochlear nerve palsy may adopt a head tilt position that helps internally rotate (intort) the affected eye (head tilts away from the affected side). When a patient with a trochlear nerve palsy tries to look down, which in this case is while going downstairs, the affected eye cannot look down properly and vertical diplopia occurs. Clinically, CN IV palsy occurs congenitally or as a result of trauma as in this man's case. It is prone to damage from trauma as it is the thinnest cranial nerve with the longest intracranial course.

CN II is the optic nerve, which is responsible for visual perception. Damage to the optic nerve would result in a visual field defect or change to colour perception; for example, in optic neuritis colours appear poorly contrasted. Red hues in particular seem poorly saturated or pink. The optic nerve does not control the movements of the eye.

CN III is the oculomotor nerve (CN III), which is responsible for most of the movements of the eyeball and innervates the muscles medial rectus, inferior rectus, superior rectus, inferior oblique, as well as having some other functions. The superior oblique is one of the few muscles it does not control (as well as lateral rectus). A third nerve palsy classically gives a 'down and out' eye with a blown pupil.

CN V is the trigeminal nerve, which coordinates the sensation to the face, the jaw jerk reflex, the motor function of the muscles of mastication, and some secretory functions as well. While its ophthalmic branch is responsible for the afferent limb of the corneal reflex, damage to this nerve does not cause diplopia or deviation of the eye.

CN VI is the abducens nerve (CN VI), which innervates lateral rectus, the extraocular muscle responsible for eye abduction. Patients with abducens nerve palsies can present with a medially deviated eye and horizontal diplopia, not the vertical diplopia suggested in this question.

Further reading:

https://www.youtube.com/watch?v=0nZrhl\_Xag0

Question:

A 14-year-old boy is brought to the GP by his mother. For the past two weeks, he has been complaining of pain in his distal right thigh, which is made worse when he runs. On examination, he is noted to be obese and have a full range of movement in the right knee. He is able to flex his right hip fully but internal rotation is painful.

What is the most likely diagnosis?

A. Trochanteric bursitis

B. Slipped upper femoral epiphysis

C. Transient synovitis

D. Medial collateral ligament strain

E. Perthes disease

Correct Answer:Slipped upper femoral epiphysis

Explanation:

A child presenting with a chronic slipped upper femoral epiphysis (SUFE) will generally walk with an antalgic gait, out-toeing and some shortening of the affected limb. The child may complain of vague pain in the groin, thigh or knee. Classically the child is overweight, however, this may not always be the case.

A very reliable clinical sign of a chronic SUFE, even when mild, is obligatory external rotation of the leg during hip flexion. Anteroposterior (AP) and frog lateral pelvis x-rays of both hips should be obtained.

All patients with a SUFE or concern for a SUFE should be kept non-weight bearing and referred for an urgent orthopaedic assessment in the ED. The management of SUFE is always surgical.

Transient synovitis would usually include a history of precipitating viral illness.

Perthes disease commonly affects children aged 4-8.

Trochanteric bursitis is less likely seen in children and would manifest in lateral hip pain.

A medial collateral strain would typically include a precipitating history of trauma.

Further reading:

https://patient.info/doctor/slipped-capital-femoral-epiphysis-pro

Question:

A 62-year-old man is being reviewed in GP for three months of unexplained fatigue. He does not report any fevers, weight loss, shortness of breath, palpitations, alterations in his bowel habit, blood in his stool or pain in his muscles or joints. He has no prior medical history of significance. There are no significant findings on examination.

These are the results of his most recent blood test:

Blood test Result Reference Range

Hb 120 130 – 180 g/L

Total WCC 7.2 3.6 – 11.0 x 10⁹/L

Platelet Count 350 140 – 400 x10⁹/L

MCV 90 80 – 100 fL

Haematocrit 0.45 0.40 – 0.54 /L

Ferritin 200 25 – 350 ng/mL

Vitamin B12 700 180 – 1000 pg/mL

Folate 10.0 >4.0 ng/mL

His tests for thyroid function, renal function, liver function, HBA1C, coeliac disease, and CRP are unremarkable.

What is the next best step in this patient's management?

A. Urgent referral for colonoscopy

B. Routine referral for colonoscopy

C. Faecal Immunochemical test

D. Prescribe iron supplements

E. Routine referral to haematology

Correct Answer:Faecal Immunochemical test

Explanation:

The patient in the vignette has blood results consistent with non-iron deficient anaemia. Although he does not meet the NICE criteria for an urgent (2-week-wait) referral for colonoscopy, as he has anaemia of unknown origin, NICE recommends conducting a faecal immunochemical test (FIT) to detect blood in the stool. If the patient has a positive FIT test, they are subsequently referred for an urgent colonoscopy. The FIT test is more accurate than the guaiac-based faecal occult blood test (gFOBt) as it specifically binds to the haem in human haemoglobin.

The criteria for ordering a FIT test are:

are aged 50 or over with unexplained:

abdominal pain or

weight loss or

are aged under 60 with:

changes in their bowel habit or

iron-deficiency anaemia or

are aged 60 or over and have anaemia without iron deficiency.

Although an urgent referral for a colonoscopy may be considered later in his management, he does not meet the referral criteria.

The criteria for urgent referral for a colonoscopy under the suspected colorectal cancer pathway are:

they are aged 40 or over with unexplained weight loss and abdominal pain or

they are aged 50 or over with unexplained rectal bleeding or

they are aged 60 or over with:

iron-deficiency anaemia or

changes in their bowel habit, or

tests show occult blood in their faeces.

A suspected cancer referral (for an appointment within 2 weeks) should also be considered for:

people with a rectal or abdominal mass

Therefore an urgent referral for a colonoscopy is not warranted at this time.

A routine referral for colonoscopy may be considered later in his management; however, his non-iron deficient anaemia must be investigated to find the underlying cause. NICE recommends arranging a FIT test for patients aged 60 or over who have anaemia without iron deficiency to rule out lower GI bleeding. A routine colonoscopy referral may delay this patient's investigation and management.

A prescription for iron supplements is unnecessary for the patient in the vignette as he has normal ferritin. Iron supplementation may be considered for patients with iron-deficient anaemia. As this patient is not clinically iron deficient, there will be no clinical benefit.

A routine referral to haematology is unnecessary as the patient has not been fully investigated in GP. NICE recommends arranging a FIT test for patients aged 60 or over who have anaemia without iron deficiency to rule out lower GI bleeding. Advice and guidance might be sought from haematology if the patient were to have worsening anaemia with no underlying cause identified.

Further reading:

https://www.nice.org.uk/guidance/dg30/chapter/2-Clinical-need-and-practice#the-diagnostics-and-care-pathways

Question:

A 64-year-old presents with worsening vision when driving. He has recently noticed that he has become 'hypersensitive' to the lights of oncoming vehicles and that the glare prevents him from staying straight on the road.

His past medical history includes rheumatoid arthritis, Hashimoto's thyroiditis, and osteoarthritis, for which he takes methotrexate, prednisolone, levothyroxine, and ibuprofen. He has had surgical fixation of an ectropion in his left eye.

On examination, the patient has a visual acuity of 6/24 in the right eye, and 6/12 in the left eye, with an altered red reflex in the right eye. There are no issues with eye movement, and colour vision remains intact when tested with Ishihara plates.

Given the patient's likely diagnosis, what is the most likely complication of its treatment?

A. Nausea and vomiting due to anaesthetic used

B. Malignant hyperthermia

C. Headache post-procedure

D. Permanent reduction in colour vision

E. Posterior capsule opacification

Correct Answer:Posterior capsule opacification

Explanation:

The features of an altered red reflex, unilateral vision loss and glare, particularly when driving at night, make the most likely diagnosis, in this case, the presence of a cataract in the right eye. Cataracts develop due to opacification of the lens secondary to structural alterations of the crystallin proteins within this portion of the eye; the condition is extremely common with increasing age. Patients will often complain of progressive, painless visual loss, often with blurring and glare around lights.

The only real management option for cataracts is surgical intervention; no conservative or drug treatments currently exist. Phacoemulsification is the procedure carried out; this involves breaking up the lens using ultrasound waves and inserting a prosthetic lens to replace it. This is normally carried out as a day case, with no need for general anaesthetic, provided that patients are able to lie still during the surgery. The procedure has an extremely high success rate, and patients usually report a drastic improvement in visual acuity. In some cases, there can be complications post-surgery, with an extremely small risk of damage to other ocular structures or the introduction of infection (endophthalmitis). Posterior capsule opacification is the most common complication following cataract surgery; up to 50% of patients will have an opacification of the posterior portion of the capsule within a few years following the surgery. This is secondary to the proliferation of residual lens epithelial cells. This may be referred to as a 'second cataract' and patients may complain of a worsening of their vision after the initial improvement.

As phacoemulsification does not involve the use of general anaesthetic, there is no risk of malignant hyperthermia, which is a rare complication of suxamethonium use; a drug used as a muscle relaxant. As topical anaesthesia is used, patients do not usually suffer nausea or vomiting.

Headache and a permanent decrease in colour vision are complications associated with pan-photocoagulation, a procedure used in the treatment of proliferative diabetic retinopathy. Neither of these has been commonly documented as a result of cataract procedures.

Further reading:

https://patient.info/doctor/cataracts-and-cataract-surgery

Question:

A 65-year-old male patient presents to his GP with lumps around his neck. He mentions that the lumps have appeared within the last couple of months and have become progressively larger. They are not painful. The gentleman also complains of fatigue, generalised weakness, occasional night sweats and unintentional weight loss of 1 stone over the past 4 months.

Examination confirms cervical lymphadenopathy and enlarged inguinal and axillary lymph nodes. Additionally, hepatosplenomegaly is present on abdominal examination. The GP sends off routine blood tests and later discovers that the patient is pancytopaenic. He is referred to Haematology and the GP is later made aware that his lymph nodes were biopsied and were found to be Reed-Sternberg negative.

What is the MOST LIKELY diagnosis?

A. Non-Hodgkin’s lymphoma

B. Myeloma

C. Hodgkin’s lymphoma

D. Acute lymphoblastic leukaemia

E. Infectious mononucleosis

Correct Answer:Non-Hodgkin’s lymphoma

Explanation:

The most likely diagnosis is Non-Hodgkin’s lymphoma. Non-Hodgkin's lymphoma is a lymphoproliferative malignancy that varies in behaviour and treatment response according to histological type and stage. This condition presents with painless, slowly progressive, peripheral lymphadenopathy. B-symptoms may also be present (fatigue, weakness, night sweats, weight loss, fever), as well as hepatosplenomegaly. Routine blood tests will often show pancytopaenia (i.e. anaemia, thrombocytopaenia and neutropaenia). It is more commonly diagnosed in over 60s.

Hodgkin’s lymphoma is less likely in this case as lymph node biopsy would be positive for Reed-Sternberg cells if this was the case. Hodgkin’s is also less likely to disseminate to extranodal sites. It is also more commonly diagnosed in the 20-40 age group.

Acute lymphoblastic leukaemia is less likely in this case as it typically presents in children. It is the most common cancer of childhood.

Infectious mononucleosis is less likely to be the diagnosis as it presents with rapid onset lymphadenopathy, more common in younger age groups and does not cause B-symptoms or pancytopenia.

Myeloma is less likely in this case as it typically presents with bone pain (mainly in the back), acute kidney injury and features of hypercalcaemia (thirst, nausea, constipation, confusion etc).

Further reading:

https://patient.info/doctor/non-hodgkins-lymphoma-pro

Question:

A 66-year-old male patient arrives at A&E by ambulance, triaged as suffering a stroke. He is reported to ‘not be himself’ according to his partner since waking up this morning. He had difficulty getting dressed, more because he couldn’t understand how to do it. She also noted his speech is slurred and he has weakness in his right leg. On examination, he is noted to have broken speech but can repeat words back to you. He has difficulty raising his right lower limb off the couch and you notice he has wet his trousers. He has sensory loss in his right lower limb as well.

Which vascular territory is most likely to have been affected leading to the stroke?

A. Left middle cerebral artery stroke

B. Left anterior cerebral artery stroke

C. Basilar artery stroke

D. Right anterior cerebral artery stroke

E. Right posterior inferior cerebellar artery stroke

Correct Answer:Left anterior cerebral artery stroke

Explanation:

An anterior cerebral artery stroke is a condition whereby the blood supply from the anterior cerebral artery (ACA) is restricted, leading to a reduction of the function of the portions of the brain supplied by that vessel: the medial aspects of the frontal and parietal lobes, basal ganglia, anterior fornix and anterior corpus callosum. This comprises 2% of ischaemic strokes.

This causes contralateral motor and sensory loss, involving primarily the lower limbs and pelvic floor muscle/perineum (sparing the face and upper limbs), apraxia (individual has difficulty with the motor planning to perform tasks or movements when asked, provided that the request or command is understood and he/she is willing to perform the task), behavioral issues (frontal cortex), anosmia etc.

Further reading:

https://geekymedics.com/stroke-classification/

Question:

A 43-year-old Caucasian patient presents to the GP after noticing increasing ankle swelling that has been worsening over the past few days. He had assumed that it was due to the hot weather and sitting down for prolonged periods at his office job, but the swelling appears to be worsening. He denies shortness of breath, fatigue, chest pain or orthopnoea, and has been previously well, with his only past medical history being amblyopia that was treated as a child. He takes no regular medication.

Examination reveals pitting oedema up to the mid-calf bilaterally. Cardiac and respiratory examinations are both normal, and the patient's pulse, respiratory rate and blood pressure are all within normal limits. The GP asks the patient to provide a urine sample and performs dipstick testing, this shows +++ protein, with no blood, leucocytes or nitrites.

The GP orders a set of routine blood tests and refers the patient to hospital, informing him that he may require several medications and some dietary changes to help to control his symptoms.

What is the most likely diagnosis in this patient?

A. Alport syndrome

B. Wuchereria bancrofti infection

C. Minimal change disease

D. Arrhythmogenic right ventricular dysplasia

E. Membranous glomerulonephritis

Correct Answer:Membranous glomerulonephritis

Explanation:

This patient has presented with significant pitting oedema, for which there are a number of causes. Heart, renal and liver failure can all result in physiological imbalances that can allow for the accumulation of fluid within areas of the body; given the patient's lack of past medical history, these are unlikely in this case. The proteinuria on dipstick without blood or hypertension is indicative of a likely diagnosis of nephrotic syndrome. This is a term that encompasses a number of conditions affecting the glomerulus, that can lead to proteinuria, hypoalbuminaemia and oedema; the classical triad seen in nephrotic syndrome patients.

Given the patient's age and race, the most likely diagnosis is of membranous glomerulonephritis; this is the most common cause of nephrotic syndrome in those of European descent. Confirmation of the individual disease responsible for the development of nephrotic syndrome can be obtained via renal biopsy, but patients are often treated presumptively (in this case, based on his age and race), with biopsy reserved for those who are treatment-resistant, as renal biopsy carries a significant risk of bleeding.

Minimal change disease is another form of glomerulonephritis that could cause nephrotic syndrome and account for the patient's symptoms. However, the disease is far more common in children and is less commonly seen in adults than membranous glomerulonephritis, therefore, it is not the most likely diagnosis.

Arrhythmogenic right ventricular dysplasia is a rare form of cardiomyopathy; this could in theory lead to heart failure, which could, in turn, cause oedema. However, the condition will usually develop slowly; it would not explain the rapid onset of symptoms and proteinuria in this scenario.

Alport syndrome is a congenital disease that gives faults in type 3 collagen; patients usually present with a combination of nephritic syndrome and sensorineural hearing loss. This picture is more indicative of nephrotic syndrome, given the lack of blood on dipstick testing.

Wuchereria bancrofti is the pathogen most commonly implicated in the development of lymphatic filariasis, often referred to as 'elephantiasis'. This can cause lower limb oedema, but the condition is spread via mosquitos, and usually arises in those with a history of travel to endemic areas; thus it is unlikely in this patient.

Further reading:

https://patient.info/doctor/nephrotic-syndrome-pro

Question:

A 32-year-old man with a history of intravenous drug use presents to the emergency department with a 3-day history of fever and progressive fatigue. On examination, he has five splinter haemorrhages, and on inspection of his jugular venous pressure, he has giant v waves. Auscultation of his heart reveals a new systolic murmur. Examination of his chest is unremarkable.

What is the most likely causative organism underlying his presentation?

A. Enterococcus faecium

B. Staphylococcus aureus

C. Coxiella burnetii (“Q fever”)

D. Viridans Streptococci

E. Coagulae negative staphyloccous

Correct Answer:Staphylococcus aureus

Explanation:

The organism most likely to be the cause of this gentlemen’s presentation is Staphylococcus aureus. It is important to exclude endocarditis in patients presenting with non-specific symptoms such as fatigue and low-grade fevers, particularly those with risk factors such as IV drug use. The history and examination findings described in this scenario, including a new murmur (which in real life may not necessarily be known to be new or may even be absent), splinter haemorrhages and giant v waves, are all suggestive of tricuspid valve incompetence and right-sided endocarditis, which is in keeping with a history of IV drug use. This and the rapid clinical course (already causing valvular incompetence despite only 72 hours of symptoms) make Staphylococcus aureus the most likely causative organism. There are other causative organisms which can be associated with specific clinical situations: infective endocarditis due to Streptococcus bovis (specifically Streptococcus gallolyticus) infection, for example, may suggest an occult GI tumour as the underlying source of the bacteraemia, whereas Streptococcus mitis and sanguinis (viridans streptococci) is associated with poor dental hygiene and infection after dental procedures.

Coagulase-negative staphylococci can cause endocarditis but usually affects prosthetic heart valves and is more commonly associated with a sub-acute course of infection which develops over weeks to months.

Viridans streptococci and Enterococcus faecium are both common causes of endocarditis, but in this case, the history of IV drug use, rapid clinical course, and right-sided (tricuspid) endocarditis make S. aureus the more likely causative agent.

Coxiella burnetii is a much less common cause of ‘culture negative’ endocarditis, alongside the HACEK organisms (Haemophilus, Aggregatibacter, Cardiobacterium, Eikenella, Kingella), so on the balance of probability is a much less likely cause here.

Further reading:

https://geekymedics.com/infective-endocarditis/

Question:

You are a junior doctor working in general practice. You are reviewing a patient who is complaining of numbness of the pinky finger and medial half of the ring finger. You suspect they have cubital tunnel syndrome.

Which peripheral nerve is most likely to be affected?

A. Ulnar nerve

B. Musculocutaneous nerve

C. Axillary nerve

D. Radial nerve

E. Median nerve

Correct Answer:Ulnar nerve

Explanation:

The ulnar nerve is formed from the C8/T1 nerve roots and from the medial cord of the brachial plexus. It supplies sensation to the medial one-third of the palm and dorsum of the hand, pinky finger and medial half of the ring finger. It is, therefore, most likely that this patient has an ulnar nerve palsy, causes of which include neuropathy and disorders of the elbow such as cubital tunnel syndrome.

The radial nerve innervates the triceps, extensor digitorum and abductor pollicis longus, facilitating extension at the elbow and fingers and abduction at the thumb.

The axillary nerve comes from the posterior cord of the brachial plexus and innervates the deltoid, providing abduction of the arm. It also facilitates sensation to the 'regimental badge patch' on the lateral aspect of the upper limb.

The musculocutaneous nerve provides sensation to the lateral forearm and innervates the biceps, allowing flexion at the elbow. The median nerve allows flexion and abduction of the wrist, flexion of the distal phalanx of the thumb, flexion of the distal phalanx of the index and middle fingers, pronation of the forearm and opposition of the thumb.

Further reading:

https://patient.info/doctor/ulnar-nerve-disorders

Question:

A 28-year-old man is brought to the emergency department following a motor vehicle collision. Despite analgesia, he is experiencing significant pain in his left leg.

On examination, he is found to have a pale and pulseless left leg with posterior knee dislocation. The leg is extremely swollen and tight. Passive range of motion of the foot elicits excruciating pain in the calf.

Which of the following is the definitive management option for this patient?

A. Routine fasciotomy

B. Apply circumferential dressings

C. Keep the limb at a neutral level

D. Administer high-flow oxygen

E. Emergency fasciotomy

Correct Answer:Emergency fasciotomy

Explanation:

The most likely diagnosis in this patient is compartment syndrome - the critical increase in pressure within a fascial compartment. The most crucial aspect of managing compartment syndrome is early recognition and intervention. The definitive management option for acute compartment syndrome is an emergency fasciotomy. The goals of treatment are to salvage the affected limb and prevent irreversible muscle and nerve damage. Ultimately, outcomes are improved for patients when there is no delay in this intervention.

Fasciotomy is the only accepted treatment of compartment syndrome; however, key interventions in the interim to surgery include high-flow oxygen and keeping the limb neutral to the level of the heart. Whilst these interventions may help improve perfusion to the affected limb, they are not considered definitive management options.

Compartment syndrome is a surgical emergency; therefore, referral for a routine fasciotomy would not be an appropriate option for this patient.

The use of a circumferential dressing is absolutely contraindicated in suspected compartment syndrome. All dressings, splints, and casts should be removed immediately as they may worsen the fascial compartment pressure.

Further reading:

https://orthoinfo.aaos.org/en/diseases--conditions/compartment-syndrome/

Question:

A 24-year-old man is brought into A&E following a head injury during a cricket match, in which the ball hit him in the side of the head. He is nauseous and has vomited three times in the last 30 minutes. He lost consciousness initially but regained consciousness within 30 seconds. He has gradually become less responsive since arriving at the hospital.

On examination, he is tender in the left temporal region where the ball hit his head. He has a heart rate of 50bpm and blood pressure of 150/95mmHg. GCS is 13/15 and he is confused when asked questions about what happened. His pupils are reactive to light but not equal. His breathing is irregular and deep. On examination of the limbs, there is increased tone, spasticity and hyperreflexia in all 4 limbs.

CT head demonstrates a lens-shaped hyperdensity between the cranium and outer dura mater.

What is the most likely diagnosis in this patient?

A. Ischaemic stroke

B. Extradural haemorrhage

C. Subarachnoid haemorrhage

D. Intracerebral haemorrhage

E. Subdural haemorrhage

Correct Answer:Extradural haemorrhage

Explanation:

The most likely diagnosis is extradural haemorrhage which typically presents with loss of consciousness following head trauma, with a ‘lucid interval’ in which the patient temporarily improves, and then a deterioration as the bleed elevates intracranial pressure. Head trauma is commonly sustained over the temporal region, resulting in fracture of the pterion and rupture of the underlying middle meningeal artery, causing the development of a haematoma between the skull and dura. As the bleed progresses, it compresses the cerebrum, raising intracranial pressure (ICP) and causing midline shift. Without prompt neurosurgical intervention, rapidly rising ICP eventually causes brain stem herniation and death.

Subdural haematoma typically presents with a history of gradual deterioration in consciousness level, due to venous aetiology. Typical findings on CT include a crescentic hyperdensity between the inner dura mater and arachnoid mater.

Ischaemic stroke typically presents with focal neurological symptoms and a CT head will show evidence of focal intracerebral ischaemia.

Intracerebral haemorrhage will result in evidence of intracerebral bleeding on CT scan, rather than extracerebral bleeding.

Subarachnoid haemorrhage typically presents with sudden-onset thunderclap headache. A CT will demonstrate hyperdensity between the cerebrum and the arachnoid mater.

Further reading:

https://geekymedics.com/extradural-haematoma-overview/

Question:

A 10-year-old girl presents to the emergency department complaining of a swollen red eye for the last 6 hours. Examination of the eye is limited due to the swelling and discomfort, however, conjunctival hyperaemia and a reduced visual acuity is noted. The patient also reports painful eye movements. She has no other medical conditions, however, she did have a coryzal illness with facial pain a few days ago, which was managed conservatively.

Taking into account the most likely primary diagnosis, which complication has occurred in this patient?

A. Conjunctivitis

B. Meningitis

C. Pre-septal cellulitis

D. Retinoblastoma

E. Orbital cellulitis

Correct Answer:Orbital cellulitis

Explanation:

The complication which has occurred in this patient is orbital cellulitis. The primary diagnosis was rhinosinusitis due to the symptoms described in the stem, such as facial pain and coryzal symptoms. Left untreated, rhinosinusitis can cause bacterial infection to spread from the sinuses (most notably the ethmoid sinus) to the orbit. This causes a bacterial infection behind the orbit's septum known as orbital cellulitis. Orbital cellulitis causes painful eye movements, reduced visual acuity, diplopia and relative afferent pupillary defect. Orbital cellulitis is a sight- and life-threatening emergency and should be treated immediately.

Pre-septal cellulitis is a differential diagnosis in anyone suspected of orbital cellulitis. Symptoms and signs of pre-septal cellulitis include pain, swelling, and redness of the eyelid and peri-orbital region. Examination usually reveals no reduction in visual acuity, intact ocular movements, and no afferent pupillary reflex or proptosis is seen. This is not a sight-threatening condition however any diagnostic uncertainty should prompt further review by a specialist and appropriate CT imaging.

Meningitis is always an important diagnosis to rule out however does not match the symptom profile of this patient. Meningitis would present with a headache, fever, and neck stiffness. Patients may also complain of photophobia and/or phonophobia. There would not be reduced visual acuity or painful eye movements in meningitis. However, a prodrome may be present in some patients, and so it is important to ask about other meningitis symptoms to rule it out.

Conjunctivitis is not the complication that has occurred in this patient. In conjunctivitis, there will be conjunctival hyperaemia as seen in this patient however, reduced visual acuity and painful eye movements are not typically present. Patients with conjunctivitis may complain of a gritty or burning sensation, and there may be associated discharge or watering.

Retinoblastoma is a rare type of cancer that originates from the retina. Symptoms of retinoblastoma include poor vision, eye redness, and eye swelling, and during examination, a white pupil may be seen (known as leukocoria). Retinoblastomas are usually diagnosed in children before the age of one year and so will be highly unlikely to be the cause of the presentation in this patient.

Further reading:

https://geekymedics.com/orbital-and-periorbital-cellulitis/

Question:

A 62-year-old male presents to A&E with central crushing chest pain and nausea. His symptoms started 30 minutes ago when he was sitting at home watching television. The patient has a background of hypertension and hyperlipidaemia. He also mentions that his father passed away at the age of 65 due to a heart attack The patient’s observations reveal: heart rate 84bpm, blood pressure 130/90 mmHg, pulse oximetry 92% on air and respiratory rate 20.

A 12-lead-ECG is also performed and is shown below. The patient’s cardiac troponin levels are sent to the lab and are currently pending.

Which of the following is the most likely diagnosis?

Glenlarson / CC BY-SA

A. Ventricular tachycardia

B. Anterior ST-elevation myocardial infarction (STEMI)

C. Pericarditis

D. Pulmonary embolism

E. Inferior ST-elevation myocardial infarction (STEMI)

Correct Answer:Inferior ST-elevation myocardial infarction (STEMI)

Explanation:

The patient is presenting with classical symptoms of a ST-elevation myocardial infarction (STEMI). Typical presenting features of a STEMI include central crushing chest pain radiating to the left neck/jaw/arm, shortness of breath, palpitations, sweating and nausea. A STEMI occurs when a coronary artery is blocked by thrombus, leading to full-thickness ischaemia and necrosis of the myocardial tissue which is dependent on the vessel.

Typical ECG findings in STEMI include > 1mm of ST-elevation on 2 contiguous leads or a new LBBB with associated ischaemic chest pain. The area of ST-elevation corresponds to the area of affected myocardium. The ECG shows ST-elevation in leads II, III, and aVF which represent the inferior portion of the heart, supplied by the right coronary artery. As a result, the most likely diagnosis is an inferior STEMI.

NICE guidelines were amended in 2016 and define MI as the detection of a rise and/or fall of cardiac biomarkers values (preferably cardiac troponin) with at least one value above the 99th percentile of the upper reference limit and at least one of the following:

symptoms of ischaemia

new or presumed new significant ST‑segment‑T wave (ST‑T) changes or new LBBB

development of pathological Q waves in the ECG

imaging evidence of new loss of viable myocardium or new regional wall motion abnormality

identification of an intracoronary thrombus by angiography

An anterior STEMI refers to a STEMI affecting the anterior portion of the heart. It has the same clinical presentation as an inferior MI but involves > 1mm ST-elevation in the pre-cordial leads V1-V and sometimes the lateral leads I and aVL. An anterior STEMI is commonly caused by occlusion of the left anterior descending artery (LAD). Anterior myocardial infarctions are usually associated with poorer outcomes due to the relatively larger portion of the myocardium affected.

Pericarditis involves inflammation of the pericardium. Patients commonly present with sharp stabbing chest pain that improves when leaning forward and is worsened by lying down. Typical ECG findings in pericarditis include diffuse global concave ST-elevation with associated PR-segment depression. The isolated ST-elevation in the inferior leads makers an inferior MI a more likely diagnosis in this scenario.

Ventricular tachycardia (VT) is a tachyarrhythmia originating from the ventricles which can be life-threatening. Clinical features include pre-syncope/syncope and/or chest pain. Typical ECG findings in VT include a broad complex tachycardia.

A pulmonary embolism (PE) involves obstruction within the pulmonary arterial tree by a thrombus. Clinical features include dyspnoea and pleuritic chest pain. The most common ECG finding in pulmonary embolism is sinus tachycardia, however, the rarer S1Q3T3 pattern is often mentioned because it is more specific to PE.

Further reading:

https://patient.info/doctor/acute-myocardial-infarction

Question:

A 71-year-old male is seen by the on-call dermatologist with numerous large blisters on the arms and legs and a few scattered blisters on the trunk. He denies any systemic upset and there is no history of vomiting or diarrhoea. He has not started any new medication recently. On examination, the blisters appear to be tense. Subsequent skin biopsy reveals IgG under direct immunofluorescence occurring in a linear pattern within the basement membrane.

Which of the following is the most likely diagnosis?

A. Pemphigus vulgaris

B. Bullous pemphigoid

C. Epidermolysis bullosa

D. Dermatitis herpetiformis

E. Urticarial vasculitis

Correct Answer:Bullous pemphigoid

Explanation:

Bullous pemphigoid occurs more commonly in the elderly and is characterised by numerous tense bullae which may be preceded by a pruritic urticarial eruption. IgG autoantibodies bind to bullous pemphigoid antigens in the hemidesmosomes at the basement membrane zone. The disease is self-limiting in many cases and usually treated with low dose steroids.

Pemphigus vulgaris is a less common blistering disorder occurring in middle-aged or young adults, characterised by flaccid, superficial blisters. It is a potentially life-threatening condition. Direct immunofluorescence shows intracellular epidermal IgG antibodies (to desmoglein).

Dermatitis herpetiformis occurs in young adults with gluten sensitivity, characterised by intensely itchy blisters on the extensor surfaces and granular IgA at the dermal papilla.

Epidermolysis bullosa is an inherited disease of defective keratin synthesis. It varies in severity and usually presents early in life.

Urticarial vasculitis is a form of cutaneous vasculitis of unknown origin causing hives which disappear to leave a purpuric rash.

Further reading:

https://www.dermnetnz.org/topics/bullous-pemphigoid/

Question:

Robert Lane is a 24-year-old man who has presented to the GP complaining of feeling generally unwell. On further questioning, he describes general weakness, fatigue, night sweats and some weight loss over the preceding 3 months. He also has a chronic, non-productive cough and has noticed a lump on his neck. There is no history of any recent travel and he has no significant medical history.

Clinical examination reveals a rubbery 4 cm mass on the left side of his neck, with several other similar lumps in the anterior cervical chain bilaterally. Abdominal examination reveals hepatomegaly, but nil else of note. Vital signs are unremarkable.

What is the most likely diagnosis?

A. Hepatocellular carcinoma

B. Wilson's disease

C. Branchial cyst

D. Hodgkin’s lymphoma

E. Tuberculosis

Correct Answer:Hodgkin’s lymphoma

Explanation:

The most likely diagnosis is Hodgkin's lymphoma, given this is a young patient presenting with a 3-month history of B symptoms (i.e. weight loss and night sweats), lymphadenopathy, chronic cough and hepatomegaly.

Hodgkin's lymphoma is a malignant tumour of the lymphatic system that is characterised histologically by the presence of multinucleated giant cells (known as Reed-Sternberg cells) and abnormal mononuclear cells originating from B lymphocytes. Patients typically present with asymptomatic enlarged lymph nodes, cough/dyspnoea (due to a mediastinal mass) and B symptoms (night sweats, fever and weight loss). Some patients experience alcohol-induced pain at sites of nodal disease, but this is rare. Clinical examination findings can include hepatomegaly, splenomegaly and lymphadenopathy.

Tuberculosis (TB) is a less likely diagnosis given the absence of any risk factors for the disease (i.e. no mention of exposure or travel in areas of high prevalence). However, TB could present with similar symptoms, so it would be a valid differential diagnosis to consider.

Branchial cysts typically present when patients are in their late teens as a solitary painless swelling on the side of the neck which can vary in size and be painful. A branchial cyst would not cause the systemic symptoms mentioned in this scenario, such as night sweats and weight loss. The cough would also not be explained by this diagnosis.

Wilson's disease is a disorder of hepatic copper deposition. It usually presents when patients are in their 20s to 30s with abnormal LFTs and evidence of liver cirrhosis. Although this patient has hepatomegaly, Wilson's disease would not cause the other symptoms mentioned in the scenario, making it a much less likely diagnosis.

Hepatocellular carcinoma (HCC) is typically associated with chronic liver disease, which this patient does not have. The condition would not account for most of the other symptoms the patient has, other than hepatomegaly, making it an unlikely diagnosis. The average age of HCC development is around 66 years, making it an even less likely diagnosis in this scenario.

Further reading:

https://patient.info/doctor/hodgkins-lymphoma-pro

Question:

A 25-year-old woman presents to the general practitioner with a 3-day history of vaginal discharge. She describes the discharge as offensive smelling but not itchy. She is sexually active and does not use any barrier contraception.

The GP performs a speculum examination and finds the presence of a thin white discharge on the vaginal walls. He sends off a swab sample for further testing.

What is the most likely causative organism?

A. Neisseria gonorrhoeae

B. Treponema pallidum

C. Chlamydia trachomatis

D. Gardnerella vaginalis

E. Trichomonas vaginalis

Correct Answer:Gardnerella vaginalis

Explanation:

The correct answer is Gardnerella vaginalis with the most likely diagnosis being bacterial vaginosis (BV). BV is a non-STI bacterial infection and is the most common cause of abnormal vaginal discharge in women of reproductive age. Most patients with BV remain asymptomatic. Symptomatic patients with BV typically present with a thin white discharge that is not itchy. The offensive-smelling discharge is another feature of bacterial vaginosis and is often described as “fishy”. Risk factors for BV include unprotected sexual intercourse, a new sexual partner, and an existing sexually transmitted infection (STI).

Trichomonas vaginalis is a protozoan and is the organism implicated in trichomoniasis, an STI. Although trichomoniasis can cause a foul-smelling vaginal discharge, this will often be yellow and not described as “fishy”. Patients with trichomoniasis may also complain of genital itching and painful urination.

Treponema pallidum is the bacteria that causes syphilis. Syphilis is an STI and typically presents with painless genital ulcers.

Syphilis does not usually present with vaginal discharge.

Chlamydia trachomatis is the intracellular bacteria which causes chlamydia. Chlamydia is an STI. Patients usually present with a mucopurulent vaginal discharge and may have other associated symptoms such as post-coital bleeding and intermenstrual bleeding. Patients may also complain of dyspareunia.

Neisseria gonorrhoeae is a bacteria that is implicated in the STI, gonorrhoea. Patients will typically present with cervicitis with associated mucopurulent discharge. On speculum examination, there may be cervical bleeding upon contact. Patients may also have symptoms associated with rectal or oropharyngeal infection, such as rectal discharge and pharyngitis.

Further reading:

https://geekymedics.com/bacterial-vaginosis/

Question:

A 67-year-old man presents to the GP with a 12-hour history of a hot, tender and swollen toe, with no history of trauma. He has had similar episodes in the past. His past medical history includes asthma, hypertension and heart failure with reduced ejection fraction. On examination, he is afebrile, and his observations are stable. His BMI is 37kg/m². The right metatarsophalangeal joint appears swollen, erythematous and is extremely tender to touch. The is no injury to the overlying skin.

What is the most appropriate initial management option?

A. Febuxostat

B. Aspirin

C. Allopurinol

D. Ibuprofen

E. Colchicine

Correct Answer:Colchicine

Explanation:

This patient is most likely presenting with an acute episode of gout. Gout is caused by the formation of monosodium urate crystals, secondary to chronic hyperuricemia. These crystals then deposit in the synovium, connective tissues and kidneys. Both NSAIDs (e.g. ibuprofen) and colchicine are indicated as monotherapy in the acute management of gout. However, with a history of heart failure and asthma, ibuprofen is contraindicated in this patient.

Allopurinol and febuxostat are used in the prevention of gout. They work by reducing the levels of uric acid in the blood. Allopurinol is recommended first-line for the prevention of gout and should be prescribed 1-2 weeks following the resolution of an acute episode.

Aspirin has no role in the management of gout.

Further reading:

https://cks.nice.org.uk/topics/gout/management/acute-gout/

Question:

A 52-year-old woman presents to the GP with intermittent dizziness. She describes a few instances of sudden onset and severe 'spinning' precipitated by rolling over in bed over the last month. She says each attack has lasted less than 30 seconds.

She explains that the dizziness makes her feel nauseous, but there is no associated hearing loss, tinnitus or any paraesthesia or weakness. She does not report a recent history of viral infection.

She does not have any significant past medical history.

Which of the following investigations would be most useful in reaching a diagnosis?

A. Dix-Hallpike manoeuvre

B. Epley manoeuvre

C. MRI head

D. Semont manoeuvre

E. CT head

Correct Answer:Dix-Hallpike manoeuvre

Explanation:

The most likely diagnosis in this patient is benign paroxysmal positional vertigo (BPPV). BPPV is a peripheral vestibular disorder that manifests as acute onset vertigo, usually lasting less than 1 minute and is precipitated by specific head movements, allowing patients to identify precise triggers for each attack. There are no associated symptoms such as hearing loss or tinnitus in BPPV. NICE guidelines state that BPPV can be diagnosed if the Dix-Hallpike manoeuvre provokes vertigo and rotatory (torsional) up-beating nystagmus. Left ear BPPV provokes torsional clockwise nystagmus and right ear BPPV provokes anti-clockwise nystagmus. NICE guidelines also state that all patients with vertigo should receive a complete ear, nose and throat, cardiovascular and neurological examination to exclude a central aetiology.

Investigations such as MRI or CT are typically not required to confirm the diagnosis of BPPV unless there are concerns of another underlying condition. Features that may suggest a central cause of vertigo include atypical nystagmus, additional neurological symptoms such as weakness and paraesthesia and a past medical history of trauma or cardiovascular risk factors.

The Epley manoeuvre is a repositioning manoeuvre that is often performed at the first presentation of BPPV in primary care. It is not considered a diagnostic test but instead may form part of the management of patients with BPPV.

The Semont manoeuvre is also a repositioning manoeuvre that may be offered as an alternative or adjunct to the Epley manoeuvre. It is also not considered a diagnostic test but instead may form part of the management of patients with BPPV.

Further reading:

https://cks.nice.org.uk/topics/benign-paroxysmal-positional-vertigo/diagnosis/diagnosis/

Question:

The on-call paediatric consultant is bleeped to see a baby brought to A&E by his mother, she is extremely distressed about symptoms he has developed. The baby was born at 33 weeks, and was given steroids due to prematurity, but fared very well, with no apparent breathing difficulties. After 2 days in the hospital, both baby and mother were able to be discharged home.

Over the past few days, the baby has been refusing bottle-feeds as usual and has been unusually lethargic. He has been vomiting for the past 12 hours, his mother describes this as 'brown', and denies any bilious matter being vomited. The baby has had loose stools, with some evidence of blood in the most recent, and looks extremely unwell. Examination reveals abdominal distension with taut skin overlying it, no masses are palpable.

The consultant orders an abdominal X-ray and starts broad-spectrum antibiotics; he tells the mother that it is likely that her baby will need admission for monitoring and that surgery may be required.

What is the most likely diagnosis in this case?

A. Midgut volvulus

B. Infective colitis

C. Intussusception

D. Pyloric stenosis

E. Necrotising entercolitis

Correct Answer:Necrotising entercolitis

Explanation:

Necrotising enterocolitis (NEC) is a severe inflammatory condition affecting the bowel in infants, most commonly those who were born prematurely. It most frequently presents with vomiting, diarrhoea, rectal bleeding, and abdominal distension, with tight shiny skin classically being seen on examination. The exact cause of the disease remains unexplained.

The condition is usually diagnosed via abdominal X-ray, which will often demonstrate pneumatosis intestinalis (air within the intestinal wall). Gas within the portal venous system and visibly dilated intestinal loops are other commonly observed features. Management involves making the baby nil-by-mouth and providing parenteral nutrition; antibiotics are given to cover against infection. If this more conservative approach is unsuccessful, or necrotic areas of the bowel are identified, then surgical resection is often necessary.

Midgut volvulus can cause bowel obstruction in neonates, most frequently arising due to intestinal malrotation. There is a failure of the usual rotation of the bowel in-utero, making the baby prone to an episode of volvulus, where the bowel is able to twist upon itself. The classical presentation is of bilious vomiting due to the location of the obstruction; this is not present in this scenario. The condition is most likely to be diagnosed on an upper GI contrast study rather than an abdominal X-ray.

Pyloric stenosis is a relatively common pathology affecting children in their first months of life. It most commonly presents with 'projectile vomiting', as gastric contents cannot pass beyond the stomach. It would not explain the diarrhoea in this case, nor the significant abdominal distension, and this baby is at a greater risk of NEC due to the fact they were born prematurely.

Intussusception occurs due to the invagination of a distal portion of the bowel into a more proximal site, resulting in obstruction. It can affect children in their first year of life and cause rectal bleeding as described in this scenario. However, the disease is less common in the first few weeks of life, and vomiting would likely be a late sign; abdominal distension with taut skin overlying it is far more classical of NEC.

Infective colitis could cause vomiting and bloody diarrhoea, depending on the pathogen involved. There is no history to suggest that this is likely in this case, however, and it would not explain the abdominal distension.

Further reading:

https://patient.info/doctor/necrotising-enterocolitis

Question:

A 67-year-old man presents to the emergency department following a head injury. He appears confused and is unable to provide a full history, however, he denies any neck stiffness, photophobia or fever.

On examination, his left pupil is dilated and unresponsive to light, and the left eye deviates downwards and outwards. He has 3/5 power in his right arm and leg. He has no significant past medical history and does not smoke or drink alcohol.

What is the most likely cause of his symptoms?

A. Encephalitis

B. Posterior communicating artery aneurysm

C. Brain tumour

D. Stroke

E. Intracranial haematoma

Correct Answer:Intracranial haematoma

Explanation:

The presence of a down and outwardly deviated eye indicates a third nerve palsy, while the blown left pupil points towards a surgical cause rather than a medical cause - the parasympathetic fibres that supply the pupillary sphincter run along the outside of the third cranial nerve and therefore will be the first to be compressed by an external mass. Given the history of head trauma, this patient most likely has an intracranial haematoma causing raised intracranial pressure. This can lead to uncal herniation, which can cause contralateral weakness.

Although a posterior communicating artery aneurysm may cause a surgical third nerve palsy, it typically presents with a longer history and a headache. The recent head injury also makes an intracranial haematoma more likely.

A brain tumour could cause a surgical third nerve palsy, however, it often presents with a longer history with symptoms such as early morning headaches, vomiting, seizures or behaviour changes.

Stroke is an important differential in someone presenting with unilateral weakness, however, in the absence of cardiovascular risk factors and the presence of recent head trauma and confusion, an intracranial haematoma is more likely to be the cause of this patient’s symptoms.

Encephalitis may cause neurological symptoms, including weakness, cranial nerve palsies, and confusion. However, it most typically presents with fever, headache, neck stiffness and photophobia. The recent head injury also makes an intracranial haematoma more likely.

Further reading:

https://oxfordmedicaleducation.com/clinical-examinations/neurological-examination/oculomotor-trochlear-abducens-questions/

Question:

A 15-year-old girl presents with a 3-month history of soiling her underwear with watery stools. She has had to start wearing pads in her underwear to stop it going through onto her clothes. There is no blood or mucous in the stool.

She opens her bowels every 4-5 days with a large, hard stool. She soils her underwear now on a daily basis - she does not feel any urge to go but can feel that she has passed something. There is no pain on passing stools, though she reports some crampy abdominal pain throughout most days.

There has been no recent change in diet, and the symptoms do not seem to be associated with any particular foods. She does report several urinary tract infections over the last couple of months but doesn't have one currently. She does report that her urine is frequently dark yellow.

On examination, the abdomen is soft and not tender, with a mass palpable on the left-hand side. All other system examinations are normal. Shiloh is tall and slender, with a BMI of 19.8. Vital signs and all blood tests are unremarkable.

What is the most likely diagnosis?

A. Constipation

B. Inflammatory bowel disease

C. Viral gastroenteritis

D. Wilms’ tumour

E. Laxative abuse

Correct Answer:Constipation

Explanation:

Shiloh most likely has chronic constipation with overflow diarrhoea, which is also causing compression of her bladder outflow, resulting in frequent UTIs due to stasis. This may seem like a complicated sequence of events, but is a common one to see in paediatrics. The mass on the left-hand side of her abdomen is faeces.

Constipation is a common condition in younger people, mostly functional or idiopathic. In this case, the most likely cause is dehydration, secondary to inadequate fluid intake (suggested by the dark urine).

Laxative abuse can cause faecal incontinence, but would not account for the UTIs or abdominal mass.

Gastroenteritis is usually acute and causes more severe abdominal pains. Small intestinal bacterial overgrowth can cause chronic diarrhoea and abdominal pains, but is usually associated with food intolerances.

Inflammatory bowel disease (IBD) causes chronic diarrhoea, but not usually incontinence. Ulcerative colitis typically causes diarrhoea mixed with blood and mucus, in addition to weight loss. Crohn's disease can present with similar symptoms to ulcerative colitis and can present with a mass in the left-iliac fossa caused by a fistula-associated abscess. If an abscess was present, inflammatory markers would be raised and the patient would have a history of fever.

A Wilms' tumour is a nephroblastoma, which tends to present in younger children (90% >7 years) as an abdominal mass. Wilms' tumours do not typically cause gastrointestinal symptoms and you would expect some of the blood tests to be abnormal (i.e. anaemia).

Further reading:

https://patient.info/doctor/constipation-in-children-pro

Question:

A 62-year-old woman is referred to the respiratory clinic with dyspnoea. She has had progressive shortness of breath over the last three years with associated swelling of the ankles and recurrent chest infections. She is a lifelong smoker but has no significant past medical history. Her chest x-ray is normal.

What is the most useful next step in establishing the diagnosis?

A. Trial of salbutamol

B. CT Chest

C. Peak expiratory flow rate diary

D. Spirometry

E. Echocardiogram

Correct Answer:Spirometry

Explanation:

This lady presents with symptoms suggestive of chronic obstructive pulmonary disease (progressive shortness of breath, recurrent chest infections, smoking history) and possible cor-pulmonale (ankle swelling). The investigation of choice would be spirometry. Current guidelines recommend investigation to confirm the diagnosis, rather than initiating a trial of salbutamol.

A CT chest may identify features of COPD, however, it would be non-diagnostic.

A peak expiratory flow rate diary would be more appropriate if asthma was suggested, the age and smoking history make this unlikely.

An echocardiogram would be useful to assess her degree of right heart failure (cor pulmonale) but treatment is largely symptomatic. With COPD being the primary cause of the right heart failure (cor pulmonale), spirometry would be most useful in establishing the initial respiratory diagnosis.

Further reading:

https://goldcopd.org/wp-content/uploads/dlm\_uploads/2016/12/wms-GOLD-2017-Pocket-Guide-Final.pdf

Question:

A 4-week old male baby is brought into A&E with a 3-day history of projectile vomiting after feeds that has gradually increased in frequency and force. He was initially eager to feed following the vomiting episodes but is now refusing to breastfeed.

He appears dehydrated with a capillary refill time of >3s, very concentrated urine in his nappy and BP of 75/40mmHg. His respiratory rate is 20bpm. On examination of the abdomen, you palpate an olive-shaped mass in the right upper quadrant. You manage to give a small test feed and observe visible peristalsis. An ultrasound scan is performed and confirms a diagnosis of pyloric stenosis.

An arterial blood gas is also performed which shows: pH 7.55, H+ 28nmol/L, pCO2 8.0kPa, pO2 10.5kPa and HCO3- 55mmol/L. Na+ is 129mmol/L and K+ is 1.6mmol/L.

What is the best description of this acid-base abnormality?

A. Respiratory alkalosis with partial metabolic compensation

B. Metabolic alkalosis with full respiratory compensation

C. Metabolic alkalosis with partial respiratory compensation

D. Mixed respiratory and metabolic alkalosis

E. Respiratory alkalosis with no metabolic compensation

Correct Answer:Metabolic alkalosis with partial respiratory compensation

Explanation:

The acid-base abnormality in this question is a metabolic alkalosis with partial respiratory compensation. A pH of >7.45 defines alkalosis. The high HCO3- (normal range 23-30mmol/L) suggests that this is a metabolic rather than respiratory cause of alkalosis and the raised pCO2 indicates that there is some respiratory compensation. Accumulating pCO2 (in this case as a result of reduced respiratory rate), which then dissociates in the blood to form H+, helps to compensate for the alkalosis. The compensation is only partial, as the alkalosis is unresolved. In this case, the underlying diagnosis is pyloric stenosis, which causes a ‘hypochloraemic hyponatraemic hypokalaemic metabolic alkalosis’ due to electrolyte loss. It is useful to note that two main things contribute to metabolic alkalosis in pyloric stenosis. Firstly there is a loss of H+ ions (as HCl) in the vomit. Secondly, dehydration stimulates the renin-angiotensin-aldosterone system and the aldosterone increases K+ renal excretion. Hypokalaemia stimulates K+ to shift into the blood from inside cells via the K+/H+ exchanger, which increases H+ uptake into cells from the blood.

Respiratory alkalosis with no metabolic compensation would result in a pH >7.45, but there would be a low pCO2 and normal HCO3-. Respiratory alkalosis occurs in situations where there is increased respiratory CO2 loss due to hyperventilation, for example in hyperthyroidism, anxiety disorders, mechanical ventilation (e.g. CPAP) and aspirin overdose.

Metabolic alkalosis with full respiratory compensation would be consistent with the pCO2 and HCO3- levels, but the pH would be normal as the pCO2 has risen to a level that produces sufficient H+ ions to balance the raised bicarbonate. The severe clinical picture in this question also suggests that the reduced respiratory rate has been insufficient to fully compensate for the metabolic abnormality.

Respiratory alkalosis with partial metabolic compensation would result in a pH >7.45 and low pCO2, and the metabolic compensation would be indicated by low HCO3-, which is reduced in an attempt to balance the reduction in H+. Metabolic compensation in acid-base disorders occurs very slowly (unlike respiratory compensation, which is relatively quick).

Mixed respiratory and metabolic alkalosis can occur in hyperemesis gravidarum, as well as excessive ventilation in COPD patients. It can be identified by a low pCO2 and raised bicarbonate in the context of alkalosis.

Further reading:

https://geekymedics.com/abg-interpretation/

Question:

A 38-year-old woman (gravida 3, para 2) presents to the GP with a six-month history of incontinence. She explains that whenever she coughs or sneezes, she lets out a bit of urine. She is very embarrassed by the problem, and it is now affecting her ability to socialise.

She has no features of dysuria or frequency. An abdominal and bimanual examination is normal.

She has a past medical history of migraine.

What is the most likely diagnosis?

A. Stress incontinence

B. Situational urinary incontinence

C. Urge incontinence

D. Functional incontinence

E. Overflow incontinence

Correct Answer:Stress incontinence

Explanation:

The most likely diagnosis is stress incontinence - a form of involuntary urinary leakage on effort or exertion or sneezing or coughing. Patients with stress incontinence experience this leakage because intra-abdominal pressure exceeds the urethral pressure. Typically, the underlying issue is reduced urethral support, secondary to weakness of the pelvic floor. This patient has risk factors as she is multiparous. Other important risk factors include recurrent constipation, obesity, postmenopausal or previous pelvic surgery.

Typically patients with overflow incontinence present with straining to urinate or the sensation of an incompletely emptied bladder. This is usually secondary to nerve or muscle damage or outflow obstruction.

Patients with urge incontinence present with involuntary urine leakage accompanied by, or immediately preceded by, a sudden compelling desire to pass urine. Urge incontinence is usually a result of overactivity of the detrusor muscle and is part of a larger symptom complex known as overactive bladder. The patient here does not describe any symptoms in keeping with urge incontinence.

Situational urinary incontinence is a type of urinary incontinence during a specific situation (e.g. during sexual intercourse). While this is an important consideration, the only pattern to this patient's incontinence when she coughs or sneezes. This suggests stress incontinence over situational incontinence as it is the sudden pressure on the bladder and urethra that leads to sphincter muscles opening briefly.

The diagnosis of functional incontinence is more likely in patients with a physical or mental impairment that prevents them from making it to the toilet in time. Patients with functional incontinence are typically aware of the need to urinate but cannot get to a bathroom.

Further reading:

https://cks.nice.org.uk/topics/incontinence-urinary-in-women/

Question:

A 60-year-old woman is referred to the urogynaecology clinic by her GP with a 3-month history of incontinence in which she suddenly feels the need to pass urine and is often unable to find a toilet in time. This is becoming an embarrassing problem for her and she often restricts her activities to ensure that a toilet is always available close by.

One year ago she had a transvaginal hysterectomy for persistent prolapse. She has previously had two spontaneous vaginal deliveries and has been amenorrhoeic for 10 years. Her BMI is 32kg/m2 and she is a heavy smoker with a 40-pack year history.

On examination with a Sim's speculum, you are unable to visualise any vaginal wall abnormalities, with no evidence of prolapse. When you ask her to cough in this position there is no urine leakage.

You ask her to complete a bladder diary over the next week and give general advice regarding reducing fluid intake, reducing caffeinated drinks and promoting lifestyle changes for weight loss.

What further management would be appropriate at this stage?

A. Colposuspension surgery

B. Self-catheterisation

C. Pelvic floor exercises and prescribe oxybutynin

D. Urodynamic testing

E. Bladder retraining exercises

Correct Answer:Bladder retraining exercises

Explanation:

Bladder retraining exercises consist of patients delaying voiding for several minutes beyond when they would normally void, to increase the interval between voiding. This is a helpful conservative option in managing urge incontinence. Urge incontinence occurs due to overactivity of the detrusor muscle, which contracts the bladder and is under involuntary parasympathetic control. It most commonly occurs idiopathically after menopause, although risk factors include previous gynaecological surgery (e.g. hysterectomy), smoking and comorbid neuropathy (e.g. multiple sclerosis). Involuntary detrusor activity can be counter-acted by voluntary contraction of the external urethral sphincter, levator ani and abdominal muscles – bladder retraining exercises enhance voluntary contraction of these muscles to help reduce incontinence.

It may be useful to arrange a urodynamic testing appointment to confirm the type of incontinence but it would be appropriate to begin conservative treatment measures first, especially given the classical history of urge incontinence. Also, an appointment for urodynamic testing would typically need to be arranged in advance. During testing, catheters are placed in the rectum and bladder, the bladder is filled to the point at which the patient feels the urge to urinate, and the patient is then asked to perform actions to provoke leakage (such as coughing, star jumps and the sound of running water). A urodynamic diagnosis (such as stress incontinence, urge incontinence or mixed incontinence) is then made to aid management. This is particularly useful when the history is unclear.

Colposuspension surgery involves elevating the bladder so that the urethra is in a position that is better supported by the pelvic floor and continence is improved. It is indicated for treating stress incontinence, rather than urge incontinence, and hence is inappropriate in this scenario. A possible surgical option for urge incontinence is the injection of botulinum toxin to paralyse the detrusor muscle. However, this would only be considered after conservative and medical options were unsuccessful.

It would be inappropriate to recommend pelvic floor exercises and prescribe oxybutynin. Pelvic floor exercises are beneficial in stress incontinence as they strengthen the pelvic floor, which is typically weakened. However, in urge incontinence bladder retraining exercises would be a more beneficial conservative management option. Oxybutynin is an anticholinergic drug which helps to inhibit parasympathetic fibres from stimulating detrusor contraction. Hence it is commonly prescribed to manage urge incontinence but not in combination with pelvic floor exercises.

Self-catheterisation may be used to manage neurological conditions such as multiple sclerosis in which patients struggle to void urine, but is not routinely used in urge incontinence.

Further reading:

https://cks.nice.org.uk/incontinence-urinary-in-women

Question:

A 58-year-old female patient is prescribed ciprofloxacin for a urinary tract infection by her general practitioner.

Which of the following is a recognised adverse effect associated with this medication?

A. Hyperkalaemia

B. Ototoxicity

C. Metallic taste in the mouth

D. Achilles tendon rupture

E. Discolouration of the teeth

Correct Answer:Achilles tendon rupture

Explanation:

Fluoroquinolones such as ciprofloxacin are commonly used antibiotics for conditions such as urinary tract infections and severe gastrointestinal infections. They are notable for having activity against Pseudomonas aeruginosa. Adverse effects include gastric distress, QT interval prolongation, tendonitis and Achilles tendon rupture.

Metronidazole is a commonly used medication for conditions that require coverage for anaerobic pathogens. Concurrent consumption of metronidazole with alcohol can lead to a disulfiram-like reaction (flushing, tachycardia and nausea) and a metallic taste in the mouth.

Trimethoprim-sulfamethoxazole is a commonly used medication for uncomplicated urinary tract infections in non-pregnant women. Notable side effects of trimethoprim-sulfamethoxazole include Steven-Johnson syndrome (rare), hypoglycaemia and hyperkalaemia.

Ototoxicity is more likely to be seen in aminoglycosides and vancomycin. It is not typically associated with the use of ciprofloxacin.

Discolouration of the teeth is a particular concern for children that are prescribed tetracycline antibiotics. Other side effects of these antibiotics include gastrointestinal distress and photosensitivity.

Further reading:

https://bnf.nice.org.uk/drug/ciprofloxacin.html

Question:

A 68-year-old woman has had an unwitnessed collapse on the cardiology ward. On assessment, the patient is unresponsive, has agonal breathing, and has no central pulse.

The resuscitation team is called, continual CPR is commenced, and the ECG monitor and defibrillator leads are attached. The rhythm assessment reveals a fast, regular rhythm with broad, monomorphic QRS complexes and absent P waves.

What is the most likely diagnosis?

A. Pulsesless ventricular tachycardia

B. Ventricular fibrillation

C. Supraventricular tachycardia

D. Torsades de Pointes

E. Pulseless electrical activity

Correct Answer:Pulsesless ventricular tachycardia

Explanation:

The patient in the vignette has a life-threatening arrhythmia (unresponsiveness, agonal breathing, pulseless). Therefore, it's important to determine the nature of the arrhythmia to initiate the appropriate treatment. The rhythm assessment description (fast, regular rhythm with broad, monomorphic QRS complexes and absent P waves), along with this patient's presentation, is most consistent with pulseless ventricular tachycardia (pVT), which is a shockable rhythm and requires urgent defibrillation in conjunction with cardiopulmonary resuscitation (CPR).

Pulseless electrical activity is a life-threatening arrhythmia which causes an absent pulse; however, the ECG would show organised electrical activity and the presence of P waves.

Supraventricular tachycardia (SVT) with haemodynamic compromise is a life-threatening arrhythmia; however, the ECG would show a narrow complex tachycardia as opposed to broad complex tachycardia.

Torsades de Pointes is a type of polymorphic ventricular tachycardia which may be life-threatening if associated with poor perfusion. The ECG in the vignette has sustained monomorphic ventricular tachycardia without a pulse, which is most consistent with pVT.

Ventricular fibrillation is a life-threatening arrhythmia which can cause an absence of a pulse and is also a shockable rhythm; however, the ECG would show an irregular, polymorphic ventricular tachycardia, with complexes of varying amplitudes.

Further reading:

https://litfl.com/ventricular-tachycardia/

Question:

A 31-year-old lady of Afro-Caribbean origin presents to her GP complaining of heavy menstrual bleeding for the past 12 months. She explains that she has also begun to experience significant fatigue, as well as occasional abdominal bloating. She has a regular 28-day cycle and denies any pelvic pain, dyspareunia, or change in her weight. The patient has not yet conceived despite being sexually active for 2 years without contraception.

Her past medical history is insignificant, and she comments that she has never smoked or drunk alcohol.

On pelvic examination, the GP finds a significantly enlarged, non-tender and irregular uterus. Palpation of the pelvic adnexa is normal.

Which of the following is the most likely diagnosis?

A. Hypothyroidism

B. Uterine fibroids

C. Ovarian cancer

D. Endometriosis

E. Endometrial hyperplasia

Correct Answer:Uterine fibroids

Explanation:

This patient is presenting with uterine fibroids, the most common benign tumour of the uterus. Sometimes called leiomyomata, these growths are primarily composed of smooth muscle and fibrous connective tissue. While many uterine fibroids are asymptomatic, they can also present with menorrhagia, fatigue, infertility, and a sense of abdominal bloating. Patients of a black ethnicity are also at a significantly higher risk of developing uterine fibroids, the reason for this is not yet fully understood.

While a diagnosis of ovarian cancer may be considered in this case, it is not associated with heavy menstrual bleeding. The pelvic examination findings further suggest a pathology of uterine rather than ovarian origin. The likelihood of ovarian cancer is also lowered by the patient’s young age and non-smoker status. In comparison, uterine fibroids are a more likely explanation for this patient’s symptoms.

Endometrial hyperplasia refers to the pathological thickening of the endometrial tissue, which is then at an elevated risk of developing into endometrial cancer. It is usually diagnosed in postmenopausal women, where it presents as postmenopausal bleeding. Also, endometrial hyperplasia would not lead to an enlarged uterus on pelvic examination.

Endometriosis may also be considered as a cause of infertility, however, it is made less likely in this case by the absence of pelvic pain or dyspareunia. While endometriosis can cause menorrhagia, is not as strongly associated with this presentation as fibroids. The absence of pelvic tenderness on examination further suggests an alternative diagnosis to endometriosis, although a transvaginal ultrasound scan would be required to confirm this.

Hypothyroidism rarely presents with menorrhagia and infertility, although it is a diagnosis that can be considered. Hypothyroidism is more likely to present with menstrual irregularity, which this patient denies. The absence of weight gain alongside the abnormal pelvic exam findings in this patient further suggest an alternative diagnosis.

Further reading:

https://cks.nice.org.uk/topics/fibroids/

Question:

A 59-year-old woman presents to the emergency department complaining of visual blurring and weakness in her right arm and leg. The patient explains that the symptoms appeared suddenly a few hours ago and have not improved since. An urgent CT scan of the head is performed and reveals an acute left middle cerebral artery (MCA) infarct. The patient is promptly admitted to the stroke unit.

What is the most appropriate method of venous thromboembolism (VTE) prophylaxis for this patient?

A. No VTE prophylaxis needed due to acute stroke

B. Intermittent pneumatic compression (IPC - e.g. Flowtrons)

C. Inferior vena cava (IVC) filter

D. Low-molecular weight heparin (e.g. enoxaparin)

E. Thromboembolism deterrent (TED) stockings

Correct Answer:Intermittent pneumatic compression (IPC - e.g. Flowtrons)

Explanation:

Based on Royal College of Physicians guidance, patients with immobility after acute stroke should be offered intermittent pneumatic compression (IPC - e.g. Flowtrons) within 3 days of admission to hospital for the prevention of deep venous thrombosis (DVT). IPC should be continued for 30 days or until the patient is mobile or discharged.

Patients with immobility after acute stroke should not be routinely given LMWH or graduated compression stockings. LMWH increases the risk of bleeding into the intracranial infarct (haemorrhagic transformation). There is no evidence to suggest that graduated compression stockings have a significant impact on VTE prevention in stroke patients.

IVC filter would not be an appropriate choice here. These devices are typically used in patients with recurrent thromboembolism, to reduce the risk of pulmonary embolism.

Please take time to read CLOTS 1, CLOTS 2 and CLOTS 3 trials to recognise the effectiveness of IPC in VTE prevention for patients presenting with stroke. The CLOTS 1 and 2 trials showed that graduated compression stockings were ineffective in preventing VTE – 10.0% vs 10.5%. The CLOTS 3 trial showed that IPC in the first 30 days is an effective treatment for reducing proximal DVT and improves survival – 8.5% vs 12.1%.

Further reading:

https://pubmed.ncbi.nlm.nih.gov/26418530/

Question:

A 40-year-old female patient attends Accident and Emergency with painful red eyes. The eye redness and pain has been present for 1 week and has become progressively worse, waking her from sleep on several occasions. The pain is worsened by touching her eyes. Additionally, she has noticed that her eyes have been tearing uncontrollably over the last few days. She has a past medical history of rheumatoid arthritis.

On examination, the following features are noted:

blue-red tinge to her sclera

pain on palpation of eyes

decreased visual acuity

congestion of the deep episcleral network on slit-lamp examination

What is the MOST APPROPRIATE management for the condition described?

A. Topical corticosteroid

B. Topical antihistamine

C. Quinolone

D. No management

E. Systemic NSAIDs and corticosteroids

Correct Answer:Systemic NSAIDs and corticosteroids

Explanation:

The most likely diagnosis, in this case, is scleritis. The main risk factor for this condition is the presence of an underlying autoimmune disease (e.g. rheumatoid arthritis, granulomatosis with polyangiitis etc).

Symptoms for this condition include:

eye pain, typically radiating to the brow, forehead and jaw

waking at night due to pain

eye pain is exacerbated by touch

excessive lacrimation

photophobia

eye redness

Signs for this condition include violaceous discolouration of the sclera, decreased visual acuity and deep episcleral congestion on slit-lamp examination.

First-line management of this condition (especially when accompanied by an underlying systemic disease) commonly includes systemic NSAIDs, and may also include systemic corticosteroids or immunomodulatory drugs. Topical corticosteroid therapy is often used in conjunction with systemic therapy in order to reduce the dose requirement of each.

Topical corticosteroids are not used in isolation to manage scleritis. This treatment would be more appropriate for the management of episcleritis. Episcleritis usually presents with acute onset eye pain, photophobia, lacrimation, episcleral oedema, as well as injection of superficial episcleral vessels.

Topical antihistamines are appropriate to manage allergic conjunctivitis. This condition is unlikely the cause of symptoms in this case due to the absence of eye itch.

Providing no management, in this case, may lead to vision limiting ocular complications.

Quinolone would be appropriate in the management of keratitis. This condition typically presents with severe eye pain, photophobia, foreign body sensation, reduced visual acuity and red-eye.

Further reading:

https://patient.info/doctor/episcleritis-and-scleritis-pro

Question:

An 18-year-old patient presents to the GP, concerned about stretch marks that have developed on his back. He reports having grown significantly over the last year and is now significantly taller than the rest of his family. He puts this down to a 'growth spurt', but is concerned that the presence of striae may indicate that he is growing too fast; having been shown a picture of the skin lesions, he believes them to be unsightly. The patient denies any headache, visual changes or neurological features, and has not noticed any other changes in his appearance.

The patient describes no past medical history, other than recurrent lens dislocation which has been managed surgically. There is no family history of sudden growth, nor any other relevant medical conditions. On examination, the patient has a BMI of 18, with a slender frame; the patient exhibits no coarsening of facial features. The only other finding on examination of the other organ systems is the presence of a murmur; this is heard in late systole and is accompanied by an opening snap.

The GP makes the decision to refer the patient to secondary care, where genetic testing is used to confirm that the patient's symptoms are due to an underlying inherited syndrome. The patient is concerned by this diagnosis and wishes to know the implications in terms of passing the condition onto his future children.

Which of the following inheritance patterns is most frequently associated with the likely diagnosis?

A. Autosomal recessive

B. Autosomal dominant

C. X-linked dominant

D. Mitochondrial inheritance

E. X-linked recessive

Correct Answer:Autosomal dominant

Explanation:

The most likely diagnosis, in this case, is Marfan syndrome; an autosomal dominant condition caused by a mutation in the fibrillin 1 gene; the characteristic presentation is a tall, thin individual, with a low BMI and arachnodactyly. Striae are commonly seen in those with the condition. This is not a completely typical presentation, as there is no family history of the condition; however, approximately 25% of patients with Marfan syndrome develop the disease due to a de novo mutation, which is the likely explanation in this case.

A number of features of the history alongside the patient's physical appearance point toward Marfan as the probable diagnosis; lens dislocation, referred to medically as ectopia lentis is a common complication, as is mitral valve prolapse, which is the murmur most likely to be represented by the auscultation findings. Hypermobility, dural ectasia, kyphoscoliosis and chest wall deformities are all also possible in those with the condition.

Due to the inheritance pattern of the condition, there is a 50% chance that any of the patient's children will inherit the disease (assuming his partner is unaffected).

Common autosomal recessive conditions include cystic fibrosis, sickle cell disease and thalassaemia; these can only be inherited if both parents are carriers of the mutation.

X-linked recessive conditions only affect male patients; common examples include red-green colour blindness, Duchenne muscular dystrophy and haemophilia.

X-linked dominant conditions are very rare, with only a handful of conditions following this inheritance pattern; Marfan syndrome is not one of these.

Conditions with a mitochondrial inheritance are only passed on through the maternal line - Marfan syndrome does not follow this inheritance pattern.

Further reading:

https://patient.info/doctor/marfans-syndrome-pro

Question:

You receive a phone call from the Biochemistry Laboratory about a 62-year-old male with a serum potassium level of 6.2 mmol/L. Yesterday the potassium level was 4.9 mmol/L. He is an inpatient being treated for community-acquired pneumonia. He is not known to have renal disease and you are not sure whether the potassium result is accurate. You telephone the ward and ask for a 12 lead ECG while you make your way to assess him.

Which of the following ECG changes is most likely to prompt you to begin treatment for hyperkalaemia immediately?

A. Dominant R waves

B. U waves

C. Inverted T waves

D. Small P waves

E. Narrowed PR interval

Correct Answer:Small P waves

Explanation:

Hyperkalaemia is a medical emergency and occurs with potassium levels >5.5 mmol/L. ECG changes associated with hyperkalaemia should prompt immediate treatment before confirming the serum potassium level with a repeat sample. ECG changes do not always occur in a step-wise pattern, however typically the development of tall ‘tented’ T waves occurs first, followed by flattening and eventual disappearance of P waves. The PR interval may become prolonged (>0.2 sec) and the patient may become bradycardic. With further increases in potassium level, QRS complexes widen (>0.12 sec) and the ST segment rises in a sloped fashion with eventual ‘sine wave’ formation. The presence of these later ECG signs suggests the patient is at critical risk of cardiac arrest.

Dominant R waves may be a sign of ventricular hypertrophy and right bundle branch block when occurring in V1.

Inverted T waves typically indicate ischaemia.

U waves can occur in patients with hypokalaemia.

Further reading:

https://renal.org/wp-content/uploads/2017/06/hyperkalaemia-guideline-1.pdf

Question:

A 61-year-old man presents with a history of progressive fatigue over the last 12 months. His wife is also present at the consultation and mentions she has noticed subtle behavioural changes over a similar time period, including mood swings, which is very different for him. The patient also mentions that he is having difficulties maintaining an erection during sexual intercourse.

Clinical examination reveals hepatomegaly. The patient also appears tanned, despite it being winter and him not having been on any recent travel. Vital signs are all normal. Blood tests reveal raised serum ferritin and transferrin levels.

What is the most likely diagnosis?

A. Hepatitis A

B. Addison’s disease

C. Hypothyroidism

D. Haemochromatosis

E. Wilson's disease

Correct Answer:Haemochromatosis

Explanation:

The most likely diagnosis is hereditary haemochromatosis (HHC).

HHC is an autosomal recessive genetic disease involving increased intestinal absorption of iron which subsequently accumulates in body tissues and causes organ damage. The liver is the organ most often affected by the disease and patients are often identified after an incidental finding of deranged LFTs. If left untreated, patients typically develop liver cirrhosis and are at risk from secondary hepatocellular carcinoma. Other organs that can be affected include the pancreas (diabetes), joints (joint pains), heart (heart failure), skin (bronze discolouration), brain (memory impairment, mood swings) and the gonads.

HHC often presents insidiously in males aged between 40-60 and in post-menopausal females. Initial symptoms are vague including fatigue, joint aches, non-specific abdominal pain and erectile dysfunction. In more advanced disease, patients can develop hypogonadism, liver cirrhosis, diabetes mellitus, bronzing of the skin, cardiomyopathy, impaired memory, mood swings and depression. Definitvie diagnosis is usually achieved via genetic testing for known mutations of the HFE gene.

Wilson’s disease is an autosomal recessive condition of copper metabolism leading to excessive copper deposition in the liver, basal ganglia and the renal tubules. Patients present with signs of chronic liver disease, Kayser-Fleischer rings (brown deposits at the corneal edge) and renal tubular acidosis. Investigations reveal reduced serum copper and ceruloplasmin levels and normal ferritin levels.

Hepatitis A is a viral infection that is spread via the faecal-oral route. It typically presents with upper abdominal pain, jaundice, fever, nausea, vomiting and diarrhoea.

Hypothyroidism often presents with weight gain, cold intolerance, constipation, low mood and memory impairment. This patient's bronzed appearance, hepatomegaly and raised serum ferritin and transferrin levels would not be explained by this diagnosis.

Addison’s disease involves the destruction of the adrenal cortex, resulting in insufficient glucocorticoid and mineralocorticoid production. Patients present with fatigue, postural hypotension, vomiting and diarrhoea.

Further reading:

https://patient.info/doctor/hereditary-haemochromatosis

Question:

A 54-year-old man attends the rheumatology outpatient department complaining of hip and knee pain. The rheumatologist orders pelvic and bilateral hip X-rays.

What radiological finding is most supportive of a diagnosis of osteoarthritis?

A. Joint effusion

B. Reduced joint space

C. Bony erosions

D. Osteopenia

E. Osteophyte formation

Correct Answer:Osteophyte formation

Explanation:

Osteophyte formation is the x-ray finding most supportive of a diagnosis of osteoarthritis. Sub-chondral sclerosis is also associated with osteoarthritis.

Reduced joint space is a feature of degenerative joint disease (DJD) but is a non-specific finding, also seen in other forms of arthritis, such as rheumatoid arthritis.

Bony erosions may occur in some joints affected by DJD (such as the temporomandibular joints and acromioclavicular joints) but would be more supportive of inflammatory arthritis if found in the hips.

Osteopenia in the juxta-articular regions is supportive of rheumatoid arthritis.

Joint effusions are difficult to see on plain X-rays but if present may also support a diagnosis of inflammatory arthritis or trauma.

Many students remember the mnemonic ‘LOSS’ to recall the radiographic features of osteoarthritis:

Loss of joint space

Osteophyte formation

Subchondral cysts

Subchondral sclerosis

Further reading:

https://radiopaedia.org/articles/osteoarthritis

Question:

A concerned mother brings her 15-year-old non-binary child into the emergency department who is struggling to speak following a 'funny turn' that occurred around 10-minutes ago. This event happened whilst out shopping nearby, and there was no obvious trigger for the event. She explains that her child had been well during the day, but had complained of an odd sensation in their stomach, which they struggled to describe, just before the 'funny turn' started, which was described as the child becoming unresponsive, but conscious, staring into the distance, and then beginning to repeatedly smack their lips together. They did not fall to the ground or become unconscious. In total, the event lasted around a minute. The child did not experience tongue-biting nor incontinence. Since the event, her child has seemed confused, not appearing to remember the seizure.

They also have struggled with speaking since then. The child has no known past medical history and has never experienced anything like this before. However, their maternal uncle has epilepsy.

What is the most likely diagnosis?

A. Frontal seizure

B. Temporal seizure

C. Parietal seizure

D. Occipital seizure

E. Absence seizure

Correct Answer:Temporal seizure

Explanation:

This individual has experienced a focal seizure located in the temporal lobe. Seizures involving the temporal lobe can present in a variety of ways, best remembered with the acronym HEADS:

Hallucinations

Epigastric rising/emotions

Automatisms

Deja-vu/Dysphasia post-ictally

This patient is experiencing several of these symptoms, with epigastric rising (odd sensation in the tummy), automatisms (lip-smacking), and post-ictal dysphasia. Focal impaired awareness seizures, such as this one, can last up to 2 minutes. The post-ictal period can last for hours, but more commonly self-resolves within 15-minutes.

An absence seizure is not the best answer option here. Although these seizures cause a patient to stop responding to their surroundings, they commonly last less than 15 seconds. They also are not associated with a post-ictal period, automatisms, or epigastric rising.

Occipital seizures would not present as above. These seizures generally present solely with visual changes, predominantly floaters and/or flashes in the field of vision.

Parietal seizures present with sensory changes such as paraesthesia. They are not associated with the post-ictal period and symptoms described in this case.

Frontal seizure is another good answer option, as it also presents with a post-ictal phase. However, this post-ictal phase is associated with weakness, not dysphasia. Furthermore, frontal seizures predominantly present with changes in movement, such as head or leg movements, but are not as likely to cause the epigastric rising described here.

Further reading:

https://geekymedics.com/explaining-a-diagnosis-of-epilepsy/

Question:

A 78-year-old male presents to his GP with worsening bone pain and tenderness. He also feels like his muscles are becoming weaker and he has noticed some weight loss. He has a past medical history of hypertension and diabetes mellitus and takes amlodipine and metformin. His mobility is poor, and he receives support with cooking, shopping and household cleaning.

Blood tests are taken, and the bone profile reveals the following results:

Laboratory Test Value Reference Range

Calcium (corrected) 2.06 mmol/L 2.2–2.6

Phosphate 0.6 mmol/L 0.8-1.4

Parathyroid hormone (PTH) 228 ng/L 10–65

Alkaline phosphatase (ALP) 202 U/L 30–130

What is the most likely diagnosis?

A. Primary hyperparathyroidism

B. Osteomalacia

C. Paget's disease

D. Osteoporosis

E. Disseminated malignancy

Correct Answer:Osteomalacia

Explanation:

Osteomalacia is the inadequate mineralisation of the osteoid with normal bony tissue caused by vitamin D deficiency. This is known as rickets in children, whose epiphyseal growth plates have not yet fused. This patient has reduced mobility, and likely does not leave his home or get enough sunlight, making him high risk for vitamin D deficiency. Vitamin D is essential for calcium and phosphate homeostasis and deficiency leads to reduce bone mineralisation and decreased bone strength. A reduction in vitamin D causes hypocalcaemia and hypophosphataemia, resulting in excess parathyroid hormone (PTH), which then stimulates bone resorption and a subsequent increase in alkaline phosphatase (ALP). Bone pain, tenderness and proximal myopathy (muscle weakness) are all features of osteomalacia.

Disseminated malignancy can present with bony tenderness and weight loss. However, the blood results would likely show hypercalcaemia with compensatory hypoparathyroidism (or hyperparathyroidism if there was a PTH releasing tumour0. This patient's results show hypocalcaemia and hyperparathyroidism.

Osteoporosis is characterised by decreased bone mass, leading to an increased risk of fractures. The condition is usually asymptomatic and detected when a patient presents acutely with a fracture. The bone profile will not typically reveal any abnormalities. Therefore, as this patient's bone profile results are abnormal and the patient has bone pain with proximal myopathy, osteoporosis is a less likely diagnosis.

Paget's disease of the bone involves uncontrolled, increased bone turnover due to excess osteoclast reabsorption and increased osteoblast activity. It more commonly affects the skull, long bones, spine and pelvis. Paget's would present with bony pain, skeletal deformities and pathological fractures, which is partially consistent with this patient's history. However, an isolated increased ALP would be most typical. The hypocalcaemia and hypophosphataemia in this patient suggest an alternative diagnosis.

Primary hyperparathyroidism is most commonly due to a parathyroid hormone-releasing adenoma. This condition typically results in hypercalcemia which is not in keeping with this patient's findings.

Below is a table summarising the bone profile findings for various bone disorders:

Disorder Calcium Phosphate PTH ALP

Osteomalacia ↓ ↓ ↑ ↑

Bone metastasis ↑ ↑ ↓/↑ ↑

Osteoporosis Normal Normal Normal Normal

Paget's disease of the bone Normal Normal Normal ↑

Primary hyperparathyroidism ↑ ↓ ↑ ↑

Further reading:

https://cks.nice.org.uk/topics/vitamin-d-deficiency-in-adults/

Question:

A 6-year-old child, who recently emigrated from Japan, is reviewed in Paediatric outpatients with his parents. He has been referred by his GP due to fatigue and failure to thrive. His parents mention that he is constantly tired (requiring multiple naps throughout the day) and is considerably shorter than the rest of his classmates at school. They report that his fatigue has always been present and that he was jaundiced as a newborn. On examination, the boy is shorter than would be expected for his age and underweight. He also has icteric sclera, splenomegaly and right upper quadrant tenderness with a positive Murphy’s sign. He has had blood tests taken which report:

Normochromic normocytic anaemia

Reticulocytosis

Hyperbilirubinaemia

Negative Coombs test

What ADDITIONAL INVESTIGATION FINDING would you expect to discover that is consistent with the condition described?

A. Raised HbA2 and HbF levels on haemoglobin electrophoresis

B. Decreased pyruvate kinase enzyme activity

C. Abnormal osmotic fragility test

D. Abnormal G6PD enzyme assay

E. Sickled red blood cells on blood film

Correct Answer:Decreased pyruvate kinase enzyme activity

Explanation:

The most likely diagnosis is pyruvate kinase deficiency. Risk factors for this condition include geographic location (Japan and Northern Europe) and age (usually detected by late childhood).

Typical clinical features for this condition include:

A history of jaundice and exchange transfusion in the neonatal period

Growth delay

Failure to thrive

Yellow sclera

Right upper quadrant tenderness with a positive Murphy’s sign

Investigation findings indicative of pyruvate kinase deficiency include normocytic normochromic anaemia, hyperbilirubinaemia, reticulocytosis, and a pyruvate kinase enzyme activity of 5-25% of normal.

Raised levels of HbA2 and HbF on haemoglobin electrophoresis are associated with thalassaemia. Thalassaemia is associated with hypochromic, microcytic cells and nucleated red blood cells on blood film. A ‘hair on end’ sign on x-ray (indicative of increased bone marrow activity) may also be observed.

An abnormal G6PD enzyme assay is associated with G6PD deficiency. This condition is associated with Mediterranean and African populations.

An abnormal osmotic fragility test is associated with hereditary spherocytosis. This condition is typically associated with Northern Europeans.

Sickled red blood cells are associated with sickle cell anaemia. This condition is associated with those of African descent. Sickle cell disease is characterised by periods of good health interspersed with crises (i.e. vaso-occlusive, sequestration, aplastic).

Further reading:

https://patient.info/doctor/pyruvate-kinase-deficiency

Question:

A 4-year-old boy is brought to the general practice by his mum, having recently moved to the UK from Nigeria. He has suffered from occasional episodes of painful swollen fingers since he was a baby. His mum is worried that these episodes are now increasing in severity and frequency as the weather is getting colder. The boy is smiling, appears well and is not in any pain during the consultation.

What is the most appropriate initial investigation to identify the likely diagnosis?

A. Peripheral blood film

B. Full blood count

C. Haemoglobin electrophoresis

D. Blood cultures

E. Whole genome sequencing

Correct Answer:Haemoglobin electrophoresis

Explanation:

A child of African ancestry presenting with signs of recurrent vaso-occlusive crisis should be investigated for sickle cell disease if it has not previously been diagnosed.

Haemoglobin electrophoresis is the most widely used method for determining haemoglobin subtype in children with suspected haemoglobinopathies. This is the most appropriate initial investigation here as it is a simple, rapid and inexpensive way to separate the common haemoglobin variants and identify predominant HbS (75-95%) and notably absent HbA in a child with suspected sickle cell disease.

A full blood count might show some degree of anaemia and might provide useful baseline values for ongoing monitoring. However, this is not a diagnostic test for sickle cell anaemia.

The presence of sickle-shaped cells, nucleated red blood cells, and Howell-Jolly bodies on a peripheral blood film might point towards a diagnosis of sickle cell disease and help to rule out additional causes of anaemia but this requires expert interpretation and is not always a sensitive test.

Whole genome sequencing or other DNA-based assays provide the most accurate diagnosis of sickle cell disease or sickle cell trait and can often be used to confirm an abnormality found on haemoglobin electrophoresis. However, this is an expensive test that is more commonly reserved for antenatal diagnosis or patients with more difficult genotypes to diagnose.

Blood cultures should be obtained in sickle cell patients with fever to confirm a bacterial infection. However, this is not appropriate in this currently asymptomatic patient and is not a diagnostic test.

Further reading:

https://geekymedics.com/sickle-cell-anaemia/

Question:

A 50-year-old man attends his optician with blurred vision. The patient reports that his near vision has become progressively more blurred over the past 5-6 years. He now struggles with activities of daily living that require near-sight such as reading. He has no problems with his distant vision. He has no past medical or surgical history. On examination, the patient struggles to read fine print, but is able to read the Snellen chart at 6 metres without an issue.

What is the MOST LIKELY diagnosis?

A. Astigmatism

B. Myopia

C. Presbyopia

D. Glaucoma

Correct Answer:Presbyopia

Explanation:

The most likely diagnosis is presbyopia. This condition can be defined as age-related long-sightedness. Presbyopia is caused by the lens of the eye becoming progressively less elastic and, therefore, less capable of accommodating.

There are 5 main forms of presbyopia which include:

incipient presbyopia (the earliest stage whereby near vision is mildly blurred)

functional presbyopia (noticeable blurring of near vision causes functional problems in daily life)

absolute presbyopia (total inability to focus on nearby objects)

premature presbyopia (presbyopia prior to 40 years of age)

nocturnal presbyopia (presbyopia made much worse due to dim lighting)

Major risk factors for presbyopia include increasing age (main risk factor) and excessive ultraviolet sunlight exposure. Presbyopia can be corrected in a number of ways including glasses, contact lenses and laser eye surgery.

Myopia can be defined as short-sightedness (difficulty focusing on distant objects) due to any cause. Astigmatism is a refractive error caused by an uneven cornea. This condition results in various symptoms including reduced visual acuity, photophobia, headaches, difficulty focusing on contrasting colours and sometimes diplopia.

Glaucoma involves the progressive degeneration of the optic nerve, often associated with raised intraocular pressure. In its early stages, it affects the peripheral visual field only but as it advances it affects central vision and results in loss of visual acuity, which can lead to severe sight impairment and complete loss of vision.

Further reading:

https://patient.info/health/long-sight-hypermetropia/age-related-long-sight-presbyopia

Question:

A 69-year-old man presents to the emergency department with a three-day history of constant left iliac fossa pain, diarrhoea and blood in the stool.

His observations are:

Oxygen saturation: 99% on room air

Respiratory rate: 16/min

Heart rate: 76bpm

Blood pressure: 129/89 mmHg

Temperature: 38.4 °C

He is initially started on intravenous antibiotics, intravenous fluids and is given analgesia.

A CT scan shows a pericolic abscess 2cm in diameter.

What is the most appropriate next step in his treatment?

A. Sigmoid colectomy with primary anastomosis

B. Hartmann’s procedure

C. Percutaneous drainage

D. Paracetamol and safety netting advice

E. Step down to oral antibiotics

Correct Answer:Step down to oral antibiotics

Explanation:

This patient has acute diverticulitis complicated by a pericolic abscess. According to NICE guidelines, percutaneous drainage is not necessary for abscesses <2cm in size and the patient should be stepped down to oral antibiotics where possible.

Continuing intravenous antibiotics and performing percutaneous drainage would be appropriate if the abscess were >3cm in size.

Paracetamol and safety netting advice is used in the management of simple diverticulitis in a systemically well patient; it is not suitable for managing pericolic abscesses.

A Hartmann’s procedure and a sigmoid colectomy with primary anastomosis are used to manage complicated diverticulitis that has resulted in perforation or peritonitis. As this patient has only a small pericolic abscess, resection is not indicated at this stage.

Further reading:

https://www.nice.org.uk/guidance/ng147/chapter/Recommendations#acute-diverticulitis

Question:

A 68-year-old man is admitted to the coronary care unit following primary percutaneous coronary intervention for an ST-elevation myocardial infarction. He suddenly becomes unresponsive. A carotid pulse is palpable, and he is making respiratory effort. This rhythm is observed on the telemetry:

Glenlarson, Public domain, via Wikimedia Commons

What is the most appropriate initial management option?

A. Defibrillation

B. Synchronised DC cardioversion

C. IV amiodarone

D. IV adenosine

E. IV adrenaline

Correct Answer:Synchronised DC cardioversion

Explanation:

The telemetry shows ventricular tachycardia, a complication of ST-elevation myocardial infarction due to the formation of scar tissue within the myocardium. Given that the patient is unresponsive, the advanced life support (ALS) guidelines recommend that patients undergo synchronised DC cardioversion due to the presence of adverse features. These adverse features include shock, syncope, myocardial ischaemia and heart failure.

Defibrillation would be the most appropriate initial management option for pulseless ventricular tachycardia as part of the shockable cardiac arrest algorithm. The ALS guidelines suggest that up to three-stacked shocks may be considered if a patient enters a witnessed shockable rhythm (ventricular fibrillation or pulseless ventricular tachycardia) whilst on a telemetry monitored bed, such as in a coronary care unit.

IV amiodarone is a class III antiarrhythmic that primarily blocks voltage-gated potassium channels. It is used in the management of ventricular tachycardia without adverse features. This would involve initial loading with 300mg of amiodarone followed by an infusion of 900mg over 24 hours.

IV adrenaline is a non-selective adrenergic receptor agonist and is used in the management of cardiac arrest as per the ALS guidelines. For shockable rhythms (such as ventricular fibrillation or pulseless ventricular tachycardia), it is administered after the third shock and then every other cycle. For non-shockable rhythms (such as pulseless electrical activity or asystole), it is administered immediately and then every second cycle.

IV adenosine is an antiarrhythmic medication that causes a transient heart block at the atrioventricular node (AVN). This mechanism can interrupt re-entry circuits involving the AVN and restore normal sinus rhythm. Adenosine can therefore be used in the management of supraventricular tachycardia, where it is given as a rapid IV bolus of 6mg, increasing to 12mg, then 18mg for subsequent doses, if required.

Further reading:

https://www.resus.org.uk/library/2021-resuscitation-guidelines/adult-advanced-life-support-guidelines

Question:

You are a junior doctor working on the gastroenterology ward. You are asked to see a 68-year-old gentleman with a background of liver cirrhosis and ascites who was admitted directly from the gastroenterology outpatient clinic this afternoon.

He has felt feverish and nauseous with a decreased appetite for the last 48 hours. In addition, his abdomen has become significantly more swollen over the same time and is painful.

On examination, his abdomen is grossly distended and there is mild generalised tenderness. Shifting dullness is demonstrable. His temperature is within normal limits currently but was raised when measured earlier during his clinic appointment.

The patient had an ultrasound scan performed earlier this afternoon demonstrating a large volume of ascites. There is significantly more fluid evident today than was seen on an ultrasound scan performed 3 months ago.

Which investigation is most likely to give a definitive diagnosis?

A. Liver function tests

B. Ascitic tap

C. Serum albumin

D. Coagulation screen

E. CT abdomen

Correct Answer:Ascitic tap

Explanation:

The most likely diagnosis here is spontaneous bacterial peritonitis (SBP) and an ascitic tap is required to obtain peritoneal fluid for sampling. The fluid obtained should be sent for cell count, microscopy, culture and sensitivity as well as protein, albumin, LDH and amylase levels. Diagnosis is confirmed with an elevated ascitic fluid absolute neutrophil count (ANC) >250 /mm3 without an evident intra-abdominal surgically treatable source of infection.

A CT abdomen alone will not diagnose SBP but may be required at some point during the patient's clinical course. A coagulation screen and serum albumin level are useful in assessing the patient's synthetic liver function and liver function tests have a role in assessing the severity of liver dysfunction. However, none of these tests will give a definitive diagnosis of SBP.

Further reading:

https://patient.info/doctor/intra-abdominal-sepsis-and-abscesses

Question:

You are a junior doctor working in the acute medical unit. You are asked to review an unwell 23-year-old male personal trainer who has been referred urgently to acute medicine from his GP. He presented this morning with a 24-hour history of severe thirst, polyuria and severe lethargy. He has no significant past medical history, takes no regular medications and has no known allergies.

On examination, he looks pale and unwell. His observations are as follows:

Respiratory rate: 22 per minute

Heart rate: 115 beats per minute

Blood pressure: 98/56 mmHg

Oxygen saturation: 97% on room air

Temperature 36.8 degrees

He has been cannulated and a venous blood gas shows the following:

pH: of 7.1

Bicarbonate: 6 mmol / L

PaCO2: 3 kPa

PaO2: 7 kPa

Blood glucose: 37 mmol / L

What is the most important test to perform next?

A. Immediate point of care ketone testing

B. Urea and electrolytes

C. Chest x-ray

D. Full blood count

E. Serum lactate

Correct Answer:Immediate point of care ketone testing

Explanation:

This young and otherwise well patient presents significantly unwell with a short history of thirst and polyuria. His blood gas, although venous, demonstrates significant metabolic acidosis (as demonstrated by the low bicarbonate and low PaCO2) as well as hyperglycaemia. This raises significant suspicion of diabetic ketoacidosis (DKA). The most important urgent investigation in this situation is, therefore, a point of care ketone test. Some patients will have DKA as the first presentation of type 1 diabetes and so his lack of past medical history is not reassuring here.

DKA may present with subtle symptoms but has a characteristic metabolic derangement of metabolic acidosis, ketosis and hyperglycaemia. The gold standard for ketone detection is capillary blood ketone testing but many hospitals employ a point of care method which allows rapid testing. Making sure you are familiar with your local protocol is therefore important and you should be aware that you may need to send a formal lab ketones sample (depending on your hospital protocol) along with urea and electrolytes whilst you commence treatment.

Chest x-ray, full blood count and serum lactate will be important in helping to determine if there are contributing factors to the patient's presentation in DKA, such as infection, but will not confirm the diagnosis, which is the most important first step.

It is important to be familiar with local guidelines as DKA treatment can seem confusing and frightening when it is first encountered.

Further reading:

https://www.diabetes.org.uk/professionals/position-statements-reports/specialist-care-for-children-and-adults-and-complications/the-management-of-diabetic-ketoacidosis-in-adults

Question:

A 45-year-old man is brought to the emergency department by the police after breaking through a shop window. He is aggressive and appears confused. He cannot give a coherent history himself; however, he is well known to both hospital staff and the police as a frequent attendee.

A review of his medical records reveals he has no fixed abode and has a history of drug and alcohol misuse.

On examination, he appears unkempt and agitated with multiple lacerations on his arms; he also smells strongly of alcohol. His vital signs are recorded as normal with a temperature of 37.0°C, pulse 84/min, blood pressure 136/93mmHg and SpO2 98% on room air. On neurological examination, he is oriented only to person; there is bilateral horizontal nystagmus and a broad-based gait. Reflexes are normal.

What is the most likely diagnosis in this patient?

A. Tabes dorsalis

B. Viral encephalitis

C. Delirium tremens

D. Miller-Fisher syndrome

E. Wernicke's encephalopathy

Correct Answer:Wernicke's encephalopathy

Explanation:

The most likely diagnosis in this patient is Wernicke's encephalopathy - an acute but reversible condition caused by severe thiamine (vitamin B1) deficiency. This can be caused by a combination of factors, including poor intake, low vitamin content in alcohol, low liver storage capacity, decreased intestinal absorption, impaired conversion of thiamine to its active form (thiamine pyrophosphate), and increased demand to metabolise the carbohydrates in alcohol.

Suggestive features in this patient include a history of alcohol misuse and the presentation of acute cognitive dysfunction, ataxia, impaired balance and nystagmus. It is important to note that the classic triad associated with Wernicke's encephalopathy - mental status changes, ophthalmoplegia and gait dysfunction - is only present entirely in approximately 20% of patients.

Patients with delirium tremens (DTs) typically present with features of autonomic dysfunction, including tachycardia, hypertension, agitation, diaphoresis, mydriasis, hallucinations and seizures, in the context of alcohol cessation. On examination, this patient had normal vital signs and smells of alcohol, suggesting he is unlikely to have recently discontinued alcohol use; therefore, this is a less likely diagnosis.

Patients with viral encephalitis typically present with a combination of cognitive dysfunction, altered mental status, seizures, fever ± focal neurological deficits. Whilst it is essential to consider this differential, this patient's history of alcohol misuse and otherwise normal vital signs are more suggestive of Wernicke's encephalopathy at this time.

Miller-fisher syndrome (MFS) is a rare form of Guillain-Barré syndrome (GBS); it is a neurological condition that characteristically presents following a viral illness with ophthalmoplegia, ataxia and reduced or absent reflexes; however, patients with MFS rarely experience altered mental status. Therefore, whilst this patient has some suggestive features of MFS, the normal reflexes, abnormal mental status and significant history of alcohol misuse make MFS a less likely diagnosis.

Syphilitic myelopathy, also known as tabes dorsalis, is a late consequence of neurosyphilis. It typically manifests in weakness, paresthesias, broad-based ataxia and diminished reflexes. This patient has normal reflexes and no other features to suggest tertiary syphilis on examination; therefore, this is a less likely diagnosis.

Further reading:

https://www.nice.org.uk/guidance/cg100/chapter/Recommendations

Question:

A 1-year-old, female baby is brought by her mother to her GP with a left-sided neck lump. The mother describes that the lump appeared 4 months previously and has grown much larger in the last week. Additionally, the mother enquires whether this neck lump is related to the fact that her daughter suffers from Down's syndrome. On examination, the baby has a left-sided neck lump located within the posterior triangle of the neck. The lump is soft to touch and measures around 2 x 2 inches. The overlying skin is mildly blue in colour and the lump transilluminates.

What is the MOST LIKELY diagnosis?

A. Thyroglossal cyst

B. Parotitis

C. Cystic hygroma

D. Carotid aneurysm

E. Branchial cleft cyst

Correct Answer:Cystic hygroma

Explanation:

The most likely diagnosis is a cystic hygroma (also known as a lymphatic malformation). A cystic hygroma is a congenital fluid-filled sac resulting from defects in the lymphatic system. This condition most commonly affects the head and neck, with a tendency to appear on the left side. Other locations affected may include the axilla, groin and mediastinum. The condition is more likely to occur in patients with Down's syndrome, Turner's syndrome and Klinefelter's syndrome. Cystic hygromas are usually evident by the age of 2 years.

Typical clinical features of a cystic hygroma in the neck include:

A history of a slow-growing lump in the posterior triangle

A sudden increase in the size of the lump (due to infection or intra-lesional bleeding)

Easily compressible on palpation

Able to be transilluminated

A blueish discolouration of the overlying skin

Branchial cleft cysts usually present on the lateral neck in late childhood to early adolescence. They typically appear after an upper respiratory tract infection, anterior to the middle third of the sternocleidomastoid muscle.

Parotitis usually affects school-aged children who present with tenderness and swelling of the parotid glands. Systemic upset is also typically present (i.e. fever, malaise).

Thyroglossal cysts are typically located in the midline of the neck and elevate on protrusion of the tongue.

Carotid aneurysms present as pulsatile neck masses with associated neurological features (e.g. stroke).

Further reading:

https://en.wikipedia.org/wiki/Cystic\_hygroma

Question:

A 5-year-old boy is brought to the GP by his mother as she has noticed that he is generally clumsy and has poor depth perception compared to his friends of the same age. When playing catch with his friends, he cannot catch the ball when it is thrown to him. The boy is otherwise fit and well. He was delivered by elective caesarean section at 37 weeks and weighed 3.2 kg at birth. His past medical history is significant for a congenital cataract in his right eye which was present at birth secondary to his mother having a measles infection during pregnancy. It was managed with a lensectomy at 11-months of age.

On examination, fundoscopy reveals no abnormality. The boy’s visual acuity is 2/20 in the left eye, and 2/30 in the right eye. Colour vision is normal, and a cover test is normal for both near and far fixation. Cranial nerve and neurological examinations are normal.

What is the most likely diagnosis?

A. Amblyopia

B. Type 1 diabetes mellitus

C. Strabismus

D. Retinopathy of prematurity

E. Retinitis pigmentosa

Correct Answer:Amblyopia

Explanation:

Amblyopia is a disparity in the acuity of the two eyes, as in the clinical examination of this patient. This is caused most commonly by strabismus or astigmatism, but other causes include unilateral congenital cataract or other visual opacity affecting one eye. The unilateral opacity causes asymmetrical development of the visual pathways and subsequent disparity in the visual acuity between the eyes. The mainstay of treatment involves occlusion of the healthy eye with a patch to encourage the development of the eye with reduced acuity.

Strabismus is a misalignment between the two eyes and can cause amblyopia. However, in this case, near and far fixation was normal on the cover test which indicates there was no strabismus.

Retinopathy of prematurity (ROP) is a condition affecting the retinal vasculature of infants born prematurely. It can resolve spontaneously or cause blindness in some cases if left untreated. In this case, the patient was born at term and is not at risk of this condition.

Retinitis pigmentosa causes progressive destruction of the visual cells, usually manifesting principally with night-blindness and progressing to visual loss during the day. A fundoscopy examination is abnormal, with characteristic optic disc pallor and peripheral pigment changes.

Type 1 diabetes mellitus can present in childhood with symptoms of visual blurring or myopia, but the changes are equal between both eyes.

Reference:

Nelson, Leonard B., and Scott E. Olitsky. Harley's Pediatric Ophthalmology, Wolters Kluwer, 2013. ProQuest Ebook Central, https://ebookcentral.proquest.com/lib/kcl/detail.action?docID=3417897.

Further reading:

https://eyewiki.aao.org/Amblyopia

Question:

A 50-year-old woman with a family history of breast cancer visits her GP after finding a lump on her breast. She tells you she felt a hard mass on her left breast two weeks ago whilst doing a self-check. On palpation, there is a 2 cm hard, fixed nodule in the upper outer quadrant of her left breast. Left axillary lymph nodes are enlarged.

Biopsy of the breast mass is positive for invasive ductal carcinoma, but a biopsy of the axillary lymph nodes is negative.

What is the most appropriate management?

A. Axillary node dissection at time of surgery

B. Repeat axillary node biopsy

C. Sentinel lymph node biopsy at time of surgery

D. Hormone injections to the axilla

E. Radiation to the axilla

Correct Answer:Sentinel lymph node biopsy at time of surgery

Explanation:

The axillary nodes are typically the first place of lymphatic invasion in breast cancer. When metastasis is suspected in the axilla, fine needle aspiration or core biopsy is performed to determine the most appropriate management. If the biopsy is positive, an axillary node dissection should be done at the time of breast surgery. If the biopsy is negative, a sentinel lymph node biopsy (SLNB) should be done at the time of surgery.

A SLNB involves the injection of a blue dye into the region, which then drains to the sentinel lymph node (which turns blue). A biopsy is then taken from this lymph node. The reasoning behind this is that any metastases present in the region, theoretically, would be most likely to be found in this sentinel node.

Further reading:

https://patient.info/doctor/breast-cancer-pro

Question:

A 65-year-old man with a BMI of 35kg/m2.(20-25) has long-standing gastro-oesophageal reflux disease. On further questioning, he denies any recent weight loss, vomiting or difficulty swallowing. His clinical examination is unremarkable, with no associated lymphadenopathy.

On upper gastrointestinal endoscopy the upper and middle parts of the oesophagus display a smooth pearly white surface, whereas the lower segment has a salmon-coloured appearance. No mass is seen. Representative biopsies are taken from the lower segment.

What is the most likely diagnosis?

A. Helicobacter pylori infection

B. Barrett’s oesophagus

C. Adenocarcinoma

D. Candida infection

E. Squamous cell carcinoma

Correct Answer:Barrett’s oesophagus

Explanation:

The most likely diagnosis in this patient is Barrett’s oesophagus. This patient has a high BMI and a long history of gastro-oesophageal reflux - both risk factors strongly associated with the development of Barrett's oesophagus. In this condition, the normal squamous mucosal epithelium in the distal oesophagus is replaced by intestinal-type glandular mucosa as a result of a process termed 'metaplasia'. This metaplastic epithelium is thought to provide more resistance to damage caused by reflux of the acidic gastric contents into the lower oesophagus. On endoscopy, the metaplastic epithelium has a characteristic salmon-coloured appearance in contrast to the pearly white surface appearance of normal squamous epithelium.

Barrett's oesophagus is recognised as a premalignant condition, which predisposes to the development of adenocarcinoma of the oesophagus (adenocarcinoma because the epithelium from which the tumour arises is glandular/columnar in type). However, here the patient has no clinical features suggestive of malignancy which would typically include progressive dysphagia (first to solids then liquids), weight loss, vomiting, odynophagia and hoarseness of voice (due to compression of the recurrent laryngeal nerve). In addition, the endoscopic findings which showed no masses together with the salmon-coloured appearance of the lower oesophageal segment are most in keeping with a diagnosis of Barrett’s oesophagus rather than an adenocarcinoma.

Adenocarcinoma and squamous cell carcinoma are the most common malignancies affecting the oesophagus. Squamous cell carcinoma of the oesophagus tends to arise in the middle third or proximal oesophagus, whereas adenocarcinomas commonly arise near the distal segment in close proximity to the gastroesophageal junction.

Candida infection of the oesophagus presents as white or yellowish plaques on endoscopy and is often associated with a clinical history of immunosuppression.

Helicobacter pylori is classically associated with peptic ulceration and if left untreated it significantly increases the risk of developing gastric carcinoma.

Further reading:

https://gut.bmj.com/content/63/1/7

Question:

A 42-year-old lady with a history of rheumatoid arthritis presents to the GP with fatigue and a 2-day history of a painful, swollen, stiff right knee. For the past three years, her symptoms and disease have been well controlled. Her drug history includes paracetamol, diclofenac, methotrexate and sulfasalazine. On examination, she is apyrexial. The right knee is swollen and tender but not hot to the touch.

Initial blood tests reveal:

Hb 130 g/L (130 – 180)

WCC 8 x 10⁹/L (3.6 – 11.0 )

CRP 72 mg/L (<5)

What is the next most appropriate management option?

A. Intravenous flucloxacillin

B. Infliximab

C. Intra-articular glucocorticoid

D. Oral prednisolone

E. Celecoxib

Correct Answer:Intra-articular glucocorticoid

Explanation:

Glucocorticoids are good for the short-term treatment of acute flares in patients with established rheumatoid arthritis with the goal of reducing inflammation. Short-term treatment is also appropriate for acute flares in patients who have recently commenced DMARD therapy; it can take several weeks for DMARDs to work. Intra-articular glucocorticoid injections have fewer side effects than systemic oral glucocorticoids (e.g. prednisolone), therefore, if steroid injections are available and appropriate (e.g. shoulder and knee joints), they should be considered before oral steroids.

Oral steroids can cause weight gain, hyperglycaemia and osteoporosis. Patients need to be weaned off oral steroid therapy and may also require calcium and vitamin D supplementation for bone protection.

The recommended pharmacological management of rheumatoid arthritis is a non-NSAID analgesic + NSAID/COX-2 inhibitor + 2 DMARDs (e.g. methotrexate/sulfasalazine/hydroxychloroquine/leflunomide/gold injections unless an initial combination DMARD therapy is inappropriate due to contraindications).

An additional biologic agent such as anti-TNF drugs (e.g. infliximab/etanercept/adalimumab), should only be considered if conventional DMARDs have not worked or if the patient has ongoing side-effects of DMARD treatment.

Celecoxib is a COX-2 inhibitor; COX-2 inhibitors are good analgesics for inflammation and pain but reduce the risk of peptic ulceration in comparison to oral NSAIDs such as ibuprofen and diclofenac. Celecoxib should not be taken in addition to diclofenac, hence it is not the next best step.

It is important to consider septic arthritis in any monoarthritis, especially if the patient has risk factors such as rheumatoid arthritis, diabetes mellitus, immunosuppression, chronic renal failure or joint prosthesis. Septic arthritis is unlikely here; the joint is not hot, she is apyrexial, and the WCC is low. If suspicious, further investigations would include an urgent joint aspiration and x-ray. If in doubt, commence treatment with empirical antibiotics.

Further reading:

https://www.nice.org.uk/guidance/ng100

Question:

A 28-year-old woman is seen in the Early Pregnancy Clinic with abdominal pain and vaginal bleeding. She is 8 weeks pregnant and has had 2 episodes of heavy fresh red vaginal bleeding associated with painful cramps in the lower abdomen. An abdominal ultrasound scan reveals partial loss of products of conception from the uterus and on examination her cervical os is open.

What is the most likely diagnosis?

A. Threatened miscarriage

B. Inevitable miscarriage

C. Incomplete miscarriage

D. Complete miscarriage

E. Missed miscarriage

Correct Answer:Incomplete miscarriage

Explanation:

Miscarriage is defined as the loss of a pregnancy before 24 weeks of gestation, not including ectopic pregnancies. An incomplete miscarriage involves an abdominal ultrasound showing partial loss of the products of conception and a speculum examination revealing an open cervical os. The other types of miscarriage are explained below.

Threatened miscarriage:

Mild vaginal bleeding, usually without abdominal pain

Cervical os remains closed

Patient may go on to have a miscarriage, or the bleeding/pain may stop and a healthy pregnancy may continue

Inevitable miscarriage:

Heavier bleeding associated with lower abdominal pain

Cervical os is open

No loss of products of conception

Pregnancy will not continue and either incomplete or complete miscarriage is inevitable

Complete miscarriage:

Minimal bleeding

Abdo USS confirms complete loss of uterine contents

Cervical os closed

Missed miscarriage:

Abdo USS confirms the presence of non-viable intrauterine pregnancy (i.e. the fetus has died but has not spontaneously aborted)

Often asymptomatic and picked up at scan, or the patient may notice a loss of the symptoms of pregnancy such as nausea and tiredness, or experience a dark brown vaginal discharge.

Cervical os is closed

Further reading:

https://patient.info/doctor/miscarriage-pro

Question:

You are the Obstetric SHO on call. You are bleeped to review a patient on the labour ward who has just delivered vaginally. The midwife wants your advice regarding excessive vaginal blood loss post-delivery. This is her first pregnancy. She suffered from gestational diabetes and was induced at 38 weeks on the basis of fetal macrosomia. On arrival, the patient reports that she is feeling dizzy.

On examination, you note the following:

blood pressure 90/60mmHg

heart rate 110 beats per minute

800ml total blood loss

‘boggy’ uterus on palpation.

What is the MOST LIKELY cause of this patient's postpartum haemorrhage?

A. Vascular episiotomy or tear

B. Disseminated intravascular coagulation (DIC)

C. Uterine atony

D. Uterine scar rupture

E. Retained placenta

Correct Answer:Uterine atony

Explanation:

The most common cause of postpartum haemorrhage (PPH) is uterine atony. PPH can be defined as excessive blood loss in the postpartum period. Uterine atony occurs when the uterus fails to contract postpartum, meaning that uterine blood vessels are not compressed and continue to bleed.

Risk factors for this condition are numerous and include:

antenatal factors (e.g. placenta praevia, placental abruption, multiple pregnancy, macrosomia, previous postpartum haemorrhage)

delivery factors (e.g. c-section, mediolateral episiotomy, induction of labour, labour lasting >12 hours)

bleeding disorders (e.g. haemophilia, Von Willebrand's disease).

Clinical features include excessive vaginal bleeding, tachycardia and hypotension.

Management includes:

Continuous monitoring of vital signs

Wide bore IV access

IV fluid resuscitation

Cross-match +/- blood transfusion

Bloods: FBC, U&E, Coagulation, LFTs

Close monitoring of fluid balance (including the insertion of a catheter)

Bimanual uterine compression

IV oxytocin and ergometrine

Consideration of hysterectomy as a last resort if bleeding is not controlled by other management strategies

Retained placenta is the second most common cause of PPH. This condition should be considered if the whole placenta is not delivered.

Episiotomy or tear is indeed a cause of PPH but not the most common and there is no mention of either in the clinical vignette.

DIC is an uncommon cause of PPH. This condition would more likely present with bleeding from unrelated sites, skin features (e.g. petechiae, purpura), elevated prothrombin time, raised activated partial thromboplastin time and a low fibrinogen level.

Uterine scar rupture is indeed a cause of PPH, however, this patient does not have a history of caesarian section.

Further reading:

https://patient.info/doctor/postpartum-haemorrhage

Question:

A 16-year-old girl presents to the GP with palpitations. She is 1.48m tall and weighs 36 Kg. Blood pressure is 95/70 mmHg. She has no significant past medical history or family history. An ECG is performed which shows a heart rate of 48, tall P waves and flattened T waves.

Which of the following is the most likely underlying cause of this presentation?

A. Heroin abuse

B. Anxiety

C. Bartter’s syndrome

D. Anorexia nervosa

E. Liddle’s syndrome

Correct Answer:Anorexia nervosa

Explanation:

Of the options available, anorexia nervosa is the most likely underlying cause of her presentation. Anorexia nervosa can cause hypokalaemia which can result in symptoms such as palpitations and the ECG features as described in the question. Note the patient's BMI is very low and she is bradycardic and hypotensive – all features of anorexia nervosa.

Liddle’s syndrome is a rare autosomal dominant condition causing hypertension and hypokalaemia alkalosis.

Cushing’s syndrome is a cause of hypokalaemia however would also cause hypertension and other symptoms such as central obesity and hirsutism, therefore, is unlikely in this patient.

Bartter’s syndrome is an inherited cause of hypokalaemia. It usually presents in childhood with polyuria, polydipsia and weakness. It is typically associated with normotension.

Further reading:

https://patient.info/doctor/anorexia-nervosa-pro

Question:

A 28-year-old man visits his GP with a two-day history of visible haematuria. He experienced a similar episode five years previously whilst travelling abroad, which stopped without treatment.

His past medical history includes asthma, an inguinal hernia and a viral throat infection five days prior. There is no family history of renal disease. Clinical examination is unremarkable, and blood pressure is 151/93 mmHg. A plain abdominal X-ray is unremarkable.

Blood tests reveal the following:

Test Result Reference range

Sodium 144 133 – 146 mmol/L

Potassium 5.2 3.5 – 5.3 mmol/L

Urea 4.9 2.5 – 7.8 mmol/L

Creatinine 178 ♂ 59 – 104 μmol/L

CRP 34 <5mg/L

Normal complement C3/C4 levels

ANCA negative and dsDNA negative

What is the most likely cause of this patient's haematuria?

A. Henoch-Schonlein nephritis

B. IgA nephropathy

C. Post-infectious glomerulonephritis

D. Bladder cancer

E. Nephrolithiasis

Correct Answer:IgA nephropathy

Explanation:

The answer here is IgA nephropathy, which can present with visible haematuria at the time of, or very shortly after a respiratory tract or other infection (so-called synpharyngitic glomerulonephritis). Usually, this disappears spontaneously after the resolution of the infection.

Post-infectious glomerulonephritis typically does not present until several weeks after the initial infection and classically will exhibit hypocomplementaemia (whereas IgA nephropathy usually does not).

Henoch-Schonlein nephritis (HSP nephritis) can be indistinguishable from IgA nephropathy on renal biopsy, but might be expected to present with extrarenal symptoms such as abdominal pain and a rash. Additionally, HSP nephritis typically (but not exclusively) occurs in childhood whereas the peak incidence of IgA nephropathy ranges between 15-30 years of age.

Nephrolithiasis is a possibility and can present with haematuria. It would often be associated with abdominal pain, however, and would not be expected to be associated with a respiratory infection.

Bladder cancer would be unexpected in this age group and wouldn’t typically cause two episodes of visible haematuria five years apart.

Further reading:

https://www.ncbi.nlm.nih.gov/pubmed/11231337

Question:

A 42-year-old is called to see the GP after some abnormalities were detected in blood tests taken before departure on a 6-month business trip to Africa. He has previously been well, with no past medical history of note; he takes no regular medication. He has never smoked and drinks approximately 8 units of alcohol per week. There is no family history of autoimmune disease.

Liver function tests reveal the following:

ALP - 145 U/L

ALT - 63 U/L

Bilirubin - 24 μmol/L

GGT - 60 U/L

Albumin - 36 g/L

Iron studies are normal, and a liver screen shows no abnormalities with the exception of low ceruloplasmin levels. On examination, there is a palpable mass measuring approximately 4 finger-widths under the right costal margin. When the patient is distracted, the GP notices a fine resting tremor in the patient's left hand.

Given the likely diagnosis, which of the following represents the underlying pathophysiology behind the development of the disease?

A. Anti-smooth muscle antibodies causing hepatocyte destruction

B. HFE gene mutation resulting in faulty iron metabolism

C. ATP7B gene mutation resulting in deficiencies in copper transport

D. Deficiency in protease inhibitor responsible for protection against neutrophil elastase

E. Inherited APC mutation resulting in faulty regulation of the cell cycle

Correct Answer:ATP7B gene mutation resulting in deficiencies in copper transport

Explanation:

The most likely diagnosis, in this case, is Wilson's disease, an autosomal recessive condition that is characterised by copper accumulation, principally within the liver, but possibly within other body organs - the basal ganglia being another common site. The disease arises due to an ATP7B mutation that results in deficiencies in copper transport. This mutation causes low ceruloplasmin levels to be present; ceruloplasmin is the transport protein for copper, and therefore, those with the disease have difficulties excreting the metal, allowing for levels to rise.

The most manifestation of the condition is chronic hepatitis that may progress to cirrhotic disease; this may, as in this scenario, go undetected for a number of years, until complications begin to arise. This patient's LFTs show a chronic hepatitic picture, with low-level abnormalities in both ALT and ALP; hepatomegaly on examination also makes Wilson's more likely. If cerebral involvement is present, patients may present with tremors, Parkinsonism, or possibly behavioural changes. Kayser-Fleischer rings are a pathognomonic ophthalmological sign associated with the condition.

HFE gene mutation resulting in faulty iron metabolism refers to the pathophysiology of hereditary haemochromatosis; another inherited syndrome that can cause chronic hepatitis. Rather than copper accumulation causing liver damage, those with the condition fail to regulate iron metabolism. The normal iron studies make the diagnosis far less likely in this case.

Anti-smooth muscle antibodies are implicated in autoimmune hepatitis (along with anti-LKM antibodies); another differential for chronic liver impairment in younger patients. However, this disease would not explain the elevated copper levels, nor the resting tremor and the antibodies are likely to be detected in a liver screen.

A deficiency in protease inhibitor responsible for protection against neutrophil elastase describes the underlying pathophysiology of alpha-1-antitrypsin deficiency. Those with this inherited deficiency have a greatly increased risk of developing COPD, and also of liver cirrhosis. Whilst this patient has presented with LFTs in keeping with chronic hepatitis, A1AT would not explain the elevated copper levels in this scenario, and there are no signs of lung involvement in this patient.

Inherited APC gene mutations are implicated in the development of familial adenomatous polyposis; a genetic syndrome that carries a substantially increased risk of bowel malignancy. Whilst liver metastasis could present with LFTs similar to those in this scenario, there is no history of gastrointestinal signs or symptoms.

Further reading:

https://patient.info/doctor/wilsons-disease-pro

Question:

A 62-year-old man presents to his GP with double vision that has gradually come on and worsened over the past month. His past medical history includes type 2 diabetes, peripheral neuropathy and a current foot ulcer. On examination, the right eyelid is drooped, and the right eye deviates downwards and outwards. Both pupils are equal in diameter.

What is the most likely cause of his symptoms?

A. Uncal herniation

B. Brain tumour

C. Diabetes

D. Adie syndrome

E. Posterior communicating artery aneurysm

Correct Answer:Diabetes

Explanation:

The combination of ptosis and a down and outwardly deviated eye indicates a third nerve palsy. The lack of a blown pupil points towards a medical cause rather than a surgical cause - the parasympathetic fibres that supply the pupillary sphincter run along the outside of the third cranial nerve, and so external compression will result in dilatation of the affected pupil. This patient has peripheral neuropathy and a foot ulcer, which suggests poor control of his type 2 diabetes. Taken together, these findings make his diabetes the most likely cause of his symptoms.

A posterior communicating artery aneurysm is a cause of a surgical third nerve palsy and would therefore cause a blown pupil. It also typically causes a headache.

Extrinsic compression of the third cranial nerve by a brain tumour would cause a surgical third nerve palsy, which would result in a blown pupil. The patient may also have symptoms of raised intracranial pressure, such as an early morning headache, or other symptoms of a space-occupying lesion, such as vomiting, seizures or behaviour changes.

Uncal herniation is a cause of a surgical third nerve palsy and would therefore cause a blown pupil. It would also cause symptoms of raised intracranial pressure, such as a headache, altered mental status or Cushing’s triad of hypertension, bradycardia and irregular breathing.

Adie syndrome describes an idiopathic unilateral dilated pupil. It would not cause ptosis or eye deviation.

Further reading:

https://oxfordmedicaleducation.com/clinical-examinations/neurological-examination/oculomotor-trochlear-abducens-questions/

Question:

A 44-year-old gentleman presents to the GP with a persistent itching feeling. He states this affects his whole body and is becoming increasingly hard to deal with. He denies any rashes and is bemused and frustrated about the origin of his symptoms. He informs the doctor that he has also experienced an uncomfortable burning sensation in his hands and feet, accompanied by an increased redness of these areas; this seems to be sporadic in nature.

His past medical history is limited, other than two recent admissions for deep vein thromboses; these seemed to occur without a trigger, and as a result, he is currently taking apixaban. The only other medication he takes is paracetamol, which he reports using frequently to deal with a chronic headache.

The patient states that both his father and mother suffered from hypothyroidism and that they both complained of itch before they were started on medication to treat the condition; he wonders if he could have the same disease.

On examination, the patient is of normal height and weight, and a thorough examination reveals no rashes, nor any other abnormalities. Nevertheless, the GP is concerned about the patient's symptoms, and orders a set of blood tests, as well as making a referral to secondary care.

What is the most likely diagnosis in this case?

A. Polycythaemia vera

B. Anti-phospholipid syndrome

C. End-stage renal disease

D. Hashimoto's thyroiditis

E. Iron deficiency anaemia

Correct Answer:Polycythaemia vera

Explanation:

This patient is describing symptoms of polycythaemia vera; a form of haematological malignancy involving the abnormal proliferation of erythrocytes. The exact pathophysiology is unknown, but there is a significant association with JAK2 mutations; a genetic alteration that is often present in many myeloproliferative disorders.

The excessive numbers of red blood cells can result in a number of clinical symptoms; most notably recurrent thrombosis due to hyperviscosity, with flushing and headache also commonly reported. Pruritus is another common manifestation; this is classically described as worsening in the presence of water exposure (so-called 'aquagenic pruritis') although this classical description is not always seen. Erythromelalgia is the term used to describe an intense burning pain of the extremities; this can arise in both polycythaemia vera and essential thrombocytosis.

If polycythaemia is suspected, a full blood count and haematocrit are important first-line investigations. The full blood count will likely reveal a raised haemoglobin level and red blood cell count, as well as a slightly raised WBC and platelet count. The haematocrit will be raised, as the increase in red blood cells will increase the erythrocyte: plasma ratio. A genetic test using PCR to screen for the presence of a JAK-2 mutation will likely be carried out, if this is negative, polycythaemia vera is much less likely. Treatment is usually via venesection to remove a proportion of the excess red blood cells. Given this patient's significant thrombotic history, he is likely to receive both aspirin and hydroxycarbamide, as both of these therapies can reduce the risk of venous thromboembolism.

Iron deficiency anaemia can cause pruritus; however, there is no evidence in the history to suggest that this patient is likely to be anaemic, and it would not explain the other symptoms experienced by the patient.

Anti-phospholipid syndrome can cause recurrent thromboses as experienced by this patient but does not normally cause itching. The condition is more common in young women.

The significant family history of hypothyroidism make Hashimoto's thyroiditis a possibility - pruritus is a documented feature of the condition. However, the patient does not report any features in keeping with an underactive thyroid gland such as weight gain, constipation or cold intolerance, and a lack of thyroxine would not cause thrombosis or erythromelalgia. Therefore, it is not the most likely diagnosis in this case.

End-stage renal disease can cause pruritus secondary to phosphate and urea accumulation; however, there is nothing in the patient's presentation or past medical history that indicates that this is the likely diagnosis.

Further reading:

https://cks.nice.org.uk/topics/polycythaemia-erythrocytosis/

Question:

A 77-year-old man is rushed to hospital with severe abdominal pain. The pain came on rapidly and is described as all over the abdomen, he rates it 10/10. He has vomited twice and says he has not opened his bowels for 4 days. He was due to undergo a left hemicolectomy next week for a recently diagnosed sigmoid carcinoma.

On examination, he appears pale and in obvious discomfort. He has a heart rate of 109bpm, blood pressure of 90/69 mmHg, respiratory rate 25 and oxygen saturations of 95% on air.

Abdominal examination reveals a distended abdomen with involuntary guarding. He is unable to tolerate deep palpation. On auscultation, bowel sounds are inaudible.

What is the most significant radiological finding to confirm the likely diagnosis?

A. 10cm dilated caecum

B. Sentinel bowel loops

C. Pneumoperitoneum

D. Rigler's sign

E. Colonic thumbprinting

Correct Answer:Pneumoperitoneum

Explanation:

The correct answer is pneumoperitoneum (free air under the diaphragm), the patient has presented with peritonism most likely due to bowel perforation from his cancer. Pneumoperitoneum is the most sensitive radiological sign of bowel perforation and is something that doctors of all levels should be able to recognise on an erect chest x-ray.

Rigler's sign is another indicator of bowel perforation and can be seen on abdominal x-ray, however, this can be difficult to identify and not always as clear as pneumoperitoneum hence it is not the most likely finding. Rigler's sign refers to both sides of the bowel wall being visible on x-ray due to the presence of gas.

Sentinel bowel loops are an indicator of a more localised inflammatory process, hence they may be present but would not indicate a perforation.

Colonic thumbprinting is a sign seen in inflammatory bowel disease.

A dilated caecum may be noted given the patient's likely diagnosis of bowel obstruction, but this would not directly confirm the presence of a perforation.

Further reading:

https://www.radiologymasterclass.co.uk/gallery/abdo/abdominal\_xray/perforation

Question:

A 56-year-old man presents to the GP complaining of problems with swallowing. He has noticed that larger pieces of food appear to get stuck, and it takes a great deal of effort to 'get them down'. This has been present for approximately 3 weeks, has not progressed, and affects solids only. He denies weight loss, any change in appetite, and has not noticed any abdominal pain or blood in his stools. He admits to having suffered from acid reflux for a number of years; he believes that this is likely to be linked to the fact that he is obese and has a poor diet, and has not presented to the GP about this.

The patient has no past medical history of note and takes no regular medication, other than over the counter paracetamol for persistent knee pain. Abdominal examination reveals no tenderness or masses, and the patient has no notable lymphadenopathy. A full blood count reveals no evidence of anaemia, and the patient's observations are all within the normal range.

What is the most appropriate next management step for this patient?

A. Referral to hospital via 2-week-wait pathway

B. 4 week trial of proton-pump inhibitors

C. Non-urgent hospital referral

D. 8 week trial of proton pump inhibitors

E. Discharge patient with dietary advice and encouragement to lose weight

Correct Answer:Referral to hospital via 2-week-wait pathway

Explanation:

This patient meets the criteria for a referral to hospital via the 2-week-wait pathway; NICE states that all patients should be referred for suspected oesophageal cancer if they meet the following criteria:

Any individual with dysphagia OR

Aged 55 years and over with weight loss and one of - upper abdominal pain, reflux, or dyspepsia

Given that this patient has presented with dysphagia, he requires referral via this pathway, so that endoscopy can be carried out to rule out malignancy. The lack of other worrying features make oesophageal cancer less likely (pathology such as a benign oesophageal stricture is more probable) - only approximately 6% of 2-week-wait referrals result in a cancer diagnosis. However, it is essential to make a referral when the criteria are met, so as to not miss the presence of malignancy. A non-urgent hospital referral would therefore not be an appropriate course of action for the management of this patient.

Whilst proton pump inhibitors may well be of benefit to this patient, given his history of reflux and the potential for this to be implicated in his dysphagia, to discharge him without making a hospital referral would not be appropriate, as he requires further investigation of his dysphagia. Discharging the patient with dietary advice and encouragement to lose weight is certainly not indicated, given his symptoms.

Further reading:

https://cks.nice.org.uk/topics/gastrointestinal-tract-upper-cancers-recognition-referral/

Question:

A 10-year-old girl attends the GP with her father. She complains that her ear hurts and is itchy. Her father has noticed a small amount of discharge. She denies any tinnitus or hearing loss. On examination, otoscopy reveals an oedematous ear canal that partially obstructs with an erythematous, but normal looking, tympanic membrane.

What is the most likely diagnosis?

A. Acute otitis media

B. Contact dermatitis

C. Chronic otitis media

D. Otitis externa

E. Otomycosis

Correct Answer:Otitis externa

Explanation:

The most likely diagnosis is otitis externa. This is also commonly referred to as “swimmer’s ear.” Swimmer's ear is an infection of the external auditory canal. It most commonly results from contaminated water that enters the outer ear during swimming which provides a nidus for bacterial growth. The most typical organisms that result in bacterial otitis externa are pseudomonas aeruginosa, staphylococcus aureus and occasionally other gram-negative rods.

Patients with otitis externa typically present with external, localised ear pain, which is made worse with palpation of the tragus and external ear. This can make examination particularly challenging, especially in children. Tinnitus and hearing loss are suggestive of more serious pathology of the middle or inner ear.

Otomycosis is a fungal otitis externa most commonly caused by aspergillus and candida. It is more common in countries with tropical climates.

Further reading:

https://patient.info/doctor/otitis-externa-and-painful-discharging-ears

Question:

A 25-year-old woman presents to the emergency department with confusion, abdominal pain and vomiting. Her mother, who is with her, says that she has been unwell for a few days following a recent viral infection.

On examination, she appears dehydrated and there is generalised abdominal tenderness.

Her blood gas on admission is shown below.

Which of the following answer options best describes her metabolic state?

pH 7.21 (7.35-7.45)

pO2 10.9 kPa (10-14)

pCO2 2.1 kPa (4.5-6.0)

HCO3- 13 mEq/L (22-26)

Na+ 137 mmol/L (135-145)

K+ 4.0 mmol/L (3.5-5.0)

Cl- 105 mmol/L (95-105)

A. Raised anion gap respiratory alkalosis

B. Normal anion gap respiratory acidosis

C. Raised anion gap respiratory acidosis

D. Raised anion gap metabolic acidosis

E. Normal anion gap metabolic acidosis

Correct Answer:Raised anion gap metabolic acidosis

Explanation:

This patient is presenting with symptoms typical of diabetic ketoacidosis, with vomiting, dehydration, and abdominal pain. Her blood gas shows acidosis (decreased pH), which we know is metabolic due to the reduced bicarbonate and reduced CO2. The bicarbonate has been used up in buffering reactions to try and normalise the pH, and the CO2 is reduced as the respiratory rate will increase to try and compensate for the acidosis.

The fact that the value for chloride has been provided in the question is often a clue that the anion gap needs to be calculated. This can be calculated by: (Na+ + K+) - (Cl- + HCO3-). In this case, the calculation would be: (137+4) - (105+13) = 23. The normal range for the anion gap is 10-18 mmol/L, so this is metabolic acidosis with a raised anion gap. Other examples of a raised anion gap metabolic acidosis are sepsis (due to lactate build-up) and renal failure (due to urate build-up).

Examples of normal anion gap metabolic acidosis are Addison's disease and renal tubular acidosis.

This is not respiratory acidosis as there is reduced bicarbonate and reduced CO2. CO2 would be high in respiratory acidosis. Examples of respiratory acidosis include airway obstruction (for example in COPD), respiratory muscle weakness or central nervous system (CNS) depression.

Respiratory acidosis is not classified based on the anion gap. It is also incorrect for the reasons mentioned above.

Again, respiratory alkalosis is not classified based on the anion gap. Examples of respiratory alkalosis include pain, hyperventilation and pulmonary emboli.

Further reading:

https://geekymedics.com/abg-interpretation/

Question:

You are the FY2 doctor in a General Practice. A 60-year-old gentleman attends with gradual bilateral hearing loss. You perform Weber and Rinne's tests that establish the presence of bilateral conductive deafness. Further neurological examination is unremarkable. The man also mentions that he thinks that his head has increased in size over the previous couple of months and that his head feels sore all over. He remembers that his father suffered from a similar set of symptoms but cannot remember what the diagnosis was. You order a bone profile and ALP is later reported as being raised.

Which of the following is the MOST APPROPRIATE management plan?

A. Vitamin D supplements

B. No management required

C. Analgesia and bisphosphonate therapy

D. Calcium supplements

E. Analgesia

Correct Answer:Analgesia and bisphosphonate therapy

Explanation:

The patient is most likely suffering from Paget’s disease which, in this case, should be treated with analgesia and bisphosphonate therapy. Analgesia is indicated for the gentleman’s head pain and bisphosphonate therapy is required to strengthen his mechanically weak bone. Sufferers of Paget’s disease may also require management such as fracture fixation, joint replacement and osteotomy.

Paget’s disease can be defined as focal increases in bone remodelling which results in bone that is mechanically weak. The pelvis is most commonly affected followed by the spine, skull, femur and tibia in order of descending frequency. Major risk factors include: aged over 50 years, European descent (excluding Scandinavians), genetic predisposition, and lifestyle factors (like poor diet, exposure to infections, skeletal damage and repetitive mechanical loading). Patients are often asymptomatic but may suffer from bone pain, hearing loss, bone deformity, pathological fracture, and increased temperature over affected bones. ALP is typically raised.

Analgesia alone would indeed treat this patient’s skull pain however would not address his mechanically weak bone.

Calcium supplementation is incorrect as often Paget's disease results in hypercalcaemia in later stages.

No management is sometimes appropriate in Paget’s disease but only when the patient is asymptomatic.

Vitamin D supplementation is not indicated in Paget’s disease. It is instead used in conditions such as osteomalacia.

Further reading:

https://patient.info/doctor/pagets-disease-of-bone-pro

Question:

A 40-year-old woman is found collapsed at home by her daughter. She has recently been feeling unwell with abdominal pain, nausea, vomiting and dizziness. On arrival to the emergency department, her observations are as follows: HR 95 bpm, BP 80/40 mmHg, temp 36.4°C, SpO2 97% on room air and RR 20/min. An ECG shows normal sinus rhythm.

Her blood tests demonstrate:

Blood test Result Reference range

Haemoglobin (Hb) 125 g/L (115 – 165)

White cell count (WCC) 8 x 109/L (3.6 – 11.0)

Na+ 132 mmol/L (133–146)

K+ 5.8 mmol/L (3.5-5.3)

Urea 7 mmol/L (2.5 - 7.8)

Creatinine 60 μmol/L (45–84)

Serum glucose (random) 5.5 mmol/L (4.0 to 7.8)

Serum cortisol (random) <5 nmol/L (137 - 429)

After fluid resuscitation, which of the following would be the most appropriate next treatment?

A. 100 mcg fludrocortisone PO

B. 10ml of 10% calcium gluconate IV

C. 100mg IV hydrocortisone

D. 10 units short-acting insulin

E. 1mg glucagon IM

Correct Answer:100mg IV hydrocortisone

Explanation:

The most likely diagnosis is Addison’s disease (primary adrenal insufficiency), given the history of abdominal pain, vomiting and dizziness in addition to the clinical features of hypotension, hyperkalaemia and undetectable levels of serum cortisol. As a result, the most appropriate next treatment after initial fluid resuscitation would be the administration of IV hydrocortisone, to treat the lack of endogenous steroids.

Oral fludrocortisone is typically used in the long-term management of patient's with adrenal insufficiency, with the dose being doubled during episodes of intercurrent illness. It is not typically required in the acute treatment of an adrenal crisis.

Calcium gluconate is usually administered in the context of hyperkalaemia with associated ECG changes (i.e. tall tented T waves) to stabilise the myocardium.

Glucagon is used in the management of hypoglycaemia, to encourage the breakdown of glycogen stores to increase blood glucose levels.

Short-acting insulin may be used as subcutaneously as part of a basal bolus regime, or intravenously with an insulin sliding scale or in the treatment of diabetic ketoacidosis. However, DKA is unlikely here due to the normal glucose.

Further reading:

https://patient.info/doctor/adrenal-insufficiency-and-addisons-disease#nav-2

Question:

Alvin Sanchez, 72, presents with collapse, left-sided weakness and a blood pressure of 170/90 mmHg. As part of his initial investigations, he has a CT brain which reveals a right-sided lobar intracerebral haemorrhage. You learn that he usually takes warfarin for atrial fibrillation. His INR is 2.2, which is within his usual range as per his treatment plan (target range 2-3 in his yellow book), his platelet count is 151 × 109/L.

After stopping warfarin, what is the most important next management step?

A. Reduce systolic blood pressure to a target of 140 mmHg

B. Give prothrombin complex concentrate

C. Stop warfarin but give aspirin 300mg once daily instead

D. Give tranexamic acid

E. Give 1 pool of platelets

Correct Answer:Give prothrombin complex concentrate

Explanation:

This patient has a warfarin-associated intracerebral haemorrhage, a life-threatening complication of the treatment that has mortality rates of around 50%. Immediate warfarin reversal with prothrombin complex concentrate is required to limit haematoma expansion, which is also associated with a poor prognosis. This should be done with the guidance of a haematologist.

It is not appropriate to give aspirin as this time due to ongoing bleeding risk and recent research shows platelet transfusions may cause harm is this patient group.

Treatment with tranexamic acid would not reverse warfarin-related coagulopathy.

Reducing his blood pressure is reasonable but not the key intervention here.

Further reading:

https://radiopaedia.org/articles/intracerebral-haemorrhage

Question:

A 59-year-old female patient has recently been diagnosed with rheumatoid arthritis (RA) by her consultant rheumatologist. She is being commenced on methotrexate for disease-modifying therapy.

Which of the following should be co-prescribed with methotrexate?

A. Folic acid

B. Leflunomide

C. Meloxicam

D. Paracetamol

E. Hydroxychloroquine

Correct Answer:Folic acid

Explanation:

Methotrexate is a dihydrofolate reductase inhibitor, an enzyme responsible for the conversion of folic acid to tetrahydrofolate (FH4). Lack of FH4 prevents cellular replication, which accounts for the efficacy of methotrexate in cancer patients. Methotrexate also has potent anti-inflammatory and immunosuppressive properties which account for its role in autoimmune diseases such as RA and psoriatic arthritis. Co-prescription of folic acid supplements is, therefore, recommended for patients taking methotrexate on a regular basis. It is typically taken each day apart from the day of the week on which methotrexate is taken.

Paracetamol is a commonly used, over the counter analgesic which does not need to be prescribed with methotrexate if it is not clinically indicated.

Whilst medications like hydroxychloroquine (HCQ) also carry disease-modifying benefits in patients with rheumatoid arthritis, it is not mandatory for HCQ to be prescribed with methotrexate.

Meloxicam is a COX-2 selective non-steroidal anti-inflammatory medication used for symptomatic relief in patients with various forms of arthritis. It does not need to be co-prescribed with methotrexate.

Leflunomide is another disease-modifying agent used in the management of RA. It is not compulsory to prescribe methotrexate with leflunomide.

Further reading:

https://cks.nice.org.uk/dmards#!scenario:10

Question:

A 50-year-old woman presents to her GP complaining of pain on the left side of her face. She describes several weeks of sudden, intense, ‘electric shocks' which involve her left cheek and forehead.

On examination, she is exquisitely tender to palpation of her forehead and maxilla on the left side. There are no rashes.

Aside from this pain, she is usually fit and well. She has no significant past medical history and has had no recent surgeries or procedures.

What is the most likely diagnosis?

A. Giant cell arteritis

B. Herpes zoster

C. Temporomandibular disorder

D. Trigeminal neuralgia

E. Atypical odontalgia

Correct Answer:Trigeminal neuralgia

Explanation:

This patient’s symptoms are most likely caused by trigeminal neuralgia (TN), a neuropathic condition involving cranial nerve five. TN presents with sudden onset, brief, unilateral pain in the distribution of the trigeminal nerve. This can be associated with allodynia and triggers such as cold wind, skin contact, and brushing teeth.

Giant cell arteritis commonly presents with temporal headache, myalgia, and malaise and so is less likely to be the cause of this patient’s symptoms.

Atypical odontalgia is persistent pain in a tooth or the jaw that is not adequately explained by dental or bone pathology, often starting after a dental procedure. As this patient’s symptoms are paroxysmal and she does not report any recent surgery or procedures to the teeth or jaw, atypical odontalgia is unlikely.

Temporomandibular disorder causes bilateral, paroxysmal, and dull pain located around the temporomandibular joint. This patient has unilateral symptoms and describes a sharp pain so temporomandibular joint disorder is unlikely.

Herpes zoster can develop in the trigeminal nerve and cause pain in its distribution. The pain usually precedes or is associated with a rash in the distribution of the affected nerve. The rash develops within 1-3 days of the onset of pain, and so this patient’s weeks of pain in the absence of rashes is unlikely to be herpes zoster.

Further reading:

https://cks.nice.org.uk/topics/trigeminal-neuralgia

Question:

A 72-year-old man presents to the emergency department with a 2-day history of cough, increased sputum and shortness of breath. He has a history of chronic obstructive pulmonary disease (COPD) and continues to smoke 20 cigarettes a day. He was recently admitted required non-invasive ventilation for type 2 respiratory failure.

On examination, he is visibly short of breath, alert and able to talk in complete sentences.

Respiratory rate: 30/min

Oxygen saturation: 89% on room air

Heart rate: 120 bpm

Blood pressure: 110/65 mmHg

ABG: pH of 7.36, PaCO2 6.8, PaO2 7.1

What is the most appropriate intervention to treat his oxygen saturations?

A. Non-invasive ventilation (NIV)

B. 35% venturi mask

C. 15L/min non-rebreather mask

D. 2L/min nasal cannula

E. Remain in room air

Correct Answer:Remain in room air

Explanation:

This gentleman is having an acute exacerbation of his COPD. Given his history of type 2 respiratory failure, his oxygen saturation target range should be between 88-92%. Given he is achieving this in room air, no further intervention is required. He does not have a respiratory acidosis and so does not require NIV, his raised PaCO2 is most likely chronic. Although his PaO2 is low, oxygen therapy should be targeted at his oxygen saturations. The oxygen delivery equation shows that the saturation of oxygen is a far more important contributor to tissue oxygen delivery than the PaO2.

Further reading:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5531304/#targetText=%E2%9C%93%20For%20patients%20who%20use,the%20patient%20is%20in%20hospital.

Question:

A 70-year-old man presents to his GP with a 2-month history of leg pain.

He describes 7/10, cramping pain on the posterior aspect of both lower legs when walking and is relieved by rest. The pain is worse when ascending a hill or stairs. There is no erythema, altered sensation, weakness, swelling or ulcers in the lower legs.

His past medical history includes type 2 diabetes, hypertension and hypercholesterolaemia. He has no known drug allergies, with his regular medications below:

Metformin 500 mg BD

Ramipril 10 mg OD

Amlodipine 5 mg OD

Atorvastatin 20 mg OD

There is no family history of note. He is an ex-smoker (40-pack-year smoking history) and drinks alcohol only on special occasions.

What is the most likely diagnosis?

A. Intermittent claudication

B. Sciatica

C. Acute limb ischaemia

D. Spinal stenosis

E. Critical limb ischaemia

Correct Answer:Intermittent claudication

Explanation:

Peripheral arterial disease (PAD) can be considered an umbrella term which largely encompasses intermittent claudication, acute limb ischaemia and critical limb ischaemia. This patient has mutiple risk factors for PAD including male sex, increasing age, smoking history, diabetes, hypertension and hypercholesterolaemia.

This presentation is in keeping with intermittent claudication. Intermittent claudication is characterised by cramping pain in the legs when walking which is relieved by rest. The pain is most common in the calves but the thighs and buttocks can also be affected.

Acute limb ischaemia is not inkeeping with this presentation due to the nature and longer duration of his symptoms. NICE CKS (see further reading) outline the features of acute limb ischaemia as the 6Ps:

Pain (constant and persistent)

Pulslessness

Pallor

Paralysis/power loss

Paraesthesia

Perishingly cold

Critical limb ischaemia is also incorrect. This is characterised by rest pain (often worse at night and patients may let the limb hang over the end of the bed to allow gravity to help perfusion), skin changes (including ulcers and gangrene), and absent pulses in the foot. In this gentleman, the pain is more akin to the pain seen in intermittent claudication.

Spinal stenosis refers to narrowing of the spinal canal and is a key mimic of intermittent claudication. In spinal stenosis the patient often complains of back pain along with buttock/leg pain and weakness. The pain can be worse on standing and walking, but relieved in certain positions such as sitting or leaning forwards. In this gentleman, the absence of back pain and weakness, along with his cardiovascular risk factors makes intermittent claudication more likely.

Sciatica occurs due to compression of the nerve root. It causes back pain along with unilateral neuropathic pain extending down the thigh and below the knee. This may be accompanied by paraesthesia. On examination a straight leg raise may illicit the sciatic pain.

Further reading:

https://cks.nice.org.uk/topics/peripheral-arterial-disease/

Question:

A 65-year-old woman presents to the emergency department with a 24-hour history of severe crampy abdominal pain and vomiting. She has a longstanding femoral hernia and is on the waiting list to have this repaired electively.

She looks dehydrated, but her observations are within normal limits. On examination, her abdomen is distended with generalised tenderness but no peritonism. There is a tender irreducible swelling in the left groin located below and lateral to the pubic tubercle.

What is the most appropriate term to use to describe this patient’s hernia?

A. Obstructed

B. Eviscerated

C. Strangulated

D. Incarcerated

E. Recurrent

Correct Answer:Obstructed

Explanation:

The most likely diagnosis, in this case, is an obstructed femoral hernia. This means that the contents of a hernia containing bowel are being compressed to the extent that the bowel lumen is no longer patent, leading to obstruction. The cardinal features of intestinal obstruction are colicky abdominal pain, distension, vomiting and absolute constipation. Obstructed hernias generally require emergency surgery unless they can be reduced very quickly. Femoral hernias are at very high risk of both obstruction and strangulation as the femoral canal is a narrow space bordered medially by the sharp edge of the lacunar ligament.

An incarcerated hernia simply means that the contents of the hernia are stuck and cannot be reduced back into their original position. Sudden constriction of the hernia at the level of the fascial defect often results in painful swelling of the tissues. Acutely incarcerated hernias should be repaired urgently. Other hernias can gradually become adherent to the surrounding tissues over time without causing any constriction of the contents. Chronically incarcerated hernias are usually repaired electively unless they are very painful or at high risk of obstruction or strangulation.

A strangulated hernia means that the blood supply to the contents of the hernia is compromised. Compression at the level of the fascial defect prevents blood flow into the tissues, causing ischaemia which may lead to infarction and necrosis. This typically presents with disproportionately severe constant pain, systemic illness and sepsis. These hernias are the most serious and require emergency surgery as soon as possible to salvage or resect their contents.

A recurrent hernia is any hernia which reoccurs at the site of a previous surgical repair. The risk factors for developing a recurrent hernia are very similar to those for incisional hernias. Recurrent hernias are usually more challenging to repair than primary hernias due to scarring, damaged tissue planes and the presence of old mesh.

An eviscerated hernia (also sometimes called a ruptured hernia) is a very rare complication which occurs when the skin and subcutaneous tissues overlying a hernia break down completely. This causes its contents (usually bowel loops) to be exposed to the environment. Evisceration is a life-threatening surgical emergency which typically occurs in high-risk patients, such as those with large umbilical hernias secondary to liver cirrhosis and ascites.

Further reading:

https://geekymedics.com/hernias/

Question:

A 27-year-old woman (gravida 1, para 0), at 35-weeks gestation, presents to the emergency department with abdominal pain and severe vaginal bleeding. She describes the blood as "bright-red" and "enough to saturate a sanitary towel in 10 minutes".

She has no significant medical history. She reports she has been a smoker for ten years and has continued to smoke throughout the pregnancy. She smokes approximately ten cigarettes a day.

On examination, her temperature is 37.0°C, pulse 110/min, blood pressure 90/58mHg and SpO2 98% on room air. The fundal height measures 41cm, the uterus feels hard and is tender to palpation. The foetal heart rate is recorded at 172/min with recurrent decelerations.

Which of the following management options is most appropriate for this patient?

A. Intramuscular dexamethasone

B. Intravenous magnesium sulphate

C. Conservative management

D. Vaginal delivery

E. Emergency caesarean delivery

Correct Answer:Emergency caesarean delivery

Explanation:

The most likely diagnosis in this patient is placental abruption - a condition characterised by partial or complete separation of the placenta from the uterus before delivery. Placental abruption is an important cause of antepartum haemorrhage (APH). Highly suggestive clinical features in this patient include a history of smoking, painful vaginal bleeding and a hard, tender uterus. This patient is haemodynamically unstable, and the foetal status is concerning for compromise due to tachycardia and recurrent decelerations on monitoring. These clinical findings indicate an obstetric emergency, necessitating an emergency caesarean delivery.

When a mother is haemodynamically stable at >34 weeks gestation and there is no evidence of foetal compromise, vaginal delivery may be attempted. However, whilst this mother is close to term, there is evidence of haemodynamic compromise and a concerning foetal status; therefore, a vaginal delivery would not be recommended.

In cases where the foetus and mother are both stable and there is no evidence of further complications, conservative management may be chosen in the first instance. Conservative management is generally prefered in cases where the foetus is <34 weeks. Therefore, this patient would not be suitable for conservative management.

Corticosteroids, such as dexamethasone, should be administered intramuscularly to patients between 24-34 weeks gestation to promote foetal lung maturation. Corticosteroids are also often used alongside a tocolytic agent such as magnesium sulphate, which helps delay preterm labour (pregnancies less than 34 weeks gestation) and allows time for the steroids to take effect on the foetus. This patient is 35 weeks gestation, is haemodynamically unstable and has concerning foetal observations; therefore, delaying delivery would be harmful.

Further reading:

https://www.rcog.org.uk/globalassets/documents/guidelines/gtg\_63.pdf

Question:

A 69-year-old man presents to the emergency department with a two-day history of constant left iliac fossa pain and non-bloody diarrhoea. He feels otherwise well in himself. He has no significant past medical history.

His observations are:

Oxygen saturation: 99% on room air

Respiratory rate: 16 breaths per minute

Heart rate: 78 beats per minute

Blood pressure: 129/84 mmHg

Temperature: 37.4 °C

A CT abdomen reveals diverticulosis, peri-colic fat stranding and a thickened gut wall.

What is the most appropriate treatment?

A. Oral antibiotics and safety netting advice

B. Paracetamol and safety netting advice

C. IV antibiotics and percutaneous drainage

D. Sigmoid colectomy with primary anastomosis

E. Hartmann’s procedure

Correct Answer:Paracetamol and safety netting advice

Explanation:

This patient has diverticulitis, but they are systemically well. According to NICE guidance, a no-antibiotic prescribing strategy should be considered in systemically well patients with diverticulitis, unless they are immunocompromised or have significant comorbidity. Therefore, paracetamol and safety netting advice is the correct answer.

Oral antibiotics and safety netting advice is incorrect, as the patient is systemically well.

IV antibiotics and percutaneous drainage is used to treat abscesses. The CT scan does not show an abscess, so this answer is incorrect.

A Hartmann’s procedure is a sigmoid colectomy with an end colostomy and oversewn rectal stump. It is used in the treatment of complicated diverticulitis. This patient is presenting with simple diverticulitis and is systemically well, therefore surgery is not indicated.

Similarly, a sigmoid colectomy with primary anastomosis is not indicated in simple diverticulitis.

Further reading:

https://www.nice.org.uk/guidance/ng147/chapter/Recommendations#acute-diverticulitis

Question:

A 51-year-old gentleman presents with weakness of his limbs and facial muscles, and difficulty swallowing. His problems came on rapidly over the course of 3 days. Currently, his voice is very slurred and nasal. You can only just make out what he is saying. He has bilateral ptosis, ophthalmoplegia and easily fatigable limb weakness. You also notice that his respiratory effort is poor with oxygen saturations of 94%.

Which of the following is the most important initial investigation for this patient?

A. MRI head and spine

B. Chest x-ray

C. Forced vital capacity measurement

D. Swallow assessment

E. Arterial blood gas

Correct Answer:Forced vital capacity measurement

Explanation:

The clinical features of this patient are consistent with myasthenia gravis (MG), and furthermore a myasthenic crisis. A small proportion of patients who develop MG may first present in a crisis.

He has marked bulbar failure with dysphagia and slurred, nasal speech. More concerning is the finding that he has poor respiratory effort (despite normal oxygen saturations). This makes forced vital capacity (FVC) measurement the most important initial investigation. His FVC should be measured serially and is a good guide to when he might require further respiratory support and escalation to ICU.

An arterial blood gas (ABG) is a sensible option, however, it will only become abnormal late in the course of his decompensation. FVC measurement is a better way to predict decompensation at this stage, especially while his saturations are just normal.

Swallow assessment is an important test to be performed by speech and language therapists later on in this patient’s admission, once he is more stable and a medical plan for his MG has been commenced.

Infections are a common cause of myasthenic crises, so a chest x-ray might be requested later, especially if he has symptoms.

MRI head and spine would be normal in a patient with MG because the problem is at the neuromuscular junction rather than in the central nervous system.

Further reading:

https://patient.info/doctor/myasthenia-gravis-pro

Question:

A 50-year-old man presents to the GP with a ‘lump’ on his penis. He first noticed this last month. It is painless, there are no other changes or genitourinary symptoms. He states he is single and has had sex with 6 different partners in the past 12 months. He doesn’t use contraception and doesn’t remember the last time he had an STI screen. He is otherwise fit and well.

On examination, there is a 12mm ulcer on the dorsal aspect of the penis, with an erythematous margin with enlarged painless lymph nodes in the inguinal region.

What is the most likely diagnosis?

A. Primary syphilis

B. Herpes simplex

C. Lymphogranuloma venereum

D. Herpes zoster

E. Fournier gangrene

Correct Answer:Primary syphilis

Explanation:

Syphilis is more common in men who have sex with men and in 2015 there were twice as many cases as the previous year, albeit rates are still quite low with 316 in 2015. Primary syphilis usually presents with a painless ulcer known as a chancre. This can then progress to multiple organ involvement if left untreated but often primary syphilis will remain asymptomatic for long periods of time.

Herpes zoster infections lead to ‘chickenpox’ and shingles.

Herpes simplex infection leads to oral (HSV1) or genital (HSV2) lesions.

Lymphogranuloma venereum (LV) is an atypical presentation of chlamydia trachomatis infection. It is more common in the developing world. It presents with lesions resembling ulcers or vesicles, urethritis and tender lymphadenopathy. This progresses over 30 days to secondary LV where buboes develop effecting inguinal and pelvic lymph nodes. Tertiary LV involves the anus and distal rectum.

Fournier gangrene is necrotising fasciitis of the perineum. It is more common in men, diabetics and those with a history of excessive alcohol consumption. Initially, the condition mimics the presenting symptoms of cellulitis with erythema and tenderness but then progresses to bullae and ecchymosis, requiring urgent surgical referral for debridement and intravenous antibiotics.

Further reading:

https://patient.info/doctor/syphilis-pro

Question:

A 65-year-old patient, Mr David Adjei, presents to the Emergency Department via ambulance following a collapse. Mr Adjei reports that he was climbing up his stairs at home when he experienced chest pain and breathlessness, the next thing he remembers, he was waking up on the floor surrounded by his family. Mr Adjei reports that he has been getting progressively short of breath for about 6 months and that occasionally he wakes up from sleep feeling breathless.

The patient's past medical history includes a myocardial infarction in 2007, hypertension, and non-insulin-dependent diabetes.

On examination, Mr Adjei looks tired but well perfused. On chest auscultation you hear a loud high pitched murmur at the beginning of systole, radiating to the carotids. You also notice that Mr Adjei has oedematous swollen legs. An ECG is recorded and is shown below.

His vital signs are as follows:

O2 96% on air

HR 60 bpm

RR 25

BP 140/70 mmHg

Temp 37 oC

What is the most likely cause of this patients collapse?

Source: James Heilman, MD [CC BY-SA 3.0]

A. Vasovagal syncope

B. Pulmonary embolism

C. Mitral regurgitation

D. Aortic stenosis

E. Postural hypotension

Correct Answer:Aortic stenosis

Explanation:

The most likely diagnosis is aortic stenosis (AS).

AS occurs due to restricted opening of the aortic valve cusps most commonly secondary to calcification/degeneration. The restriction results in obstructed ventricular outflow. Patients with severe AS may present with breathlessness, chest pain and exertional syncope, however many patients are asymptomatic.

This patient presents with a longstanding history of progressive breathlessness, a new ejection systolic murmur and evidence of left heart failure. The ECG shows a left bundle branch block (LBBB), a common finding in severe AS due to the left ventricle becoming hypertrophied to maintain stroke volume when aortic outflow is obstructed.

A pulmonary embolism is a reasonable differential diagnosis for a patient presenting with collapse, however in the context of a new cardiac murmur and signs of chronic heart failure, AS is more likely.

Mitral regurgitation (MR) is a valvular disease that also causes a systolic murmur on chest auscultation. MR is heard throughout systole however, instead of just at the beginning. In addition, patients attending with acute MR are more likely to show signs of pulmonary oedema and right heart failure.

Both vasovagal syncope and postural hypotension can cause collapse however they would not account for the chest pain and progressive breathlessness, and they are therefore not the most likely cause for this presentation.

Further reading:

https://www.rcemlearning.co.uk/references/valvular-heart-disease/

Question:

An 18-month-old girl has been brought to A&E by her mother who is concerned after her daughter started coughing and making unusual noises. Her mother says this started about an hour ago whilst she was making lunch and her daughter was playing with her toys. She has never had anything like this before and has been fit and well recently. There is no significant past medical history or family history of note. On examination, the girl appears well but is crying with audible stridor and an occasional dry sounding cough. A respiratory examination is normal. A chest x-ray is ordered which shows no obvious abnormality.

What is the most likely cause of the stridor?

A. Inhaled foreign body

B. Croup

C. Anaphylaxis

D. Epiglottitis

E. Laryngomalacia

Correct Answer:Inhaled foreign body

Explanation:

The most likely diagnosis is an inhaled foreign body. This is suggested by the acute onset of symptoms during a period where the child was playing and the parent was distracted. The symptoms match those of inhaled foreign body and the important detail to bear in mind is that respiratory exam and chest x-ray are often normal as most inhaled foreign bodies are small and radiolucent.

The alternatives are possible but less likely. The vignette says the patient is well with the only notable finding on examination being stridor and an occasional dry cough. With croup you would expect more of a barking cough and other associated symptoms of upper respiratory tract infection such as coryza and fever. With epiglottitis, you would expect an unwell child with additional symptoms such as drooling. Similarly, if the cause was anaphylaxis you may expect the child to appear much more generally unwell with associated urticaria and angioedema.

Laryngomalacia is the most common cause of stridor but is unlikely to be seen for the first time in an 18-month-old child as this is a congenital condition which usually appears earlier in life.

Further reading:

https://radiopaedia.org/articles/airway-foreign-bodies-in-children

Question:

A 68-year-old patient is admitted to the stroke ward after being severely disabled by an ischaemic stroke two weeks earlier. She has a dense right hemiparesis, is globally aphasic, and has right-sided homonymous hemianopia. Investigations were as follows: initial ECG in the emergency department showed sinus rhythm, serial CT brain scans showed an evolving large left middle cerebral artery infarction, carotid dopplers and blood tests were unremarkable.

What is the most likely source of her ischaemic stroke?

A. Hypertensive cerebral small vessel disease

B. Cardioembolic, from paroxysmal atrial fibrillation

C. Paradoxical embolus from concurrent deep vein thrombosis

D. Embolic, from carotid artery disease

E. Cerebral vasculitis

Correct Answer:Cardioembolic, from paroxysmal atrial fibrillation

Explanation:

This patient has an ischaemic stroke due to large artery occlusion; she presented with a total anterior circulation syndrome (TACS), evidenced by hemiparesis AND hemianopia AND ‘higher’ or ‘cortical’ dysfunction, in this case, aphasia. Her brain imaging backs this up by confirming evolving changes in the distribution of the left middle cerebral artery.

The two most common causes of large artery occlusion are cardioembolic (e.g. from AF), or plaque embolization (e.g. from significant carotid disease).

In this case, carotid dopplers were normal, this rules out carotid artery disease, as you would still be able to see a ruptured plaque had that embolised previously.

Although a single ECG in the emergency department showed sinus rhythm, paroxysmal AF has not been excluded and is one of the commonest cause of this presentation. Previously, the prevalence of paroxysmal atrial fibrillation was underestimated, and the current NICE guidance recommends prolonged monitoring and implanted devices.

Hypertensive cerebral small vessel disease causes lacunar infarcts and hypertensive primary intracerebral haemorrhage as the main clinical presentation.

Cerebral vasculitis would present with elevated CRP/ESR due to vascular inflammation.

There is nothing in the history to suggest a paradoxical embolus from concurrent deep vein thrombosis which might be present if there was a DVT that migrated across a patent foramen ovale (PFO).

Further reading:

https://geekymedics.com/stroke-classification/

Question:

A 48-year-old female is reviewed in the endocrinology clinic. She reports a recent history of weight gain, tiredness and constipation and blood tests carried out by her GP showed a low free thyroxine (T4) level and raised thyroid-stimulating hormone (TSH).

What is the most appropriate first step in management?

A. Amiodarone

B. Levothyroxine

C. Vitamin B12 replacement

D. Propranolol

E. Carbimazole

Correct Answer:Levothyroxine

Explanation:

This patient has symptoms and biochemical features of primary hypothyroidism. The standard first step in treatment is initiating oral levothyroxine, starting at a dose of 50-100 micrograms per day. It is important to review and adjust the dose if necessary based on the response. The aim is generally for normalisation, not suppression, of the TSH level. In the elderly or those with ischaemic heart disease, the initial dose may be lower.

Carbimazole and propranolol are used in the treatment and management of hyperthyroidism.

Vitamin B12 replacement is indicated only in those who are deficient. There is no indication that this is the case here.

Amiodarone is an antiarrhythmic drug and is a rare cause of both hyper- and hypothyroidism.

Further reading:

https://patient.info/doctor/hypothyroidism

Question:

You are a junior doctor working in paediatrics. Your supervising consultant asks you to assess a newborn child with a myelomeningocele. The consultant then asks you to organise an investigation which is required for this patient to assess for potential coexisting conditions.

What is the most appropriate investigation to request to assess for the presence of coexistent conditions?

A. Magnetic resonance imaging (MRI) of the head

B. Urinalysis

C. Abdominal ultrasound

D. Echocardiography

E. Ultrasound of the hips

Correct Answer:Magnetic resonance imaging (MRI) of the head

Explanation:

The newborn in the above case has a myelomeningocele, which is the most common form of neural tube defect. The Chiari II malformation (also called Arnold – Chiari malformation type II) is a herniation of the cerebellar vermis and tonsils through the foramen magnum and is present in almost all patients with a myelomeningocele. MRI of the head should, therefore, be carried out.

Ultrasound of the hips is important in newborns who have developmental dysplasia of the hip (DDH). DDH is not associated with myelomeningocele.

Echocardiography is an important diagnostic tool for assessing congenital heart disease. However, congenital heart disease is not associated with myelomeningocele.

Urinalysis can be utilised when diagnosing urinary tract infections, but would not be indicated in the above scenario.

Abdominal ultrasound is important for newborns suspected to have posterior urethral valves (PUV). PUV is not associated with neural tube defects.

Further reading:

https://patient.info/doctor/spina-bifida-pro

Question:

A 45-year-old man presents to the GP with intermittent dizziness. He describes a few occasions of severe 'spinning' precipitated by rolling over in bed or turning his head quickly over the last month. He says each attack has lasted for about a minute.

He has vomited twice over the last month during an attack. He reports there is no associated hearing loss or tinnitus.

He does not have any significant past medical history.

The Dix-Hallpike manoeuvre in this patient provokes the same sensation of dizziness. You note his eyes develop upward beating torsional (clockwise) nystagmus.

What is the most appropriate initial management for this patient?

A. Diazepam

B. Posterior canal occlusion surgery

C. Prochlorperazine

D. Brant-Daroff exercises

E. Epley manoeuvre

Correct Answer:Epley manoeuvre

Explanation:

The most likely diagnosis in this patient is benign paroxysmal positional vertigo (BPPV) - a peripheral vestibular disorder that manifests as acute onset vertigo, usually lasting less than 1 minute and is precipitated by specific head movements. There are no associated symptoms such as hearing loss or tinnitus in BPPV. NICE guidelines state that BPPV can be diagnosed with confidence if the Dix-Hallpike manoeuvre provokes upward beating torsional nystagmus. The clockwise rotation in this patient indicates left ear BPPV. The Epley manoeuvre is a particle repositioning manoeuvre that improves symptoms of BPPV quickly after treatment. This patient does not have any apparent contraindications to repositioning manoeuvres, such as cervical disease, cardiovascular disease or suspected vertebrobasilar disease; therefore, the Epley manoeuvre is the most suitable intervention to offer first.

The use of vestibular suppressant medications such as diazepam and prochlorperazine are generally not recommended in most cases of BPPV. Vestibular suppressant medications rarely control symptoms effectively due to the sudden-onset and short-lived nature of BPPV.

Surgical treatment, such as posterior canal occlusion surgery, is typically reserved for unrelenting and incapacitating cases of BPPV where repeated repositioning manoeuvres and vestibular rehabilitation exercises have failed.

NICE guidelines recommend Brant-Daroff vestibular rehabilitation exercises as an alternative to the Epley manoeuvre if it cannot be performed immediately or is considered inappropriate in a specific patient. As this patient does not have any apparent contraindications to the Epley manoeuvre, this would not be the most appropriate initial management step.

Further reading:

https://cks.nice.org.uk/topics/benign-paroxysmal-positional-vertigo/

Question:

A 75-year old gentleman presents to A&E complaining of new-onset abdominal pain and a distended abdomen. On further questioning, he reports a 1-month history of increased defecation frequency and passage of blood in his stools.

He has a past medical history of COPD and hypertension. He was recently admitted to hospital with pneumonia for which he received IV antibiotics. Inspection of the abdomen reveals significant distension. On palpation, he has right-sided tenderness and bowel sounds are minimal. A rectal examination is performed, which demonstrates no faeces in the rectum and no prostate enlargement.

An abdominal X-ray is ordered, which is shown below.

What is the most likely diagnosis given the clinical and abdominal X-ray findings?

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A. Sigmoid volvulus

B. Gastroenteritis

C. Toxic megacolon

D. Small bowel obstruction

E. Large bowel obstruction

Correct Answer:Large bowel obstruction

Explanation:

The most likely diagnosis in this patient is large bowel obstruction. Any patient presenting with a change in stool habit and passage of blood per rectum should be investigated for colorectal malignancy, and this patient is in a particularly high-risk group as he is male and over 65-years-old. Patients with colorectal malignancies may present with large bowel obstruction if the tumour prevents the movement of stool through the bowel, and are at risk of perforation. Clinical signs of bowel obstruction include distension, minimal bowel sounds and a lack of faecal matter in the rectum. An abdominal X-ray (AXR) will typically reveal dilated large bowel.

Large bowel can be distinguished from small bowel on AXR as it lies more peripherally ('framing the abdomen') and has a typical haustral pattern. It should be noted that when the large bowel is dilated the haustra can appear to traverse the whole width of the bowel wall, which can make it more difficult to distinguish the large bowel from the valvulae conniventes of the small bowel.

The diagnosis of toxic megacolon is incorrect. The clinical history is more suggestive of colorectal malignancy and subsequent large bowel obstruction. Whilst toxic megacolon may also result in colonic dilatation and abdominal distension, toxic megacolon is specifically defined as dilatation without obstruction. It is also most commonly associated with an underlying diagnosis of inflammatory bowel disease and you would expect to find other abdominal X-ray findings consistent with this diagnosis, such as thumbprinting of the bowel (inflammation causes thickening of the haustra that appear like thumbprints on the bowel wall) or a ‘lead-pipe colon’ in which chronic inflammation results in a loss of haustra and a featureless bowel wall.

Sigmoid volvulus is also incorrect. Although this is an underlying cause of large bowel obstruction, you would expect to see the classical ‘coffee bean’ appearance on abdominal X-ray. Sigmoid volvulus occurs when the bowel twists on its mesentery and is a less common cause of bowel obstruction than colorectal carcinoma. The patient’s clinical symptoms are more suggestive of colorectal carcinoma.

Small bowel obstruction can be distinguished from large bowel obstruction by identifying prominent valvulae conniventes traversing the width of the bowel on abdominal X-ray which result in a ‘coiled spring appearance’ of the bowel. The dilated bowel will also be more central than in large bowel obstruction. The clinical picture is more suggestive of large bowel obstruction; colorectal malignancy is associated with large bowel obstruction, whilst small bowel obstruction is more commonly associated with adhesions from previous surgeries wrapping around and obstructing transit through the bowel.

Although gastroenteritis can result in abdominal pain and distension, the clinical history is suggestive of a more chronic underlying diagnosis and the abdominal X-ray demonstrates dilated loops of large bowel indicating obstruction, that you would not expect in gastroenteritis.

Further reading:

https://geekymedics.com/abdominal-x-ray-interpretation/

Question:

A 45-year-old man is referred to the surgical assessment unit after his GP noticed a bulge on his abdominal wall during a routine examination. The patient says this has been present for a long time and has not been causing him any symptoms. He is obese and has had previous surgery for abdominal trauma.

On examination, there is a full-length laparotomy scar and a soft reducible swelling in the upper midline with a palpable fascial defect 4cm above the umbilicus.

What is the most likely diagnosis?

A. Divarication of the recti

B. Spigelian hernia

C. Incisional hernia

D. Paraumbilical hernia

E. Epigastric hernia

Correct Answer:Incisional hernia

Explanation:

The most likely diagnosis, in this case, is a midline incisional hernia. Incisional hernias are ventral hernias which pass through the site of a previous surgical incision. They occur because the fascial closure of the abdominal wall failed to heal properly and are most likely to complicate upper midline incisions. Risk factors include suboptimal surgical technique, certain comorbidities, emergency procedures and post-operative wound infections. Obesity is an important risk factor for incisional hernias as it raises intra-abdominal pressure and puts additional tension on the fascial closure. This patient has had a trauma laparotomy, which usually involves a long midline incision from the xiphisternum to the pubis. Hernias related to these incisions are often anatomically complex with multiple fascial defects. However, as this patient’s hernia is asymptomatic and reducible, it can safely be managed conservatively.

Paraumbilical hernias are the most common type of ventral hernia. They pass through a fascial defect in the linea alba within 3cm of the umbilical ring. The majority are small and asymptomatic and can safely be managed conservatively. They are more common in women, especially during and after pregnancy. Ascites secondary to liver disease is another important risk factor.

Epigastric hernias are a less common type of ventral hernia. They pass through the linea alba in the upper midline above the umbilical territory. They are often asymptomatic and have a low risk of obstruction or strangulation as they usually only contain extraperitoneal fat.

Spigelian hernias are a rare type of lateral ventral hernia. They pass through the Spigelian fascia lateral to the rectus sheath. They are usually very small and present with localised pain or a lump immediately lateral to the rectus abdominis muscle. They have a fairly high risk of obstruction or strangulation due to the tight fascial layers around the hernia neck.

Divarication of the recti, also known as rectus diastasis, is an important differential diagnosis for a primary midline abdominal wall swelling. It occurs when the rectus abdominis muscles separate, stretching the linea alba to a width of more than 2cm. This causes a prominent midline bulge which can look quite striking on examination. However, it is not a hernia as there is no underlying fascial defect. It is usually treated with physiotherapy and exercise programmes and rarely requires surgery.

Further reading:

https://geekymedics.com/hernias/

Question:

A 4-year-old child is brought to the emergency department by his mother as his eyes have been swollen for two days. She has also noticed that his fingers are swollen and his urine is frothy. This child has no past medical history and his vaccinations are up to date.

The medical team diagnoses the patient with minimal change disease.

What is the most appropriate treatment for this patient?

A. Angiotensin–converting enzyme (ACE) inhibitors

B. Close observation

C. Computed tomography (CT) of kidney, ureter and bladder (KUB)

D. Cyclophosphamide

E. Corticosteroids

Correct Answer:Corticosteroids

Explanation:

The young child in the above scenario has presented with a nephrotic syndrome caused by minimal change disease (MCD). MCD is a condition that most commonly presents in children and is typically characterised by heavy proteinuria (> 3.5 grams / 24 hours), hypoalbuminaemia (and therefore oedema), hyperlipidaemia, hypercoagulability and fatty casts in the urine. The first-line treatment for MCD is corticosteroids. Most children have an excellent response to this treatment.

CT KUB is used when renal stones are being considered in the differential. The patient in the above question stem has been diagnosed with MCD for which a CT KUB is not needed.

Close observation would be inappropriate as the child could potentially develop renal failure.

Cyclophosphamide is a medication that can be used in the treatment of nephritic syndromes such as Goodpasture syndrome. Notable side effects of cyclophosphamide include haemorrhagic cystitis, immunosuppression and hyponatraemia.

ACE inhibitors are used in the prevention of diabetic nephropathy and can also be used in the treatment of focal segmental glomerulosclerosis. However, they are not indicated in the management of MCD.

Further reading:

https://patient.info/doctor/nephrotic-syndrome-pro#nav-4

Question:

An 18-month-old boy presents to A&E with a 1-day history of pyrexia and irritability. Mum reports the child has been progressively more drowsy in the past 12 hours and is now refusing feeds.

Clinical assessment reveals the following:

The child is lethargic and appears generally unwell

Peripheries are cool to touch and capillary refill time is 4 seconds

There is a non-blanching rash on the child's left arm and right leg

The chest is clear on auscultation with normal heart sounds

Pulse 150 bpm

Temperature: 39 oC

Respiratory rate: 20

What is the most likely causative organism?

A. E. coli

B. S. Pneumoniae

C. Group B Streptococcus

D. Neisseria meningitidis

E. H. Influenzae

Correct Answer:Neisseria meningitidis

Explanation:

This child most likely has a diagnosis of bacterial meningitis with associated sepsis, given the presence of fever, non-blanching rash, irritability, drowsiness and signs of septic shock (i.e. prolonged capillary refill time).

The most common cause of bacterial meningitis is neisseria meningitidis in children and young people aged 3 months or older. This is likely to change given the introduction of a serogroup B vaccine that was introduced in 2015. Vaccines for Haemophilus influenza type B, serogroup C meningococcus and pneumococcal disease are now given routinely to children and this has resulted in a significant shift in the likely causative organisms of the disease.

S.Pneumoniae is a common cause of meningitis in children over the age of 4 and elderly patients.

H.influenzae can cause bacterial meningitis and used to be a common cause of the condition in children and adults. However, thanks to the introduction of the HiB vaccine (given at 12 months), this organism is now rarely responsible for bacterial meningitis.

Group B streptococcus is a common cause of bacterial meningitis in neonates, however, it is much less common in older children.

E. coli is a common cause of bacterial meningitis in neonates.

Further reading:

https://patient.info/doctor/meningococcal-disease

Question:

A 52-year-old woman presents to the GP, complaining of persistent fatigue. She is now struggling in her job as a maths teacher and feels exhausted by the end of the day. The patient explains that they have also experienced frequent urinary tract infections, and often gets pains in a number of her joints after a long day at work. She stopped menstruating 3 months previously, and wonders if her symptoms are simply due to menopause; she denies any issues with her mood or sleep, and has no other past medical history of note. She reports drinking roughly 4 units of alcohol per week.

There are no abnormalities on examination; the patient has no evidence of pallor, rather she appears relatively tanned. Abdominal examination is unremarkable.

The GP informs the patient that menopause could account for a number of her symptoms, but orders a number of investigations to rule out other possibilities. FBC and U&E are both normal, however, LFT's demonstrate a mildly elevated ALP and ALT. A HBA1c measurement returns a result of 54, which the GP tells the patient is above the threshold for a diagnosis of diabetes mellitus. This comes as a great surprise to the patient, as she maintains a healthy diet and exercise routine.

Which of the following is the most likely to account for the patient's symptoms and investigation results?

A. Latent autoimmune diabetes in adults (LADA)

B. Hereditary haemochromatosis

C. Immunoglobulin G4-related disease

D. Menopause

E. Addison's disease

Correct Answer:Hereditary haemochromatosis

Explanation:

Hereditary haemochromatosis is a disorder of iron metabolism in which patients have issues with the excretion of the metal, leading to accumulation and deposition within organs. This can go unnoticed for many years; in women, it commonly presents post-menopause, as prior to this, iron is naturally removed from the body via menstruation.

Excessively high iron levels can damage a number of internal organs; the liver is frequently infected, with low-level hepatitis developing, with possible progression to cirrhosis. Pancreatic inflammation can result in secondary diabetes mellitus; this explains the abnormal HBA1c result in this patient. Other features can include:

Arthralgia

Pituitary gland dysfunction

Restrictive cardiomyopathy

Skin hyperpigmentation

Iron studies are an important first-line investigation; these will usually demonstrate a raised ferritin, which makes the diagnosis extremely likely. Genetic testing for a mutation in the HFE gene may be carried out if there is diagnostic uncertainty. Management is through methods that allow for the removal of iron from the body; venesection or chelation therapy.

Addison's disease can cause hyperpigmentation and fatigue, and as a condition that frequently occurs due to autoimmune disease, can be associated with diabetes (possibly as part of autoimmune polyglandular syndrome type 2). However, it would not explain the LFT abnormalities in this scenario.

Menopause can commonly cause fatigue and urinary tract infections (due to alterations in vaginal pH); however, it would not account for the HBA1c result, nor the liver function test abnormalities. In addition, for a diagnosis of menopause to be made, the patient must have had an absence of menstruation for at least 12 months, which is not the case in this scenario.

Latent autoimmune diabetes in adults (LADA) is a form of type 1 diabetes that develops at an older age to that which is expected; with most cases of type 1 diabetes developing before adulthood. Whilst this is a possible explanation for the HBA1c result, it is not usually associated with LFT changes, nor hyperpigmentation.

Immunoglobulin G4-related diseases are a group of autoimmune conditions that are being increasingly recognised within medicine; these can affect almost any organ system. Autoimmune pancreatitis is a possibility, and arthralgia has also been documented in those with the condition. However, these conditions remain rare, and the features described are classical of hereditary haemochromatosis, which is far more frequently diagnosed.

Further reading:

https://patient.info/doctor/hereditary-haemochromatosis

Question:

A 60-year-old man presents with a loss of consciousness that occurred as he was sitting eating dinner with his family. He denies any prodrome. Witnesses report that he fell out of his chair without putting out his hands to protect himself. He looked pale on the floor and his arm twitched several times. Within 20 seconds, he was sitting up and talking normally. He denies any relevant past medical problems.

What is the most likely cause of this man’s episode?

A. Atrial fibrillation

B. Third-degree heart block

C. Atrioventricular nodal re-entrant tachycardia (AVNRT)

D. Vasovagal syncope

E. Second-degree heart block (Mobitz type I)

Correct Answer:Third-degree heart block

Explanation:

This man has suffered from a sudden drop in cardiac output, often referred to as a ‘Stokes-Adams attack’. These attacks are usually caused by a block of the SA or AV nodes, most commonly third-degree AV block.

Third-degree heart block is often caused by past or ongoing myocardial infarctions, but it can also be caused by idiopathic degeneration of the conduction system (as it was in this case). He will require a pacemaker.

The lack of prodrome and lack of protective arm movements are characteristic and suggest a cardiac cause. The fact the episode occurred whilst the patient was sitting also suggests a cardiac and not vasovagal cause.

It is rare for syncope to be caused by supraventricular tachycardias such as AVnRT or AF. Mobitz type I heart blocks are usually benign and asymptomatic, and thus this is a less likely cause than third-degree heart block.

Further reading:

https://patient.info/doctor/stokes-adams-attacks

Question:

A 70-year-old female is admitted to the respiratory ward with haemoptysis and suspected lung cancer. The patient is currently stable with normal vital signs. A full blood count reveals a haemoglobin of 67 g/dL and as a result, a blood transfusion (2 units of packed red cells) is arranged. Thirty minutes into the transfusion of the first unit of blood the patient spikes a temperature of 38.0 degrees.

Which of the following is the most likely diagnosis?

A. Anaphylaxis

B. Non-haemolytic transfusion reaction

C. Transfusion-related acute lung injury (TRALI)

D. Acute haemolytic transfusion reaction

E. Transfusion-associated circulatory overload (TACO)

Correct Answer:Non-haemolytic transfusion reaction

Explanation:

The most likely diagnosis is a non-haemolytic transfusion reaction. Non-haemolytic transfusion reaction is the most common type of transfusion reaction, affecting 1-2% of patients. Patients typically develop a fever and sometimes rigors during a red cell or platelet transfusion due to patient antibodies directed against transfused white cells. Risk factors for developing a non-haemolytic transfusion reaction include having had multiple previous transfusions or multiple pregnancies. This type of reaction is not life-threatening and symptoms typically develop towards the end of the transfusion or in the following 2 hours. Management includes slowing the rate or stopping the transfusion, or stopping the transfusion in addition to providing paracetamol for the fever.

Anaphylaxis is rare and generally presents rapidly after a transfusion is commenced (within 15 mins). Symptoms include urticaria, angioedema, shortness of breath and anaphylactic shock (i.e. haemodynamic instability). The transfusion needs to be stopped immediately and the patient needs urgent review using an ABCDE approach.

Transfusion-related acute lung injury (TRALI) is a form of acute respiratory distress due to donor plasma containing antibodies against the patient's leukocytes. Typical presenting symptoms of TRALI include respiratory distress, sudden onset dyspnoea, low oxygen saturations (<90% on room air), fever and hypotension. These symptoms usually occur within 6 hours of a transfusion. A chest X-ray will usually reveal multiple perihilar nodules with infiltration of the lower lung fields.

An acute haemolytic transfusion reaction is a very rare, but incredibly dangerous type of transfusion reaction. It is usually caused by ABO incompatibility (i.e. the patient receiving the wrong blood type). As a result of the incompatibility, the patient's antibodies destroy the transfused red blood cells. The complement system is also activated which can ultimately result in disseminated intravascular coagulation. Symptoms include shortness of breath, hypotension, chest pain, fever and red urine. Mortality can be up to 10%.

Transfusion-associated circulatory overload (TACO) is another term for fluid overload. TACO occurs when too much blood or other blood products are transfused. Those patients at risk of developing TACO (i.e. elderly patients, patients with heart failure) are often given IV furosemide prior to the infusion to reduce the risk.

Further reading:

https://patient.info/doctor/blood-transfusion-reactions

Question:

A 52-year-old man presents with unilateral testicular pain that has been ongoing for several weeks. He explains that the pain radiates into the lower abdomen and has also noted some dysuria. He has been pyrexial over the past several days but denies any further symptoms. He has a past medical history of benign prostate hyperplasia. Examination reveals a unilaterally tender, swollen, and indurated right testis on the posterior-lateral aspect. The patient lives with his husband of 10-years and has no other sexual partners.

Which of the following is the most likely causative organism which led to this presentation.

A. Enterococcus faecalis

B. Neisseria gonorrhoeae

C. Mumps virus

D. Chlamydia trachomatis

E. Escherichia coli

Correct Answer:Escherichia coli

Explanation:

The correct answer is Escherichia coli. In men over 35-years-old the main causative agent for cases of epididymitis is enteric bacteria, mainly e coli. The history of benign prostate hyperplasia makes this even more likely as this is a risk factor for developing epididymitis (Bradford and Farry 2015)

Neisseria gonorrhoeae and chlamydia trachomatis are both incorrect. These are sexually transmitted infections that commonly cause epididymitis in the under <35-year-old category. This patient has only one, long term, sexual partner, making this scenario less likely.

Enterococcus faecalis is another enteric cause of epididymitis. However, its incidence rate is much lower than that of E. coli making it less likely to be the causative organism.

Mumps is a cause of viral orchitis. Given this man's age, he may not have been vaccinated against mumps. This being said, the lack of parotiditis would make this scenario less likely.

It is worth highlighting that in any patient with testicular swelling, testicular torsion must be excluded. You must also consider the possibility of an inguinal hernia in a patient of this age group complaining of testicular swelling.

Further reading:

https://www.aafp.org/afp/2009/0401/p583.html

Question:

A 24-year-old male is brought into A&E by ambulance after being stabbed whilst walking home from a night out. On examination, there is a stab wound in the midline of the back. Neurological examination of the lower limbs reveals weakness of the right leg, loss of proprioception and vibration sensation in the right leg and loss of temperature and pain sensation in the left leg.

What is the most likely diagnosis?

A. Central cord syndrome

B. Brown-Séquard syndrome

C. Anterior cord syndrome

D. Posterior cord syndrome

E. Todd's paresis

Correct Answer:Brown-Séquard syndrome

Explanation:

Brown-Séquard's syndrome involves a hemisection of the spinal cord. It presents with ipsilateral hemiplegia with contralateral pain and temperature sensation deficits (because of the crossing of the fibres of the spinothalamic tract). The patient's clinical findings in this scenario fit with this diagnosis.

Todd's paresis involves a focal weakness of a part of the body after a seizure that typically fully resolves. There is no clear history of a seizure in this scenario and the clinical findings do not fit with this diagnosis.

Anterior cord syndrome involves damage to the corticospinal and spinothalamic tracts, resulting in bilateral motor paralysis, loss of pain and temperature sensation and autonomic dysfunction below the level of the lesion.

Posterior cord syndrome involves damage to the posterior columns and presents with ipsilateral loss of proprioception, vibration and touch sensation below the level of the lesion.

Central cord syndrome involves damage to the central corticospinal and lateral spinothalamic tracts in the cervical cord, resulting in bilateral paresis of the upper and lower extremities.

Further reading:

https://patient.info/doctor/brown-sequards-syndrome

Question:

A 35-year-old man attends general practice complaining of pain in his hands and feet. This started roughly 6-months ago with no precipitating event. The pain is localised to the fingers and toes and is experienced particularly when exercising and in cold weather. Over-the-counter paracetamol and ibuprofen have failed to control the pain. There are no other significant symptoms.

The patient has no past medical history. He has smoked 20-cigarettes per day since the age of 16. He works as a solicitor.

On examination:

Respiratory rate - 12 breaths per min

Heart rate - 70 beats per min, regular, diminished radial pulse

Oxygen saturations - 99% on room air

Blood pressure - 120/80 mmHg

Temperature - 36.5 °C

The fingers and toes are mottled and blue with gangrene developing at the left hallux

What is the most likely diagnosis?

A. Thromboangiitis obliterans

B. Fibromyalgia

C. Septic embolism

D. Raynaud's phenomenon

E. Peripheral arterial disease

Correct Answer:Thromboangiitis obliterans

Explanation:

This is a classical description of thromboangiitis obliterans (Buerger's disease). It is characterised by thrombus formation in small- to medium-sized arteries which can result in the occlusion of vessels supplying the hands and feet. The disease is strongly associated with smoking. The average age of patients with this condition is between 20 and 45 years old. The cause of this disease is not well understood. The 35-year-old patient in this stem presents with claudicant pain in the hands and feet, is a smoker and has examination findings of critically ischaemic digits and an area of necrotic tissue at the left hallux. Thromboangiitis obliterans is the most likely diagnosis.

Raynaud's phenomenon is a transient reduction in blood flow to the extremities caused by vasospasm, characteristically in response to cold weather. Patients will describe predictable episodes of colour change and pain and examination findings in the consultation room will typically be unremarkable.

Peripheral arterial disease and critical limb ischaemia would present with intermittent claudication, pain at rest and latterly the five Ps (pain, pallor, paraesthesia, pulseless and paralysis). This patient is relatively young and has no past medical history of cardiovascular disease, with symptoms developing over a 6 month time period. His symptoms affect all 4 limbs which is an unusual distribution for peripheral arterial disease, which typically begins with symptoms in 1 or both of the lower limbs.

Patients with overwhelming infection become pro-thrombotic and may present with septic embolism. This patient is apyrexial, haemodynamically stable and has no signs or symptoms of infection. Risk factors for septic embolism include prosthetic heart valves, immunodeficiency and intravenous drug use.

Fibromyalgia is a chronic pain syndrome which does not produce the examination findings seen in this patient.

Further reading:

https://www.vasculitis.org.uk/about-vasculitis/buergers-disease

Question:

A 24-year-old male presents to his GP complaining of a change in shape to his scrotum. He explains that 2 weeks ago he noticed a mass on his left testis after getting out of the shower and that it has remained there since. The patient denies any testicular pain, dysuria or urethral discharge.

His past medical history is insignificant. The patient comments that he is sexually active with one long-term partner and uses barrier contraception.

On examination, the scrotum is non-tender. A small, hard and irregular mass that does not transilluminate is noted on the left testis.

Which is the most appropriate investigation?

A. Lactate dehydrogenase levels

B. Urinalysis

C. Ultrasound of the scrotum

D. CT abdomen and pelvis

E. Testicular biopsy

Correct Answer:Ultrasound of the scrotum

Explanation:

The presence of a hard, irregular mass that does not transilluminate on the testis in a young male is suggestive of testicular cancer. Any patient presenting with a change in the shape of the testes should be referred for an ultrasound of the scrotum under the NICE 2 week wait criteria.

A testicular biopsy is not an appropriate investigation, as an ultrasound scan is much less invasive and still has an extremely high sensitivity for testicular cancer. However, histology of the testicular mass may be performed after its removal during an orchidectomy in patients who are undergoing treatment for testicular cancer.

Urinalysis is a useful investigation for investigating a suspected sexually transmitted infection or urinary tract infection. While these pathologies could present with epididymo-orchitis, the absence of pain, dysuria or urethral discharge and a non-tender scrotum on examination suggest an alternative diagnosis.

Patients with confirmed testicular cancer may undergo a CT abdomen and pelvis for the purposes of assessing metastatic spread. However, at this stage, such an investigation would not be appropriate.

Some testicular carcinomas are associated with elevated lactate dehydrogenase levels, however, this hormone has a relatively low sensitivity for testicular cancer and is not currently recommended as an initial investigation.

Further reading:

https://cks.nice.org.uk/topics/scrotal-pain-swelling/management/testicular-cancer/

Question:

A 65-year-old woman presents with abdominal pain. The patient highlights that the pain is exacerbated by eating, somewhat relieved by defecation, and is associated with constipation. She denies any weight loss or abdominal bloating but has noted some occasional rectal bleeding associated with constipation. She has no significant past medical or family history. On further questioning, the patient admits to having a low fibre diet. On examination, you identify that the pain is worst in the left iliac fossa and suprapubic regions. Rectal examination is unremarkable. Her temperature is 37°C, her pulse is 70bpm, her blood pressure is 120/80 mmHg, her respiratory rate is 15 breaths per minute and has oxygen saturation of 98%. You decide to send off a full blood count and later discover that the white cell count is normal.

Which of the following is the most appropriate further investigation?

A. MRI abdomen

B. Abdominal ultrasound

C. Barium enema

D. Colonoscopy

E. Abdominal X-ray

Correct Answer:Colonoscopy

Explanation:

The patient is suffering from diverticulitis with associated constipation or colonic malignancy. The change in bowel habit, abdominal pain and history of intermittent rectal bleeding require further investigation to rule out underlying malignancy. Further investigations would typically include blood tests (e.g. FBC, U&E, CRP, LFTs) to look for evidence of anaemia or infection, a CT abdomen and a colonoscopy to confirm the diagnosis of diverticulitis (and treat any source of bleeding) as well as rule out colorectal cancer.

A contrast CT scan of the abdomen as the imaging modality of choice for a patient with suspected acute diverticulitis and raised inflammatory markers, however, this option is not available to us and also this patient has a normal white cell count and so the balance is between that and also colonic malignancy. Colonoscopy is used when the diagnosis of diverticular disease is unclear and cancer or bowel ischaemia is suspected. Endoscopic evaluation of the colon should be avoided in acute diverticulitis due to the risk of perforation or exacerbation of the existing inflammation. However, this patient has an unknown diagnosis and colonoscopy is a reasonable next investigation if CT abdomen is not available.

Diverticular disease can be defined as small protrusions of bowel mucosa covered by peritoneum – most commonly located in the sigmoid colon. Major risk factors for diverticular disease include a low fibre diet with increased stool bulk in the middle-aged and obesity in the young.

There are three main forms of diverticular disease:

Diverticulosis = presence of diverticula in an asymptomatic patient

Uncomplicated diverticulitis = presence of diverticula in a symptomatic patient

Complicated diverticulitis = presence of diverticula with systemic signs (fever, tachycardia etc) +/- local features (pericolic abscess, bleeding, perforation or stricture)

Abdominal X-ray is not indicated in the initial investigation of diverticulitis. It is instead more commonly used in the investigation of bowel obstruction.

Barium enema may be used in the investigation of diverticulitis but it is typically less helpful than a colonoscopy and would not be able to rule out colorectal cancer.

Abdominal ultrasound may be used in rare circumstances in the investigation of diverticulitis to look for collections, but generally, CT does a much better job.

MRI abdomen is not routinely used in the investigation of diverticulitis, CT abdomen is much more commonly used to inform management decisions (e.g. preoperative planning).

Further reading:

https://cks.nice.org.uk/topics/diverticular-disease/diagnosis/assessment/

Question:

A 65-year-old man presents to the emergency department with a 48-hour history of central abdominal pain. There is no associated vomiting, and he opened his bowels normally yesterday. He has a longstanding incisional hernia and is on the waiting list to have this repaired.

His temperature is 37.9°C, heart rate 104 bpm, blood pressure 131/70 mmHg, respiratory rate 22/min and oxygen saturation 98% on air. On examination, there is a midline laparotomy scar and a tender irreducible supraumbilical swelling with erythema of the overlying skin. The abdomen is otherwise soft and non-distended.

What is the most likely diagnosis?

A. Littre's hernia

B. Spigelian hernia

C. de Garengeot's hernia

D. Richter's hernia

E. Amyand's hernia

Correct Answer:Richter's hernia

Explanation:

This patient has presented with abnormal physiology (fever, tachycardia and tachypnoea) in the context of an acutely painful hernia. The most likely diagnosis in this case is an incisional Richter’s hernia. A Richter’s hernia involves the partial herniation of one edge of the bowel wall as opposed to its whole circumference. This phenomenon can affect any type of hernia and may result in serious complications, as the herniated portion of the bowel wall can rapidly become strangulated and ischaemic. Richter’s hernias do not cause obstruction as the bowel lumen remains patent. Patients often present with vague symptoms and clinicians may be falsely reassured by the absence of features of bowel obstruction. When assessing a patient with an acutely painful hernia, it is important to take any abnormal findings seriously to avoid missing a diagnosis of bowel ischaemia. Red flags include skin changes over the hernia (such as erythema, cellulitis, bruising or dark discolouration), abnormal observations, raised inflammatory markers, acute kidney injury, elevated serum lactate or a patient who simply “doesn’t look right”.

A Spigelian hernia is a rare type of lateral ventral hernia which passes through the Spigelian fascia lateral to the rectus sheath. Most of these are very small and only contain extraperitoneal fat. Spigelian hernias containing bowel have a fairly high risk of obstruction or strangulation due to the tight fascial layers around the hernia neck.

An Amyand’s hernia is an inguinal hernia containing the appendix.

A de Garengeot’s hernia is a femoral hernia containing the appendix.

A Littre’s hernia is any hernia containing a Meckel’s diverticulum.

Whilst there are many eponymously named hernias, most of them are very rare. Richter’s hernias and Spigelian hernias are the only ones which are likely to be relevant in everyday clinical practice.

Further reading:

https://geekymedics.com/hernias/

Question:

A 61-year-old woman presents to her GP with double vision that started two weeks ago. It is persistent throughout the day. Her past medical history includes hypertension, for which she is taking ramipril, amlodipine and indapamide.

On examination of her eye movements, she experiences double vision when looking up and when looking to the right, and her right eye fails to elevate and abduct. Her pupils are equal and reactive to light.

What is the most likely cause of her symptoms?

A. Brain tumour

B. Uncal herniation

C. Posterior communicating artery aneurysm

D. Hypertension

E. Myasthenia gravis

Correct Answer:Hypertension

Explanation:

The third cranial nerve performs elevation and abduction of the eye, therefore, this patient’s presentation is consistent with a third nerve palsy. The lack of a blown pupil points towards a medical cause rather than a surgical cause - the parasympathetic fibres that supply the pupillary sphincter run along the outside of the third cranial nerve, and so external compression will result in dilatation of the affected pupil. Given this patient’s past medical history, the most likely cause of her medical third nerve palsy is hypertension.

A posterior communicating artery aneurysm is a cause of a surgical third nerve palsy and would therefore cause a blown pupil. It also typically causes a constant headache.

A brain tumour is a cause of a surgical third nerve palsy, so a blown pupil would be seen. You may also expect to see symptoms of raised intracranial pressure, such as an early morning headache, or other symptoms of a space-occupying lesion, such as vomiting, seizures or behaviour changes.

Uncal herniation is a cause of a surgical third nerve palsy and would therefore cause a blown pupil. It would also cause symptoms of raised intracranial pressure, such as a headache, altered mental status or Cushing’s triad of hypertension, bradycardia and irregular breathing.

Myasthenia gravis can cause double vision, however, this is typically worse towards the end of the day. Furthermore, the findings of unilateral impaired abduction and elevation are more suggestive of a third nerve palsy.

Further reading:

https://geekymedics.com/the-oculomotor-nerve-cn-3/#:~:text=Cranial%20nerve%20III%20is%20the,see%20the%20environment%20around%20us.

Question:

A 20-year-old student presents to A&E with severe abdominal pain and the passage of numerous watery stools. The pain is reported to be 'crampy' in nature and appears to come and go in waves. The stool is not bloody and the patient has not noticed any mucus contained within it. A full history reveals that he is was concerned about some leftover Chinese takeaway that he reheated 12 hours ago; he was warned by his girlfriend at the time that this was unwise, and that the food should be discarded. The takeaway is described to have been a mixture of rice and vegetables.

The patient's observations are all within the expected ranges, with the exception of the pulse rate, which lies just above the normal range at 104. Clinical examination reveals a normal capillary refill time and skin turgor, moist mucous membranes and warm peripheries.

Given the most likely diagnosis and organism responsible, which of the following would be most likely to form the management plan for this patient?

A. IV normal saline

B. Stool culture and oral ciprofloxacin

C. Dioralyte rehydration solution

D. Oral metronidazole

E. IV co-amoxiclav

Correct Answer:Dioralyte rehydration solution

Explanation:

The patient has presented with signs of infective colitis, with a classical presentation of colicky abdominal pain and diarrhoea. The likely source of infection is the Chinese takeaway; given the fact that this was eaten only 12 hours previously, and symptoms have already developed, a toxin-producing bacteria is the most likely culprit. The description of rice consumption makes the most likely organism in this particular scenario Bacillus cereus, a gram-positive, spore-forming bacteria that can cause infection in those consuming rice that has not been thoroughly reheated.

Whilst the symptom-onset can be rapid in infective colitis due to toxin production, most infections will usually resolve without therapy, with prevention of dehydration the main consideration for management. Significant fluid and electrolyte losses can arise due to diarrhoea and/or vomiting, and these can lead to complications such as arrhythmias or seizures if left uncorrected. In this particular case, the patient does not exhibit any worrying features of dehydration on examination or observations. Therefore, a conservative approach, with the encouragement of oral fluid intake, and possibly the provision of rehydration solutions such as Dioralyte to replace the electrolytes will likely be adequate.

If the patient had demonstrated signs of severe dehydration or hypovolemia, then there would be a need to consider providing the patient IV fluids, especially if they were unable to tolerate oral intake. However, the use of intravenous fluid should be avoided unless necessary, as there are more complications associated with this method of delivery compared to oral intake.

Antibiotics are not usually required in most cases of infective colitis, as the condition will usually be self-limiting. In some more severe infections causing dysentery, oral therapies may be used, macrolides being a common choice. IV co-amoxiclav is very unlikely to be necessary in this case, and oral metronidazole is largely indicated in the setting of suspected Clostridium difficile infection or infection with an anaerobic bacteria.

Stool cultures are not routinely required in infective colitis unless an atypical organism is suspected, or the symptoms are severe. Therefore, stool culture and oral ciprofloxacin would not be an appropriate management approach in this case, especially given that the presentation is unlikely to warrant an antibiotic prescription.

Further reading:

https://patient.info/doctor/gastroenteritis-in-adults-and-older-children

Question:

A 15-month-old child, Larry Brown, is brought to the General Practitioner with a rash. Larry’s father reports that the rash started on his back yesterday, he initially thought it was an insect bite but over the past 24 hours, it has spread all over his body including inside his mouth. Larry has been a bit ‘under the weather’ for a few days, with reduced appetite and he seems to be more clingy and tearful than usual. Larry has also been scratching the rash, and some spots have begun to bleed.

Larry was born at term via vaginal delivery, he has no known allergies, family history or medical conditions. He is up to date with vaccinations.

On examination, Larry is bright and alert with moist mucous membranes. He is cooperative with the examination, and you illicit that the rash is widespread, blanching and there is a combination of raised papules and vesicles across the skin (see image).

Larry’s vital signs are as follows:

O2 98% on air

HR 130 bpm

RR 24

BP 106/43 mmHg

Temp 37.4 oC

What is the most likely diagnosis?

Source: Jonnymccullagh [CC BY-SA 3.0]

A. Rubella

B. Atopic dermatitis

C. Varicella-zoster

D. Hand foot and mouth disease

E. Measles

Correct Answer:Varicella-zoster

Explanation:

The correct answer is varicella-zoster (VZ) or ‘chickenpox’. VZ is a common viral infection that is airborne spread and highly contagious. The virus most commonly affects children and manifests with an acute fever, coryzal symptoms and a widespread itchy blistering rash of papules and vesicles.

Childhood rashes can be difficult to diagnose, this question encourages you to consider the patient’s history alongside a ‘spot diagnosis’ clinical image.

Rubella is increasingly rare (due to immunisation regimes) and the rash typically begins on the face, spreading to trunk and limbs. The rash is usually itchy and characteristically small red raised bumps accompanied by lymphadenopathy. Larry is up to date with vaccinations and has no demonstrable lymphadenopathy making rubella a less likely diagnosis. Likewise, measles is also included in the childhood immunisation programme and is a less likely diagnosis.

Hand foot and mouth disease (HFM), commonly caused by a coxsackievirus, manifests with characteristic lesions on the palms, soles of the feet and soft palate. The lesions are vesicular in nature. Larry’s rash has extended onto his limbs and trunk, and by definition, this is uncharacteristic of HFM disease.

Atopic dermatitis (also known as eczema), is a chronic itchy skin condition that characteristically manifests with dry thickened skin patches and acute flares of weepy red blisters. Eczema is associated with atopic disease (such as asthma, food allergies etc.) moreover there tends to be a family history. In infants, eczema typically appears on the cheeks and extensor areas of the arms and legs. In Larry’s case, the rash that has appeared is acute and widespread including mucosal involvement, there is an absence of a family history of atopy, and so a common viral infection like VZ is more likely to be the cause of his presentation.

Further reading:

https://www.dermnetnz.org/topics/chickenpox/

Question:

A 50-year-old woman presents to her GP with a lump in her left breast. Following triple assessment, she is diagnosed with breast cancer. She began her periods at age 15 and had her last period one year ago. She gave birth to her two sons at the age of 29 and 36 and breastfed them both for a year. She has been taking the combined oral contraceptive pill (COCP) continuously since the age of 18, taking a 2-year break for each pregnancy. She does not smoke or drink alcohol.

Which aspect of this patient’s history is most likely to be a risk factor for her diagnosis?

A. Pregnancy after the age of 35

B. Breastfeeding

C. Multiple pregnancies

D. COCP use

E. Age of menopause

Correct Answer:COCP use

Explanation:

The only aspect of the history provided that is a risk factor for breast cancer is COCP use. A late age of menopause would be a risk factor, however, this patient ended her periods at a normal age. Having the first pregnancy after the age of 35 is a risk factor for breast cancer, however, the age of subsequent pregnancies is not associated with breast cancer. Nulliparity is a risk factor for breast cancer; multiple pregnancies are protective. Breastfeeding is also protective against breast cancer.

There are many risk factors for breast cancer to remember, and it can be useful to group them into those common to all cancers and those specific to breast cancer.

Common to all cancers:

Older age

Smoking

Alcohol

Irradiation (specifically mantle irradiation)

Specific to breast cancer:

Previous breast cancer

Family history of breast cancer or genetic predisposition

Uninterrupted oestrogen exposure

Early menarche, late menopause or nulliparity

First pregnancy after age 35

Not breastfeeding

Obesity

COCP (combined oral contraceptive pill) use

HRT (hormone replacement therapy) use

Further reading:

https://www.cancer.net/cancer-types/breast-cancer/risk-factors-and-prevention

Question:

An 18-month-old girl is brought to the GP by her mother. The mother explains that she was brushing the girl's hair this morning when she suddenly found "insect-like creatures" crawling across her scalp. The mother picked off one of the live creatures and attached it to some sticky tape to show you.

The girl has no significant past medical history. Her mother does not know anyone else in the girl's nursery class with similar symptoms.

On examination of her head and scalp, you note small whitish spots close to the scalp and adherent to the hair shaft. You also identify a small, insect-like creature (3-4mm in length) at the nape of the neck.

The mother expresses that she would like a medication to treat the girl quickly as she is very busy with work.

Which of the following is the most appropriate initial management in this patient?

A. Isopropyl myristate and cyclomethicone solution

B. Wet combing

C. Dimeticone 92% spray

D. Dimeticone 4% lotion

E. Permethrin 5% cream

Correct Answer:Dimeticone 4% lotion

Explanation:

The most likely diagnosis in this patient is head lice (pediculosis capitis), a parasitic infestation of the hairs of the human head caused by Pediculus humanus capitis. The transmission of head lice requires head-to-head contact and is commonly seen in young children. NICE guidelines recommend dimeticone 4% lotion as a first-line management option in young children aged between 6 months to 2 years - other patient groups, including pregnant women and patients with a history of eczema or asthma, are also recommended dimeticone 4% lotion. Dimeticone works by creating a physical barrier around lice, nymphs and embryos; it offers a high cure rate and is unlikely to lead to resistance.

NICE guidelines highlight that the choice of treatment for head lice may vary depending on the preference of the patient and/or their parents/carers. Whilst wet combing is a recommended first-line management option in children aged 6 months to 2 years; it is a time-consuming technique and labour intensive. Therefore, it would likely not be acceptable for this patient and her mother, who preferred a 'quick' treatment.

There is a lack of safety data regarding the use of dimeticone 92% in children under 2 years of age; therefore, NICE guidelines do not recommend it as an appropriate first-line management option in this age group.

Isopropyl myristate and cyclomethicone (IPM/C) kill head lice by dissolving the wax coating on the louse exoskeleton. Whilst IPM/C offers a high cure rate, there is a lack of safety data on its use in children younger than 2 years of age; therefore, NICE guidelines do not recommend IPM/C as an appropriate first-line management option in this age group.

Permethrin is a pyrethroid insecticide that acts on cell membranes to disrupt sodium channel currents that regulate membrane polarisation. Whilst permethrin is licensed in the BNF for use in scabies and pediculosis pubis; it is no longer recommended to treat head lice due to growing resistance levels.

Further reading:

https://cks.nice.org.uk/topics/head-lice/

Question:

Stephen Williams is a 28-year-old gentleman who underwent a surgical repair of his right anterior cruciate ligament 10 days previously. He has now presented to A&E with a painful red swollen knee, fever and malaise. Stephen has no other significant past medical history and is in a long term relationship. Clinical examination reveals a hot, tender right knee joint with a significantly reduced range of motion. Vital signs reveal fever and tachycardia.

The joint is aspirated and the fluid is sent to the lab for culture.

Which of the following organisms is most likely to be grown?

A. Staphylococcus aureus

B. Chlamydia

C. Streptococcus viridans

D. E. coli

E. Neisseria gonorrhoea

Correct Answer:Staphylococcus aureus

Explanation:

This patient is presenting with typical symptoms and signs of septic arthritis. Patients with septic arthritis usually present with an acutely hot, erythematous and swollen joint, with associated fever and general malaise. Patients with existing joint disease and those who have undergone recent joint surgery are most at risk.

The most likely organism to be grown is staphylococcus aureus, a gram-positive bacterium. Staphylococcus aureus is the most frequent pathogen responsible for septic arthritis in any age group.

Chlamydial and gonococcal disseminated disease are less common causes of septic arthritis generally. In this scenario, there are no significant risk factors for sexually transmitted infections (i.e. unprotected sexual intercourse with multiple individuals), making these diagnoses even less likely. Reactive arthritis secondary to chlamydial or gonococcal disease would tend to present with a triad of oligoarthritis, urethritis and conjunctivitis.

Streptococcus viridans is a commensal organism, often found in the mouths of individuals. In rare situations, it can cause septic arthritis, but it is more commonly associated with endocarditis.

Further reading:

https://patient.info/doctor/septic-arthritis-pro

Question:

A 45-year-old woman attends her GP with muscle weakness. The patient reports experiencing progressive muscle weakness affecting her upper arms, neck, shoulders, thighs and hips over the past 3-4 months. She is now struggling with activities of daily living (e.g. climbing stairs, standing up from being seated etc). On further questioning, she also reports intermittent fever, morning stiffness, unintentional weight loss of around 3kg over the past 3 months and fatigue.

Clinical examination reveals weakness of the aforesaid muscles in a symmetrical distribution.

Blood results reveal the following:

leukocytosis

elevated ESR

raised creatinine kinase

myoglobinuria

positive rheumatoid factor and antinuclear antibodies

What is the most appropriate first-line management option for the condition described?

A. Intravenous immunoglobulin

B. Tacrolimus

C. Methotrexate

D. Prednisolone

E. Azathioprine

Correct Answer:Prednisolone

Explanation:

The most likely diagnosis, in this case, is polymyositis. This condition can be defined as an inflammatory myopathy. Major risk factors for this condition include female gender, age 45-60 years and underlying malignancy. Polymyositis typically develops over a period of 3-6 months.

Clinical features are varied and may include the following:

proximal symmetrical muscle weakness (most commonly)

myalgia

arthralgia

respiratory muscle weakness (presenting as aspiration pneumonia, exertional dyspnoea etc)

cardiac involvement

generalised symptoms (e.g. fatigue, weight loss, anorexia, fever, and morning stiffness)

Investigations for polymyositis include:

Full blood count (leucocytosis)

ESR (raised)

Creatinine kinase (raised)

Autoantibody screen

Imaging studies to investigate underlying malignancy (e.g. whole-body CT, MRI)

Electromyography

Muscle biopsy (shows inflammation)

First-line therapy for polymyositis is prednisolone which is initially given at high doses and then tapered according to creatinine kinase levels and clinical response. Second-line therapy includes immunosuppressive agents (e.g. methotrexate).

Azathioprine is a second-line therapy for polymyositis (e.g. in patients who do not respond to corticosteroid therapy or for those who develop complications of corticosteroid management).

Intravenous immunoglobulin may be used as short-term management for steroid-resistant cases of this condition.

Tacrolimus is a calcineurin inhibitor that is used in cases of polymyositis refractory to other therapies.

Methotrexate is a second-line therapy used in the management of polymyositis.

Further reading:

https://patient.info/doctor/myositis-polymyositis-and-dermatomyositis

Question:

You are the FY2 doctor in a General Practice. A 52-year-old gentleman attends with problems related to his throat. He describes an unusual gurgling sound after eating, as well as a difficulty swallowing solids and occasional regurgitation of food. You cannot help to notice that the patient has halitosis while he is conveying this information. The patient has no significant past medical history or family history. No positive findings can be elicited on examination of the throat.

What is the MOST APPROPRIATE investigation?

A. Manometry

B. Barium swallow

C. Endoscopy

D. Computed tomography (CT)

E. 24-hour ambulatory impedance pH test

Correct Answer:Barium swallow

Explanation:

This patient is most likely suffering from a pharyngeal pouch (a.k.a Zenker’s diverticulum). The first-line investigation for a pharyngeal pouch is a barium swallow. This will highlight the diverticulum arising from the midline of the posterior wall of the pharynx near the pharyngoesophageal junction at C5-6.

Endoscopy is contraindicated in cases of suspected pharyngeal pouch due to the risk of iatrogenic rupture.

Manometry is primarily used in the investigation of achalasia to establish the pressure of the lower oesophageal sphincter and will not be helpful in diagnosing a pharyngeal pouch.

Impedance pH testing is primarily used in the investigation of gastro-oesophageal reflux disease and will not be helpful in diagnosing a pharyngeal pouch.

Computed tomography (CT) is not an appropriate first-line investigation for identifying a pharyngeal pouch.

Further reading:

https://radiopaedia.org/articles/zenker-diverticulum-1

Question:

A 24-year-old male presented to A&E following sustaining a head injury whilst playing rugby. At the time, his teammate reported he lost consciousness, but came round after around a minute. Whilst in the department he becomes increasingly confused, before becoming unresponsive with a blown pupil. Emergency CT head is shown below.

What is the underlying diagnosis?

Source: Image by Hellerhoff. Published online 2009

A. Extradural haematoma

B. Chronic subdural haematoma

C. Intracerebral haematoma

D. Acute subdural haematoma

E. Intraventricular haemorrhage

Correct Answer:Extradural haematoma

Explanation:

Extradural haematomas appear as a biconvex or lenticular area of increased density on CT scan. The spread of extradural blood is generally limited by suture lines where the dura is adherent to the inner aspect of the skull. They are frequently associated with underlying skull fractures, as demonstrated in the image above.

Subdural haematomas appear as a crescentic-shaped collection, spreading around the cortical surface. Acute subdural haematomas appear hyperdense (brighter), whereas chronic subdural haematomas appear hypodense (darker) compared to the underlying brain.

Intracerebral haematomas comprise of blood within the brain parenchyma itself, appearing as an area of density within the brain itself.

Intraventricular haemorrhages occur when bleeding enters the ventricular system.

Further reading:

https://radiopaedia.org/articles/extradural-haemorrhage

Question:

A 36-year-old woman has 3 days of increasingly severe abdominal pain followed by fever and vomiting. A CT scan shows a ruptured appendix abscess. The surgeon performs a laparotomy to remove the appendix and washout the peritoneal cavity. She is treated with intravenous ceftriaxone and oral metronidazole postoperatively but makes slow clinical progress with persistent abdominal pain and fever. A repeat CT scan shows a large retro-caecal collection.

What is the most appropriate course of action in her subsequent management?

A. Switch the route of metronidazole administration from oral to intravenous

B. Organise for the collection to be drained either percutaneously or surgically

C. Insert a PICC line because she will require long term antibiotic treatment

D. Counsel and test for Human Immunodeficiency Virus (HIV) infection

E. Switch antibiotics to intravenous meropenem to cover pseudomonas

Correct Answer:Organise for the collection to be drained either percutaneously or surgically

Explanation:

The most appropriate course of action in the subsequent management of this patient is to organise for the collection to be drained either percutaneously or surgically. Intra-abdominal collections of pus (abscesses) are a frequent complication of intra-abdominal surgery in which there has been faecal contamination of the peritoneum. In this context, the collection seen on CT is almost certainly infected and is the most likely explanation for this patient’s poor clinical progress since antibiotics penetrate abscesses/collections poorly. Appropriate management is source control – i.e. drainage of the collection. This may be done either percutaneously via a drain, usually by a radiologist under ultrasound or CT guidance (most likely in this case as there is a single large collection that is likely to be accessible percutaneously); or surgically (for example when not amenable to percutaneous drainage due to position or presence of multiple collections).

Counsel and test for Human Immunodeficiency Virus (HIV) infection is incorrect. Although it is good practice to think about HIV testing in all patients presenting with severe infections, there is nothing in this presentation that makes one particularly concerned about HIV infection – which typically presents as a myriad of symptoms including weight loss, fatigue, myalgia, lymphadenopathy, mouth sores, rashes and often a history of recurrent infections.

Inserting a PICC line for long-term antibiotic treatment is incorrect. Peripherally Inserted Central Catheters (“PICC” lines) are used when long-term intravenous access is required e.g. for prolonged antibiotic therapy. However, there is no reason to think this patient will need prolonged antibiotic therapy as long as the collection is adequately drained.

Switch antibiotics to intravenous meropenem to cover pseudomonas is incorrect. While pseudomonas is a bowel commensal and may therefore be implicated in intra-abdominal infections/collections arising from faecal soiling of the peritoneum, the presence of the collection is much more likely to be the cause of treatment failure than primary antibiotic failure.

Switch the route of metronidazole administration from oral to intravenous is incorrect. Metronidazole has excellent oral bioavailability so should always be given orally unless oral administration is not possible.

Further reading:

https://patient.info/doctor/intra-abdominal-sepsis-and-abscesses

Question:

A 15-year-old girl comes into the emergency department accompanied by her mother appearing confused and lethargic over the past 6-hours. The triage nurse identifies that she is extremely pyrexial and severely hypotensive. Examination reveals a sunburn-like rash on the palms of her hands. Her mother explains that she has no previous medical/surgical history with the exception of menorrhagia. This has been particularly distressing for her daughter, who has been struggling to manage this with absorbent tampons.

Given this presentation, what is the most likely causative organism responsible for this patient's symptoms?

A. Neisseria gonorrhoeae

B. Streptococcus pyogenes

C. Staphylococcus aureus

D. Escherichia coli

E. Klebsiella pneumoniae

Correct Answer:Staphylococcus aureus

Explanation:

The correct answer is Staphylococcus aureus . This patient is presenting with toxic shock syndrome, most likely causative by staphylococcal inflitration of her absorbant tampons. Toxic shock syndrome is caused by with Staphylococcus aureus or Streptococcus pyogenes infection leading to the production of superantigen toxins which activate a T-cell mediated cytokine storm. Staphylococcus aureus infection is more likely to be a menstrual cause for toxic shock syndrome and manifests with an acute presentation with a characteristic 'sunburn' rash.

Streptococcus pyogenes can cause the streptococcal toxic shock-like syndrome. This is more commonly associated with previous streptococcal skin infections.

Escherichia coli is not a cause of toxic shock syndrome and is unlikely to be the causative agent in this case. This is more likely to be a cause of a urinary tract infection.

Neisseria gonorrhoeae is also unlikely to be the cause due to its lack of association with toxic shock syndrome. The same is true of Klebsiella pneumoniae.

Further reading:

https://dermnetnz.org/topics/toxic-shock-syndrome-and-toxic-shock-like-syndrome

Question:

A 63-year-old lady presents to A&E in excruciating pain; she reports that this started around an hour ago, and appears to come and go in waves. When asked to localise the pain, she points to her right-hand side and states that it radiates down into her groin. She has felt extremely nauseous, but has not vomited, and is desperate for some medication to relieve the pain.

The patient informs you that she is currently undergoing chemotherapy for high-grade diffuse large B-cell lymphoma; she is now on her third round of treatment. Other than this, she takes no regular medications. Observations reveal an elevated pulse rate, but no fever, with normal blood pressure.

The clerking doctor is suspicious she may have renal colic and orders several investigations. Urinalysis reveals blood (++) but no protein, leukocytes or nitrites. FBC reveals no signs of neutropenia. An abdominal X-ray is taken in A&E, as a CT scan cannot be arranged; this is reported as showing no evidence of a stone within the urinary tract.

U&E's reveal the following:

Na+ - 137 mmol/L

K+ - 5.7 mmol/L

Ca2+ - 2.0 mmol/L

Urea - 6.8 mmol/L

Creatinine - 72 μmol/L

What is the most likely diagnosis in this case?

A. Staghorn calculus

B. Tumour lysis syndrome

C. May-Thurner syndrome

D. Calcium oxalate stone causing ureter obstruction

E. Psoas abscess

Correct Answer:Tumour lysis syndrome

Explanation:

This patient is most likely suffering from a uric acid calculus secondary to tumour lysis syndrome. This arises most commonly due to some form of excessive cell turnover; classically in those with aggressive, high-grade malignancies, or those undergoing chemotherapy. In these scenarios, there is a high level of cell breakdown, meaning intracellular products are released in high quantities. Uric acid production will be high, explaining the stone formation, and potassium is also predominantly an intracellular ion; thus explaining the hyperkalemia on the blood results. Calcium classically falls in tumour lysis syndrome, as the phosphate released causes excessive binding with the ion, leading to reduced levels of free calcium within the blood.

Uric acid stones are also common in those who have a high purine intake, or who have renal dysfunction (less clearance of uric acid). Other risk factors for urinary calculi include dehydration, high salt intake and a high protein diet. Uric acid stones are usually radiolucent on X-ray - this explains why no stones were visualised.

Tumour lysis syndrome is usually managed prophylactically via the provision of xanthine oxidase inhibitors such as allopurinol, or drugs such as rasburicase, which act to convert uric acid into a non-active form that is more easily excreted. If the condition does develop, close monitoring of potassium levels is essential due to the risks associated with hyperkalemia.

Whilst this patient does likely have a urinary calculus, a calcium oxalate stone is less likely, as this would likely be visible on an X-ray. Although calcium oxalate stones are the most common subtype, given the patient's past medical history, a uric acid stone is more probable.

A staghorn calculus is a type of urinary stone that usually arises secondary to infection - Proteus mirabilis is a common causative organism. These stones are usually radiopaque and would be visible on X-ray.

May-Thurner syndrome is a rare condition that arises due to compression of the left iliac vein by the right iliac artery. It classically presents with recurrent left-sided venous thromboembolism rather than urinary tract stone formation.

A psoas abscess can cause flank pain due to the location of the muscle, but would likely cause a fever. There are also no risk factors such as IV drug use.

Further reading:

https://patient.info/doctor/oncological-emergencies

Question:

A 70-year-old man attends his GP with his wife following a fall at home. He explains that he has found it progressively harder to balance over the past 6 months, and can no longer mobilise without the aid of a stick. The patient also comments that he has noticed a slight tremor of his right hand when he is not using it. He denies any memory loss, visual hallucinations or restlessness.

On questioning the patient’s wife, she reports that she hasn’t observed any personality changes in her husband. He has no family history of note.

On examination, the GP observes a shuffling gait affecting the patient’s right side. She also notes rigidity of the right upper limb, as well as bradykinesia when she asks the patient to mimic certain hand movements.

Which of the following is the most likely diagnosis?

A. Lewy body dementia

B. Parkinson’s disease

C. Alzheimer’s disease

D. Frontotemporal dementia

E. Huntington’s disease

Correct Answer:Parkinson’s disease

Explanation:

Parkinson’s disease describes a progressive, neurological disease associated with postural instability, bradykinesia, rigidity and resting tremor. Bradykinesia and rigidity may lead to a characteristic shuffling gait. Other features of Parkinson’s disease include masked facies, depression and micrographia. Parkinson’s disease occurs due to a loss of dopamine-producing cells in the substantia nigra of the basal ganglia.

Huntington’s disease typically presents with chorea, loss of coordination and personality changes such as impulsivity and irritability. Most cases are hereditary and inherited in an autosomal dominant fashion, although the disease can more rarely occur due to a new mutation.

Patients with Lewy body dementia often present with features of Parkinson’s disease, however, these patients would also be expected to experience visual hallucinations and a decline in their cognitive function.

Frontotemporal dementia is a type of neurodegenerative disorder characterised by personality and social conduct changes, as well as a loss of language skills and memory impairment. It usually affects patients in their 5th decade of life. Many patients with frontotemporal dementia also experience features of Parkinson’s disease in addition to their behavioural symptoms.

Alzheimer’s disease is the most common cause of dementia and typically presents with memory loss accompanied by a generalised decline in cognitive function. Alzheimer’s disease does not ordinarily cause changes to physical mobility, and so physical examination would be expected to be normal.

Further reading:

https://patient.info/doctor/parkinsonism-and-parkinsons-disease

Question:

An 18-year-old female presents to the local sexual health service for emergency contraception. The unprotected sexual intercourse was 24 hours ago. She has not used emergency contraception in this cycle and usually uses barrier contraception. The patient states she would prefer to avoid a procedure. She suffers from severe asthma but is otherwise well.

Which of the following would be the most appropriate option for this patient?

A. Mirena coil

B. Ulipristal acetate

C. Levonorgestrel

D. Copper coil

E. Progesterone only pill

Correct Answer:Levonorgestrel

Explanation:

The most appropriate option for this patient would be levonorgestrel.

The emergency contraceptive pill with levonorgestrel contains progesterone and should be taken within 72 hours of unprotected sex.

Around 1% to 2.6% of people become pregnant after taking the emergency contraceptive pill with levonorgestrel.

Advantages of levonorgestrel include not requiring an invasive procedure and minimal side effects.

Disadvantages of levonorgestrel include occasional side effects such as nausea and vomiting, changes to the timing of the patient's next period and a shorter window of opportunity to take the pill to prevent pregnancy compared to other methods (i.e. 3 days vs 5 days of other methods). Patients with a high BMI may also need an increased dose of the medication for it to be effective.

The Copper intrauterine device (also known as the “Copper Coil” or “Emergency IUD”) is a small plastic and copper device that can be fitted up to 5 days, (120 hours) after unprotected sex. It also provides immediate long-term contraception. In this scenario, the patient did not want to undergo a procedure, ruling this option out.

The only emergency contraceptive pill with ulipristal acetate (UPA) sold in the UK is EllaOne. EllaOne is a tablet which should be taken within 120 hours of unprotected sex. UPA is contraindicated in patients with asthma and therefore this option is less appropriate in this scenario.

The Mirena coil and progesterone-only pill are not used in the context of emergency contraception.

Further reading:

https://geekymedics.com/emergency-contraception-counselling-osce-guide/

Question:

Mr I, a 57-year-old man with type 2 diabetes, attends his GP for his annual diabetes check. He has been attending his podiatry and eye appointments but admits he is not always able to maintain a healthy diet. He has however managed to quit smoking in the last year.

His past medical history includes type 2 diabetes, congestive cardiac failure, ischaemic heart disease and hypertension.

His current medications include metformin 1g BD, ramipril 5mg OD, bisoprolol 2.5mg OD, furosemide 40mg OD, atorvastatin 20mg ON, aspirin 75mg OD and GTN spray PRN.

His most recent HbA1c is 56mmol/mol.

What is the most appropriate step to help this gentleman with his diabetic control?

A. Start gliclazide

B. Reinforce dietary and lifestyle advice

C. Refer to a diabetic specialist

D. Increase metformin dose

E. Start pioglitazone

Correct Answer:Reinforce dietary and lifestyle advice

Explanation:

According to NICE guidance, for type 2 diabetics on metformin, an increase in pharmacological therapy should be considered if the HbA1c is >58mmol/mol. Mr I does not meet this criterion and therefore lifestyle and dietary advice should be given to help him control his diabetes further.

Should Mr I’s HbA1c increase to >58mmol/mol in the future, gliclazide (a sulfonylurea) could be considered, however pioglitazone would be contraindicated as he has heart failure. He is already on the maximum dose of metformin.

Referral to a diabetic specialist may be required further down the line if Mr I requires insulin therapy or develops complications of his diabetes which require secondary care input.

Further reading:

https://www.nice.org.uk/guidance/ng28

Question:

A new rapid antigen test is developed for COVID-19 and trialled in a group of individuals with suspected COVID. The test is found to have a sensitivity of 99% and a specificity of 56%.

What can be concluded about the test based on the sensitivity and specificity?

A. A positive result is equally likely to rule in and rule out COVID

B. A negative result is likely to rule out COVID

C. A positive result is likely to rule out COVID

D. A negative result is likely to rule in COVID

E. A positive result is likely to rule in COVID

Correct Answer:A negative result is likely to rule out COVID

Explanation:

If a test has a high sensitivity, it is able to easily pick up individuals with a condition. Therefore, if a test with a high sensitivity returns a negative result, this rules out the condition and so the correct answer is a negative result is likely to rule out COVID.

This can be remembered using the ‘SNOUT’ and ‘SPIN’ rule:

For a test with a high SeNsitivity, a Negative result rules OUT a diagnosis

For a test with a high SPecificity, a Positive result rules IN a diagnosis

Further reading:

https://geekymedics.com/statistics-for-medical-students/

Question:

A 59-year-old man presents to his GP requesting a prostate-specific antigen (PSA) test. Although he has not had any recent symptoms, he is concerned that he may have prostate cancer because his friend was recently diagnosed, despite being asymptomatic. He last ejaculated 36 hours ago but has not had any other significant recent history.

What is the most appropriate next investigation step?

A. Inform the patient that he is not eligible to receive the PSA test

B. Wait at least a further 48 hours before testing the patient's PSA

C. Test the patient's PSA test today

D. Refer the patient for a multiparametric MRI

E. Wait at least a further 12 hours before testing the patient's PSA

Correct Answer:Wait at least a further 12 hours before testing the patient's PSA

Explanation:

The patient's clinical features are not suggestive of prostate cancer; however, because the patient is over 50 years old, they are eligible to request a PSA test. Patients should be tested at the point of presentation unless:

They have ejaculated less than 48 hours ago

They have exercised heavily in the past 48 hours

They have had a urological investigation or intervention in the past 6 weeks

They have had a urinary tract infection in the past 6 weeks

Because this patient ejaculated 36 hours ago, the most appropriate next investigation step is to wait at least a futher 12 hours before testing the patient's PSA, so that there is a clear 48 hours between the time of ejaculation and the time of the test. In addition to testing at a later time point, the patient should also have a DRE after the blood sample has been taken, so as to avoid an artefactual increase in PSA post-DRE.

It is inappropriate to inform the patient that he is not eligible to receive the PSA test as he is over the age of 50. Were he under 50, he would not be eligible to receive the test unless there was a clinical indication.

The patient's PSA should not be tested today because the patient ejaculated 12 hours ago. Ejaculation within 48 hours is one of the indications to defer the test to prevent a false reading.

The patient does not need to wait 48 hours before testing their PSA because the patient has already gone 12 hours without ejaculating. The patient only needs to wait a further 12 hours to make up the total 48 hour period.

It is inappropriate to refer the patient for a multiparametric MRI because the patient does not have any clinical features suggestive of prostate cancer and has not had their PSA tested. This action would be appropriate if the clinical history was more suggestive of prostate cancer.

Further reading:

https://geekymedics.com/prostate-cancer/

Question:

A 42-year-old woman presents to her GP with itching, which has become increasingly severe over the last three months. In addition, she has felt tired and had intermittent right upper quadrant pain. Her only regular medication is levothyroxine 100 micrograms once daily. Her sister has ulcerative colitis, and she is concerned she may also be developing this.

What is the most appropriate treatment option to manage her symptoms?

A. Topical hydrocortisone

B. Hydroxyzine

C. Diphenhydramine

D. Cetirizine

E. Cholestyramine

Correct Answer:Cholestyramine

Explanation:

This lady likely has primary sclerosing cholangitis (PSC) and will need to be referred to the gastroenterology/hepatology clinic. Pruritis is a common and often severe symptom of PSC and is best treated initially with cholestyramine, which is an ion exchange resin that works as a bile acid sequestrant. Other options include rifampicin and naltrexone. Cetirizine, hydroxyzine and diphenhydramine are all antihistamines and are useful for lots of causes of itch, especially allergic, but less helpful in cholestatic itch. Topical hydrocortisone is used in conditions such as eczema.

Further reading:

https://patient.info/doctor/primary-sclerosing-cholangitis-pro

Question:

A 41-year-old woman presents to general practice with amenorrhoea for the past 3-months. The patient is a long-distance runner. Pregnancy tests have all come back negative. She also describes headaches starting a month ago, which are beginning to affect her vision. The headaches affect her on both sides of her head. On examination, she has a diffuse, bitemporal visual field defect more prominent in the upper quadrants of her visual field.

What is the most likely cause of her symptoms?

A. Craniopharyngioma

B. Retinoblastoma

C. Hypothalamic amenorrhoea

D. Prolactinoma

E. Migraine with aura

Correct Answer:Prolactinoma

Explanation:

The correct answer is prolactinoma. The combination of headache, amenorrhoea, and visual field defect is suspicious for a prolactinoma. Prolactinoma classically causes bitemporal hemianopia more prominent in the upper quadrants. This is via compression of the optic chiasm from below, where optic nerve fibres corresponding to supero-temporal visual field cross over.

Craniopharyngioma is a rare benign brain tumour that compresses the optic chiasm from above. Neurons running along the superior (compressed) aspect of the optic chiasm cross over to innervate the lower quadrants of the visual field. Therefore, craniopharyngioma presents with bitemporal hemianopia worse in the lower quadrants. Craniopharyngiomas can sometimes cause panhypopituitarism, as with the prolactinoma, so could account for her amenorrhoea and headaches. However, the upper quadrant dominant temporal hemianopia, the age of the patient, and the fact prolactinoma more commonly causes these hormonal disturbances all point more towards prolactinoma.

Hypothalamic amenorrhoea is the most common cause of secondary amenorrhoea and tends to be caused by stress (emotional or physical). While she does run long distances, this does not explain the visual field defect or headache.

Retinoblastoma is a retinal tumour typically found in children under five and tends to present with an absent red reflex, strabismus, and leukocoria. This woman is not in the usual age range and it also doesn't account for her amenorrhoea.

Migraine with aura is a common cause of headaches and can account for visual disturbances. However, the aura would usually be present with the onset of the headaches rather than constantly. Furthermore, migraines wouldn't account for her amenorrhoea.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK459347/

Question:

An 80-year-old patient on the oncology ward has intractable vomiting secondary to malignant gastric outlet obstruction. They have become unwell overnight, and an arterial blood gas (ABG) has been obtained:

ABG Value Result Normal range

pH 7.55 7.35 - 7.45

pO2 11.2 kPa 10 - 14

pCO2 5.0 kPa 4.5 - 6.0

HCO3 35 mmol/L 22 - 26

BE + 7 mmol/L -2 to +2

What best accounts for this acid-base abnormality?

A. Increased renal chloride secretion

B. Loss of chloride ions

C. Hyperventilation

D. Hypoventilation

E. Loss of potassium ions

Correct Answer:Loss of chloride ions

Explanation:

This ABG shows a metabolic alkalosis. The clear culprit for this is the patient's intractable vomiting, which results in a loss of chloride ions found in the acidic gastric juices. Another scenario where you may see this ABG pattern is in babies with pyloric stenosis, who develop a hypochloraemic metabolic alkalosis due to the projectile vomiting caused by gastric outlet obstruction.

Increased renal chloride secretion may cause a metabolic alkalosis, too - the most likely scenario in which this would occur is diuretic use, which is not indicated in the question stem.

Loss of potassium ions occurs in intractable vomiting and bloods should be monitored for hypokalaemia. However, this does not fully account for the metabolic alkalosis seen here.

In metabolic alkalosis, hypoventilation is the respiratory system's method of compensating for a raised blood pH. Increased carbon dioxide levels lower the blood pH (because carbon dioxide plus water forms carbonic acid, which dissociates into H+ ions). Hypoventilation may be seen in this patient as a compensatory mechanism but does not account for the original metabolic alklaosis.

Hyperventilation (e.g in an anxiety attack) causes a respiratory alkalosis and does not account for this patient's blood gas result.

Further reading:

https://litfl.com/metabolic-alkalosis/

Question:

A 32-year-old female presents to her general practitioner (GP) with a three-day history of a painful and red left breast. Since the birth of her first son eight weeks ago she has been exclusively breastfeeding. The patient denies fever or chills. She does not have other medical problems.

Physical examination reveals a warm, erythematous and tender left breast with no signs of masses. There is a small amount of non-bloody discharge present at the left nipple.

What is the most likely diagnosis?

A. Inflammatory breast cancer

B. Fat necrosis

C. Lactational mastitis

D. Breast abscess

E. Galactocele

Correct Answer:Lactational mastitis

Explanation:

The patient above is suffering from infective lactational mastitis – a common condition that typically affects women in the first 3 months of breastfeeding. Initially, milk engorgement occurs due to poor milk drainage (likely due to nipple trauma) followed by milk stasis and infection. Clinical features include breast redness, tenderness, warmth and systemic complaints may also be present (fever, chills and malaise). Most cases are caused by Staphylococcus aureus and therefore an oral antibiotic such as flucloxacillin for 10-14 days is indicated.

A galactocele (also called a milk retention cyst) is a cystic collection of fluid secondary to an obstructed milk duct which typically presents as a painless, soft mass without systemic clinical features.

Breast abscess typically presents with a painful, fluctuant breast mass that can be associated with systemic manifestations. Ultrasound is the test of choice for the diagnosis of a breast abscess.

Inflammatory breast cancer (IBC) should be considered in women if mastitis does not improve with treatment. IBC is also more likely to present with skin changes (dimpling, tethering) and axillary lymph node enlargement.

Fat necrosis refers to a benign, painless lump in the breast that is often associated with local trauma (car accident, breast surgery). These masses typically resolve spontaneously.

Further reading:

https://patient.info/doctor/puerperal-mastitis

Question:

A 33-year-old man with breathing difficulties is diagnosed with alpha-1 antitrypsin deficiency.

What lung pathology is most likely to be present in this patient?

A. Emphysema

B. Haemoptysis

C. Pulmonary effusion

D. Pulmonary oedema

E. Empyema

Correct Answer:Emphysema

Explanation:

Emphysema is correct because alpha-1 antitrypsin deficiency (A1AD) most commonly presents with lung manifestations. It increases the risk of developing COPD. Normally, alpha-1 antitrypsin inhibits the action of neutrophil elastase. Without it (as in A1AD), the lungs are exposed to high levels of elastase activity. This destroys alveoli over time and causes emphysema. This gives an obstructive picture of lung disease in the same way COPD.

Empyema is essentially an abscess and is much less likely than emphysema.

A1AD is more common in people with granulomatosis with polyangiitis (Wegener's granulomatosis), and people with this condition classically present with haemoptysis. However, the majority of A1AD cases do not coincide with this relatively rare vasculitis, so emphysema is much more common.

Pulmonary effusion is not particularly linked to A1AD.

Pulmonary oedema is incorrect as A1AD is much more likely to present with emphysema, as this occurs first to bring on the patient's symptoms (as they have a poor gas exchange from the vastly reduced alveolar surface area).

Further reading:

https://bestpractice.bmj.com/topics/en-gb/1075?q=Alpha-1%20antitrypsin%20deficiency&c=suggested

Question:

A 34-year-old woman presents to her GP with a three-year history of chronic pelvic pain. The pain is worse during menstruation and sometimes spreads to the posterior aspect of her thighs. In addition, she describes deep dyspareunia and occasional pain on defecation. She married her husband five years ago, and they have been trying to conceive ever since.

There is generalised tenderness during vaginal examination, and the uterus appears fixed and retroverted.

What is the most likely diagnosis?

A. Interstitial cystitis

B. Ovarian torsion

C. Leiomyoma

D. Acute pelvic inflammatory disease

E. Endometriosis

Correct Answer:Endometriosis

Explanation:

This case demonstrates endometriosis, where endometrial tissue is found outside the uterine cavity, most commonly around the pelvic peritoneum and ovaries. Endometriosis typically presents with chronic or cyclical pelvic pain, deep dyspareunia, dysmenorrhoea and subfertility. In addition, non-gynaecological symptoms such as dysuria and dyschezia may also be seen. There is commonly diffuse tenderness during vaginal examination, and the uterus is typically fixed and retroverted.

Interstitial cystitis is a chronic clinical syndrome of urinary frequency, urgency, and pelvic pain. Diffuse chronic pain and dyspareunia are common. In this case, the history of subfertility, cyclical pelvic pain, dyschezia, and the examination features make this a less likely diagnosis.

Acute pelvic inflammatory disease typically presents with fever, nausea and an offensive vaginal discharge. In addition, cervical motion tenderness and cervical excitation are common features found on examination.

Leiomyomas (uterine fibroids) typically cause lower abdominal pain, dyspareunia and subfertility. However, menorrhagia is a more common feature, and an enlarged uterus may be identified on pelvic examination.

Ovarian torsion is a surgical emergency and typically presents with sudden onset, severe pelvic pain, nausea and vomiting and a palpable adnexal mass. However, this case demonstrates chronic pelvic pain, making ovarian torsion an unlikely diagnosis.

Further reading:

https://cks.nice.org.uk/topics/endometriosis/

Question:

A 26-year-old G2P2 presents to the emergency department with vaginal bleeding 10 days following the delivery of her second child. The bleeding started 4 hours ago. She describes it as spotting with occasional clots. Both of her pregnancies have been uncomplicated vaginal deliveries.

Her observations are stable and she is apyrexial. On examination, the abdomen is non-tender and a bulky uterus is palpable.

A secondary post-partum haemorrhage is suspected.

What is the definition of this diagnosis?

A. Blood loss >500ml from 24 hours after delivery to 6 weeks postpartum

B. Blood loss >500ml from 24 hours after delivery to 12 weeks postpartum

C. Blood loss >500ml within 24 hours of delivery

D. Blood loss >500ml before the onset of labour

E. Blood loss >500ml during delivery

Correct Answer:Blood loss >500ml from 24 hours after delivery to 12 weeks postpartum

Explanation:

This case demonstrates a secondary postpartum haemorrhage (PPH). Secondary PPH is defined as blood loss >500ml between 24 hours to 12 weeks after delivery, most commonly after 7 days. The most common causes are retained products of conception and endometritis (infection of the endometrium). The secondary PPH in this patient is most likely to be caused by retained placental tissue, as this typically presents with a bulky, palpable uterus.

A primary PPH is defined as blood loss >500ml within 24 hours of delivery, including blood loss >500ml during delivery.

Vaginal bleeding before the onset of labour is an antepartum haemorrhage and may be due to several causes, e.g. placental abruption, placenta praevia.

Further reading:

https://geekymedics.com/postpartum-haemorrhage/

Question:

A 30-year-old male presents to hospital in the early hours of the morning vomiting bright red blood after a night of heavy drinking. He states that he began vomiting a few hours ago, however, only started vomiting blood recently. He is known to binge drink every other weekend and smokes 10 cigarettes every day. He has no significant medical history; however, his father was a heavy drinker and suffered from alcoholic liver disease.

On examination, he has a soft non-tender abdomen and there are no clinical findings of note. Rectal examination reveals an empty rectum with no melaena or fresh blood. Vital signs and laboratory tests are all normal.

What is the most likely diagnosis?

A. Acute variceal bleed

B. Mallory-Weiss tear

C. Gastritis

D. Peptic ulcer disease

E. Oesophagitis

Correct Answer:Mallory-Weiss tear

Explanation:

A Mallory-Weiss tear is the most likely diagnosis in this scenario. The patient was initially vomiting normal food contents and then started to vomit blood, which is typical of a Mallory-Weiss tear. The haematemesis is due to a tear in the upper gastrointestinal tract, usually at the gastro-oesophageal junction or gastric cardia. The haematemesis typically occurs after a prolonged or forceful bout of vomiting.

Peptic ulcer disease generally presents with epigastric pain which is usually related to eating (either relieved or worsened by food depending on the type of ulcer). The most common cause of peptic ulcer disease is H. Pylori.

An acute variceal bleed typically presents with sudden-onset large volume haematemesis. There is often assocated abdominal pain and malaena. Patients typically have a past medical history of liver cirrhosis.

Gastritis and oesophagitis typically present with a burning sensation or pain in the epigastric region which is associated with eating. There may also be associated nausea.

Further reading:

https://patient.info/doctor/mallory-weiss-syndrome-pro

Question:

A 57-year-old man presents to the GP after noticing blood in his urine. On further questioning, he describes bright red blood in his urine, with no associated clots or dysuria. He denies any fever but does mention intermittent left loin pain and unintentional weight loss of around 5kg over the last 3 months.

Clinical examination reveals a mass in the left flank. A urine dipstick is positive for blood only and there is visible blood in the urine sample. Vital signs are normal.

Which of the following is the most likely diagnosis?

A. Kidney stone

B. Urinary tract infection

C. Benign prostatic hypertrophy

D. Bladder cancer

E. Renal cell carcinoma

Correct Answer:Renal cell carcinoma

Explanation:

Renal cell carcinoma (RCC) typically presents with haematuria, loin pain and a loin mass. Other symptoms can include fatigue, weight loss and varicocele. RCC can metastasise quickly to the adrenal glands, spleen, liver, pancreas, colon, bone and the lungs. Further investigation would include an ultrasound of the abdomen to assess the structures of the renal tract and then a CT abdomen if malignancy was suspected.

A urinary tract infection (UTI) would typically present with fever, dysuria and suprapubic pain. If a UTI was present, you would expect that the urine dipstick would have been positive for leucocytes and nitrites. A UTI also wouldn't explain the weight loss or mass in the left flank.

Kidney stones usually present with renal colic and microscopic haematuria. The presence of a mass in the left flank makes a diagnosis of renal cell carcinoma much more likely.

Benign prostatic hypertrophy (BPH) is unlikely given the patient has no symptoms to suggest this diagnosis. Patients with BPH usually present with poor urinary flow, terminal dribbling and difficulty initiating urination.

Bladder cancer typically presents with painless haematuria and clinical examination is typically unremarkable. In advanced bladder cancer, the patient may develop voiding symptoms caused by obstruction, but this is less typical.

Further reading:

https://patient.info/doctor/renal-cancer

Question:

A 10-month-old boy presents to the emergency department with a 2-day history of vomiting and bloody diarrhoea. His mother reported that he has been irritable recently and his oral intake has been poor. His vomiting has recently changed from a yellow to a green colour and he has frequent periods of distress with inconsolable crying and drawing up of his legs. On examination he is pale and his abdomen is distended.

What is the most likely diagnosis?

A. Intussusception

B. Appendicitis

C. Gastroenteritis

D. Meckel's diverticulum

E. Pyloric stenosis

Correct Answer:Intussusception

Explanation:

The most likely diagnosis is intussusception. This is the invagination of a proximal segment of bowel into a more distal segment of bowel. Two thirds of cases occur in patients under one year of age. The peak age range is 5-10 months. It is usually of sudden onset and paroxysmal episodes of colicky abdominal pain occur every 10-20 minutes. During these episodes the child becomes pale, cries and draws their legs up to their chest. The child appears well in between these episodes. Vomiting is an early sign which can rapidly become bile stained. Bloody diarrhoea ("red currant jelly stool") is a late sign. Abdominal distension is common and a characteristic sausage-shaped mass can sometimes be palpable in the right upper quadrant.

Appendicitis is uncommon in children under the age of 5 years. Symptoms of appendicitis include diarrhoea and vomiting, however, the child is usually febrile with severe abdominal pain which later localises to the right iliac fossa.

Gastroenteritis usually presents with diarrhoea and/or vomiting. The child can show signs of dehydration such has lethargy, tachycardia, prolonged capillary refill time (>2 seconds), reduced skin turgor and sunken eyes. There is usually a history of recent ingestion of undercooked foods meats, recent foreign travel or sick contacts.

Pyloric stenosis presents most commonly between 2-8 weeks of age with projectile vomiting which is non-bilious. An olive shaped mass may be palpable in the epigastrium.

Meckel's diverticulum is a vestigial remnant of the omphalomesenteric duct in the small bowel and is present in 2% of the population. It most commonly presents before the age of 2 years. Most patients with Meckel’s diverticulum are asymptomatic. Symptoms are similar to those present in intussusception however bleeding from the bowel is more frank and can result in severe haemorrhage. Intussusception can be a complication of Meckel’s diverticulum.

Further reading:

https://patient.info/doctor/intussusception-in-children

Question:

A 52-year-old woman presents to the GP, complaining of persistent fatigue. She is now struggling in her job as a maths teacher and feels exhausted by the end of the day. The patient explains that they have also experienced frequent urinary tract infections, and often gets pains in a number of her joints after a long day at work. She stopped menstruating 3 months previously, and wonders if her symptoms are simply due to menopause; she denies any issues with her mood or sleep, and has no other past medical history of note. She reports drinking roughly 4 units of alcohol per week.

There are no abnormalities on examination; the patient has no evidence of pallor, rather she appears relatively tanned. Abdominal examination is unremarkable.

The GP informs the patient that menopause could account for a number of her symptoms, but orders a number of investigations to rule out other possibilities. FBC and U&E are both normal, however, LFT's demonstrate a mildly elevated ALP and ALT. A HBA1c measurement returns a result of 54, which the GP tells the patient is above the threshold for a diagnosis of diabetes mellitus. This comes as a great surprise to the patient, as she maintains a healthy diet and exercise routine.

The GP is not certain of the cause of the patient's wide array of symptoms and therefore arranges a hospital referral for a second opinion and further investigations. Those carried out include iron studies and a liver biopsy; these confirm the diagnosis, and the patient is started on the first-line treatment for their condition.

Given the likely diagnosis, which of the following is most likely to be used as the management initiated in hospital?

A. Liver transplant

B. Venesection

C. Deferoxamine chelation therapy

D. Long-acting insulin injections

E. Methotrexate

Correct Answer:Venesection

Explanation:

Hereditary haemochromatosis is a disorder of iron metabolism in which patients have issues with the excretion of the metal, leading to accumulation and deposition within organs. This can go unnoticed for many years; in women, it commonly presents post-menopause, as prior to this, iron is naturally removed from the body via menstruation.

Excessively high iron levels can damage a number of internal organs; the liver is frequently infected, with low-level hepatitis developing, with possible progression to cirrhosis. Pancreatic inflammation can result in secondary diabetes mellitus; this explains the abnormal HBA1c result in this patient. Other features can include:

Arthralgia

Pituitary gland dysfunction

Restrictive cardiomyopathy

Skin hyperpigmentation

Iron studies are a good first-line investigation for hereditary haemochromatosis; these will usually demonstrate a raised ferritin, which makes the diagnosis extremely likely, although the role of ferritin as an acute phase reactant must be taken into account. Genetic testing and liver biopsy are other possibilities, should diagnostic doubt remain.

Venesection is the first-line treatment for hereditary hemochromatosis; this is an effective means of removing excess iron from the body. Should this fail to bring levels to within the normal range, then chelation with drugs such as deferoxamine can be added; these are not frequently used first-line however.

A liver transplant may be required in very rare cases, where hereditary haemochromatosis has led to significant enough damage to cause cirrhosis and liver failure; this is unlikely to be the case in this scenario. Venesection would still be required to manage the underlying disease.

Hereditary haemochromatosis is not an immune-mediated condition; therefore, methotrexate would not be an appropriate management option for this patient.

Insulin injections may be required to manage the diabetes that has developed due to this patient's disease; however, studies have shown that if treatment is initiated early, insulin requirements can be significantly reduced. Therefore, venesection is the most important treatment to initiate first-line.

Further reading:

https://patient.info/doctor/hereditary-haemochromatosis

Question:

An 82-year-old male presents to the general practitioner after becoming progressively more short of breath on exertion. He reports requiring more pillows to sleep and waking in the middle of the night with severe breathlessness. He has also noticed his legs swelling. His GP recently stopped his diuretic medication as he was complaining of dizziness and his blood pressure at the surgery was slightly low (BP 100/70 mmHg).

Clinical examination reveals gross peripheral oedema, a raised JVP and bibasal coarse crackles on auscultation of his chest.

Vital signs are as follows:

BP: 110/80 mmHg

Heart rate: 80bpm

Respiratory rate: 22/min

What is the next most appropriate step in his management?

A. Continuous positive airway pressure (CPAP)

B. Beta-blocker

C. Oral diuretic therapy

D. Intravenous diuretic therapy

E. Angiotensin-converting enzyme inhibitor

Correct Answer:Intravenous diuretic therapy

Explanation:

Acute heart failure can present as either new-onset heart failure in a patient with no known previous cardiac dysfunction or as acute decompensation of chronic heart failure. In this scenario, it is likely the patient had known cardiac dysfunction, given that he was previously prescribed diuretic tablets. His acute decompensation of chronic heart failure was most likely precipitated by the cessation of his diuretic therapy.

The clinical history and assessment confirm he is in acute heart failure. He requires treatment with intravenous diuretics in the first instance to offload fluid from his lungs and legs to improve his symptoms. He is haemodynamically stable and thus likely to tolerate high doses of IV diuretic medication. He should be catheterised and his urine output strictly monitored with daily fasting weights and fluid restriction of 1.5L of fluid per day.

Oral diuretics are unlikely to be as effective for initial management, but they will need to be resumed on discharge (with monitoring of his renal function and blood pressure in the community).

He is likely to already be on a beta-blocker and ACE-inhibitor which may need suspending in the short term to preserve renal function. After initial stabilisation, these medications can be re-introduced for his chronic heart failure management.

CPAP is not indicated in this scenario. CPAP is recommended for the treatment of severe dyspnea in the context of cardiogenic pulmonary oedema with associated acidaemia (where there has been a minimal response to initial management with IV diuretics).

Further reading:

https://www.nice.org.uk/guidance/cg187

Question:

A 38-year-old woman presents to her GP with pain around her anus during and after bowel movements. She has also noticed blood on the toilet paper when she wipes after a bowel movement. She denies any diarrhoea, weight loss or abdominal pain.

On examination, there is a fissure at the 6 o'clock position.

Given the diagnosis, what is the most likely underlying cause?

A. Trauma

B. Tuberculosis

C. Inflammatory bowel disease

D. Constipation

E. Human immunodeficiency virus (HIV)

Correct Answer:Constipation

Explanation:

This patient has an anal fissure, the commonest cause of which is constipation. Anal fissures are most commonly located at the 6 o’clock position (posterior midline) due to this area receiving less perfusion than the rest of the anal canal.

Anal fissures in a lateral position are more commonly caused by other pathologies, such as inflammatory bowel disease, HIV, trauma or tuberculosis.

Further reading:

https://teachmesurgery.com/general/anorectal/anal-fissure/

Question:

A 74-year-old man presents with a two-day history of inability to pass urine. He describes a deep lower abdominal pain that has worsened over the past 24 hours and the persistent feeling of needing to urinate. On examination, an enlarged bladder can be palpated to the level of the umbilicus. His past medical history includes hypertension, hypercholesterolaemia, type 2 diabetes, atrial fibrillation and benign prostatic hyperplasia.

What is the most likely cause of his current presentation?

A. Atrial fibrillation

B. Benign prostatic hyperplasia

C. Hypercholesterolaemia

D. Hypertension

E. Type 2 diabetes

Correct Answer:Benign prostatic hyperplasia

Explanation:

The correct answer is benign prostatic hyperplasia (BPH). The short timeframe and presentation of inability to pass urine, lower abdominal pain and a palpable enlarged bladder is the typical presentation of acute urinary retention. The enlarged prostate caused by BPH impinges on the urethra and, over time, causes inflammation, eventually leading to complete blockage and inability to pass urine. Other risk factors for acute urinary retention include the use of anticholinergic medications, constipation and ureteric calculi.

There is no known association between hypertension and acute urinary retention, as described in this question.

Hypercholesterolaemia is not known to be a risk factor for acute urinary retention.

There is not known to be an association between type 2 diabetes and acute urinary retention.

Atrial fibrillation is incorrect as it is not known to be a risk factor for acute urinary retention.

Further reading:

https://teachmesurgery.com/urology/presentations/acute-urinary-retention/

Question:

A 3-year-old child with a history of well-controlled eczema presents to the GP with a worsening facial rash. The rash is worse than it was last night and she now has red painful blisters clustered around both cheeks and forehead. No other family member is unwell. She usually uses emollients to control her eczema.

Vital signs are as follows:

Temperature is 37.9 oC

Heart rate is 80 bpm

Blood pressure 100/65 mmHg

Which of the following is the most appropriate management option?

A. Admit to hospital for IV acyclovir

B. Send home with an emollient and steroid cream

C. Admit to hospital for observations only

D. Make a routine referral to dermatology

E. Send home with flucloxacillin

Correct Answer:Admit to hospital for IV acyclovir

Explanation:

The most likely diagnosis is eczema herpeticum. Eczema herpeticum is a severe primary infection of the skin by herpes simplex virus 1 or 2. It is more commonly seen in children with atopic eczema. As it is potentially life-threatening, children should be admitted for IV aciclovir. It is necessary to scrupulously care for the skin and carefully monitor fluid and electrolyte balance.

The other options presented are inappropriate, as all lack the administration of IV aciclovir in hospital.

Further reading:

https://patient.info/doctor/atopic-dermatitis-and-eczema

Question:

A 63-year-old man presents to the A&E department with an active nosebleed. He reports that despite first aid measures, the bleeding has been ongoing for 20 minutes. He has had nosebleeds before but never lasting this long.

He has a past medical history of hypertension and takes amlodipine 5mg daily. He is allergic to penicillin, causing a rash.

On general examination, he appears anxious, with a pulse of 85 bpm and blood pressure of 145/95 mmHg. Using the nasal speculum, you are able to identify the bleeding site.

What is the most appropriate initial management step?

A. Refer for emergency ligation of the sphenopalatine artery

B. Activate the major haemorrhage pathway

C. Apply a topical antiseptic preparation

D. Perform chemical cautery

E. Continue with first-aid measures until the bleeding stops

Correct Answer:Perform chemical cautery

Explanation:

This is an example of epistaxis (nosebleed). The management of epistaxis should always take into consideration how unwell the patient is. Whilst the patient is anxious, he is haemodynamically stable. According to NICE guidelines, the most appropriate next step in management is to perform chemical cautery. This is because first aid measures have failed, but the site of bleeding has been identified.

First aid, including leaning forward, applying firm pressure against the cartilaginous part of the nose, breathing through the mouth and spitting out blood, are important first aid measures. However, guidelines recommend that if the bleeding does not stop after 10-15 minutes of first aid measures, alternative measures should be implemented to control the bleeding.

A major haemorrhage pathway should be activated immediately when a patient is haemodynamically unstable - features of which include hypotension and tachycardia. Be sure always to follow your local major haemorrhage protocol.

Emergency ligation of the sphenopalatine artery is indicated only in: life-threatening bleeding, high risk of re-bleeding and follow up to suspected malignancy.

Topical antiseptic preparations are typically used once the bleeding stops. This helps to reduce crusting and prevent vestibulitis.

Further reading:

https://cks.nice.org.uk/topics/epistaxis-nosebleeds/

Question:

A 25-year-old female attends her optician with a red right eye. She reports that her eye first became red 24 hours previously, soon after she removed her contact lenses. The patient also reports excessive eye-watering, blurred vision, photophobia, eye pain and a foreign body sensation. She denies keeping her contact lenses in situ for extended periods.

On examination, the following are noted:

mildly reduced visual acuity in the right eye compared to the left

conjunctival injection

a small line of green staining on the cornea under normal light after fluorescein staining

What is the MOST LIKELY diagnosis?

A. Superficial corneal abrasion

B. Contact lens neovascularization

C. Penetrating corneal injury

D. Giant papillary conjunctivitis

E. Bacterial keratitis

Correct Answer:Superficial corneal abrasion

Explanation:

The most likely diagnosis is a superficial corneal abrasion. Clinical features of this condition include eye redness (i.e. conjunctival injection), pain, watering, foreign body sensation, blurred vision, photophobia and a positive fluorescein dye test (the abrasion appears green under cobalt blue light).

Further investigations are unnecessary if a superficial injury is likely. Typical management of small corneal abrasions includes analgesia and infection prophylaxis. Larger corneal abrasions (e.g. >60% of the cornea) require urgent referral to an ophthalmologist.

All cases of red eye and corneal abrasions in contact lens wearers should be treated as a potential bacterial keratitis and referred promptly for specialist ophthalmological opinion.

Penetrating corneal injuries are very unlikely complications of contact lenses (more likely as a result of high-velocity injuries). This condition would typically present with a distorted globe, iris or pupil, subconjunctival haemorrhage, and hyphaema.

Bacterial keratitis is less likely in this case as the fluorescein exam findings are consistent with an abrasion and no areas of infiltrate have been seen (round, yellow-white areas of corneal inflammation)

Contact lens neovascularization is typically asymptomatic, unless the central visual axis is involved. Risk factors include extended or improper contact lens use. Clinical features include limbal hyperaemia and neovascularization visible under slit-lamp.

Giant papillary conjunctivitis would typically present with ocular itching, reduced visual acuity, ocular redness, eye discharge and a history of poor contact lens hygiene.

Further reading:

https://patient.info/doctor/corneal-foreign-bodies-injuries-and-abrasions

Question:

A 72-year-old lady presents to A&E with a 3-day history of central abdominal pain and distension. She last emptied her bowels three days ago and has not passed flatus in two days. On examination, she has a distended abdomen and high-pitched bowel sounds. She refuses a rectal examination. The patient has no significant past medical history, however, she reports feeling more tired over the last 6 months and has had a poor appetite for the last 3-4 months.

Her vital signs are as follows:

Blood pressure is 100/70 mmHg

Heart rate 105 bpm

Respiratory rate 21

O2 saturations 98% on air

Temperature 37.2 oC

Blood tests reveal:

Hb 83g/dL

White cell count of 13x109 cells/L

CRP of 70 ng/L

Lactate of 2.5 mM

An abdominal x-ray reveals large bowel measuring between 5 and 9 cm in diameter, and small bowel measuring 2-4 cm in diameter.

What is the most likely cause of this lady’s presentation?

A. Adhesions

B. Malignancy

C. Constipation

D. Ileus

E. Stricture

Correct Answer:Malignancy

Explanation:

This patient has dilation of both the small (>3 cm) and large (>6 cm, or >9 cm at the caecum) bowel, which is consistent with large bowel obstruction (LBO). Most cases of large bowel obstruction are caused by colorectal malignancies, as was, unfortunately, the case in this patient. Hyperactive ‘tinkling’ bowel sounds are characteristic, and the history of anaemia is consistent with bowel cancer. Roughly a third of colorectal malignancies will be in the rectum and may be palpable on rectal examination.

Constipation is a rare cause of bowel obstruction. When it is, it is referred to as Ogilvie syndrome and is often secondary to electrolyte abnormalities or surgery. In the context of this scenario, malignancy must be ruled out before constipation is considered.

Adhesions are the most common cause of small bowel obstruction but rarely affect the large bowel. This is most often seen in patients who have had previous surgery.

Ileus reflects hypoactivity of the gastrointestinal tract, usually after surgery, or in the context of severe hypokalaemia; bowel sounds will be reduced or absent.

Strictures, secondary to previous diverticulitis or inflammatory bowel disease are a cause of large bowel obstruction, but are much less common than malignancy. This patient has no history of bowel disease.

Further reading:

https://patient.info/doctor/intestinal-obstruction-and-ileus

Question:

A 70-year-old woman presents to the emergency department with fatigue, weakness, and abdominal bloating that has developed over the last 3-months. Her past medical history is notable for contracting coronavirus 6-months prior. Her observations were a respiratory rate of 14 breaths per minute, a heart rate of 116 beats per minute, and a blood pressure of 100/70 mmHg. An abdominal examination revealed pulsatile hepatomegaly and moderate ascites. Chest X-ray reveals a small heart with calcification seen in the lateral view. The 12-lead ECG demonstrates low QRS voltage and T wave inversion. Echocardiography shows no heart enlargement or valvular disease.

What is the most likely cause of her ascites?

A. Renal failure

B. Protein-losing enteropathy

C. Portal vein thrombosis

D. Constrictive pericarditis

E. Liver cirrhosis

Correct Answer:Constrictive pericarditis

Explanation:

The most likely diagnosis is constrictive pericarditis which typically has a very gradual onset (usually months, occasionally days). A history of cardiac surgery or systemic disease(mostly viral) that affects pericardium makes the diagnosis more likely. The pericardium becomes thickened and fibrotic and later `eggshell` calcification may be visible on CXR.

Nephrogenic ascites is an entity that manifests as refractory ascites in patients with end-stage renal disease as well, but is not compatible with what we see here clinically.

Portal vein thrombosis is a frequent complication of liver cirrhosis. Most people have no symptoms, but in some people, fluid accumulates in the abdomen, the spleen enlarges, and/or severe bleeding occurs in the oesophagus.

Liver cirrhosis may present with vague symptoms such as anorexia, nausea, and weight loss. In advanced decompensated liver disease, the presentation may include oedema, ascites, easy bruising, poor concentration and memory, bleeding oesophageal varices and sometimes spontaneous bacterial peritonitis.

Protein-losing enteropathy mainly presents with oedema due to hypoproteinaemia. Consider it in any patient presenting with oedema, especially if this is against a background of GI disease.

Further reading:

https://patient.info/doctor/chronic-pericarditis

Question:

A 50-year-old man presents with a pigmented skin lesion on his right cheek. The lesion grew to a diameter of 0.8 cm within 9 months and appeared in previously normal skin with no associated naevus. It is a dark brown, firm, raised, circular growth resembling a blood blister.

The patient's sister had recent surgery for melanoma. The patient has phototype two according to the Fitzpatrick phototype classification.

What is the most significant prognostic factor in the patient?

A. Family history of melanoma

B. Location of the lesion

C. Sex

D. Phototype

E. Age

Correct Answer:Location of the lesion

Explanation:

Clinical presentation of the described lesion and positive family history for melanoma point towards the diagnosis of melanoma in this patient. The head/neck or acral location of the lesion is listed among risk factors for metastasis of malignant melanoma among patients with stage I and stage II disease. In this patient, the tumour is located on the cheek, so it fits that criteria. Other risk factors for metastasis include age older than 55 years, Breslow's thickness greater than 4 mm, vascular invasion, absence of regression, and mutations in TERT promoter and BRAF genes. The most important prognostic indicators in malignant melanoma are Breslow's depth of the tumour, ulceration, mitotic rate, and lymph node status.

Older age is an unfavorable prognostic factor for melanoma. However, this patient is still within the age range where most melanomas are usually detected. Also, because he is not older than 55 years, he does not fit the criteria to be positive for that risk factor. Therefore, it is relatively less worrisome compared to the head localisation of the lesion.

The female sex is generally more at risk for melanoma. Therefore, the male sex is not a significant factor in comparison with other factors listed above. Also, it is considered a risk factor for the development of melanoma rather than a prognostic factor in a patient who is already presenting with melanoma.

This patient's phototype and family history of melanoma are also risk factors for melanoma development, however, location remain the greatest prognostic factor.

Further reading:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5467960/

Question:

A 74-year-old woman presents to the emergency department with left wrist pain following a fall onto an outstretched hand, earlier today.

On examination, the wrist is tender to touch. There is reduced sensation over the lateral two-thirds of the palm, palmar aspect of lateral three fingers and the dorsal fingertips of lateral three fingers. Weakness in thumb abduction is also noted.

What nerve is most likely injured?

A. Axillary nerve

B. Musculocutaneous nerve

C. Median nerve

D. Radial nerve

E. Ulnar nerve

Correct Answer:Median nerve

Explanation:

This case demonstrates a distal radius fracture. It most commonly occurs from a fall onto an outstretched hand (FOOSH). These fractures are typically seen in older women with osteoporotic bones. Nerve injury can occur and so it is essential to perform a fully neurovascular exam in any patient with a limb injury. In this case, the sensory and motor deficits are indicative of injury to the median nerve.

Radial nerve injury typically presents with a sensory deficit over the posterior arm and forearm, lateral two-thirds of the dorsum of the hand and the proximal dorsal aspect of the lateral three and a half fingers, alongside weakness in finger and wrist extension.

Ulnar nerve injury typically presents with a sensory deficit over the medial third palm of the hand, the palmar aspect of the medial one and a half fingers, the medial third of the dorsum of the hand, and the dorsal aspect of medial one and a half fingers. There will be weakness in adduction of the thumb.

Axillary nerve injury typically presents with a sensory deficit over the "Sergeant's patch" of the lower deltoid and weakness in shoulder abduction, flexion, extension and external rotation.

Musculocutaneous nerve injury typically presents with a sensory deficit over the lateral forearm and weakness in elbow flexion and forearm supination.

Further reading:

https://geekymedics.com/fractures-of-the-distal-radius-wrist-fractures/

Question:

A 30-year-old female presents to the emergency department with central chest pain. She states that the pain is sharp in nature and sometimes radiates to her upper abdomen. The pain is worsened by deep breathing, coughing and lying flat, and the only thing that seems to improve the pain is leaning forward. She has taken paracetamol and 5mg of oral morphine sulphate solution, neither of which has helped to alleviate the pain. She has no other associated symptoms and otherwise feels well in herself. She has never had any issues like this previously.

She has no significant past medical history or drug allergies, and takes the combined oral contraceptive pill. Family history is unremarkable and she does not smoke. Vital signs are normal.

Clinical examination is unremarkable. Her BMI is within the normal range. Urinalysis is normal. An ECG shows concave ST-segment elevation in leads V1-V6.

Which of the following is the most serious complication associated with the most likely diagnosis?

A. Tension pneumothorax

B. Ventricular rupture

C. Cardiac tamponade

D. Mitral valve prolapse

E. Respiratory arrest

Correct Answer:Cardiac tamponade

Explanation:

The most likely diagnosis, given the patient's history and the characteristic ECG findings, is pericarditis. One of the most serious complications of pericarditis is cardiac tamponade secondary to pericardial effusion. This occurs when there is a build-up of inflammatory fluid in the pericardial sac, which compresses the great vessels and myocardium, reducing cardiac filling. Left untreated, this can lead to cardiac arrest secondary to cardiac tamponade. Typical clinical findings of cardiac tamponade include hypotension, muffled heart sounds and increased jugular venous pressure (Beck's triad).

Tension pneumothorax is a life-threatening condition that is commonly associated with penetrating chest trauma and not pericarditis.

Ventricular rupture is a life-threatening condition that can develop post-myocardial infarction. It is not a complication of pericarditis.

Mitral valve prolapse is typically associated with myocardial infarction and not pericarditis.

Respiratory arrest is not a complication associated directly with pericarditis.

Further reading:

https://patient.info/doctor/acute-pericarditis

Question:

A 69-year-old man presents to his GP with a severely painful and swollen toe. He is limping due to the pain. His past medical history includes hypertension, congestive cardiac failure, hypercholesterolemia and gout. He takes ramipril, bisoprolol, atorvastatin, bendroflumethiazide and allopurinol.

On examination, the left great toe appears swollen, erythematous and is painful to touch.

What medication is the most likely contributing factor?

A. Allopurinol

B. Ramipril

C. Bisoprolol

D. Bendroflumethiazide

E. Atorvastatin

Correct Answer:Bendroflumethiazide

Explanation:

This case demonstrates gout, characterised by acute onset severe joint pain, swelling, effusion, warmth, erythema, and tenderness. Raised uric acid levels lead to the deposition of urate crystals in joints and tissues, with the first metatarsophalangeal joints commonly affected. Diuretics (e.g. bendroflumethiazide, furosemide) are a significant risk factor for gout, as they reduce urate excretion by increasing reabsorption and decreasing secretion.

Hypercholesterolaemia is a risk factor for gout, and so atorvastatin is a protective factor.

Allopurinol is used in the prophylactic management of gout, to reduce uric acid concentration in the blood.

Whilst bisoprolol and ramipril have been shown to increase the level of uric acid in the blood mildly, their effect is minimal when compared to thiazide diuretics, such as bendroflumethiazide.

Further reading:

https://cks.nice.org.uk/topics/gout/management/acute-gout/

Question:

A 25-year-old presents with progressive lower back pain over the past month. He describes it as a dull ache that’s worse in the mornings and tends to improve throughout the day. He has no past medical history but does have a family history of ulcerative colitis (mother). He is a graduate student and spends most of his time in the library.

On examination, there is no obvious deformity, but he is tender over the sacroiliac joints bilaterally. Schober’s test reveals a spinal distance of 18cm. Femoral and sciatic stretch tests are negative.

What is the most likely diagnosis?

A. L5 lumbar disc herniation

B. Lumbar spondylolysis

C. Ankylosing spondylitis

D. Musculoskeletal lower back pain

E. Spondylolisthesis

Correct Answer:Ankylosing spondylitis

Explanation:

The most likely diagnosis is ankylosing spondylitis given the history of a young male with lower back pain and associated morning stiffness, in addition to the clinical findings of sacroiliac tenderness and reduced range of lumbar spine movement.

Ankylosing spondylitis is an inflammatory seronegative arthropathy involving the spine. The cause is unknown but it is felt to be a combination of environmental and genetic factors (with genetics playing the more significant role). It is more common in young men and has a significant familial tendency, with a strong association with HLA-B27 (inflammatory bowel disease is also associated with HLA-B27).

Typical presenting symptoms of the condition include lower back pain and stiffness that progress insidiously over months to years. Morning stiffness and pain of the lumbar spine is particularly characteristic (often waking the individual), with the stiffness improving as the day goes on. Clinical examination usually reveals sacroiliac joint tenderness and reduced range of spinal motion.

Lumbar spondylolysis is a bony defect in the vertebral arch, it is common in young women in those either in high impact sports or pre-existing spinal conditions such as hyperlordosis. The majority of people with spondylolysis are asymptomatic but it can cause pain with lumbar extension.

Spondylolisthesis is the anterior displacement of one vertebra over another. Although there are many types, the most common in young people is isthmic spondylolisthesis, occurring secondary to spondylolysis. Most cases of spondylolisthesis are asymptomatic, however, it can present with back pain that is worsened with activity.

An L5 lumbar disc herniation would typically cause back pain that may radiate depending on nerves compressed. The onset is usually sudden following strenuous activity (i.e. heavy lifting). In this scenario, you would expect the femoral or sciatic nerve stretch test to be positive if this was the diagnosis. In addition, morning stiffness is not associated with this condition.

Musculoskeletal lower back pain is stiffness, pain and soreness in the lumbosacral region where the exact cause of the pain has not been identified. As a result, this is a diagnosis of exclusion. This is unlikely in this case due to the inflammatory features of this patient’s pain (i.e. morning stiffness improved with activity).

Further reading:

https://patient.info/doctor/ankylosing-spondylitis-pro#nav-1

Question:

An 82-year-old man presents to the GP with increased urinary frequency, nocturia and poor flow when urinating. He reports struggling to start passing urine and then dribbling when he finishes. This has been present for several months but he has previously been too embarrassed to seek advice, but he has now had enough. His past medical history is unremarkable, although he has had recent falls that were attributed to postural hypotension.

The GP suspects a diagnosis of benign prostatic hyperplasia (BPH) and performs a PR exam that reveals the presence of a smooth, symmetrically enlarged prostate gland. He explains to the patient that there are several options for management, including conservative options such as fluid restriction and bladder training. The patient is desperate for acute management, however, and the GP discusses medication options with him. He explains that there are two medications that may be of benefit, but one is more appropriate for this patient, going on to tell the gentleman that he will need to give the drug time for its effects to be seen.

What is the mechanism of action of the drug most likely to be given to this patient?

A. Muscarinic antagonist

B. Beta-blocker

C. Phosphodiesterase type 5 inhibitor

D. 5-alpha-reductase inhibitor

E. Alpha-blocker

Correct Answer:5-alpha-reductase inhibitor

Explanation:

The most likely drug that this patient will be prescribed is a 5-alpha-reductase inhibitor, finasteride being a common example. This acts to actively shrink the prostate gland by blocking the conversion of testosterone to dihydrotestosterone (DHT); DHT has been shown to be associated with prostate growth. This acts to reduce the degree of bladder outlet obstruction that is present and help to ease the patient's urinary symptoms. The drug often takes up to 6 months for the full effect to be seen, and therefore patience is required; alpha-1 blockers often provide benefits more quickly. Another noteworthy point is that the shrinkage of the prostate caused by 5-alpha-reductase inhibitors can abnormally decrease any PSA readings up to around 50%, this must always be taken into account whenever interpreting values in patients on the drug.

A good rule of thumb is that if the patient has a palpable prostate = needs 5-alpha-reductase inhibitor. If the patient has no palpable prostate but has LUTS symptoms then they should be started on alpha-blockers as first-line. Regardless, both should be combined with behavioural modification.

Alpha-blockers are another option for the medical management of benign prostatic hyperplasia; tamsulosin is a commonly prescribed drug within this class. These act to reduce the activity of the sympathetic nervous system, therefore allowing relaxation of the internal urinary sphincter and helping the passage of urine. The drugs are often popular amongst patients, as they can provide benefits very rapidly, however, they are contraindicated in this gentleman, due to his history of postural hypotension. A postural BP drop is a common side-effect of alpha-1 blockers, due to their action on alpha receptors within blood vessels, causing unwanted vasodilation.

Phosphodiesterase type 5 inhibitors include drugs such as sildenafil ('Viagra'); these can be used to increase blood flow to the penis and aid the maintenance of an erection during sexual intercourse. These drugs may also be used for pulmonary hypertension due to their vasodilatory properties, but not for BPH.

Muscarinic antagonists would not be a good choice for this patient, as they inhibit the parasympathetic action on the urinary system, making it more difficult to pass urine. Drugs such as oxybutynin can be given in urinary retention but would worsen symptoms in this gentleman.

Beta-blockers are not included in the management of BPH. Like drugs such as tamsulosin (alpha-blockers), these reduce the action of the sympathetic nervous system; however, their effect is on the beta receptors present in cardiac and respiratory tissue rather than the alpha receptors present within the urinary tract, and therefore would not be beneficial in symptom reduction.

Further reading:

https://patient.info/doctor/benign-prostatic-hyperplasia

Question:

A 57-year-old male presents to the emergency department with sudden onset, generalised abdominal pain and nausea with non-bloody, non-bilious vomiting. The pain started 2 hours ago while exercising, and he described it as 10/10 on a standardised pain scale. He passed a normal stool 1 hour ago. His medical history includes atrial fibrillation, for which he takes bisoprolol 5mg once daily.

On examination, he is GCS 15, pulse 120bpm, respiratory rate 24/min, and blood pressure 107/72 mmHg. All other observations are within the normal range. His abdomen is incredibly tender on light and deep palpation with generalised guarding, but no other abnormalities are noted. Bowel sounds are normal.

Based on the likely diagnosis, what is the diagnostic investigation?

A. CT abdomen with IV contrast

B. Abdominal ultrasound

C. CT abdomen without IV contrast

D. Erect chest x-ray

E. CT abdomen with oral contrast

Correct Answer:CT abdomen with IV contrast

Explanation:

This patient is presenting with signs of acute mesenteric ischaemia (AMI). This condition occurs when a sudden drop in perfusion to the bowel leads to an area of ischaemia which, if left untreated, may lead to perforation and intraabdominal sepsis. AMI commonly presents with sudden-onset, diffuse and constant abdominal pain, which is out of proportion with the examination findings, as seen in this case. Atrial fibrillation is a risk factor for AMI due to the production of a thrombus within the atria, which may then embolise. This is particularly important in this patient, as they are not anti-coagulated due to an initial CHA₂DS₂-VASc score of 0.

The diagnostic investigation for AMI is a CT abdomen with IV contrast. Typical findings include bowel wall thickening and loss of bowel enhancement, which will eventually progress to pneumatosis intestinalis (gas in the bowel wall caused by bacterial invasion) and pneumatosis portalis (gas emboli moving into the hepatic portal vein from the mesenteric veins). Pneumoperitoneum may also be seen if the ischaemia has resulted in gastrointestinal perforation. CT abdomen allows for the whole abdomen to be assessed, while IV contrast allows for the vasculature to be evaluated for occlusion and improves the visibility of the other pathology features.

An abdominal ultrasound is useful when screening for an abdominal aortic aneurysm (AAA). It is also first-line imaging for acute appendicitis in children and pregnancy. In this case, a simple abdominal ultrasound would not allow for adequate assessment of the bowel wall and mesenteric vasculature.

CT abdomen without contrast is used where IV contrast is contraindicated or for CT kidneys, ureters, and bladder (KUB), where renal stones are suspected. IV contrast is contraindicated in pregnancy, significant renal disease and in those with a previous severe allergic reaction to contrast. CT abdomen without contrast would be unsuitable in this case, as contrast is required to visualise the occlusion in the mesenteric vascular and pathological bowel wall changes, and there are no known contraindications.

CT abdomen with oral contrast is becoming increasingly redundant as it is no longer required for most patients. However, it remains indicated in the investigation of a select number of pathologies, including anastomotic leaks following surgery and gastrointestinal fistula, and in CT colonoscopy.

An erect chest x-ray is a modality that is classically used to identify gastrointestinal (GI) perforation, as free air is commonly seen under the diaphragm. However, this is not a diagnostic investigation but only an indicator of bowel pathology.

Further reading:

https://radiopaedia.org/articles/mesenteric-ischaemia?lang=gb

Question:

A 57-year-old man with a background of chronic pancreatitis attends his follow-up clinic. He complains of recent steatorrhoea, bloating and weight loss. He suffers from persistent epigastric pain, which is well controlled with analgesia. He takes no other regular medications.

The consultant suspects he is developing exocrine pancreatic insufficiency.

Deficiency of which enzyme is responsible for his steatorrhoea?

A. Amylase

B. Lipase

C. Amylin

D. Trypsin

E. Glucagon

Correct Answer:Lipase

Explanation:

This patient has developed exocrine pancreatic insufficiency secondary to chronic pancreatitis. The exocrine pancreatic enzymes are secreted into the duodenum and play an important role in digestion in the small intestine.

The correct answer is lipase. This enzyme is responsible for the digestion of triglycerides into free fatty acids. Without this function, the fat in foods cannot be absorbed; this presents as steatorrhoea. With inadequate fat absorption, deficiency of fat-soluble vitamins (A, D, E and K) also occurs.

Amylase is responsible for the digestion of polysaccharides into maltose.

Trypsin is responsible for the digestion of proteins and polypeptides.

Amylin is an endocrine secretion of the pancreas and is responsible for slowing gastric emptying.

Glucagon is also an endocrine secretion of the pancreas and acts to increase blood glucose levels.

Exocrine pancreatic insufficiency can be managed with enzyme supplementation in the form of Creon.

Further reading:

https://cks.nice.org.uk/topics/pancreatitis-chronic/

Question:

A 65-year-old male presents to the emergency department with nausea and worsening vomiting. There has been no blood or bile in the vomit. He has had gradually increasing abdominal distension and has not moved his bowels for the last 3 days, which is unusual for him as he usually moves his bowels twice per day. His past medical history is significant for type two diabetes mellitus for which he takes metformin. His surgical history includes an appendectomy and cholecystectomy many years ago.

The patient's observations are normal. Physical examination reveals mild abdominal distention but no guarding or rigidity.

Radiological and laboratory investigations confirm the diagnosis of small bowel obstruction.

What is the most appropriate management plan for this patient?

A. NG tube & IV fluids

B. Colonoscopy

C. Metoclopramide

D. Immediate surgery

E. Intravenous antibiotics

Correct Answer:NG tube & IV fluids

Explanation:

The patient has been diagnosed with small bowel obstruction which is most likely secondary to adhesions from previous surgery. Other risk factors for small bowel obstruction include hernias, malignancy and prior radiation therapy. As the patient is clinically stable with no signs of haemodynamic compromise, peritonitis or bowel strangulation, he can be managed conservatively with nasogastric tube insertion (for gastric decompression and to minimise the risk of aspiration) and intravenous fluid therapy with electrolyte replacement. Conservative measures are typically trialled for 24 hours and then surgical exploration is considered if there is no clinical improvement.

Immediate surgery would be indicated in a patient who has signs of peritonitis (guarding, rigidity) or haemodynamic compromise (hypotension, tachycardia). This patient has stable vital signs.

Colonoscopy in the acute setting of small bowel obstruction is not indicated. A colonoscopy typically only examines the large bowel.

Intravenous antibiotics are indicated in patients with bowel perforation or as prophylaxis in those undergoing surgical exploration. The patient in the above question stem has an uncomplicated small bowel obstruction and does not require intravenous antibiotics.

Metoclopramide is a dopamine antagonist often used in the management of diabetic gastroparesis as a bowel motility agent, however, it is contraindicated in patients with small bowel obstruction due to the risk of perforation.

Further reading:

https://patient.info/doctor/intestinal-obstruction-and-ileus

Question:

A 35-year-old man presents to the fertility clinic, with a 1-year history of infertility with two different sexual partners. He does not report any trauma or procedure to his groin, loss or gain of weight, visual disturbance, headache or childhood illness. Past medical history is unremarkable.

On examination, there is a milky discharge around his nipples. His breasts appear enlarged but with normal overlying skin. On palpation, there is no tenderness or mass felt. Blood tests are requested and demonstrate the following:

Test Value Reference range

Serum follicle-stimulating hormone (FSH) 0.1 IU/L (1.42- 15.4 IU/L)

Serum luteinizing hormone (LH) 0.8 IU/L (1.3- 8 IU/L)

Serum prolactin 200 ng/mL (3 - 13 ng/mL)

What is the most likely cause of this patient's infertility?

A. Stimulation of a hypothalamic hormone

B. Pituitary gland ischaemia

C. Resistance of the testes to stimulatory hormones

D. Breast malignancy

E. Inhibition of a hypothalamic hormone

Correct Answer:Inhibition of a hypothalamic hormone

Explanation:

The most likely cause of this patient's infertility is the inhibition of a hypothalamic hormone, likely due to a prolactinoma resulting in hyperprolactinaemia. A prolactinoma is a pituitary tumour that secretes prolactin. Prolactinomas are the most common anterior pituitary adenomas. They can be classified as microprolactionmas (<10mm in diameter) or macroprolactinomas (>10mm in diameter). The latter can compress surrounding structures and cause visual disturbances (bitemporal hemianopia), persistent headaches or deficiency of one or more pituitary hormones. Prolactin has inhibitory effects on the hypothalamic hormone, gonadotropin releasing hormone (GnRH), leading to hypogonadotropic hypogonadism. Thus, high amounts can cause inhibition of spermatogenesis (decreased FSH) and testosterone production (decreased LH). It is therefore not uncommon for men to have symptoms of low testosterone such as low libido, gynecomastia (as seen in this patient) and erectile dysfunction.

Prolactin causes inhibition of GnRH, not stimulation.

Pituitary gland ischaemia can cause pituitary insufficiency. However, it is more likely to affect the production of multiple hormones (panhypopituitarism). Also, it usually requires an inciting event such as an acute hemorrhage. Neither of these is present in this patient.

Resistance of the testes to GnRH will result in hypergonadotropic hypogonadism in which FSH and LH will be increased, but testosterone levels will be decreased. In this patient, FSH and LH are markedly reduced.

A breast malignancy is rare in males but when it does occur, may present with a painless and irregular mass with overlying skin changes. It may also present with or without signs of distant metastasis. It is not likely to primarily cause infertility in a man. Also, this patient’s breast examination findings are not suggestive of a malignancy.

Further reading:

https://geekymedics.com/infertility/

Question:

You are the FY2 in paediatrics. A 12-year-old male patient is having blood taken in hospital. Afterwards, you notice that his bleeding fails to stop as quickly as expected. The patient’s vital signs are stable. The boy mentions that his grandfather was diagnosed with a bleeding disorder but he cannot remember what the condition was. On review of his electronic record, you read that he is being investigated by haematology and the following results have been reported:

Factor VIII concentration (reduced)

APTT (prolonged)

Prothrombin time, Fibrinogen levels and Von Willebrand factor (all normal)

What is the most appropriate management?

A. Recombinant factor VIII

B. Desmopressin

C. Fibrinogen concentrate

D. Tranexamic acid

E. Transfusion of platelets

Correct Answer:Recombinant factor VIII

Explanation:

The most appropriate management for haemophilia A, in this case, is recombinant factor VIII. This condition is caused by a deficiency of clotting factor VIII. There are two main forms of Haemophilia (A + B). Haemophilia A is 5 times more common than type B. It is mainly inherited, but acquired forms do exist.

Disease severity is determined by remaining levels of factor VIII. Mild disease presents as excessive bleeding after major trauma (e.g. surgery, dental procedures). Moderate disease presents as excessive bleeding following minor trauma (e.g. venepuncture). Severe disease may present with spontaneous joint bleeding resulting in arthropathy and joint deformity, intramuscular haemorrhage or haematuria.

Major risk factors for haemophilia A include male gender and genetic predisposition. Haemophilia A is predominately inherited in an X-linked-recessive fashion (i.e. affects males born to carrier mothers).

Platelet transfusion is used in the management of disseminated intravascular coagulation, not haemophilia.

Tranexamic acid may be used in the management of haemophilia but is not the gold-standard management.

Fibrinogen concentrate is used in the management of disseminated intravascular coagulation in cases of severe hypofibrinogenaemia where bleeding persists despite transfusion.

Desmopressin may be used in the management of haemophilia, as it increases factor VIII levels. However, it is mainly reserved for acute nasal or oral bleeding, in mild haemophilia A (factor levels >5%), in those with a previous positive response to the drug.

Further reading:

https://patient.info/doctor/haemophilia-a-factor-viii-deficiency

Question:

A 27-year-old woman attends her GP after her family noticed a change in her behaviour. The patient explains that she has suffered from intense anxiety, irritability, and difficulty sleeping for the past 9 months. She adds that these symptoms started following a traumatic emergency caesarean section and that she still experiences intrusive flashbacks of this event on a regular basis.

The patient denies experiencing any euphoric moods, hallucinations, or self-harm. However, she comments that she refused to attend the hospital for a follow-up appointment after her caesarean section because it triggers traumatic memories for her. The patient also says that her family complains that she appears very tense and is easily startled by ordinary events.

What is the most likely underlying diagnosis?

A. Bipolar affective disorder

B. Post-traumatic stress disorder (PTSD)

C. Depression

D. Acute stress reaction

E. Generalised anxiety disorder (GAD)

Correct Answer:Post-traumatic stress disorder (PTSD)

Explanation:

This patient is presenting with post-traumatic stress disorder (PTSD), a psychiatric illness characterised by the presence of intrusive flashbacks, hyperarousal and avoidance following a traumatic experience. These symptoms can persist for many years, but should be present for at least one month before a diagnosis of PTSD can be considered. Treatment involves therapies such as CBT as well as eye movement desensitisation and reprocessing (EMDR).

An acute stress reaction describes the presence of symptoms similar to those present in PTSD but that are only experienced temporarily and subside within one month of the stressful event. In this patient’s case, the chronic nature of her symptoms indicates that an acute stress reaction is not the correct answer.

Patients with PTSD may sometimes develop comorbid depression, a disease characterised by symptoms such as persistently low mood, fatigue, and anhedonia. However, the symptoms of flashbacks, hyperarousal and avoidance reported in this patient’s case are all features of PTSD and so depression would not be the appropriate diagnosis.

Bipolar affective disorder refers to a psychiatric condition where patients experience both episodes of depressive symptoms as well as episodes of mania. As this patient denies experiencing euphoric moods and is not presenting with episodes of depression, bipolar affective disorder would not be the correct diagnosis.

Patients who present with chronic anxiety, insomnia, and irritability may be considered to have generalised anxiety disorder (GAD). However, this patient’s symptoms are directly related to a traumatic event and a specific, related trigger can be identified. Therefore a diagnosis of PTSD is more appropriate than GAD.

Further reading:

https://geekymedics.com/anxiety-disorders/

Question:

A 19-year-old lady presents to her GP complaining that she has been unsteady on her feet for the last 6 weeks and has had multiple falls. She also has a tremor in her left hand. Her mother is present, who tells you that things have not been right for a few months, with her daughter getting in trouble at work for strange behaviour. Looking at her notes, she is also being investigated for deranged LFTs but has not attended any of her clinic appointments.

What is the most appropriate initial investigation for this patient?

A. Serum ceruloplasmin

B. Dopaminergic agent trial

C. MRI head

D. Iron studies

E. Liver biopsy

Correct Answer:Serum ceruloplasmin

Explanation:

Wilson’s disease can present with a wide range of symptoms including neurological movement disorders, psychiatric symptoms and liver disease. The symptoms are caused by copper toxicity due to a defect in the enzyme involved in excretion of copper. The best option of the above to aid diagnosis at this stage is serum ceruloplasmin. Another useful test is a 24-hour urinary copper.

An MRI head may show some changes, especially to the basal ganglia, however, these are non-specific so are not very helpful with a definitive diagnosis.

This patient’s clinical picture is not typical of haemochromatosis (a disease of iron overload), so iron studies would likely be unhelpful.

Liver biopsy is not required if the clinical signs and non-invasive tests allow the final diagnosis to be established.

A trial of dopaminergic agents might be used to aid the diagnosis of Parkinson’s disease. Although the patient has some similar neurological features, this test is not helpful in her case.

Further reading:

https://patient.info/doctor/wilsons-disease-pro

Question:

A 75-year-old man presents to his GP as he has noticed slight yellowing of his skin, dark urine and pale stools. His jaundice has also been noted by his family over the past few weeks. He has some mild discomfort in his abdomen and reduced appetite.

He has lost around 5kg in the last month. He has a past medical history of hypertension and COPD. He is an ex-smoker, with a 40 pack-year history.

On examination, he is visibly jaundiced with epigastric tenderness on palpation but no guarding or signs of peritonism.

Blood tests are conducted which reveal normal inflammatory markers, bilirubin of 30umol/L and ALP of 250IU/L.

What is the most likely diagnosis in this patient?

A. Chronic pancreatitis

B. Gastric cancer

C. Peptic ulcer disease

D. Tumour in the pancreatic head

E. Biliary colic

Correct Answer:Tumour in the pancreatic head

Explanation:

The most likely diagnosis in this patient is a tumour in the pancreatic head. He has presented with the typical sign of ‘painless jaundice’ – obstructive jaundice which occurs as a result of compression of the biliary duct by a tumour in the head of the pancreas, which impedes bile flow. This explains the elevation in ALP and bilirubin and is the reasoning for his pale stools and dark urine. He also has systemic signs suggestive of sinister pathology, including a loss of appetite and weight loss.

Chronic pancreatitis typically presents with a past medical history of recurrent episodes of acute pancreatitis and often alcohol misuse.

Biliary colic episodes tend to be transient, lasting between 30 minutes and a few hours before self-resolving.

Peptic ulcer disease is associated with episodes of epigastric gnawing pain after meals and not typically associated with obstructive jaundice.

Gastric cancer usually causes epigastric pain and could explain the weight loss and appetite changes but does not typically cause obstructive jaundice.

Further reading:

https://patient.info/doctor/pancreatic-exocrine-tumours

Question:

A 65-year-old male presents to the emergency department after several episodes of vomiting bright red blood. He has presented to the same hospital in the past for alcohol intoxication and recurrent falls.

His observations are as follows:

Temperature: 36.5 degrees Celcius

Blood pressure: 102/64 mmHg

Respiratory rate: 18 breaths/minute

Heart rate: 109 beats/minute

SpO2: 99% on room air

Physical examination is significant for dry mucous membranes, hepatomegaly, palmar erythema and several spider angiomata. There is no asterixis.

The patient is aggressively resuscitated with intravenous fluids. Bleeding oesophageal varices is thought to be the cause of the patient’s presentation.

Which medication is indicated in the above patient at this current stage?

A. Warfarin

B. Terlipressin

C. Ranitidine

D. Azithromycin

E. Propranolol

Correct Answer:Terlipressin

Explanation:

This patient should be prescribed terlipressin. Terlipressin is a synthetic analogue of vasopressin and acts as a vasoconstrictor (via V1 receptor agonism) in the context of variceal haemorrhage. It has been shown to significantly reduce the risk of death in patients with bleeding oesophageal varices. As terlipressin has been associated with hyponatraemia, it is important to monitor sodium levels in patients receiving this medication.

Propranolol is a non-specific beta-blocker used in the prophylaxis of patients with oesophageal varices. It is not indicated in the acute management of this condition.

Patients suffering from chronic liver disease are typically in a hypercoagulable state, despite their serology often revealing significant for thrombocytopenia and an elevated international normalised ratio (INR). Warfarin in the above patient, however, is likely to worsen his bleeding and lead to further deterioration in his clinical status.

Although patients with bleeding oesophageal varices should receive prophylaxis with a fluoroquinolone or a third-generation cephalosporin, macrolide antibiotics like azithromycin are not indicated in these patients.

H2 receptor antagonists such as ranitidine, cimetidine and famotidine can be used as alternatives to proton pump inhibitors in some patients with peptic ulcer disease but do not have a role in oesophageal variceal bleeding.

Further reading:

https://patient.info/doctor/upper-gastrointestinal-bleeding-includes-rockall-score#nav-5

Question:

A 16-year-old girl presents to her General Practitioner with her parents, who are concerned about their daughter's eating habits. The parents describe that she has halved her portion size over the past year, often skips meals, and runs 5 kilometres every day after school. The patient feels that she is overweight and that these measures are necessary for her to stay healthy. She is frustrated by her parents' concern about her eating. She denies any vomiting or laxative abuse. On examination, the patient's body mass index (BMI) is 20 kg/m2, and she scores 3 on the sit-up, squat, stand test.

What factor is most likely to predict a poorer prognosis in this patient?

A. Regular exercise

B. Age < 20 years old

C. Sit-up, squat, stand test score of 3

D. Disturbance to body image

E. BMI of 20 kg/m2

Correct Answer:Disturbance to body image

Explanation:

This patient is likely to have anorexia nervosa. Anorexia nervosa is characterised by a preoccupation with weight and pursuing measures to become thin. This may include restricting food intake, use of laxatives and diuretics, purging, and excessive exercise. The most likely indicator of a poorer prognosis, in this case, is the disturbance to body image. This is because the disturbance to body image suggests the patient lacks insight into her condition, which may make engaging with psychological therapy more challenging.

A BMI of 20 kg/m2 is normal for someone of this age. Patients with a low BMI have been found to have a poorer outcome.

Patients who are younger than 20 years old have been found to have a better outcome from treatment than those over 20. A later age of onset is associated with a poorer outcome.

The sit-up, squat, stand test is used to assess for physical complications of anorexia nervosa. A score of 3 is normal, while a score less than 3 suggests the patient is weaker than expected.

In some patients with anorexia nervosa, regular exercise has been found to improve their quality of life and prognosis.

Further reading:

https://www.cambridge.org/core/journals/bjpsych-advances/article/marsipan-management-of-really-sick-patients-with-anorexia-nervosa/931F219709E53FC00F7832DD9910F915

Question:

Mr Morton is a 68-year-old man who has come to the surgical day unit for an elective inguinal hernia repair. He takes amlodipine for hypertension but has no other medical history, takes no other medications and has no allergies. He reports no symptoms during systemic enquiry. On examination, he has a reducible left-sided inguinal hernia but no other abnormalities.

His routine full blood count is normal except for a white cell count of 55 × 109/ L. The laboratory has not yet released the differential count.

What is the most likely cause of this abnormality?

A. Incarceration of hernia

B. Urinary tract infection

C. Spurious lab result

D. Multiple myeloma

E. Chronic myeloid leukaemia

Correct Answer:Chronic myeloid leukaemia

Explanation:

The most likely diagnosis here is chronic myeloid leukaemia (CML). It is often found in asymptomatic patients during the chronic phase on a 'routine' full blood count taken for an unrelated reason, such as in general practice or outpatient clinics. The differential shows the composition of the white cell count. In CML this typically shows granulocytes at various ages of development with neutrophilia, basophilia and eosinophilia.

There are no signs of urinary tract infection and.a white cell count of 55 × 109/ L would be unusual for a simple infection. This story is also not in keeping with an incarcerated hernia as it is reducible on examination.

Multiple myeloma often presents with bone pain and full blood count tends to show anaemia and thrombocytopenia rather than significantly raised white cell count.

It is unlikely that a spurious lab result would lead to an isolated significantly raised white cell count and it would be inappropriate to assume that this was the case in the first instance.

Further reading:

https://patient.info/doctor/chronic-myeloid-leukaemia-pro

Question:

A 67-year-old man presents to hospital complaining of crushing central chest pain; this started around 20 minutes ago and is increasing in severity. The patient describes that it radiates up to his jaw and that he feels nauseous; he denies shortness of breath. The patient's observations are stable but an ECG demonstrates ST elevation in the anterior leads. A troponin is ordered, and the admitting doctor books the patient in for coronary angiography.

Whilst this is awaited, the patient is started on a number of medications; he was given 300mg aspirin by the paramedics as well as 5mg of oral morphine. The doctor adds 180mg ticagrelor as well as 10mg metoclopramide to treat the patient's nausea; anticipating that the prescription of morphine may worsen this.

Coronary angiography reveals significant occlusion of the left coronary artery, and percutaneous coronary intervention is deemed necessary. Due to this, the patient is started on abciximab; the doctor explains to him that this is a newer medication that has been shown to be beneficial in reducing ischaemic complications of the stenting procedure.

What is the mechanism of action of this drug?

A. Direct inhibition of thrombin

B. Phosphodiesterase-3 inhibitor

C. Inhibition of glycoprotein IIb/IIIa receptors

D. Inhibition of von Willebrand factor receptors

E. Inhibition of thromboxane A2

Correct Answer:Inhibition of glycoprotein IIb/IIIa receptors

Explanation:

Abciximab and tirofiban (both given as a one-off dose) are new medications that are licensed for use in patients awaiting percutaneous coronary intervention; their use has been shown to reduce the risk of ischaemic complications within the procedure. The drugs function by inhibiting glycoprotein IIb/IIIa receptors; these act to facilitate the binding of von Willebrand factor to its receptor and the activation of platelets. This inhibition leads to reduced thrombus formation.

Whilst von Willebrand factor receptors play an important role in primary haemostasis, there are currently no medications that directly target these; although several drugs with this mechanism are undergoing clinical trials.

Bivalirudin is a drug that functions to inhibit secondary haemostasis by blocking the effects of thrombin. This may also be given to patients awaiting percutaneous coronary intervention, but is not described to have been given in this scenario.

Dipyridamole is an antiplatelet agent that acts as a phosphodiesterase-3 inhibitor; this is less commonly used in clinical practice, but in some cases can be used as an adjunct to aspirin in those at risk of ischaemic stroke. It is not used in the setting of primary percutaneous coronary intervention.

Inhibition of thromboxane A2 is the mechanism by which aspirin exhibits its antiplatelet effect. Thromboxane A2 has a mediating effect on platelet aggregation, and thus aspirin is an inhibitor of primary haemostasis.

Further reading:

https://www.drugs.com/cons/abciximab-intravenous.html

Question:

A patient wishes to know more about the risks of conservative antibiotic therapy for appendicitis. Their doctor finds a research paper which states that conservative antibiotic therapy has a number needed to harm (NNH) of 11.

What is the most accurate interpretation of this number needed to harm?

A. For every 11 patients treated with conservative antibiotic therapy, 1 patient is protected from harm

B. 11 times as many patients are harmed from conservative antibiotic therapy compared to laparoscopic appendicectomy

C. For every 11 patients treated with conservative antibiotic therapy, 1 is harmed

D. Conservative antibiotic therapy increases the risk of harm 11-fold

E. Conservative antibiotic therapy increases the risk of harm by 11%

Correct Answer:For every 11 patients treated with conservative antibiotic therapy, 1 is harmed

Explanation:

The number needed to harm (NNH) is the number of patients that would have to be treated before one patient is harmed. For example, a NNH of 11 means that 11 patients need to be treated before 1 is harmed. Therefore, the correct answer is for every 11 patients treated with conservative antibiotic therapy, 1 is harmed.

Further reading:

https://geekymedics.com/statistics-for-medical-students/

Question:

You a junior doctor working in the gynaecology team. You are reviewing a 45-year-old woman who was admitted as an emergency with right iliac fossa discomfort. She has had an ultrasound scan showing a multilocular cyst in the right ovary with some free fluid possibly representing ascites. She is premenopausal.

Which tumour marker is used in the calculation of her risk of malignancy index (RMI)?

A. BRCA1

B. CA 15-3

C. Alpha-fetoprotein

D. CA 125

E. Beta-human chorionic gonadotropin (beta-hCG)

Correct Answer:CA 125

Explanation:

The clinical concern here is for ovarian cancer. The Risk of Malignancy Index (RMI) is a tool that is used to help determine the risk of malignancy of an ovarian mass. It is calculated as:

RMI = U x M x CA 125

'U' stands for ultrasound features, 'M' indicates pre- or post-menopausal status and CA 125 represents the serum CA 125 level in IU/ml. 'U' and 'M' are scored from 1 to 3. A score of greater than or equal to 250 needs specialist review.

Alpha-fetoprotein is associated with several cancers including hepatocellular carcinoma. Beta-human chorionic gonadotrophin is usually produced by the placenta and is abnormally raised in testicular cancer. CA 15-3 is a tumour marker associated with breast cancer. BRCA1 is a gene coding for a tumour suppressor protein; abnormalities of this can be seen in breast, ovarian and prostate cancer.

Further reading:

https://www.nice.org.uk/guidance/cg122/resources/ovarian-cancer-recognition-and-initial-management-pdf-35109446543557

Question:

A 22-year-old male patient is admitted with diabetic ketoacidosis (DKA). The nursing staff have asked you to prescribe his insulin infusion. His weight is 85 kg. The local hospital policy states 'Fixed-rate insulin infusion at 0.1 units/kg/hour'. The infusion chart asks you to state the rate in ml/hour. The nursing staff ask you to check their syringe of rapid-acting insulin which they have made to 50 units in 50 ml sodium chloride.

What rate should the infusion run at in ml/hour?

A. 85 ml/hour

B. 1 ml/hour

C. 8.5 ml/hour

D. 0.85 ml/hour

E. 10 ml/hour

Correct Answer:8.5 ml/hour

Explanation:

The local protocol can vary, but most trust guidelines advocate a fixed-rate infusion of insulin at 0.1 unit/kg/hour treatment dose. 50 units of rapid-acting insulin in 50 ml sodium chloride is a standard concentration that nurses will make up in a 50ml syringe. This equates to 1 unit of insulin per 1 ml. For safety, it is important to always work in the standardised concentrations.

An 85 kg patient, therefore, needs 8.5 units per hour and with an insulin concentration of 1 unit/ml, this equates to 8.5 ml/hour. The other answers listed are incorrect.

If in doubt it is vital to seek senior/expert help. It is important to become familiar with the local DKA protocol as these can vary.

Further reading:

https://www.diabetes.org.uk/professionals/position-statements-reports/specialist-care-for-children-and-adults-and-complications/the-management-of-diabetic-ketoacidosis-in-adults

Question:

A 74-year-old man presents to the emergency department with visual disturbances. He describes an episode of painless vision loss in his left eye earlier that morning. This lasted for only two minutes, and his vision has since returned to normal. The patient describes that this loss of vision began over a few seconds, like a 'black curtain coming downwards'. His past medical history is significant for type 2 diabetes mellitus and hypertension, for which he takes metformin, gliclazide, and lisinopril. The patient has never smoked tobacco and does not drink alcohol.

On examination, the patient's pupils are equal, round, and reactive to light. Fundoscopy is unremarkable.

What is the most likely cause of the patient's visual loss?

A. Central retinal vein occlusion

B. Amaurosis fugax

C. Retinal detachment

D. Vitreous haemorrhage

E. Optic neuritis

Correct Answer:Amaurosis fugax

Explanation:

The correct answer is amaurosis fugax. Amaurosis fugax describes painless loss of vision, usually affecting only one eye, and is considered a type of transient ischaemic attack. Patients with amaurosis fugax classically describe a 'curtain' descending vertically down their visual field in one eye. While the aetiology varies, amaurosis fugax is thought to be caused by microvascular emboli, most commonly from atherosclerotic internal carotid arteries. NICE recommends that aspirin 300 mg should be given immediately unless contraindicated, and patients should be referred for assessment within 24 hours if the TIA has occurred within the last week. Amaurosis fugax literally means 'dark fleeting'.

Central retinal vein occlusion may cause sudden painless visual disturbance in one eye, although this would be unlikely to resolve spontaneously as is seen in this case. Vision loss associated with central retinal vein occlusion typically worsens with time.

Retinal detachment typically would not cause a 'descending curtain' pattern of visual loss. Patients with retinal detachment may report a sudden increase in floaters or bright flashes of light.

Vitreous haemorrhage typically would not cause a 'descending curtain' pattern of visual loss and would not resolve spontaneously after several minutes.

Optic neuritis is typically a painful cause of vision loss. Optic neuritis may also be associated with loss of colour vision in the affected eye and is classically seen in multiple sclerosis.

Further reading:

https://geekymedics.com/neurological-causes-of-visual-loss/#:~:text=Amaurosis%20fugax%20describes%20a%20transient,artery%20disease%20(Figure%205)

Question:

Bill is a 60-year-old mechanic who has been admitted to A+E with palpitations, sweating, dizziness and shortness of breath even though he has not been unduly exerting himself. He is experiencing some chest discomfort with the palpitations. Whilst waiting to be seen in A+E, he collapses and gets rushed to the resuscitation room where his observations are recorded and show a BP of 50/30 mmHg with a heart rate of 170 bpm. He is attached to a cardiac monitor and an ECG is printed showing AF with a fast ventricular response. His only past medical history is essential hypertension for which he takes Ramipril. He normally exercises three times per week.

What is the most important initial management?

A. Emergency DC cardioversion

B. Intravenous metoprolol

C. Intravenous amiodarone

D. Fluid resuscitation

E. Digoxin

Correct Answer:Emergency DC cardioversion

Explanation:

Atrial fibrillation (AF) is the most common sustained cardiac arrhythmia, and estimates suggest its prevalence is increasing. If left untreated atrial fibrillation is a significant risk factor for stroke and other morbidities. The patient has had a syncopal event and is haemodynamically unstable with confirmed AF. In this situation, the appropriate course of action is to perform emergency DC cardioversion to restore haemodynamic stability.

The other options are not treatments for AF with haemodynamic compromise, but can be considered in clinically stable AF. The NICE guidelines recommend initial cardioversion, followed by rate or rhythm control if haemodynamic stability is achieved.

Amiodarone can be used for cardioversion or for maintaining sinus rhythm after DC cardioversion (it is also safe to use in patients with structural heart disease).

If the AF has been present for longer than 48 hours and rhythm control is desirable with cardioversion, then the patient should be anticoagulated for a minimum of 3 weeks prior to the procedure.

Rate control can be offered if it is longer than 48 hours and Digoxin should be usually avoided except in patients with non-paroxysmal AF who are sedentary and not very physically active. Metoprolol can be used to slow down the heart rate and is more rapid-acting then Bisoprolol. The patient may require intravenous fluid therapy, however, this will not restore sinus rhythm or haemodynamic stability (as the tachyarrhythmia is the underlying cause of this).

Further reading:

https://www.nice.org.uk/guidance/cg180

Question:

You are the FY2 in a community paediatric clinic. A 12-year-old boy has been referred by his GP accompanied by his mother. The mother worries that her son is more inattentive and hyperactive compared to her elder son. She has been aware of these behaviours for the past 2 years. His inattention is characterised by the following: he often seems in a daze when spoken to and has trouble finishing activities. The boy constantly taps his hands and feet and interrupts the conversation. During the consultation, the patient suddenly stands up and starts walking around the room and climbing onto chairs. On further questioning, you establish that the boy is not functioning at school, and also having difficulty maintaining friendships.

What is the FIRST-LINE pharmacological management for the condition described?

A. Citalopram

B. Fluoxetine

C. Methylphenidate

D. Dexamfetamine

E. Atomoxetine

Correct Answer:Methylphenidate

Explanation:

The condition described is most likely attention deficit hyperactivity disorder (ADHD). This condition is characterised by inattention, hyperactivity and impulsivity demonstrated by the boy's symptoms. This often disrupts children's abilities to maintain friendships and function appropriately in school. Methylphenidate (Ritalin) is the first-line pharmacological management for this condition. Specialist referral is needed to confirm the diagnosis and to start management. Pharmacological management of ADHD may be secondary to conservative management in some cases, including adopting a watch and wait approach or offering various psychosocial interventions.

Atomoxetine is used as a second-line drug therapy for ADHD.

Dexamfetamine may be used as third-line drug therapy for ADHD.

Fluoxetine is a SSRI which is not indicated for use in ADHD. SSRIs are instead indicated for conditions such as depression.

Citalopram is a SSRI which is not indicated for use in ADHD. SSRIs are instead indicated for conditions such as depression.

Further reading:

https://patient.info/doctor/attention-deficit-hyperactivity-disorder-pro

Question:

A 26-year-old woman presents to her GP with a 6-month history of headaches which are increasing in frequency. She reports experiencing debilitating headaches 2 to 3 times per week lasting 3-6 hours. The headaches are associated with photophobia, phonophobia, and nausea. When she gets a headache, she takes 1g of paracetamol and 500mg ibuprofen and lies down in a dark room until the headache goes away.

She has a past medical history of endometriosis which is managed with the IUS. She denies any further medical conditions. There is no family history of headaches.

She works as a teacher and uses a screen for 2-3 hours per day. She wears glasses and has had a recent eye test, with no change in her prescription. She has a regular sleep pattern of 7-8 hours per night. She drinks 2 cups of coffee per day and between 1.5-2L of clear fluid and eats a healthy diet with regular meals. She denies smoking and drinks 5 units of alcohol each weekend. She can find her work stressful at times. She cannot identify any particular trigger for her headaches and can experience them at any time.

Observations: HR 85, BP 142/87, Sp02 97%

Her cranial nerve and neurological examination are completely normal.

Which element of the history is most likely to be contributing to her symptoms?

A. Blood pressure of 142/87

B. Alcohol intake of 5 units per week

C. Glasses use

D. Caffeine intake

E. Analgesia overuse

Correct Answer:Analgesia overuse

Explanation:

The most likely contributing factor is analgesia overuse. While medication-overuse headache itself is a key differential diagnosis for any headache presentation, medication overuse (regular use of analgesia on 2 or more days every week) can also precipitate and increase the severity of migraines. Patients must be counselled regarding this and advised that prophylactic medication for migraine is unlikely to be effective if they are not able to reduce their analgesia use.

Alcohol intake of 5 units per week may trigger migraines in some people, due to vasodilation of cerebral vessels and diuresis resulting in dehydration. However, there would normally be a pattern associated with alcohol intake, and the type of alcohol consumed.

The use of glasses is unlikely to contribute to headache symptoms if there has been a recent eye test and the prescription is up to date.

Excessive caffeine intake can trigger headaches due to dehydration, or as a result of caffeine withdrawal. With a daily low-level intake and adequate hydration, symptoms of headaches should not occur.

Blood pressure of 142/87 will not result in symptoms of headache. While a hypertensive crisis (blood pressure of over 180/110) can result in symptoms of headaches, at lower readings, symptoms are unlikely to occur.

Further reading:

https://cks.nice.org.uk/topics/headache-medication-overuse/

Question:

A patient has just undergone a mammogram for suspected breast cancer and has received a positive result. She would like to know how likely this positive result is to be a true positive versus a false positive. The sensitivity of a mammogram for breast cancer is 85% and the specificity is 90%.

What is the likelihood ratio for a positive result on a mammogram?

A. 0.9

B. 85

C. 8.5

D. 90

E. 9

Correct Answer:8.5

Explanation:

The likelihood ratio for a positive result (LR+) is the probability that a positive result is a true positive versus a false positive. For example, a positive likelihood ratio of 8.5 means that a patient with a positive result has 8.5 times higher odds of truly having the disease than not.

The positive likelihood ratio can either be calculated directly from the raw data by dividing the proportion of patients with the disease who test positive by the proportion of patients without the disease who test positive, or it can be calculated from the sensitivity and specificity using the formula below:

Here, as the sensitivity (85%) and specificity (90%) have both been provided, the positive likelihood ratio can be found by performing the calculation 0.85/(1-0.9), which gives a positive likelihood ratio of 8.5.

Further reading:

https://geekymedics.com/statistics-for-medical-students/

Question:

A 59-year-old female is brought to the emergency department by ambulance after suffering a witnessed collapse at home. A collateral history is gained from a family member, who explains that the patient complained of a sudden-onset, severe headache along with nausea shortly before the collapse. There is no history of trauma before the headache.

She has a past medical history of hypertension and drinks approximately 35 units of alcohol a week.

An urgent CT scan is arranged, which shows a hyperdense region around the circle of Willis.

A rupture of which of the following structures is the most likely cause of this presentation?

A. Middle meningeal vein

B. Bridging cranial vein

C. Berry aneurysm

D. Middle meningeal artery

E. Arteriovenous malformation

Correct Answer:Berry aneurysm

Explanation:

The history of a sudden-onset, severe headache followed by a loss of consciousness is indicative of a subarachnoid haemorrhage (SAH). The most common cause of a spontaneous SAH is a rupture of a berry aneurysm, accounting for around 70% of spontaneous SAH cases. These intracranial aneurysms are often located around the circle of Willis, and so their rupture leads to bleeding in this region.

An arteriovenous malformation (AVM) describes an abnormally direct connection between an artery and vein that bypasses capillary vessels. As a result, there are high pressures on the local venous vasculature that make it susceptible to rupture. An AVM rupture accounts for around 10% of cases of a spontaneous SAH.

The middle meningeal artery is a terminal branch of the external carotid artery. It runs beneath a thin part of the skull called the pterion, and so is particularly vulnerable to damage during head trauma. Bleeding of this artery accounts for the majority of extradural haemorrhages.

Damage to the middle meningeal vein can also lead to an extradural haemorrhage, although venous bleeding only accounts for a small minority of extradural haemorrhages.

A bridging cranial vein takes venous blood from the neural tissue and crosses the subdural space before draining into a venous sinus. A traumatic injury to the head can rupture one of these veins and lead to a subdural haemorrhage.

Further reading:

https://geekymedics.com/subarachnoid-haemorrhage-an-overview/

Question:

A 25-year-old man is receiving a blood transfusion following a road traffic accident. 5 minutes into the transfusion, he develops shortness of breath and rigors.

His temperature is 38.3ºC, his heart rate is 105 bpm, his respiratory rate is 25/min, his blood pressure is 95/55 mmHg, and his oxygen saturations are 88%. On auscultation, air entry is equal bilaterally and there are no additional heart sounds.

What is the most likely diagnosis?

A. Anaphylaxis

B. Acute haemolytic reaction

C. Transfusion-associated lung injury

D. Transfusion-associated circulatory overload

E. Non-haemolytic febrile reaction

Correct Answer:Acute haemolytic reaction

Explanation:

Acute haemolytic reaction is correct. This is typically characterised by fever, and haemodynamic instability (tachycardia, tachypnoea, and hypotension). Abdominal pain is another feature that is characteristic. This is nearly always due to human error and transfusion of ABO-incompatible blood. This leads to macrophage activation and systemic inflammation, leading to the signs and symptoms seen.

Non-haemolytic febrile reaction is incorrect. This would present as fever and chills following a transfusion without signs of haemodynamic instability.

Although anaphylaxis can also lead to haemodynamic instability and shortness of breath, a key feature seen is wheezing on auscultation, as well as urticaria and rash. Abdominal pain is not typically seen in anaphylaxis.

Transfusion-associated circulatory overload is incorrect. This occurs in patients who are susceptible to fluid overload (e.g. pre-existing heart failure), leading to hypertension instead of hypotension, and pulmonary oedema, which would manifest as crackles on auscultation.

Transfusion-associated lung injury (TRALI) is incorrect. This is due to leukocyte antibodies in the donor blood causing activation of granulocytes in the recipient's lungs, leading to increased vascular permeability. TRALI does not typically develop as soon as an acute haemolytic transfusion reaction. This can lead to hypotension, fever, and hypoxia, however, it is not associated with abdominal pain. If a chest x-ray were to be performed, it may show pulmonary infiltrates due to fluid 'leaking' out of the pulmonary vasculature.

Further reading:

https://geekymedics.com/blood-transfusion-osce-guide/

Question:

A patient presents with acute onset weakness and sensory loss in the right leg. They are also noted to be incontinent of urine whilst in hospital and are demonstrating some behavioural disturbance. Clinical examination reveals no obvious cranial nerve defects, and weakness and sensory loss of the right lower limb. The patient also responds slowly to questions.

Infarction of which of the following arteries is most likely to have occurred?

A. Left middle cerebral artery

B. Basilar artery

C. Left posterior cerebral artery

D. Left anterior cerebral artery

E. Left middle meningeal artery

Correct Answer:Left anterior cerebral artery

Explanation:

The anterior cerebral artery supplies the medial aspect of the cerebral cortex, as well as the anterior aspect of the frontal lobe. Infarction of this artery can lead to contralateral weakness, mainly affecting the lower limb, emotional or behavioural disturbance (patients may be abulic), as well as urinary incontinence.

The middle cerebral artery supplies the majority of the lateral surface of the cerebral hemisphere. Infarction leads to contralateral hemiplegia and hemiparesis mainly of the face and upper limb, in addition to contralateral homonymous hemianopia. Global aphasia can occur if the stroke affects the dominant hemisphere.

Occlusion of the basilar artery would cause, vertigo, ataxia, bilateral motor and sensory dysfunction, lower cranial nerve deficits and impaired consciousness.

The posterior cerebral artery supplies the occipital lobe. Occlusion typically leads to homonymous hemianopia with macular sparing, and the patient may have difficulty in naming objects.

The middle meningeal artery does not supply any brain parenchyma so no clinical deficit would be expected.

Further reading:

https://patient.info/doctor/cerebrovascular-events

Question:

A 30-year-old woman presents to the emergency department after experiencing 12 hours of worsening arm weakness. This was preceded by four days of severe abdominal pain and vomiting that started after a night out drinking with her friends. She experienced a similar episode of abdominal pain and vomiting six months ago, which resolved within a week without treatment.

On examination, flexion and extension power was reduced bilaterally at both the elbow and the shoulder joints. Power in more distal arm joints was normal. Her reflexes were normal. Her abdomen was soft, and the pain did not significantly increase with palpation. There were no signs of peritonism. Bowel sounds were normal. Routine blood tests were unremarkable.

What is the most likely diagnosis?

A. Methanol poisoning

B. Seizure

C. Guillain Barre syndrome

D. Acute intermittent porphyria

E. Functional disorder

Correct Answer:Acute intermittent porphyria

Explanation:

This patient is presenting with a classical case of acute intermittent porphyria (AIP). Her episode was triggered by alcohol consumption, which causes upregulation of heme synthesis, and thus is a frequent trigger of AIP. Her abdominal pain was severe, but not in keeping with her physical exam, and had previously resolved without treatment. Very few causes of an acute abdomen can also cause neurological problems, and the proximal arms are classically the first muscles to be affected in an AIP attack. If a patient presents with an acute abdomen and neurological symptoms, think AIP.

Guillan Barre syndrome is one of the differential diagnoses for AIP; however, it tends to affect the legs first, before migrating to more proximal muscles. It can be precipitated by certain types of gastroenteritis; however, in such cases, one might also expect the patient to also have diarrhoea.

It is plausible that a patient with a functional disorder may present like the patient above, however functional disorders are diagnoses of exclusion, and AIP is a better fit.

Simple partial seizures can affect motor control, however, they would usually be unilateral if patient consciousness is unaffected.

Methanol poisoning is another cause of both abdominal pain and neurological symptoms, however, it usually causes confusion, ataxia, and visual disturbance/blindness rather than proximal weakness.

Further reading:

https://patient.info/doctor/porphyrias#nav-4

Question:

Thomas is a 4-year-old boy who has presented to the emergency department with difficulty breathing. For the past 24 hours, he has had coryza and cough. He has no significant past medical history or family history.

On examination, he has a barking cough and stridor. His work of breathing is increased, indicated by the severe intercostal recession. Chest auscultation reveals bilaterally reduced air entry. Supplemental oxygen has been commenced due to borderline SpO2 and a budesonide nebuliser has been commenced, with minimal response.

What is the most appropriate next step in management?

A. Commence 4 hourly salbutamol inhalers

B. Chest x-ray

C. Commence ipratropium bromide nebuliser

D. Examine the throat

E. Commence nebulised adrenaline

Correct Answer:Commence nebulised adrenaline

Explanation:

This child most likely has a diagnosis of croup, given the presence of a barking cough and stridor on a background of corzyal symptoms. Croup is most commonly caused by parainfluenza virus, however, it can be caused by a wide range of other viruses (i.e. respiratory syncytial virus, adenovirus, rhinovirus, etc). The condition usually starts with non-specific coryza, fever and cough. Over a couple of days, it progresses to include characteristic symptoms such as a barking cough, hoarse voice and inspiratory stridor.

The first-line management of mild croup includes:

Keeping the child calm

Paracetamol and ibuprofen

Ensuring adequate fluid intake

If a child has more severe croup, they require hospital admission and:

Dexamethasone (IV or oral) or nebulised budesonide

Nebulised adrenaline (if the child is in moderate-to-severe distress)

In this scenario, the child has moderate to severe croup based on their symptoms and clinical signs. As a result, the most appropriate next step would be the administration of nebulised adrenaline (as oxygen and budesonide have already been given).

Salbutamol inhalers and nebulised ipratropium bromide have no role in the management of this patient, given the absence of wheeze. These medications are typically used in the management of asthma.

Examining the throat would be inappropriate in the context of croup, as it will likely distress the child and worsen their breathing.

A chest x-ray may be an appropriate investigation to rule out other pathology such as consolidation, however, the child is currently unstable and therefore nebulised adrenaline is the next most appropriate management choice.

Further reading:

https://patient.info/doctor/croup-pro

Question:

A 6-year-old patient, Miss Zaynab Ali, attends the Emergency Department with fevers. Her father reports that for the past 24 hours Zaynab has been very clingy and tearful and ‘not herself’. He adds that she has been listless today and is refusing to eat or drink. Zaynab has been complaining of feeling ‘hot’ today, and her father reports that her temperature was 39.4 oC prior to administration of paracetamol this afternoon.

Zaynab is up to date with immunisations and she takes salbutamol regularly for asthma.

On examination, Zaynab looks alert and well perfused. She seems very coryzal with a snotty nose and ‘snuffly’ breathing sounds, although cardiovascular and respiratory examinations are unremarkable. Examination of the throat reveals inflamed tonsils, but an absence of exudate or enlargement. Zaynab's vital signs and findings on otoscopy are shown below.

Vital signs:

O2 98% on air

HR 112 bpm

RR 24

Temp 37.6 oC

What is the most likely diagnosis?

Source: Michael Hawke MD [CC BY 4.0]

A. Acute otitis media

B. Otitis media with effusion

C. Cholesteatoma

D. Acute otitis externa

E. Chronic suppurative otitis media

Correct Answer:Acute otitis media

Explanation:

The most likely diagnosis is acute otitis media (AOM).

Otitis media is a term used to describe a number of middle ear pathologies including AOM, otitis media with effusion (OME), chronic suppurative otitis media (CSOM) and cholesteatoma.

AOM is an acute inflammation of the middle ear. Zaynab has presented with acute symptoms, an inflamed tympanic membrane, and evidence of suppuration (pus in the middle ear), all of which make AOM the most likely diagnosis for her. The otoscopy image reveals the middle ear is filled with a creamy white mucopurulent exudate which is causing the tympanic membrane to bulge laterally. Note the dilatation of the radial blood vessels of the tympanic membrane which appear like the spokes of a wheel.

OME is a chronic condition whereby a glue-like effusion collects in the middle ear space in the absence of acute signs and symptoms. Zaynab's symptoms have manifested in a short time period, therefore making OME less likely.

Acute otitis externa (AOE) is an inflammation of the outer ear, auricle or external auditory canal. A patient with AOE would not present with a middle ear fluid collection medial to the tympanic membrane. This distinction makes AOE an unlikely cause of Zaynab’s presentation.

A cholesteatoma refers to a collection of keratinising squamous epithelium (skin) within the middle ear. A cholesteatoma is a potential complication of recurrent AOM. Cholesteatomas can grow invasively and destroy the ossicles if not identified early. Patients with a cholesteatoma usually present with a longstanding history of progressive hearing loss, headache and vertigo. Zaynab presents with acute symptoms and a suppurative middle ear collection, both of which make cholesteatoma unlikely.

CSOM refers to an inflamed tympanic membrane that has perforated and is discharging. Zaynab’s tympanic membrane is intact however CSOM can develop following AOM.

Further reading:

https://patient.info/doctor/acute-otitis-media-in-children

Question:

A 30-year-old woman is admitted post-laparoscopic investigation for endometriosis. She is complaining of severe central chest pain that started gradually 2 hours after her laparoscopy. The pain is sharp in nature and sometimes radiates to her upper abdomen, and is worsened by deep breathing, coughing and lying flat. The only thing that seems to improve the pain is leaning forward.

She takes the combined oral contraceptive pill but no other regular medications. She has no significant family history and does not smoke. Vital signs are unremarkable.

Clinical examination reveals a mildly distended abdomen in keeping with her recent procedure, but no other abnormal findings in any major body system. Urinalysis is unremarkable. An ECG shows concave ST-segment elevation in leads V1-V6.

What is the most likely cause of her condition?

A. Rheumatoid arthritis

B. Aspergillosis

C. Myocardial infarction

D. HIV

E. Coxsackie virus

Correct Answer:Coxsackie virus

Explanation:

All of the above can cause pericarditis, however, the most common cause is coxsackievirus. Viruses tend to cause about 85% of cases of pericarditis.

HIV is a potential cause of pericarditis that should be ruled out if there are risk factors in the patient's history.

Pericarditis can also occur in the context of rheumatoid arthritis, however, there is no history of clinical features suggestive of the condition in this scenario.

Late-onset post-myocardial infarction pericarditis (Dressler's syndrome) typically occurs one to six weeks after the initial event, although it can be delayed for as long as three months. There is no history of myocardial infarction in this scenario.

Aspergillosis is a fungal cause of pericarditis. It is more likely in immunocompromised patients or those with underlying respiratory diseases such as cystic fibrosis or asthma. The patient, in this case, suffers from neither of these, making the diagnosis unlikely.

Further reading:

https://patient.info/doctor/acute-pericarditis

Question:

A 61-year-old patient presents to the emergency department with sudden onset chest pain. She reports that she was sitting at her office desk when she suddenly felt a sharp stabbing pain in the right side of her chest. The pain has eased slightly now but is worse every time she breathes in. Her past medical history includes previous breast cancer, hypertension and varicose veins.

Vitals signs are HR 110bpm, RR 28/min, BP 115/70mmHg, SpO2 95% on air and temp 36.5 oC. Chest examination is unremarkable, and lung fields are clear on auscultation. An ECG reveals sinus tachycardia, but no other acute changes. A chest X-ray is performed and is shown below.

Source: Ptrump16 [CC BY-SA 4.0]

What is the most likely diagnosis?

A. Musculoskeletal chest pain

B. Pneumonia

C. Pulmonary embolism

D. Pneumothorax

E. Myocardial infarction

Correct Answer:Pulmonary embolism

Explanation:

The most likely diagnosis is a pulmonary embolism (PE). PE is a difficult diagnosis to make because of its non-specific presenting symptoms and the inability to exclude or confirm its presence on clinical grounds alone.

This patient has presented with four of the most commonly documented signs of PE; dyspnoea, pleuritic chest pain, tachycardia, and tachypnoea. She also has several risk factors for developing a PE, including being older than 60 and having varicose veins. Her previous breast cancer is inactive and is therefore not considered a risk factor.

The investigations requested for this patient help to exclude the common differentials, for instance, the ECG shows a sinus tachycardia (a common finding for patients with PE) and, importantly, does not show any ischaemic changes making a myocardial infarction less likely. The normal CXR (a common finding for patients with PE) excludes other causes of chest pain, such as pneumonia or pneumothorax. The diagnosis of musculoskeletal chest pain should be made cautiously in all patients with chest pain and should be considered a diagnosis of exclusion.

This patient's Wells score would be 4.5 (moderate risk), and so the most likely diagnosis is PE in this scenario.

Further reading:

https://www.rcemlearning.co.uk/references/pulmonary-embolism/

Question:

A 52-year-old gentleman is admitted to the acute medical ward feeling generally unwell. He has a background of liver cirrhosis secondary to alcohol and continues to drink 4-5 pints of lager per day. For the last 2 days, he has noticed that his abdomen has swelled up significantly and become diffusely painful. He has felt nauseous and has vomited several times, has had diarrhoea and is passing considerably less urine than normal. On examination, he has scleral icterus and a large swollen abdomen with shifting dullness, which is generally tender to palpate. His temperature is 38.4 degrees and he is tachycardic at 110 beats per minute but normotensive.

What is the most appropriate investigation to perform to establish the underlying diagnosis?

A. Paracentesis

B. Liver biopsy

C. Urine culture and sensitivities

D. CT abdomen/pelvis

E. Stool culture and sensitivities

Correct Answer:Paracentesis

Explanation:

Spontaneous bacterial peritonitis (SBP) is a common complication of liver cirrhosis and often presents with abdominal pain, vomiting, ascites and high fevers in a patient with underlying risk factors. Patients with spontaneous bacterial peritonitis can quickly become septic and decompensate so rapid identification of the diagnosis is vital. Paracentesis should be performed and the ascitic fluid should be sent for microscopy, culture/sensitivities, biochemistry and cell counts. An ascitic absolute neutrophil count of 250/mm3 or greater is diagnostic of SBP.

Urine and stool cultures may be helpful if an alternative source of infection is suspected.

A CT abdomen would not be diagnostic but may indicate other pathology such as possible hepatocellular carcinoma (HCC).

A liver biopsy would not be useful at this point as we know the patient has liver cirrhosis although it may be helpful if HCC is suspected from imaging.

Further reading:

https://patient.info/doctor/intra-abdominal-sepsis-and-abscesses

Question:

Betty, an 84-year-old female, is brought into A&E by her neighbour after collapsing outside in the street. She is not responding to questions but conscious. On examination, there is weakness down the left side of her arm and leg and there is increased tone on that side. Her vital signs are within normal limits, except for her blood pressure which is 190/110 mmHg. Her routine blood tests are unremarkable. You feel it is likely that she has suffered a stroke.

What is the next most appropriate step in management?

A. Lower the blood pressure

B. Thrombolysis with alteplase

C. Aspirin 300mg

D. Brain imaging

E. Assessment of swallowing function

Correct Answer:Brain imaging

Explanation:

It is important before administering drug treatment to exclude a primary intracerebral hemorrhage, especially if the patient has bleeding tendencies or has been taking oral anticoagulants. Urgent brain imaging is, therefore, the right answer.

Determining the time of symptom onset is an important aspect of history taking, in order to determine if the patient would qualify for thrombolysis. This would be a difficult decision to make in this case as the patient had an unwitnessed collapse. Currently NICE guidance recommends treatment with alteplase to be administered as early as possible and within 4.5 hours of the onset of symptoms. It also has to be administered within a well-organised stroke service with staff trained in delivering this treatment.

Aspirin would be the right initial treatment to give this patient after having brain imaging (if a haemorrhagic stroke is ruled out).

Assessment of swallowing function is important as there is a high risk of aspiration, especially if a person’s speech is also affected. The patient should be nil-by-mouth until an assessment is undertaken by the speech and language therapy team. Rectal aspirin can be administered as an alternative route.

It is not recommended to lower the blood pressure in acute stroke initially, as a reduction in arterial pressure may cause a detrimental reduction in cerebral perfusion, potentially giving rise to ‘watershed infarcts’. However, NICE recommends lowering the blood pressure to about 185/110 if the patient is a candidate for thrombolysis.

Further reading:

https://www.nice.org.uk/guidance/cg68/chapter/1-Guidance

Question:

A 60-year-old farmer presents to his GP with numerous lesions on his scalp and the back of his hands. He complains that the lesions are sometimes itchy, but he feels well otherwise. He has no significant past medical history. Some examples of the patient's skin lesions are shown below.

Which of the following is the most likely diagnosis?

James Heilman, MD / CC BY-SA

A. Actinic keratoses

B. Pyoderma gangrenosum

C. Basal cell carcinoma

D. Bowen's disease

E. Melanoma

Correct Answer:Actinic keratoses

Explanation:

The patient is presenting with actinic keratoses (also known as solar keratoses). Actinic keratoses are scaly lesions typically found on areas of sun-damaged skin such as the scalp, face and dorsum of the hands. The patient's occupation as a farmer suggests he may have a history of significant sun exposure. Actinic keratoses are often asymptomatic, but patient's may complain of intermittent itching or discomfort. The appearance of actinic keratoses can vary from barely visible to pink or reddish-brown 1-2 centimetre patches. The surrounding skin may have evidence of sun damage. Palpation reveals a rough scaly texture, similar to that of sandpaper. Actinic keratoses are a pre-cancerous lesion which can in some cases transform into squamous cell carcinoma. Elevation, tenderness and bleeding of actinic keratoses are suggestive of malignant transformation.

Bowen's disease is a form of intraepidermal (in situ) squamous cell carcinoma (SCC) of the skin (the risk of progressing to invasive SCC is approximately 3%). Bowen's disease also typically develops in areas which have received excessive sun exposure. Typical presenting features include a single slowly growing erythematous, hyperkeratotic patch with an irregular border. There may be an associated small erosion or crusting and the lesions are typically asymptomatic. The presence of multiple similar lesions in this scenario makes this diagnosis highly unlikely.

Basal cell carcinomas (BCCs) are slow-growing, locally invasive malignant epidermal skin tumours. BCCs typically develop on sun-exposed sites (usually the head and neck) and appear as pearly lesions with rolled edges and telangiectasia.

Melanomas represent cancerous growths of melanocytes. Typical presenting features include a progressively enlarging pigmented lesion with an asymmetrical irregular border, non-uniform pigmentation and a diameter of greater than 7mm.

Pyoderma gangrenosum is a rare skin disease involving the development of painful nodules or pustules which subsequently break down to form a progressively enlarging painful ulcer. Pyoderma gangrenosum is associated with several diseases including inflammatory bowel disease and rheumatoid arthritis.

Further reading:

https://patient.info/doctor/actinic-keratosis-pro

Question:

A 72-year-old woman is brought into the emergency department by ambulance following a fall at home 2 hours ago. She tells you she tripped at the bottom of the stairs and fell onto her side.

On examination, her right leg is noted to be shortened, externally rotated and abducted. Palpation of the hip increases the pain.

Which of the following imaging investigations would be most appropriate to perform first?

A. CT

B. AP pelvis and lateral hip X-ray

C. AP pelvis X-ray

D. Ultrasound

E. MRI

Correct Answer:AP pelvis and lateral hip X-ray

Explanation:

This patient most likely has a fractured neck of femur. The history of a fall and age ≥65 years (female) are both risk factors for a fracture. The most appropriate investigation to confirm a fractured neck of femur is via X-ray imaging. Two views, using an AP pelvis and lateral hip X-ray, are indicated as first-line investigations.

Opting to perform a pelvic X-ray with only an AP view is not appropriate. It is good practice to have a minimum of 2 projections of a pelvic X-ray. This is because a fracture may not be visible on a single view ('a single view is no view').

MRI is the gold standard investigation to exclude a hip fracture; however, it is only indicated if a fracture is suspected despite negative X‑rays of the hip of an adequate standard.

If MRI is not available within 24 hours or MRI is contraindicated, a CT is recommended as an alternative for further investigation. Like MRI, it is not the first-line investigation and should only be used if a fracture is suspected despite negative X‑rays of the hip of an adequate standard.

Whilst ultrasonography may be used as part of the bedside FAST scan in trauma situations, it is not used to confirm the diagnosis of a femoral fracture.

Further reading:

https://www.nice.org.uk/guidance/CG124

Question:

A 31-year-old male attends his GP with a 7-month history of generalised abdominal pain and discomfort. He explains that he often feels bloated, and commonly experiences constipation that does not improve with over the counter laxatives. He adds that on some days he also gets diarrhoea, but denies any rectal bleeding, fatigue or weight loss.

His past medical history is significant for anxiety and depression.

A gastrointestinal exam is normal. Further investigations including a full blood count and serology testing for immunoglobulin A-tissue transglutaminase (IgA-tTG) are arranged, both of which are unremarkable. A colonoscopy shows no signs of pathology.

Given the likely diagnosis, which diet is it most appropriate for the GP to recommend?

A. Gluten-free

B. Ketogenic

C. Low FODMAP (fermentable oligosaccharides, disaccharides, monosaccharides, and polyols)

D. Low-sodium

E. High FODMAP (fermentable oligosaccharides, disaccharides, monosaccharides, and polyols)

Correct Answer:Low FODMAP (fermentable oligosaccharides, disaccharides, monosaccharides, and polyols)

Explanation:

This patient is presenting with irritable bowel syndrome (IBS), which describes the presence of abdominal pain and bowel dysfunction in the absence of any other diagnosis. A low FODMAP (fermentable oligosaccharides, disaccharides, monosaccharides, and polyols) diet is recommended for improving symptoms in patients with IBS.

A high FODMAP (fermentable oligosaccharides, disaccharides, monosaccharides, and polyols) diet would not be recommended for this patient, and would most likely worsen his symptoms. Patients with IBS should be advised to avoid food in the high FODMAP category.

Patients with hypertension may be advised to eat a low-sodium diet, as this diet can help lower blood pressure and reduce the patient’s risk of cardiovascular disease. However, a low-sodium diet is unlikely to offer any benefit to a patient with IBS.

If a diagnosis of coeliac disease is made, patients should begin a gluten-free diet. Patients with coeliac disease are typically anaemic, and an elevated value would be expected on IgA-tTG serology.

A ketogenic diet refers to a diet that is very low in carbohydrates. This forces the body to use ketones in the absence of glucose as an energy source. These raised levels of ketones have been found to be helpful in controlling epilepsy, but are unlikely to help this patient.

Further reading:

https://patient.info/doctor/irritable-bowel-syndrome-pro#nav-6

Question:

Sally Mann, 52, presents to her GP with shortness of breath and palpitations. On examination, the GP hears a mid-diastolic murmur which is loudest on expiration. Her apex beat is undisplaced and her pulse is irregularly irregular.

Which of the following is the most likely cause of her presentation?

A. Functional

B. Congenital

C. Degenerative calcification

D. Infective endocarditis

E. Previous rheumatic fever

Correct Answer:Previous rheumatic fever

Explanation:

This is a description of mitral stenosis. The biggest clues to this are the mid-diastolic murmur, undisplaced apex (which is sometimes described as ‘tapping’), and the fact that she is in atrial fibrillation. Patients with mitral stenosis have an undisplaced apex beat as the ventricles have not become volume overloaded. Enlargement and stretching of the left atrium leads to myocardial remodelling and predisposes these patients to atrial fibrillation. Left-sided murmurs are heard loudest in expiration (lEft= heard loudest on Expiration, rIght= heard loudest on Inspiration).

Almost all cases of mitral stenosis are due to rheumatic fever. For this reason, it is increasingly rare in developed countries but is still prevalent in developing countries.

Infective endocarditis would be more likely to lead to a regurgitant murmur due to destruction of the valves or chordae tendinae.

Congenital mitral stenosis would usually present within the first two years of life with feeding difficulties, poor weight gain, breathlessness and sometimes cyanosis.

Functional mitral stenosis is when there is diastolic mitral obstruction, for example, due to annular calcification, without stenosis of the actual leaflets. With advancing age, the valves are more prone to degenerative calcification, which can reduce valve mobility and result in mitral stenosis.

Further reading:

https://patient.info/doctor/mitral-stenosis-pro

Question:

A 30-year-old man presents with fever and fatigue over the past week. He also complains of dysuria, right knee pain and bilateral eye discomfort over a similar time period. He denies any changes in the appearance of his urine. He is currently single and has had recent unprotected sex with several individuals in the last 2 months. He denies any recent trauma.

On examination, he has bilateral uveitis, fever and right knee swelling. The knee joint is tender on palpation. Examination of his genitals is unremarkable.

What is the most likely diagnosis?

A. Gout

B. Osteoarthritis

C. Pseudogout

D. Septic arthritis

E. Reactive arthritis

Correct Answer:Reactive arthritis

Explanation:

The most likely diagnosis is reactive arthritis, given this is a young patient presenting with fever, conjunctivitis, dysuria and oligoarthritis on a background of unprotected sexual intercourse with several individuals.

Reactive arthritis is a form of seronegative spondyloarthritis that often follows 1-6 weeks after a gastrointestinal or urogenital infection (i.e. chlamydia). In this scenario, the patient most likely has Reiter's syndrome, a subtype of reactive arthritis that specifically presents with large joint oligoarthritis, urogenital tract infection and uveitis.

Septic arthritis is an important differential diagnosis and it would be reasonable to aspirate and culture the joint fluid to exclude this. However, the history and presence of extra-articular features (dysuria and uveitis) make a diagnosis of reactive arthritis much more likely.

Gout and pseudogout can both present with large joint oligoarthritis and fever, however, again, the patient's age and presence of uveitis and dysuria make reactive arthritis much more likely.

Osteoarthritis is a form of non-inflammatory arthritis that is more common in older individuals. It is a highly unlikely diagnosis in this scenario, as it does not account for the fever, dysuria, uveitis, or tender single joint swelling.

Further reading:

https://patient.info/doctor/reactive-arthritis-pro

Question:

A 22-day old baby girl is brought to the GP by her father due to concerns about dark urine, pale stools and persistent jaundice.

The child was born at 39 weeks gestation via spontaneous vaginal delivery. There were no issues following her birth and she has been exclusively breastfed. There is no significant family history. Her father reports noticing jaundice a few days after birth and speaking with the midwife who reassured him that this was due to breastfeeding and nothing to worry about.

On examination, the child appears alert but jaundiced with yellowing of the sclera. Abdominal examination is unremarkable and the nappy does contain what looks like clay coloured stool. Vital signs are normal.

What is the most likely diagnosis?

A. Breast milk jaundice

B. Neonatal hepatitis

C. Hypothyroidism

D. Urinary tract infection

E. Biliary atresia

Correct Answer:Biliary atresia

Explanation:

The most likely diagnosis is biliary atresia.

Biliary atresia is a condition in which the extrahepatic bile ducts are obliterated by inflammation and subsequent fibrosis, leading to biliary obstruction and jaundice.

The condition typically presents soon after birth, with persistent jaundice, steatorrhoea and dark urine. LFTs will reveal conjugated hyperbilirubinaemia. Abdominal ultrasound can help confirm the diagnosis. Surgical intervention is required to treat the condition, as left untreated it can be fatal.

Breast milk jaundice typically occurs later in the newborn period, reaching a peak between the 6th and 14th days of life. It is caused by an absence of gut flora that would normally breakdown conjugated bilirubin to allow excretion. As a result, the conjugated bilirubin is reabsorbed in the enterohepatic circulation leading to jaundice. This is unlikely in this scenario given the earlier presentation of jaundice in addition to the presence of both steatorrhoea and dark urine which aren't typical of breast milk jaundice.

Neonatal hepatitis could cause a very similar presentation, however, the absence of any risk factors for hepatitis (i.e. maternal infection) make this diagnosis less likely than biliary atresia.

A urinary tract infection may cause darker, more offensive urine, but it would not cause jaundice or steatorrhoea and you would expect the child to have a fever.

Hypothyroidism is a cause of prolonged neonatal jaundice, however, it would not cause steatorrhoea.

Further reading:

https://patient.info/doctor/biliary-atresia

Question:

A 13-year old boy is brought to the GP by his parents with a 4-week history of pain and swelling affecting his mid-thigh, particularly at night. The swelling is tender and causes mild but constant pain. He denies any other symptoms, but his parents report he has been sleeping a lot during the day.

His vital signs and blood tests are unremarkable. An X-ray of the lesion shows a region of bone destruction surrounded by laminated (‘onion-like’) layers of periosteal bone formation.

What is the most likely diagnosis?

A. Osteomyelitis

B. Non-accidental injury

C. Osteosarcoma

D. Ewing’s sarcoma

E. Benign bone cyst

Correct Answer:Ewing’s sarcoma

Explanation:

This boy has developed Ewing’s sarcoma; the slow presentation and X-ray findings are typical. His sleepiness is likely the result of this malignancy. Ewing’s sarcoma makes up 14% of all bone sarcoma diagnoses. It most commonly affects teenagers and young adults with the pelvis, thigh bone and shin bone being the most commonly affected areas. It can present at any location in the long-bones.

Typical symptoms of Ewing's sarcoma include:

Bone pain, particularly occuring at night

A mass or swelling

Restricted movement in a joint

Osteosarcoma is the most common type of bone malignancy in children greater than 10 years old. It tends to occur at the metaphyses of long-bones (whereas this malignancy was located in the mid-femoral shaft).

Osteomyelitis could present with similar symptoms; however the absence of fever, normal vitals and unremarkable blood tests make this diagnosis less likely.

Non-accidental injury is always an important differential to consider; however, these X-ray findings do not correspond to any type of abuse.

Bone cysts (e.g. osteoid osteomas) usually present with pain that is worse at night and relieved by NSAIDs, but redness and tenderness are not typical. On X-ray, they appear as lytic zones demarcated by areas of sclerosis and do not have the ‘onion-like’ appearance of Ewing’s.

Further reading:

https://patient.info/doctor/bone-tumours

Question:

A 16-year-old female attends Accident and Emergency with abdominal pain. The patient describes that her abdominal pain is centred in her right lower quadrant and has been present with consistent intensity for the past week. She has also experienced a small amount of vaginal bleeding. She denies any nausea, vomiting or change to her bowel habit. On examination, the patient appears uncomfortable at rest with normal vital signs. Abdominal palpation reveals tenderness and guarding in the right iliac fossa. Urinalysis and urine pregnancy test are both negative. A routine panel of blood tests (FBC, U&E, CRP, LFT) are unremarkable.

What is the MOST LIKELY diagnosis?

A. Appendicitis

B. Nephrolithiasis

C. Biliary colic

D. Crohn’s disease complicated by ileitis

E. Ruptured ovarian cyst

Correct Answer:Ruptured ovarian cyst

Explanation:

The most likely diagnosis, in this case, is a ruptured ovarian cyst. The presentation of this condition may vary from asymptomatic to features mirroring an acute abdomen. Clinical symptoms of a ruptured ovarian cyst include nausea, vomiting, lower abdominal pain, vaginal bleeding, syncope and circulatory collapse. Signs may include lower abdominal tenderness (+/- guarding), rebound tenderness and an adnexal mass. A urine HCG should be performed for all women of childbearing age who present with abdominal pain, to rule out an ectopic pregnancy. Other investigations for this condition include urinalysis (to rule out urinary tract infection), pelvic ultrasound scan, and diagnostic laparoscopy. Blood, urine and cervical cultures should also be performed, to rule out pelvic inflammatory disease. Patients diagnosed with ovarian cyst rupture usually require conservative management only (e.g. analgesia, anti-emetics).

Appendicitis is less likely in this case, given the normal vital signs, absence of changes to her bowel habit and normal blood tests. In addition, vaginal bleeding does not fit with a diagnosis of appendicitis.

Nephrolithiasis would more likely present with ‘loin to groin’ pain and urinalysis typically show the presence of blood.

Biliary colic would more likely present with right upper quadrant pain in an older individual.

Crohn’s disease complicated by ileitis is less likely in this case. This condition would more likely present with crampy, right iliac fossa pain associated with a mass, as well as typical features of inflammatory bowel disease (e.g. diarrhoea, weight loss).

Further reading:

https://patient.info/doctor/benign-ovarian-tumours

Question:

A 27-year-old 39/40 primigravida woman is going into labour. She expresses concern that she didn't have any vaccinations as a child and thinks she might have been exposed to a certain illness early on in the pregnancy. She is originally from Bolivia and travelled to the UK when she was 13 weeks pregnant.

After an uncomplicated delivery, her baby is noted to have bilateral milky opacities of the eyes. The neonate does not respond to the newborn hearing screen.

Based on the probable diagnosis, is the most likely causative organism?

A. Zika virus

B. Treponema pallidum

C. Rubella virus

D. Varicella zoster virus

E. Toxoplasma gondii

Correct Answer:Rubella virus

Explanation:

Rubella virus is correct, as congenital rubella syndrome can cause congenital cataracts and sensorineural deafness (indicated by the milky opacities and lack of response to the hearing screen respectively). The risk of damage to the foetus increases the earlier in the pregnancy infection occurs, with 90% being affected if infected in the first 8-10 weeks. Miscarriage can occur as a result of the infection, otherwise, neonates can also be born with congenital heart defects (usually a patent ductus arteriosus), purpuric 'blueberry muffin' skin lesions, intellectual disability, hepatosplenomegaly, and more.

Toxoplasma gondii is incorrect and is the protozoan that causes toxoplasmosis. Congenital toxoplasmosis tends to be asymptomatic, and pregnant women are classically exposed to the parasite through cat litter rather than person-to-person transmission. When signs and symptoms are present, they typically include cerebral calcification, chorioretinitis and hydrocephalus, among others.

Treponema pallidum is the bacterium that causes syphilis. Congenital syphilis tends to present 2-6 weeks after birth. It can present with blunted upper incisor teeth (Hutchinson's teeth), rhagades, saber shins, saddle nose, keratitis, and deafness. It does not tend to cause cataracts in neonates.

Varicella zoster virus is incorrect; foetal varicella syndrome causes skin scarring, microphthalmia, limb hypoplasia, and intellectual disability.

Zika virus is a flavivirus, which is the same family as dengue fever. It causes congenital zika syndrome. This is characterised by microcephaly and central nervous system abnormalities. It is spread by the Aedes aegypti mosquito, which is endemic to South America, India, south-east Asia, and certain parts of Africa. While she is from Bolivia, the clinical picture doesn't fit congenital zika syndrome and is better explained by rubella.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK507879/

Question:

A 27-year-old female presents to her general practitioner with a 5-day history of green, frothy vaginal discharge and vulvar itchiness. The patient has been in a monogamous relationship with her husband for two years. She has no significant past medical history and takes no medications on a regular basis.

A speculum examination shows small punctate areas of haemorrhage on the cervix. Vulvar erythema is also present. No lesions are present on the vulva.

What is the most likely diagnosis based on the clinical findings?

A. Primary syphilis

B. Genital herpes

C. Neisseria gonorrhoeae infection

D. Trichomoniasis

E. Vulvovaginal candidiasis

Correct Answer:Trichomoniasis

Explanation:

This patient’s presentation is consistent with Trichomoniasis - a sexually transmitted infection caused by Trichomonas vaginalis. This infection leads to a frothy, green vaginal discharge often accompanied by pruritus, vaginitis and post-coital bleeding. Small punctate haemorrhages are also commonly seen on speculum examination (often referred to as a ‘strawberry cervix’). First-line treatment is usually metronidazole. Treatment of the patient and their sexual partners is essential to prevent reinfection.

Vulvovaginal candidiasis (‘yeast’ infection) classically presents in women with a ‘cottage cheese’ like discharge and pruritus. The patient in the above scenario has complaints of green, frothy discharge.

Primary syphilis most commonly presents with a painless chancre on the genital region and regional painless lymphadenopathy 3-4 weeks after exposure to this pathogen.

Genital herpes presents with genital lesions that are shallow and painful to touch on physical examination.

N. gonorrhoeae is more likely to present with a mucopurulent discharge from the cervix upon speculum examination. This is more likely to be seen in a patient with high-risk sexual behaviours.

Further reading:

https://patient.info/doctor/trichomonas-vaginalis

Question:

A 69-year-old male presents to his general practitioner. He is complaining of symptoms of nocturia, hesitancy and urinary frequency. A digital rectal exam reveals a moderately enlarged prostate. A prostate-specific antigen (PSA) test reveals normal PSA 48 hours post-last ejaculation. He has no further past medical history and denies any weight loss, lethargy or back pain.

What region of the prostate would the likely pathology most likely be found?

A. Peripheral zone

B. Transition zone

C. Prostatic urethra

D. Anterior fibromuscular stroma

E. Central zone

Correct Answer:Transition zone

Explanation:

The prostate consists of four zones:

Peripheral zone

Central zone

Transition zone

Anterior fibromuscular stroma

The most likely diagnosis, in this case, is benign prostatic hypertrophy. The transition zone is the exclusive site of benign prostatic hyperplasia (BPH), and is a balloon-shaped component of the prostate that is located in the periurethral region. Most prostatic adenocarcinomas develop in the peripheral zone, although some arise in the transition zone. Both adenocarcinomas and BPH affecting the transition zone may cause urinary obstruction. Carcinomas that develop in the transition zone are generally of the well to moderately differentiated type (Gleason grades 1, 2, 3). Additionally, tumour cells characteristically have pale to clear cytoplasm.

Image from Teach me anatomy

Further reading:

https://patient.info/doctor/benign-prostatic-hyperplasia

Question:

A 62-year-old woman is an inpatient on the surgical ward 3 days post-operative from a bowel resection for carcinoma. You are asked to review her as she has become tachycardic at 112 beats per minute. She has mild chest pain which is worse on coughing and is complaining of a sore right leg. Blood tests performed yesterday show normal renal function and mild microcytic anaemia.

Clinical assessment reveals the following:

Blood pressure: 124/74 mmHg

SpO2: 93% on room air

Respiratory rate: 19

Temperature: 37.7 degrees

Auscultation: Chest clear and heart sounds normal

Swollen, erythematous right calf with tenderness on palpation

Which first-line investigation is most appropriate to confirm the underlying diagnosis?

A. Chest x-ray

B. Arterial blood gas

C. Computed tomography pulmonary angiogram (CTPA)

D. D-dimer

E. ECG

Correct Answer:Computed tomography pulmonary angiogram (CTPA)

Explanation:

This lady has several clinical factors supportive of pulmonary embolism (PE) including tachycardia, a history of cancer, recent surgery and clinical evidence of deep vein thrombosis. These combined would give her a two-level PE Wells score of 7, indicating a likely PE. NICE recommendations for a likely PE are performing a CTPA to confirm the diagnosis. A D-dimer would not be diagnostic and would be raised regardless, given her recent surgery. Likewise an ABG and ECG would be supportive but not diagnostic in this case.

Further reading:

https://www.nice.org.uk/guidance/cg144/chapter/Recommendations#diagnosis-2

Question:

An 88-year-old woman attends the GP with her daughter with a 2-week history of a painless breast lump. She has not noticed any other symptoms and otherwise feels well.

She has a past medical history of hypertension and diverticular disease. There is no personal or family history of breast disease.

On examination, there is a firm non-tender lump measuring around 20mm x 30mm in the lower outer quadrant of her right breast, with overlying skin thickening and associated right nipple inversion. There are palpable nodes in the right axilla. No abnormalities are detected on examination of the left breast.

A mammogram is conducted which demonstrates an irregular spiculated mass in the right breast and a core biopsy is obtained which demonstrates abnormal cells in cord-like tubular formations with evidence of calcification and invasion of the basement membrane. The report also states that it is E-cadherin positive.

What is the most likely diagnosis in this patient?

A. Invasive ductal carcinoma

B. Fibroadenoma

C. Invasive lobular carcinoma

D. Ductal carcinoma in situ (DCIS)

E. Lobular carcinoma in situ (LCIS)

Correct Answer:Invasive ductal carcinoma

Explanation:

The most likely diagnosis in this patient is an invasive ductal carcinoma. There are many different variants of breast disease, and a new breast lump will usually be referred to the breast clinic for ‘triple assessment’ which will involve a thorough history and examination, imaging and biopsy/aspiration. The examination findings of a firm painless lump, as well as the presence of palpable nodes in the axilla, are suggestive of malignancy with potential metastatic spread. An ‘irregular spiculated mass’ on mammography is also supportive of a diagnosis of malignancy. The most common type of invasive carcinoma is ductal carcinoma (i.e. it arises from the ductal tissue in the breast). Although histology of a core biopsy can vary, cord-like tubular formations and calcification are common findings in ductal carcinomas, and a positive E-cadherin stain is also supportive of ductal rather than lobular carcinoma. Invasion of the basement membrane indicates it is an invasive carcinoma rather than a carcinoma in situ.

Invasive lobular carcinoma is incorrect. Ductal carcinomas are more common than lobular carcinomas and the application of E-cadherin can be used to distinguish the two - lobular carcinomas will usually stain negative for E-cadherin whilst ductal carcinomas will stain positive.

Ductal carcinoma in situ and lobular carcinoma in situ are both incorrect. The histology demonstrates that there is an invasion of the basement membrane. Carcinomas in situ are defined by a lack of basement membrane invasion.

Fibroadenoma is incorrect as this will usually present with an isolated painless highly mobile breast lump in a young woman.

Further reading:

https://patient.info/doctor/breast-cancer-pro

Question:

You are a junior doctor working in general practice. You are reviewing a 79-year-old gentleman who reports a 3-month history of difficulty using his right hand. On examination, you find that he is unable to abduct the fingers on his right hand.

Dysfunction of which peripheral nerve is most likely to be responsible for this weakness?

A. Musculocutaneous nerve

B. Radial nerve

C. Median nerve

D. Ulnar nerve

E. Axillary nerve

Correct Answer:Ulnar nerve

Explanation:

The ulnar nerve is formed from the C8/T1 nerve roots and from the medial cord of the brachial plexus. It innervates flexor carpi ulnaris, the first dorsal and second palmer interosseous, adductor pollicis and flexor digitorum profundus (ulnar aspect). This facilitates abduction of the pinky finger and index finger, adduction of the index finger and adduction of the thumb. It also allows flexion of the distal phalanx of the ring and pinky fingers. It is, therefore, most likely that this patient has an ulnar nerve palsy, causes of which include neuropathy and disorders of the elbow.

The radial nerve innervates the triceps, extensor digitorum and abductor pollicis longus, facilitating extension at the elbow and fingers and abduction at the thumb.

The axillary nerve comes from the posterior cord of the brachial plexus and innervates the deltoid, providing abduction of the arm. It also facilitates sensation to the 'regimental badge patch' on the lateral aspect of the upper limb.

The musculocutaneous nerve provides sensation to the lateral forearm and innervates the biceps, allowing flexion at the elbow. The median nerve allows flexion and abduction of the wrist, flexion of the distal phalanx of the thumb, flexion of the distal phalanx of the index and middle fingers, pronation of the forearm and opposition of the thumb.

Further reading:

https://patient.info/doctor/ulnar-nerve-disorders

Question:

A 29-year-old lady presents with acute left iliac fossa pain, constant and sharp in character associated with nausea and dizziness. Her last menstrual period was 9 weeks prior to presentation. Past medical history is significant for pelvic inflammatory disease. Upon examination, the patient is found to be tachycardic with a pulse of 117bpm, all other vital signs are within normal limits. The patient's abdomen is soft and extremely tender in the left iliac fossa. Pelvic examination reveals a left adnexal tender mass. Urinary hCG is positive.

What is the primary diagnostic tool of choice for the clinical diagnosis?

A. CT abdomen, pelvis with IV contrast

B. Quantitative serum hCG

C. Transvaginal ultrasound

D. Transabdominal ultrasound

E. MRI abdomen

Correct Answer:Transvaginal ultrasound

Explanation:

The most likely diagnosis in the above stem is a left-sided ectopic pregnancy. The dizziness and tachycardia, with a missed period and a positive urine pregnancy test presenting as acute abdomen should alert the clinician to a ruptured ectopic pregnancy. The primary diagnostic modality is transvaginal ultrasound supplemented with transabdominal imaging; if required.

Given the patient's current early stage of gestation, it would be difficult to visualise the location of the pregnancy via a transabdominal approach. Moreover, the adnexae are best visualised through a transvaginal scan.

CT scanning involves ionizing radiation and is not preferred in pregnancy, especially in the first trimester due to the teratogenic potential.

Serial quantitative serum hCG levels would be helpful in the diagnosis of miscarriage and in pregnancies of unknown location – which require ultrasonographic assessment first.

MRI abdomen can be used as a second-line investigation if the diagnosis is equivocal – provided that the patient is haemodynamically stable.

Further reading:

https://www.rcog.org.uk/en/guidelines-research-services/guidelines/gtg21/

Question:

A 45-year-old male patient presents to the emergency department with severe pain behind his left eye for the last 50 minutes. He states that his left eye has also been ‘watering excessively’ for the last four hours. The man has had similar episodes like this over the last few weeks, but this time the pain is significantly worse which has prompted him to present to the emergency department.

The patient denies any recent trauma to the eye. He has no past medical history. He takes no medications and has no known drug allergies.

Physical examination reveals normal observations. Ophthalmic examination demonstrates conjunctival injection and miosis of the left pupil. Neurological examination is normal.

A computed tomography (CT) scan of the brain and erythrocyte sedimentation rate (ESR) are unremarkable.

What is the most likely diagnosis in this patient?

A. Giant cell arteritis (temporal arteritis)

B. Tension-type headache

C. Trigeminal neuralgia

D. Corneal abrasion

E. Cluster headache

Correct Answer:Cluster headache

Explanation:

Retro-orbital pain, excessive tearing and conjunctival injection that occurs in ‘clusters’ in a male patient are characteristic of cluster headaches. Cluster headaches can strike several times a day and the symptoms typically remain on the same side during a single cluster attack. Autonomic symptoms such as ptosis, miosis and nasal congestion can also be seen during a cluster headache.

Trigeminal neuralgia is characterised by a severe, sudden onset pain in the distribution of the trigeminal nerve (V3 > V2 > V1). Pain is typically shock-like and lasts for seconds at a time. Trigeminal neuralgia is unlikely to cause conjunctival injection, miosis and excessive lacrimation.

Tension-type headaches are usually mild to moderate in intensity with a bilateral frontal distribution. Retro-orbital pain, excessive lacrimation, conjunctival injection and miosis are not likely to be seen in patients with a tension-type headache.

Giant cell arteritis (temporal arteritis) is characterised by a sudden mononuclear loss of vision, jaw claudication and scalp tenderness. Elderly females (> 65 years old) are most commonly affected. Additionally, the ESR is likely to be elevated in patients with giant cell arteritis. It is unlikely to be the diagnosis in the patient in the above clinical vignette.

Corneal abrasions can present with pain, redness and tearing. However, patients with corneal abrasions are likely to have a recent history of local trauma to the eye (fingernails and contact lenses for example). Additionally, miosis is unlikely to be seen in a patient with a corneal abrasion.

Further reading:

https://patient.info/doctor/cluster-headaches-pro

Question:

A 19-year-old man presents to his general practitioner with pain above his left ankle. The pain has occurred intermittently for the past 10 days, and he describes it as a "sharp, boring pain". There is also swelling and erythema over the painful area. He has no history of trauma, weight loss or night sweats. He has a past medical history of sickle cell anaemia.

On examination, he has tenderness 2 cm above the left medial calcaneus, which is markedly swollen and erythematous. A plain radiograph revealed a lytic lesion in the distal tibia.

What is the most likely diagnosis?

A. Syndesmotic fracture

B. Osteochondroma

C. Brodie abscess

D. Giant cell tumour

E. Ewing sarcoma

Correct Answer:Brodie abscess

Explanation:

Brodie abscesses are collections of pus in a bone that occur when a pathogen (often Staphylococcus aureus) starts to erode the bone. It can be the initial presentation of subacute/chronic osteomyelitis or be a precursor to an acute presentation of osteomyelitis in the future. It most commonly occurs in boys. Furthermore, sickle cell anaemia is a risk factor for osteomyelitis.

Ewing sarcomas are a type of malignant bone tumour. They classically have an "onion skin" appearance on a plain radiograph and occur in the pelvis or femur. They are also less likely to present so suddenly and would cause systemic symptoms such as night sweats and weight loss. Ewing sarcomas often have a strong family history; most are caused by translocation of chromosomes 11 and 22. They are frequently associated with retinoblastomas.

Giant cell tumours are a type of benign bone tumour that classically have a "soap bubble" appearance on plain radiographs. They often appear in the humerus, femur, and tibia, usually in younger adults between the ages of 20 to 40 years.

Osteochondromas are the most common benign bone tumour, but they are usually asymptomatic. They are typically picked up incidentally when requesting imaging for a separate issue. If they do cause symptoms, it is usually when they have grown so big that the tumour is causing nerve impingement. Furthermore, it is unlikely to present so subacutely.

A syndesmotic fracture (Weber fracture) is a fracture of the intraosseous membrane between the tibia and fibula. It usually has a history of trauma and should not have a lytic lesion on a plain radiograph. A fracture of the syndesmosis or above is likely to require surgery due to the high risk of instability.

Further reading:

https://radiopaedia.org/articles/brodie-abscess-1

Question:

A 70-year-old man presenting with a new pigmented lesion on his chest is diagnosed with melanoma. An excision biopsy is performed, which reveals a stage II melanoma with a Breslow thickness of 3mm. He is otherwise fit and well, with no significant past medical history.

What is the most appropriate next step in the management?

A. Imiquimod

B. Wide local excision with a 2cm margin

C. Wide local excision with a 0.5-1cm margin

D. Wide local excision and sentinel lymph node biopsy

E. Chemotherapy

Correct Answer:Wide local excision and sentinel lymph node biopsy

Explanation:

The main treatment for melanoma is wide local excision with margins dependent on the Breslow thickness. For stages 0 to II, the excision margin can also be determined by the stage (0.5-1cm for stage 0, 1cm for stage I, and 2cm for stage II, according to NICE guidelines). However, for melanomas thicker than 1mm, or those with a thickness of 0.8-1mm and one of ulceration, lymphovascular invasion or a mitotic index of 2 or more, a sentinel lymph node biopsy should also be carried out. Therefore, the most appropriate next step is wide local excision and sentinel lymph node biopsy.

Wide local excision with a 2cm margin is incorrect, as a sentinel lymph node biopsy is also indicated.

Wide local excision with a 0.5-1cm margin would be appropriate if this were a stage 0 melanoma.

Imiquimod may be used to treat stage 0 melanoma, where wide local excision with a sufficient margin would lead to unacceptable disfigurement or morbidity.

Chemotherapy is generally used only for advanced melanoma.

Further reading:

https://geekymedics.com/malignant-melanoma-of-the-skin/

Question:

A 24-year-old woman presents to her GP with a slightly itchy rash that first appeared 2-days ago. She also reports a low-grade fever and headache.

She has no significant past medical history and does not take any medications. She has not travelled abroad in the last 6-months but recently went on a camping trip to the Scottish Highlands.

On examination, her temperature is 38.2°C; all other vital signs are within normal limits. On closer inspection of the skin, there is a single skin lesion, around 7cm in diameter, containing a marked central clearing.

What is the most likely diagnosis?

A. Lyme disease

B. Cellulitis

C. Chronic fatigue syndrome

D. Rocky Mountain spotted fever

E. Erythema multiforme

Correct Answer:Lyme disease

Explanation:

The most likely diagnosis in this patient is Lyme disease - an infectious disease caused by the spirochete Borrelia genus, most commonly transmitted to humans through the bite of infected ticks. The signs and symptoms of Lyme disease vary depending on the time after infection. Typically 1-2 weeks after the tick bite, patients develop erythema migrans, a pathognomic dermatological sign, characterised by a slowly expanding red ring around the bite with a marked central clearing. This is often associated with constitutional symptoms such as fever, headache, arthralgia and myalgia. In advanced and untreated disease, patients may develop neurological or cardiac complications.

Patients with Rocky Mountain spotted fever (RMSF) often present with a triad of fever, maculopapular rash and headache in the context of a recent tick bite; it is typically only seen in the Western hemisphere. RMSF is a systemic vasculitis caused by infection with a gram-negative bacterium called Rickettsia rickettsii. This patient has not presented with any notable systemic symptoms, maculopapular rash or any history of recent international travel; therefore, this is an unlikely diagnosis.

Erythema multiforme (EM) is an acute but typically self-limiting mucocutaneous condition caused by a hypersensitivity reaction to infection, vaccination or medication. EM classically presents with diffuse, symmetrical, target shaped lesions on the distal extremities and mucosa. This patient has no recent exposure history, and the skin changes described on examination are not in keeping with EM.

Patients with chronic fatigue syndrome (CFS), also known as myalgic encephalomyelitis (ME), classically present with debilitating fatigue, cognitive dysfunction, unrefreshing sleep, and post-exertional myalgia; these symptoms often last for six months. CFS/ME is an unlikely diagnosis in this patient due to the acute onset of symptoms and the objective findings of erythema migrans and pyrexia on examination, suggesting an infective aetiology.

Other skin conditions that can mimic erythema migrans include cellulitis - a local infection of the deep dermis and subcutaneous tissue. Cellulitis usually presents as uniform erythema on a limb or at the site of skin trauma. Whilst cellulitis may co-exist with erythema migrans, it is not the primary diagnosis in this patient.

Further reading:

https://cks.nice.org.uk/topics/lyme-disease/

Question:

A 43-year-old woman presents to the walk-in eye clinic complaining of a 2 day history of decline in vision in her right eye. She reports that 'colours look funny' when she closes her left eye, and that moving her right eye causes her pain. She denies photophobia, itch or discharge from either eye. This is the first such episode that she has experienced, and has had no previous issues with her vision.

The patient's past medical history is unremarkable and she takes no regular medication. On examination, visual acuity (assessed via Snellen chart) in the left eye is 6/6, compared to the right which is 6/24. The swinging flashlight test reveals that when the torch is swung towards the right eye after being shone into the left eye, it dilates rather than constricting. Fundoscopy reveals a normal red reflex and no abnormalities of the retina are visualised.

The admitting doctor orders MRI imaging to assist in the diagnostic process, but initiates treatment before the diagnosis is confirmed, given the likely delay caused by waiting for the scan. The patient is anxious about her symptoms and asks the doctor about the prognosis for the condition.

Given the likely diagnosis, what is the most likely prognostic outcome ?

A. Visual acuity will recover, but colour vision will be irreparably damaged

B. Treatment is effective at improving visual acuity and colour vision, but eye pain usually persists

C. Treatment will only allow for relief of eye pain; visual acuity and colour vision are unlikely to recover

D. Colour vision will recover, but visual acuity is likely to be permanently reduced

E. The majority of patients will recover to normal or near-normal visual acuity

Correct Answer:The majority of patients will recover to normal or near-normal visual acuity

Explanation:

The most likely diagnosis, in this case, is optic neuritis. Loss of colour vision, pain during eye movement, and a relative afferent pupillary defect (RAPD) on examination are all common features of the condition, that arises due to inflammation of the optic nerve. A relative afferent pupillary defect indicates the presence of asymmetrical retinal or optic nerve pathology, with optic neuritis, retinal detachment, anterior ischaemic optic neuropathy being common culprits.

Multiple sclerosis (MS) is the most common underlying cause identified in the setting of optic neuritis, with the patient fitting the usual demographic for this disease. The diagnosis may be confirmed via MRI of the brain and spinal cord as well as of the optic nerves to assess for the presence of demyelination.

The Optic Neuritis Treatment Trial (ONTT) was a landmark study that demonstrated an increased rate of visual recovery in typical ON patients treated with high-dose systemic (intravenous) steroids. However, the final visual outcome at 6 months was similar to the placebo group.

In some cases, patients may have a degree of impaired acuity contrast sensitvity or colour differentiation,

Persistent eye pain after the provision of steroids should prompt further investigation for a non-inflammatory cause of optic nerve disease.

Further reading:

https://geekymedics.com/optic-neuritis/

Question:

A 55-year-old man presents to his GP with chest pain. The pain occurs during exertion and settles quickly with rest. Each episode of chest pain has not lasted longer than 10 minutes and he has never experienced chest pain at rest. He has a past medical history of asthma and osteoarthritis. An ECG reveals normal sinus rhythm. His vital signs and blood results are unremarkable.

Which medications would be the most appropriate first-line treatment for the likely diagnosis?

A. Ranolazine

B. Amlodipine

C. Bisoprolol

D. Ivabradine

E. Nicorandil

Correct Answer:Amlodipine

Explanation:

This patient most likely has a diagnosis of stable angina, given the description of exertional chest pain that is relieved by rest.

The most appropriate first-line treatment for this patient would be amlodipine. NICE recommends either a beta-blocker or a calcium channel blocker to be commenced as first-line management of angina. In this scenario, the patient has a past medical history of asthma, making a calcium channel blocker a more appropriate choice. Second-generation dihydropyridines (e.g. amlodipine or felodipine), or long-acting diltiazem or verapamil are preferred.

Ivabradine, ranolazine and nicorandil are all second-line treatment options for angina.

Ivabradine works by inhibiting funny channels on the sinoatrial node, inhibiting pacemaker current and thereby decreasing heart rate.

Nicorandil causes vasodilation of the coronary arteries, similar to nitrates, but also inhibits calcium entry into cells.

Ranolazine works on sodium gated channels to inhibit calcium entry into cells, reducing heart wall tension and myocardial oxygen demand.

Further reading:

https://www.nice.org.uk/guidance/cg126/chapter/1-Guidance#anti-anginal-drug-treatment

Question:

A 71-year-old woman is admitted to the emergency department with vomiting and sudden-onset generalised abdominal pain that is severe and colicky in nature. On examination, she is pale, has cool peripheries, and her heart rate is 147 bpm. Her abdomen is diffusely tender. An electrocardiogram (ECG) taken in triage shows an irregular rhythm and has no obvious P waves.

Given the likely diagnosis, what is the most appropriate definitive management?

A. Admit for observation

B. IV antibiotics

C. Emergency endoscopy

D. Emergency laparotomy

E. Intravenous (IV) fluids

Correct Answer:Emergency laparotomy

Explanation:

The correct answer is emergency laparotomy. The most likely diagnosis in this patient is acute mesenteric ischaemia. She has presented with typical symptoms of severe colicky abdominal pain and signs of shock. Her ECG taken in triage is highly suggestive of atrial fibrillation, which is a significant risk factor associated with mesenteric ischaemia. The definitive management for this condition is an emergency laparotomy.

Admitting for observation is inappropriate as this patient is extremely unwell with signs of shock. Patients have a poor prognosis if surgical intervention is delayed in mesenteric ischaemia.

Emergency endoscopy would be the appropriate intervention if an upper gastrointestinal bleed were suspected, however, that is not the likely cause of this patient's symptoms.

IV fluids may form a part of the management of this patient, particularly given her signs of shock. However, it is not the definitive management for mesenteric ischaemia, which is what the question asks for.

This patient may also require IV antibiotics as part of her treatment, particularly if she develops peritonitis secondary to her mesenteric ischaemia. However, it would not be the definitive treatment for her illness, which is what the question asks for.

Further reading:

https://patient.info/doctor/bowel-ischaemia

Question:

You are called to see a 30-year-old female post-laparoscopic investigation for endometriosis. She is complaining of severe central chest pain that started gradually 2 hours after her laparoscopy. She states that the pain is sharp in nature and sometimes radiates to her upper abdomen. She states that the pain is worsened by deep breathing, coughing and lying flat. The only thing that seems to improve the pain is leaning forward. She has taken paracetamol and 5mg of oramorph neither of which has helped to alleviate the pain. She has no other associated symptoms and otherwise feels well in herself. She has never had any issues like this previously.

She has no significant past medical history or drug allergies. She takes the combined oral contraceptive pill but no other regular medications. She has no significant family history and does not smoke. Vital signs are unremarkable.

Clinical examination reveals a mildly distended abdomen in keeping with her recent procedure, but no other abnormal findings in any major body system. Her BMI is within the normal range. Urinalysis is normal. An ECG shows concave ST-segment elevation in leads V1-V6.

Which of the following is the most important investigation to perform next?

A. CT pulmonary angiogram (CTPA)

B. Chest X-ray

C. Troponin I

D. Echocardiogram

E. V/Q scan

Correct Answer:Troponin I

Explanation:

This patient is most likely presenting with pericarditis. The next most important investigation to perform would be troponin I. Given the patient has acute chest pain and ECG changes, a troponin I would be useful to rule out myocardial infarction (which is unlikely given her background) and potentially aid in the diagnosis of pericarditis (troponin I is typically mildly elevated).

A V/Q scan would not be indicated in this setting. This patient’s Well’s score for a pulmonary embolism (PE) is less than 4 and there are no convincing symptoms or signs of a PE.

A chest x-ray would be a useful investigation to perform to rule out obvious chest pathology (i.e. pneumothorax, pneumonia, pneumoperitoneum). However, given the absence of respiratory symptoms or signs, a troponin I would be more appropriate to check first.

An echocardiogram would be a useful investigation to perform in the context of pericarditis (to rule out an effusion), however, it would be more appropriate to check troponin I first to rule out acute coronary syndrome.

A CTPA would not be indicated in this patient, given the low Well's score and absence of respiratory symptoms (including normal SpO2).

Further reading:

https://patient.info/doctor/acute-pericarditis

Question:

A 43-year-old hotel worker presents following three days of fever, watery diarrhoea, a non-productive cough, myalgia and breathlessness. The patient has a background of rheumatoid arthritis treated with methotrexate. On questioning, he says he has felt unwell following a recent appointment to the laundry department two weeks prior.

A chest X-ray shows mid to lower zone patchy consolidation.

Which single investigation is most likely to confirm the suspected diagnosis?

A. Urea and electrolytes

B. Liver function tests

C. Full-blood count

D. Urinary antigen test

E. CT thorax

Correct Answer:Urinary antigen test

Explanation:

This vignette is suggestive of atypical pneumonia. Given the history of immunosuppression and recent job change to the laundry department (higher risk of stagnant water), Legionella pneumonia, commonly caused by Legionella pneumophilia, is the most likely diagnosis.

A positive Legionella urinary antigen test occurs from the presence of a bacterial cell wall in the urine, detected through an antibody-antigen reaction. This test is specific but not sensitive for all Legionella species, and can only detect L. pneumophilia. Therefore, a negative antigen test does not completely exclude Legionella. The remaining investigations collectively support a diagnosis of Legionella pneumonia, but are non-specific and would not give a diagnosis in isolation.

Urea and electrolytes may show common electrolyte abnormalities, such as hyponatraemia (seen in over 40% of cases) and transient hypophosphataemia (usually resolves within 7 days).

A full blood count will likely show elevated white blood cells in response to infection, and platelets may increase as an acute phase reactant in response to inflammatory processes. Neither would confirm the diagnosis, as most infective aetiologies would implicate similar changes.

A CT thorax would show consolidations and ground-glass opacities and in some cases, pleural effusions. However, neither is specific to a Legionella infection.

Liver function tests may show elevated transaminases acutely, which is more specific to Legionella than other causes of pneumonia and may indicate the need for a urinary antigen test. However, it is not confirmatory of Legionella pneumonia.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK430807/

Question:

A 28-year-old woman presents to Accident and Emergency with sudden onset breathlessness whilst out shopping. She is a non-smoker and her only regular medications are citalopram and the combined oral contraceptive pill. On examination, she appears anxious and is tachycardic. An ABG is performed on room air which shows the following:

pH 7.48

pO2 7.8 kPa

pCO2 3.4 kPa

Bicarb 24 mmol/L

What is the most likely diagnosis?

A. Sepsis

B. Acute asthma

C. Pneumothorax

D. Anxiety-related hyperventilation

E. Pulmonary embolism (PE)

Correct Answer:Pulmonary embolism (PE)

Explanation:

Each of the possible answers may present with acute shortness of breath. The key to answering this question is to first identify the respiratory alkalosis present on her ABG (low pCO2 and high pH), which suggests hyperventilation. She is also hypoxic with a pO2 of 7.8, which effectively rules out anxiety-related hyperventilation. Given her risk factor (combined oral contraceptive pill) and tachycardia, a pulmonary embolism is the most likely diagnosis based on the information given. \

A pneumothorax may present with similar features however she has no risk factors for this present in the question stem. Likewise, early acute asthma may have similar findings but this is less likely in a patient of this age with no history of asthma. Sepsis would likely yield a metabolic acidosis, although a chest infection may initially present with respiratory alkalosis.

Further reading:

https://geekymedics.com/abg-interpretation/

Question:

A 21-year-old man presents to the GP with a 2-week history of increasing pruritus and rash. The pruritus started in the webbing of his hands and now includes his arms, axilla, and feet. It is worse at night. The rash is widespread with erythematous papules and surrounding dermatitis.

He has no other relevant medical history. He feels generally well with no fever. He is a university student living in shared accommodation.

What organism is the most likely cause for his symptoms?

A. Neisseria meningitidis

B. Borrelia burgdorferi

C. Trichophyton rubrum

D. Sarcoptes scabiei var. hominis

E. Staphylococcus aureus

Correct Answer:Sarcoptes scabiei var. hominis

Explanation:

Scabies is an itchy skin condition caused by a tiny burrowing mite called Sarcoptes scabiei var. hominis. Scabies is typically found in the webbing and sides of fingers, wrists, elbows, axillae, feet and genitals. The appearance of the scabies rash can vary but can include erythematous papules or vesicles and surrounding dermatitis. Intense itching occurs in the area where the mite burrows. The urge to scratch may be especially strong at night. Scabies is spread by close contact. Poverty, overcrowding (university halls, prisons, care homes), and immunosuppression are key risk factors for scabies. Permethrin 5% cream is the treatment of choice for scabies, applied to the entire body (excluding the face) and left on for 8 hours, with treatment repeated in 7 days.

Impetigo can be caused by Staphylococcus aureus or group A Streptococcus. It usually appears as erythematous macules which can progress to be vesicular/bullous (described as a golden crust) on the face, neck or hands.

Lyme disease is caused by Borrelia burgdorferi. The rash appears as a circular or oval shape rash around a tick bite described as a 'bull's eye' rash.

Trichophyton rubrum is the most common causative agent of tina corporis. Tina corporis usually appears as a pruritic, circular, erythematous scaly patch with central clearance.

Neisseria meningitidis can cause meningococcal septicaemia which presents as a non-blanching purpuric or petechial rash.

Further reading:

https://geekymedics.com/scabies/

Question:

A 64-year-old man presents to the ophthalmology department after referral by his optometrist.

He is found to have elevated intraocular pressures bilaterally: 25mmHg in the left eye and 26mmHg in the right eye.

On dilated examination, the cup-to-disc ratio is 0.5 in his left eye and 0.6 in his right eye. Gonioscopy is normal.

He reports that he has not experienced any changes in his vision; however, some peripheral visual field loss is present on automated testing.

He has a history of type 2 diabetes and hypertension managed with metformin 500mg and ramipril 2.5mg.

What is the most likely diagnosis?

A. Proliferative diabetic retinopathy

B. Acute angle-closure glaucoma

C. Age-related macular degeneration

D. Normal-tension glaucoma

E. Primary open-angle glaucoma

Correct Answer:Primary open-angle glaucoma

Explanation:

The most likely diagnosis is primary open-angle glaucoma - a form of glaucoma that develops slowly over time and has a normal drainage angle (iridocorneal angle). Typically patients are asymptomatic until the disease is very advanced. Key findings in these patients include: raised intraocular pressure, increased cup-to-disc ratio and open angles on gonioscopy.

A subset of open-angle glaucoma known as normal/low-tension glaucoma is also an asymptomatic condition; however, intraocular pressure is normal. Whilst a reasonable differential, this patient has raised intraocular pressure bilaterally, which makes this option less suitable.

Whilst the patient has a history of diabetes, the findings are not suggestive of diabetic retinopathy. Proliferative diabetic retinopathy specifically would present with evidence of neovascularisation and likely vitreous haemorrhage on dilated examination.

Age-related macular degeneration (ARMD) classically presents with blurring or distortion of vision, known as metamorphopsia. As this patient does not have a symptomatic change in vision, ARMD is less likely. Additionally, ARMD does not affect the cup-to-disc ratio.

Patients with acute angle-closure glaucoma present with an acute onset, painful red eye, often associated with headache, nausea ± vomiting and reduced visual acuity. As this patient has an asymptomatic presentation, this diagnosis is unlikely.

Further reading:

https://cks.nice.org.uk/topics/glaucoma/management/primary-open-angle-glaucoma-intraocular-hypertension/

Question:

A 25-year-old lady is brought to A+E by ambulance. She has a 3-day history of shortness of breath, right-sided chest pain, a non-productive cough, myalgia, headache and a sore throat. She has no significant past medical history and lives with her partner, who has not experienced similar symptoms.

Clinical examination reveals the following:

Respiratory rate: 34

SpO2: 94% on air

Blood pressure: 86/45 mmHg

Temperature: 38.6 oC

Widespread target-shaped skin lesions

Coarse crackles over the right lower zone on auscultation of the chest

What is the most likely cause of this patient’s pneumonia?

A. Mycoplasma pneumoniae

B. Streptococcus pneumonia

C. Staphylococcus aureus

D. Legionella pneumophila

E. Pneumocystis pneumonia

Correct Answer:Mycoplasma pneumoniae

Explanation:

Based on the clinical vignette, the most likely diagnosis is atypical pneumonia caused by the organism mycoplasma pneumoniae (MP).

MP typically presents with a slow-onset history of fever, headache, dry cough (+/- pleuritic pain), myalgia, malaise and sore throat. MP can also cause a wide range of extra-respiratory features including erythema multiforme (target shaped erythematous skin lesions).

Streptococcus pneumoniae is the most common cause of pneumonia. It commonly affects the elderly, but can occur in any age-group. Sputum from this infection is often described a “rusty” in colour.

Legionella pneumophila causes severe atypical pneumonia. It typically has a 2-10 day incubation period and presents with headache, myalgia, fever, non-productive cough and rigors. Dyspnoea, pleuritic chest pain and haemoptysis are also commonly present. This form of pneumonia is much less common than mycoplasma pneumoniae and it is typically acquired from contaminated poorly maintained air-conditioning systems.

Staphylococcus aureus typically causes a severe pneumonia. This organism often affects patients with underlying chronic respiratory disease (i.e. cystic fibrosis, severe asthma). The development of lung abscesses is not uncommon when this organism is present.

Pneumocystis pneumonia typically affects immunocompromised individuals, such as those with AIDS secondary to HIV infection. It presents with a non-productive cough, exertional dyspnoea, fever, tachypnoea and chest pain.

Further reading:

https://patient.info/doctor/pneumonia-pro

Question:

A newborn examination is carried out by the paediatric registrar on a 1 day-old male baby. He was born by emergency C-section performed for fetal distress at 38+2 weeks. At delivery, meconium was present and the baby had an APGAR score of 5 at 1 minute that increased to 8 at 10 minutes. No further complications have been noted but the baby has been transferred to neonatal intensive care for observation.

On examination, the infant is alert with stable observations and is afebrile. The only abnormality noted during the examination is that the urethral opening is on the ventral aspect of the penis, and the penis is slightly curved. The foreskin does not appear to fully cover the head of the penis. The testes are fully descended.

He has a wet nappy and has been passing urine normally. There is no family history of similar malformations.

What is the most appropriate diagnosis?

A. Hypospadias

B. Phimosis

C. Russell-Silver syndrome

D. Epispadias

E. Chordee

Correct Answer:Hypospadias

Explanation:

The most appropriate diagnosis is hypospadias. This is a congenital abnormality of the penis occurring in around 1 in 250 males. It is characterised by the urethral meatus not being located at the head of the penis, usually on the ventral aspect. In many cases, the foreskin is also not fully developed, and this results in a ‘hooded glans’ appearance. It may also be associated with the shaft of the penis curving downward, a presentation known as ‘chordee’. Surgery can be used to straighten the penis, extend the urethra to correct the position of the meatus and to alter the foreskin.

Epispadias is incorrect as this term is used when the urethral meatus is incorrectly positioned on the dorsal (upper) aspect of the penis, rather than the ventral (lower) aspect of the penis as is described in this case.

Hypospadias can occur in the context of rare genetic syndromes such as Russell-Silver syndrome but also occur in isolation. In Russell-Silver syndrome it would also be associated with other characteristic features such as macrocephaly, stunted growth and facial abnormalities, which are not described in this case. Diagnosis would also require genetic screening which has not been conducted in this case.

Although this patient does have chordee (curvature of the penis) this would not be the most appropriate diagnosis because the chordee is not isolated. It is accompanied by malpositioning of the urethral meatus on the distal penis, and therefore hypospadias is a more appropriate diagnosis to make. Chordee often occurs in combination with hypospadias, and the term hypospadias is often used as an all-encompassing term to describe the urethral meatus malposition and curvature so is a more accurate diagnosis in this case.

Phimosis is the inability to retract the foreskin from the head of the penis and is therefore incorrect. The foreskin is described as not fully covering the head of the penis rather than being irretractable.

Further reading:

https://www.gosh.nhs.uk/file/914/download?token=4HNwRTuC

Question:

A 72-year-old man presents to the emergency department with constant pain in his left lower abdomen which came on 2 days ago and has been getting worse. He also describes having diarrhoea for the past 2 days, although he denies any blood in the stool. He has not noticed any weight loss or change in appetite and has not vomited, although he feels nauseous.

An abdominal exam reveals tenderness and guarding in the left iliac fossa.

His observations are:

Oxygen saturations: 99% on room air

Respiratory rate: 20 breaths per minute

Heart rate: 92 beats per minute

Blood pressure: 124/79 mmHg

Temperature: 38.1 °C

His CRP level is 250 mg/L (<5mg/L). Renal function is unremarkable.

What is the most appropriate diagnostic investigation?

A. Exploratory laparotomy

B. MRI

C. CT with contrast

D. Non-contrast CT

E. Ultrasound

Correct Answer:CT with contrast

Explanation:

This patient is presenting with constant left lower quadrant pain, diarrhoea and a fever, which all point towards a diagnosis of diverticulitis. The presence of guarding suggests this could be complicated diverticulitis. According to NICE guidance, patients with suspected complicated diverticulitis and raised inflammatory markers should be offered a CT with contrast within 24 hours of hospital admission to confirm the diagnosis and help plan management.

A non-contrast CT, MRI or ultrasound may be performed if a contrast CT is contraindicated.

An exploratory laparotomy is a very invasive investigation and is not undertaken to diagnose diverticulitis. It is typically used to locate the source of abdominal disease when this is unclear, or in the context of penetrating trauma to the abdomen.

Further reading:

https://www.nice.org.uk/guidance/ng147/chapter/recommendations#complicated-acute-diverticulitis

Question:

A 57-year-old woman presents to the emergency department with a sudden onset severe headache associated with vomiting. A CT scan confirms fresh blood in the basal cistern. A CT angiogram shows a right posterior communicating artery aneurysm and endovascular coiling of the aneurysm is planned for the following morning. Overnight her level of consciousness falls. She is eye-opening to pain, confused and not obeying commands.

What is the most appropriate investigation to determine the cause of the deterioration?

A. Lumbar puncture

B. CT scan of the head

C. Serum urea and electrolytes

D. MRI scan of the head

E. Emergency angiogram

Correct Answer:CT scan of the head

Explanation:

The most appropriate investigation in this scenario would be a repeat CT scan of the head. This patient has clinical and radiological features of a subarachnoid haemorrhage (the basal cistern belongs to the subarachnoid space) with an underlying aneurysmal cause. Several complications are associated with subarachnoid haemorrhage, the three most important being re-bleeding, hydrocephalus and vasospasm. A CT head enables the identification of a potential re-bleed (CTs are very good for observing fresh blood and bones) and hydrocephalus. Hydrocephalus is often temporary (due to blood disrupting absorption of CSF) and can also be assessed by CT scan where dilated ventricles may be visible.

An MRI scan of the head is less sensitive for identifying fresh blood, so would be inferior to CT here if the suspicion of a re-bleed was high, though it is superior to CT in the assessment of brain parenchyma and identification of tumours or areas of demyelination.

Lumbar puncture is used very cautiously in the setting of possible raised intracranial pressure and is usually preceded by a CT scan to determine whether it would be safe or not.

It is important to monitor serum urea and electrolytes in patients with any acute intracranial pathology as they are at risk of the syndrome of inappropriate anti-diuretic hormone section (SIADH). However, in this scenario, the typical causes to be thought of first (and those requiring more acute management) are re-bleeding, developing hydrocephalus and vasospasm.

An emergency angiogram with endovascular coiling would be the definitive management for controlling the bleed in this scenario, but an acute bleed must first be confirmed with a CT head before pursuing invasive intervention to control the focus of bleeding.

Further reading:

https://www.nice.org.uk/guidance/NG228

Question:

A 70-year-old man presents to his GP with a one-month history of gradual weight loss and general malaise. He recently began experiencing a dull pain in his stomach, which he believes coincides with his loss of appetite. Physical examination reveals massive splenomegaly.

As part of the investigation into the cause of the man's symptoms, a full blood count is performed, along with a peripheral blood smear. The full blood count reveals the man is severely anaemic and thrombocytopenic. A bone marrow biopsy is performed, showing the presence of fibrosis. Genetic testing is also carried out, revealing the presence of a JAK2 V617F mutation.

Based on the results of the investigations, what abnormality would be most likely seen on the peripheral blood smear?

A. Howell-Jolly bodies

B. Schistocytes

C. Dacrocytes

D. Spherocytes

E. Auer bodies

Correct Answer:Dacrocytes

Explanation:

Dacrocytes are red blood cells that are shaped like a 'teardrop' and are present in primary myelofibrosis (PMF). The diagnosis of PMF, according to WHO, can be made in this patient as there is evidence of bone marrow fibrosis, a causative mutation (JAK2), and the presence of teardrop red cells and palpable splenomegaly.

Schistocytes are fragments of red blood cells, that are often the result of a haemolytic process (haemolytic uraemic syndrome, thrombotic thrombocytopenic purpura) or due to the presence of mechanical heart valves.

Auer bodies are cytoplasmic inclusions seen in myeloid blast cells, sometimes present in patients with acute myeloid leukaemia and acute promyelocytic leukaemia.

Spherocytes are sphere-shaped red cells observed in autoimmune haemolytic anaemia and hereditary spherocytosis.

Howell-Jolly bodies are remnants of DNA present in red cells, observed in patients with a damaged or absent spleen. They may also be observed in sickle cell anaemia.

Further reading:

https://labtestsonline.org.uk/tests/blood-film

Question:

An 80-year-old man is reviewed on the general surgical ward with worsening abdominal pain, fever and rigors. He was admitted 2 days previously with suspected small bowel obstruction which is being managed conservatively with nasogastric decompression, IV fluids and IV analgesia as required. The patient is nil-by-mouth.

Past medical history is significant for stage 4 colorectal cancer with known liver metastases. The patient has undergone a small bowel resection in the past.

On examination:

Respiratory rate - 20 breaths/min

Oxygen saturations - 95% on room air

Heart rate - 120 beats/min

Blood pressure - 100/70 mm Hg

Temperature - 38.2 °C

Chest clear on auscultation

Rigid abdomen with generalised tenderness and guarding

Absent bowel sounds on auscultation

Which of the following is the gold standard investigation for this diagnosis?

A. Abdominal ultrasound

B. CT abdomen

C. Erect chest x-ray

D. Abdominal x-ray

E. Barium swallow

Correct Answer:CT abdomen

Explanation:

The most likely diagnosis is peritonitis (and likely sepsis) secondary to small bowel perforation, which will be definitively identified using a CT scan of the abdomen. Whilst erect chest X-ray and abdominal X-ray may visualise pneumoperitoneum (free air in the abdomen which accumulates under the diaphragm), a CT scan provides a greater level of detail regarding the area of perforated bowel and other pathology within the abdomen, which will guide further management.

Abdominal ultrasound can be used to view the abdominal viscera without delivering a dose of ionising radiation. However, it is less sensitive for small bowel perforation and requires skill to perform and interpret. Ultrasound may be used in young patients presenting with an acute abdomen (e.g intussusception, acute appendicitis).

A barium swallow study involves the ingestion of a barium radioisotope and the use of X-ray fluoroscopy to view the upper gastrointestinal tract (oral cavity, pharynx, oesophagus, stomach, and duodenum). It is unwise to encourage oral intake of a radioisotope in a patient with small bowel obstruction who is nil-by-mouth. If there is a small bowel perforation, any oral intake will leak into the abdomen, further increasing the likelihood of infection.

Further reading:

https://teachmesurgery.com/general/presentations/perforation/

Question:

A 76-year-old gentleman presents to his GP with a 6-month history of tremor. This affects his hands primarily and interferes with everyday activities like buttoning up shirts and drinking from glasses. He takes no regular medications and drinks half a bottle of wine on a Friday night, which he has noticed improves his tremor. He believes his mother had a similar tremor. On examination, he has a fine tremor affecting both hands, barely noticeable at rest but becoming more severe when attempting to pick up and use a pen.

Which of the following medications would be most appropriate to trial as a first-line management option for his symptoms?

A. Co-beneldopa

B. Fluoxetine

C. Tetrabenazine

D. Topiramate

E. Propranolol

Correct Answer:Propranolol

Explanation:

The most likely diagnosis is essential tremor, given the history of bilateral tremor that is worse with movement and better after drinking alcohol. The family history of similar symptoms makes the diagnosis of essential tremor even more likely. If the patient finds this sufficiently bothersome to consider medical management, propranolol is recommended first-line if not contraindicated. Primidone can also be trialled.

Topiramate is a later-line option if first-line options are not effective or tolerated.

Dopamine therapy is central in the management of Parkinson’s disease, and similarly, tetrabenazine is used for symptomatic management in disorders such as Huntington’s disease.

Fluoxetine and other SSRIs have been associated with the development of tremor.

Further reading:

https://bnf.nice.org.uk/treatment-summary/essential-tremor-chorea-tics-and-related-disorders.html

Question:

You are asked to review a 40-year-old male who is day 1 post-op, following endoscopic transsphenoidal resection of a pituitary tumour. The nurses are concerned about his urine output, which has been around 300ml/hr for the past 3 hours. Further investigations reveal high serum sodium and osmolality, as well as low urine sodium and osmolality. Blood glucose levels are normal.

What is the most likely diagnosis?

A. Diabetes mellitus

B. Diabetes insipidus

C. Adrenal insufficiency

D. Cerebral salt wasting

E. Syndrome of inappropriate ADH secretion (SIADH)

Correct Answer:Diabetes insipidus

Explanation:

Diabetes insipidus occurs due to low levels of antidiuretic hormone (ADH). ADH acts to increase water reabsorption from the kidney. Lack of ADH, therefore, leads to increased urine volume, with a lower osmolality. As a consequence, the serum becomes hyperosmolar with an observed hypernatraemia.

Both cerebral salt wasting and SIADH lead to hyponatraemia and decreased serum osmolarity with increase urine osmolality.

Diabetes mellitus can cause high urine output and high serum osmolality secondary to high glucose levels. This patient has normal blood glucose levels.

Adrenal insufficiency leads to low serum sodium and high potassium. This is not in keeping with the scenario described above.

Further reading:

https://patient.info/doctor/hyponatraemia-pro

Question:

A 19-year-old girl suddenly collapses and dies during a hockey match. She had no significant past medical history. An autopsy reveals a grossly hypertrophied myocardium.

What is the mode of inheritance of her likely cardiac condition?

A. Y-linked

B. Autosomal dominant

C. Autosomal recessive

D. X-linked recessive

E. X-linked dominant

Correct Answer:Autosomal dominant

Explanation:

The most likely diagnosis in this scenario is hypertrophic obstructive cardiomyopathy (HOCM), the most common genetic cardiovascular disease. Individuals with this disease are often asymptomatic and are at risk of sudden cardiac death due to arrhythmias and obstruction of the left ventricular outflow tract. There is often a family history of the condition. It is inherited in an autosomal dominant fashion, thus only 1 allele needs to be inherited to result in the development of the condition.

The genetic mutations associated with HOCM result in abnormal sarcomeric protein production, leading to myocyte disarray and fibrosis. Patient's develop hypertrophy of the myocardial tissue, leading to left ventricular outflow obstruction and increased risk of fatal arrhythmias.

Autosomal recessive inheritance involves the inheritance of a recessive allele. In order for the disease to be present, a recessive allele must be inherited from each parent.

X-linked recessive disorders usually result in carrier states in females, and disease in males. Haemophilia A & B and Duchenne muscular dystrophy are inherited in the manner.

X-linked dominant inheritance involves the inheritance of a dominant gene via the X chromosome, therefore disease states occur in both males and females. Alport syndrome and fragile X syndrome are inherited in this manner.

Y-linked inheritance results in disease states in males only. Swyer syndrome may be inherited in this manner.

Further reading:

https://patient.info/doctor/hypertrophic-cardiomyopathy-pro

Question:

Mrs Grand is an 84-year-old female on a care of the elderly rehabilitation unit. You are asked by the nursing staff to prescribe her evening dose of warfarin, which she takes for rate-controlled atrial fibrillation. She feels well, does not complain of any symptoms and denies bleeding. On examination, she is systemically well with a pulse rate of 78 bpm and blood pressure of 130/62 mmHg.

Her international normalised ratio (INR) earlier today was 5.8.

What is the most appropriate management plan regarding her warfarin?

A. Give 5 mg intravenous vitamin K

B. Give 1 unit of prothrombin complex concentrate

C. Give 2.5 mg oral vitamin K

D. Omit today's dose of warfarin and check INR tomorrow

E. Give 1 mg warfarin and check INR tomorrow

Correct Answer:Omit today's dose of warfarin and check INR tomorrow

Explanation:

The British Society for Haematology has clear guidelines for the management of raised INR in various clinical contexts as well as bleeding patients who are anticoagulated with warfarin. Here the INR is greater than 5.0 and the patient has no signs of active bleeding, therefore the most appropriate course of action is to omit 1 or 2 doses of warfarin and recheck her INR. The indication for anticoagulation here is to reduce stroke risk from atrial fibrillation and therefore her target INR would be 2-3. Consideration should be made of the cause of the raised INR and her usual maintenance dose, which is not given here, may need adjusting.

Oral vitamin K 1-5 mg is given if the INR is greater than 8.

Prothrombin complex concentrate is used for emergency reversal of warfarin for major bleeding at a dose of 25 - 50 units per kilogram alongside 5 mg intravenous vitamin K.

Giving 1 mg warfarin and rechecking her INR tomorrow is not appropriate as her INR is greater than 5.0; omitting the dose entirely is more appropriate.

Further reading:

https://b-s-h.org.uk/guidelines/guidelines/oral-anticoagulation-with-warfarin-4th-edition/

Question:

A 79-year-old man was admitted for a right-sided inguinal hernia repair 4 days ago and has been recovering well. Today he suddenly developed pleuritic chest pain, haemoptysis and shortness of breath.

His vital signs are as follows:

Respiratory rate: 32/min

Heart rate: 124 bpm

SpO2: 93% on air

BP: 89/40 mmHg

Temperature: 36 °C

A CT pulmonary angiogram confirms a large pulmonary embolism.

What is the most appropriate management option?

A. Warfarin

B. Atorvastatin

C. Thrombolytic therapy

D. Apixaban

E. Aspirin

Correct Answer:Thrombolytic therapy

Explanation:

Large pulmonary embolisms (PEs) can cause haemodynamic instability through the obstruction of the pulmonary circulation, which ultimately leads to right ventricular failure and death if left untreated.

NICE recommends thrombolytic therapy for patients with confirmed PE and haemodynamic instability.

Direct oral anticoagulants (DOACs) such as apixaban are recommended for the acute management of a pulmonary embolism without haemodynamic instability.

Aspirin and atorvastatin have no role in the initial or ongoing management of a pulmonary embolism.

Warfarin is no longer used first-line in the long-term management of a pulmonary embolism unless a DOAC is contraindicated.

Further reading:

https://www.nice.org.uk/guidance/cg144/chapter/recommendations#treatment-2

Question:

A 69-year-old gentleman presents to his GP with nocturia, reporting having to get up to go to the toilet three times per night. He is feeling increasingly lethargic during the day due to this. Additionally, he has had one episode of passing blood in his urine a few days ago. Rectal examination reveals a hard prostate, with loss of the midline sulcus.

What is the most appropriate next step?

A. Perform a PSA blood test

B. Refer to urology under the two-week wait rule

C. Perform a urine dipstick and send a sample for microscopy and culture

D. Start the patient on Tamsulosin

E. Ask the patient to complete an IPSS (international prostate symptom score)

Correct Answer:Refer to urology under the two-week wait rule

Explanation:

The most appropriate next step is to refer this gentleman under the two-week wait rule due to the possibility of this patient having a diagnosis of prostate cancer.

Findings on digital rectal examination (DRE) suggestive of prostate cancer include a prostate that feels hard and nodular. Additional features of prostate cancer include weight loss, lethargy, lower back pain, haematuria and erectile dysfunction. Men with findings on DRE suggestive of prostate cancer require referral under the 2-week-wait rule.

A PSA blood test would be the next appropriate step in a patient with this gentleman’s symptoms had his DRE been normal. PSA is a tumour marker raised in both benign prostatic hyperplasia (BPH) and prostate cancer (however, the rise is greater in prostate cancer). There are age-specific cut-offs for what is regarded as an acceptable PSA level. Once prostate cancer is diagnosed, PSA can be useful in monitoring response to treatment.

Performing a urine dipstick and sending for microscopy and culture is part of the investigation of a patient with suspected benign prostatic hyperplasia. It is a useful screening tool for urinary tract infection and microscopic haematuria (a red flag symptom for urological cancer if persistent or not associated with a UTI).

Asking the patient to complete an IPSS score would help to guide the management of confirmed BPH. Tamsulosin is one of the treatment options available for BPH. It is a selective alpha-1 receptor antagonist which causes the bladder neck to relax increasing the ability to urinate.

Further reading:

https://www.nice.org.uk/guidance/ng12/chapter/1-Recommendations-organised-by-site-of-cancer#urological-cancers

Question:

An 8-year-old boy is brought to A&E by his mother after complaining of pain in his left hip over the last few hours; she is not sure of exactly how the injury happened, but the boy appears very unhappy and is hobbling. She wonders if he fell at school, as the hip joint now appears slightly red. The child is reported to have been otherwise well up until this point, with the exception of a recent bout of diarrhoea and vomiting which was attributed to a norovirus outbreak at school.

On examination, there is a small amount of erythema over the left hip joint, although there is a negligible temperature difference between the two sides. The patient is not keen to walk but can put weight on the affected leg. He has a temperature of 38.9 degrees, with his pulse elevated at 130bpm. The doctor notes a number of partially healed cuts and grazes over the boy's arms and legs, he and his mother both inform you that these are from playing football, and the injuries are in keeping with this.

The doctor is concerned about the boy's presentation and orders a number of investigations. An X-ray of the hip is booked, but there is a backlog of requests and the results of blood tests taken in triage return before this. These show the following:

Haemoglobin - 139 g/L

MCV - 89 fL

WBC - 13 x109/L

Platelets - 450 x109/L

ESR - 54 mg/L

Given the likely diagnosis, which of the following is most likely to represent the pathophysiology underlying the condition?

A. Reduced levels of Factor VIII, resulting in deficient secondary haemostasis

B. Haematogenous spread of bacterial infection from a distant site

C. HLA-B27 mediated autoimmune response, causing localised inflammation

D. Non-specific inflammation within the synovial lining of the joint

E. Contiguous spread of infection

Correct Answer:Haematogenous spread of bacterial infection from a distant site

Explanation:

A hot, swollen joint is a commonly encountered clinical dilemma in a hospital setting. With the history provided in this scenario, a septic joint is an essential diagnosis to exclude, however, there is a significant overlap with the features experienced in transient synovitis; a self-limiting infection that often follows a viral infection. In scenarios such as this where there is diagnostic doubt, the Kocher criteria can be beneficial. This is a 4-point checklist, consisting of the following:

Non-weight-bearing on the affected side

Erythrocyte sedimentation rate > 40

Fever > 38.5 °C

White blood cell count > 12,000

The presence of 3 or more of these features corresponds to a 93% probability that septic arthritis is present. Whilst this boy is able to weight-bear, he meets the other 3 criteria, and it is therefore likely that his presentation is due to septic arthritis. Transient synovitis is still a possibility, but the approach to investigation and management should be of a septic presentation, with blood cultures, joint aspiration and IV antibiotics all important.

Septic arthritis most commonly arises due to the haematogenous spread of bacterial infection from a distant site; this is particularly common in children with the condition. In this setting, it is feasible that one of the wounds suffered by the child playing football allowed for the entry of bacteria, with later spread and involvement of a joint. Contiguous spread of infection (a direct spread from nearby structures) is another possible pathophysiological mechanism; however, this is far less common. Osteomyelitis and septic bursitis would be examples of initial infections that could progress to septic arthritis if untreated; given the short history, this is unlikely to be the mechanism of disease in this scenario.

Non-specific inflammation within the synovial lining of the joint refers to the aetiology of transient synovitis, although the exact pathophysiology is unknown. As previously discussed, this is not the most likely diagnosis in this child.

HLA-B27 mediated autoimmune response, causing localised inflammation is the mechanism of reactive arthritis, whilst reduced levels of Factor VIII, resulting in deficient secondary haemostasis would be present in haemophilia A. Given the blood results supporting infective pathology, neither is likely in this case.

Further reading:

https://www.orthobullets.com/pediatrics/4032/hip-septic-arthritis--pediatric

Question:

A 50-year-old female presents to A&E with a 1-day history of sudden onset epigastric pain radiating to the back. She is unable to eat or drink. She states that she does occasionally experience some right upper quadrant pain but this pain is worse. Her pain is improved when she leans forward and is worsened on deep inspiration.

She has a past medical history of episodic right upper quadrant pain and attended hospital for an ultrasound scan of her abdomen last week. She was informed that based on the scan results she would receive an outpatient clinic appointment with the surgeon, as the scan had demonstrated that she had gallstones.

On examination, she is jaundiced and uncomfortable. She has a BMI of 26. Her heart rate is 102bpm and blood pressure 110/90mmHg. She is tender on palpation of the epigastric region, and on examination of the chest, there is reduced air entry and a dull percussion note in the base of the right lung.

Blood tests demonstrate an amylase of 450U/L, white cell count of 16x109/L and CRP of 250U/L. Liver function tests reveal an ALT of 80IU/L. An abdominal ultrasound scan is requested.

What is the most likely diagnosis in this patient?

A. Biliary colic

B. Chronic pancreatitis

C. Acute pancreatitis

D. Peptic ulcer disease

E. Acute cholecystitis

Correct Answer:Acute pancreatitis

Explanation:

The most likely diagnosis in this patient is acute pancreatitis, most likely due to gallstones. Epigastric pain radiating to the back, in combination with nausea and anorexia, is typical of pancreatitis. Her past medical history is suggestive of biliary colic, and the outpatient ultrasound scan that she previously had presumably demonstrated gallstones (and hence surgical discussion regarding cholecystectomy would be appropriate given her episodic right upper quadrant pain).

Although chronic pancreatitis has similar presenting symptoms and signs, this appears to be the first episode of pancreatitis.

Biliary colic appears to explain her previous episodic right upper quadrant pain but does not explain the new-onset symptoms or the significantly elevated amylase, which are consistent with acute pancreatitis. This is also not a typical presentation for acute cholecystitis.

Peptic ulcer disease can cause gnawing epigastric pain and is typically associated with a history of NSAID use. The elevated LFTs and amylase are not in keeping with a diagnosis of peptic ulcer disease.

Further reading:

https://patient.info/doctor/acute-pancreatitis-pro

Question:

A 28-year-old was referred to the gynaecology outpatient clinic. She complains of cyclical pelvic pain, menorrhagia, dysmenorrhoea and dyspareunia. She gets some mild relief with paracetamol and naproxen, but despite treatment, the pain is continuing to affect her ability to function each day. She has no pain on defecation or urination. She had a recent STI screen which was negative and she has no significant past medical history.

Bimanual vaginal examination reveals generalised tenderness of the uterus and palpable nodules the uterosacral ligaments. A laparoscopy confirms the diagnosis.

Management options are discussed, with the patient stating that she cannot cope with continuing to manage the condition with simple analgesia. She explains that she is not wanting to get pregnant in the near future.

Which of the following is the next most appropriate management option according to NICE?

A. GnRH analogue

B. Hysterectomy with salpingo-oophorectomy

C. Morphine sulfate modified relief tablets

D. Combined oral contraceptive pill (COCP)

E. Copper coil

Correct Answer:Combined oral contraceptive pill (COCP)

Explanation:

This patient most likely has a diagnosis of endometriosis given the history of cyclical pelvic pain, dysmenorrhoea and dyspareunia. First-line treatment options for endometriosis include NSAIDs and paracetamol, which this patient has already tried, with limited success.

The next most appropriate management step would include a 3-6 month trial of hormonal contraception such as:

Combined oral contraceptive pill (COCP)

Progesterone only pill (POP)

Depo-Provera or Sayana Press (depot administered progesterone)

Mirena coil

A copper coil is not indicated for endometriosis and it has no hormonal component to reduce symptoms. A copper coil may worsen menorrhagia and dysmenorrhea.

Morphine sulfate modified relief tablets would be inappropriate to prescribe, given the significant side effects associated with strong opiates and their limited efficacy in the context of endometriosis.

A GnRH analogue could be considered as a third-line treatment in secondary care, in combination with add-back hormone replacement therapy.

Hysterectomy with salpingo-oophorectomy is reserved as a last resort for women with severe symptoms unresponsive to other therapies.

Further reading:

https://patient.info/doctor/endometriosis-pro

Question:

A 67-year-old woman presents to the emergency department with a three-day history of constant left iliac fossa pain, diarrhoea and blood in the stool. She feels feverish and has vomited once.

His observations are:

Oxygen saturation: 98% on room air

Respiratory rate: 22 breaths per minute

Heart rate: 90 beats per minute

Blood pressure: 124/84 mmHg

Temperature: 38.6 °C

A CT abdomen with contrast reveals diverticulosis, peri-colic fat stranding, a thickened gut wall and a 4cm pericolic abscess.

Initial treatment with IV fluids and nil by mouth have been started.

What is the most appropriate next step in her treatment?

A. Paracetamol and safety netting advice

B. Sigmoid colectomy with primary anastomosis

C. IV antibiotics and percutaneous drainage

D. Hartmann’s procedure

E. Oral antibiotics and safety netting advice

Correct Answer:IV antibiotics and percutaneous drainage

Explanation:

Any pericolic abscess greater than 3cm should be treated with IV antibiotics and percutaneous drainage or, if this is not anatomically feasible, surgery.

Paracetamol and safety netting advice is used in the management of simple diverticulitis in a systemically well patient, it is not suitable for managing pericolic abscesses.

Oral antibiotics are used in the management of abscesses less than 3cm; IV antibiotics should be used if the abscess is greater than 3cm. Therefore, oral antibiotics and safety netting advice is incorrect.

A Hartmann’s procedure and a sigmoid colectomy with primary anastomosis are used to manage complicated diverticulitis that has resulted in a perforation and peritonitis. As this patient has only a pericolic abscess, IV antibiotics and percutaneous drainage are the most appropriate next step.

Further reading:

https://www.nice.org.uk/guidance/ng147/chapter/Recommendations#acute-diverticulitis

Question:

A 61-year-old gentleman presents to A&E with an acutely painful and swollen right knee. He describes a one-day history of pain in his right knee, associated swelling, tenderness and pain on movement. Aspiration of synovial fluid demonstrates intracellular, rhomboid-shaped, weakly positively birefringent crystals.

What is the most likely diagnosis?

A. Pseudogout

B. Septic arthritis

C. Gout

D. Osteoarthritis

E. Rheumatoid arthritis

Correct Answer:Pseudogout

Explanation:

Pseudogout is an inflammation of joints caused by the deposition of calcium pyrophosphate (CPP) crystals in the articular and periarticular tissues. It typically presents as acute monoarticular arthritis in the knee joint, however it can potentially affect any joint. Affected joints become acutely inflamed, with associated swelling, pain and effusion. Non-surprisingly, the presentation of pseudogout is very similar to that of gout and therefore joint fluid analysis is important in differentiating the conditions. Synovial fluid analysis from a patient with pseudogout shows intracellular, rhomboid-shaped, weakly positively birefringent crystals.

Pseudogout has many potential precipitants including dehydration, intercurrent illness, hyperparathyroidism and hypothyroidism. There is no specific treatment for pseudogout, with management strategies instead focusing on symptom control and removal of potential underlying causes.

Commonly used treatments for pseudogout include:

NSAIDs

Ice packs

Intra-articular steroid injections

Colchicine

Pseudogout can be difficult to differentiate from septic arthritis clinically, as both can feature a warm, hot, swollen joint. However, the findings on synovial fluid analysis make a diagnosis of pseudogout much more likely. There is the possibility that patients may present with dual pathology and therefore if there is any concern of septic arthritis, it should be treated empirically whilst synovial cultures are awaited.

Gout can also be very difficult to differentiate from pseudogout clinically, however synovial fluid analysis in gout would normally reveal monosodium urate deposition, characterised by needle-shaped intracellular and extracellular negatively birefringent crystals.

Further reading:

https://patient.info/doctor/calcium-pyrophosphate-deposition-including-pseudogout-pro#nav-1

Question:

A 64-year-old man presents to his general practitioner with swollen legs, ascites and easy bruising. He has a history of type 2 diabetes, hypertension and hypertriglyceridaemia. His body mass index (BMI) is 31. He has raised liver enzymes, and a liver biopsy shows regenerating nodules of hepatocytes surrounded by fibrosis. The hepatocytes also show prominent macrovesicular steatosis.

What is the most likely diagnosis?

A. Haemochromatosis

B. Primary biliary cirrhosis

C. Non-alcoholic liver disease

D. Alcoholic liver disease

E. Viral hepatitis

Correct Answer:Non-alcoholic liver disease

Explanation:

The most likely diagnosis is non-alcoholic fatty liver disease (NAFLD). In this scenario, this man has multiple cardiometabolic risk factors which predispose him to the development of NAFLD, including type 2 diabetes, hypertension, hyperlipidemia and a high BMI. Collectively, these factors drive the stepwise progression of NAFLD through stages of increasing clinical severity: first to non-alcoholic steatohepatitis (NASH), followed by early fibrosis, and then eventually leading to advanced scarring (cirrhosis) and liver failure.

Most patients with NAFLD present asymptomatically, with deranged liver function tests (classically raised bilirubin and raised liver enzymes ALT and AST with increased ALT:AST ratio) often picked up incidentally on routine blood testing. Such patients then undergo routine non-invasive liver screening to assess for an underlying cause of liver pathology. Unfortunately, this gentleman has presented with clear signs of advanced liver disease: he has evidence of leg swelling (caused by reduced hepatic synthesis of albumin, which maintains intravascular volume), easy bruising (caused by impaired hepatic synthesis of clotting factors and insufficient thrombopoietin production resulting in reduced platelet synthesis), and ascites (arising from a combination of hypoalbuminaemia and portal hypertension). These findings, when paired with the liver biopsy results, strongly indicate the progression of NAFLD to liver cirrhosis.

Typically, the most common causes of liver cirrhosis include alcohol excess and viral hepatitis (B or C infection). However, there is no history to suggest alcohol excess in this case, making a diagnosis of alcoholic liver disease less likely. Similarly, the absence of key risk factors, including unprotected sexual intercourse with an infected partner, needlestick injuries and a history of previous blood transfusions, make viral hepatitis an unlikely cause of this patient’s liver failure.

Haemochromatosis is a far less common cause of liver cirrhosis and often presents much earlier (typically around age 40) when iron overload, the primary underlying pathology, eventually becomes symptomatic. Liver biopsy with Perl’s stain can be helpful in establishing iron deposition in the liver parenchyma. However, genetic testing for HFE gene defects (most commonly C282Y mutation) is the gold-standard for definitive diagnosis.

Cirrhosis is often a late feature of primary biliary cirrhosis, but lymphocytic infiltrates and often also granulomas are more commonly found on liver biopsy. Anti-mitochondrial antibodies present in the serum of more than 90% of patients are key to establishing the diagnosis.

Further reading:

https://www.bsg.org.uk/web-education-articles-list/nafld-diagnosis-assessment-and-management/

Question:

A 62-year-old woman presents to the A&E department with an acutely painful left eye. The pain began 4-hours ago. Over this time, the pain has spread around her eye, also causing her a headache. In the left eye, she reports blurred vision and bright coloured circles when she looks at lights.

She has no significant past medical history.

On examination, the left eye is red. The cornea appears oedematous, and the pupils are fixed and semi-dilated. Tonometry reveals intraocular pressure to be 34 mmHg.

Which of the following investigations should be performed first to help confirm the diagnosis?

A. Dilated fundoscopy

B. Ultrasound biomicroscopy

C. CT orbit

D. MRI orbit

E. Gonioscopy

Correct Answer:Gonioscopy

Explanation:

The most likely diagnosis is acute angle-closure glaucoma (AACG). A sight-threatening condition that requires an emergency referral to ophthalmology for further assessment and management. The most relevant investigations in AACG include gonioscopy and tonometry. Gonioscopy is considered the gold standard investigation for assessing the angle between the iris and the cornea (iridocorneal angle) and is the definitive test for diagnosing angle-closure. In patients with AACG, the trabecular meshwork is not visible due to contact with the peripheral iris. Gonioscopy must be performed on both eyes in all patients with suspected AACG, as the other eye is considered high risk.

Dilated fundoscopy enables visualisation of the fundus of the eye, allowing assessment of the retina, optic disc and macula. Fundoscopy may be required in the follow-up of AACG to assess the effect on the optic disc and nerve fibres; however, it is not suitable for assessing the anterior-chamber and iridocorneal angle. Therefore, fundoscopy would not be an appropriate initial investigation to confirm the diagnosis. Furthermore, visualising the retina through the oedematous cornea in the acute stages would be challenging and using pupillary dilation medication could worsen the angle-closure, further increasing intraocular pressure.

CT orbit and MRI orbit are not commonly indicated in the assessment of AACG. These imaging modalities have a limited capacity in delineating and quantifying the small alterations of anterior-segment structures.

If a clinician is uncertain about the findings from gonioscopy, a patient should be investigated further with ultrasound biomicroscopy. This investigation allows accurate visualisation of the anterior chamber of the iridocorneal angle; however, it is time-consuming and therefore should only be performed after gonioscopy has been attempted and the results are unclear.

Further reading:

https://cks.nice.org.uk/topics/glaucoma/

Question:

A 2-year-old child is brought to A&E via ambulance with a sudden onset of breathlessness and a loud, harsh, high pitched sound on inspiration. Her Mum tells you she was playing with her sister at the time and is usually fit and well with no past medical history. On examination, she is afebrile but visibly short of breath with loud inspiratory stridor.

What is the most likely diagnosis?

A. Laryngeal web

B. Viral laryngotracheobronchitis (croup)

C. Epiglottitis

D. Peritonsillar abscess

E. Inhaled foreign body

Correct Answer:Inhaled foreign body

Explanation:

Stridor is a harsh noise made by air being forced through narrowed upper airways. The age of the child, duration of stridor and presence of any associated symptoms help narrow down differential diagnoses.

The most likely diagnosis is an inhaled foreign body given the sudden development of shortness of breath and stridor with no other associated symptoms or past medical history. The object is most commonly a small toy or food. Parents may recall a recent choking episode and the child may complain of pain in some cases.

Croup is a common infective cause of acute stridor in children aged between 6 weeks and 6 months. Generally, a several day history of upper respiratory tract symptoms precedes a low-grade fever associated with a barking cough and inspiratory stridor. Symptoms are characteristically worse at night and are aggravated by agitation and crying.

Peritonsillar abscess (quinsy) is more common in older children and adolescents with pharyngitis. It typically presents with fever and chills and a hoarse or muffled voice. There may be varying degrees of stridor as well as ear pain.

Epiglottitis is a rare cause of acute stridor. Historically most cases were caused by Haemophilus influenza. The occurrence of epiglottitis has reduced dramatically over recent years by the introduction of the Hib vaccine. Epiglottitis classically presents as a sore throat associated with high fever, drooling and a muffled "hot potato" voice. If the vocal cords are inflamed, the pitch of the voice may change. There is generally not an associated cough however stridor may be present.

A laryngeal web is a congenital abnormality resulting from the failure of the embryonic airway to recanalise. This can result in chronic stridor which usually presents at birth or soon after.

Further reading:

https://patient.info/doctor/choking-and-foreign-body-airway-obstruction-fbao

Question:

A 63-year-old female presents to eye casualty following a sudden painless loss of vision in her left eye. She describes seeing flashing lights and floaters the previous day. She is bilaterally myopic with a prescription of -8. She has no medical conditions and uses no regular medications or eye drops. Her mother had an emergency eye operation in her 60s, but she does not know what this was for.

On examination, her visual acuity (with glasses) is 6/9 in her right eye and hand movements in her left eye. Her left peripheral field examination is reduced. A slit lamp examination confirms the suspected pathology.

What is the most likely cause of her vision loss?

A. Acute angle closure glaucoma

B. Vitreous haemorrhage

C. Cataract

D. Retinal detachment

E. Central Retinal artery occlusion

Correct Answer:Retinal detachment

Explanation:

This patient has sudden and painless vision loss, on a background of flashers and floaters, making retinal detachment the most likely cause of her vision loss. Retinal detachment often presents with progressive visual field loss, from the periphery to the centre and may be described as a progressive shadow/curtain coming down. New onset of floaters and flashers is common as pigment cells enter the vitreous space and there is increased traction on the retina, stimulating the photoreceptors into perceiving flashes. She has significant myopia and potential family history, which also put her at an increased risk for this diagnosis.

Retinal detachment occurs when the retina separates from the choroid underneath. Separation, often due to a tear, causes vitreous fluid to move under the retina and fill the space between the retina and the choroid. The outer retina relies on the blood vessels of the choroid to provide blood, making this a sight-threatening emergency. Myopia of -8 is a key risk factor that this patient exhibits for retinal detachment. An eye with a myopia of -7 or greater is at increased risk of vitreous traction on to the retina due to its longer length. Other risk factors for retinal detachment include previous retinal break/detachment, previous intraocular surgery, head or ocular trauma, increasing age and family history. Around 1 in 10, 000 people are affected by retinal detachment each year in the UK, and there is an approximately 1 in 300-lifetime risk. Outcomes are usually worse if there is macular involvement which is generally indicated by worse central visual acuity.

Retinal detachment is managed as an ocular emergency, and there are several treatment options. Laser therapy or cryotherapy can be used to create an adhesion between the retina and the choroid. A vitrectomy removes some vitreous body which is then replaced with oil/gas to promote reattachment of the retina. In pneumatic retinopexy, a gas bubble is injected into the vitreous body and positioned to push the retina against the choroid and promote reattachment. A scleral buckle (use of a silicone buckle to put pressure on the sclera) can also be used to bring the retina and choroid into contact and encourage reattachment.

Central retinal artery occlusion is a cause of sudden, painless one-sided visual loss and relevant afferent pupillary defect. It is caused by the blockage of blood to the retina of the affected eye. It classically presents with a cherry red spot and a pale retina on slit lamp examination. Smoking and hypertension are two of the most common risk factors, and causes include thromboembolism and arteritis.

Vitreous haemorrhage is the most common cause of painless acute vision loss. It is caused by bleeding into the vitreous humour. The most common causes are proliferative diabetic retinopathy, posterior vitreous detachment and ocular trauma. Common presenting complaints include painless visual loss and a red hue to the vision. Depending on the extent of the haemorrhage, there may be decreased visual acuity and visual fields.

Acute angle closure glaucoma is a painful cause of vision loss that results in a semi-dilated and non-reactive pupil, often alongside systemic upset. It is often caused by a pupillary block: pupillary margin adhering itself to the lens, preventing outflow of aqueous humour via the usual drainage channels. This causes an acute increase in ocular pressure and results in optic nerve damage. Patients commonly complain of a severe ache in the eye, seeing haloes around lights and having worse symptoms in a dark room (as this causes the pupil to dilate). Risk factors include hypermetropia, family history and increasing age.

A cataract is a common eye condition where the lens of the eye gradually opacifies. The opacification (cloudiness) makes it difficult for light to reach the retina and causes reduced/blurred vision. Cataracts are often caused by normal ageing but can be made worse by smoking and alcohol, diabetes mellitus and trauma. They generally have a more gradual onset and present with reduced vision and colour vision, glare and a defect in the red reflex. Cataracts can be seen on slit lamp examination.

Further reading:

https://geekymedics.com/sudden-painless-loss-of-vision/

Question:

A 69-year-old woman is admitted to hospital with a 3-day history of cough and shortness of breath. She looks unwell, is tachycardic and hypoxic, and has clinical and radiological signs of left lower lobe consolidation. Her inflammatory markers demonstrate the following:

Result Reference Range

CRP 149 mg/L (< 5)

White cell count (WCC) 17 x 109/L (3.6 – 11.0)

She is started on empirical treatment with co-amoxiclav and clarithromycin for severe community-acquired pneumonia, and her clinical condition improves over the next few days. However, on the fifth day of her admission, she becomes more unwell and develops profuse foul-smelling, non-bloody, mucoid diarrhoea accompanied by crampy abdominal pain.

What is the most appropriate next course of action?

A. Forbid the use of further antibiotics

B. Take a stool sample for microbiological culture

C. Take a stool sample for Clostridium difficile toxin

D. Close the ward to admissions for presumed Norovirus

E. Report her illness to hospital catering

Correct Answer:Take a stool sample for Clostridium difficile toxin

Explanation:

The most appropriate next course of action for this patient would be to take a stool sample for Clostridium difficile toxin. All antibiotics can cause diarrhoea – or at least looser stool than normal – due to effects on normal gastrointestinal commensal flora. Severe diarrhoea may occur if disruption of the commensal flora allows a particular bacterium, Clostridium difficile, to flourish in the ecological niche created by killing its competitors. In severe cases, this may cause pseudomembranous colitis which can (if not treated appropriately) progress to toxic megacolon, perforation and death. In general, the broader spectrum the antibiotic, the greater the risk of Clostridium difficile-associated diarrhoea (CDAD). Other risk factors include age, comorbidity, drugs, and hospital exposure (i.e. risk of having been colonised by C. difficile). CDAD does not usually cause vomiting, although vomiting may occur in sick patients for several reasons (including medications).

Close the ward to admissions for presumed Norovirus is incorrect as this scenario is not typical of a Norovirus outbreak where there are usually several patients with the symptoms (due to high infectivity), and vomiting is typically prominent. Symptoms usually resolve spontaneously over a few days.

Reporting her illness to hospital catering is incorrect as although food-borne pathogens acquired from hospital food can never be 100% excluded, the risk of this is much smaller than CDAD, given the clinical context.

Taking a stool sample for microbiological culture is certainly not unreasonable and would most likely be done in routine clinical practice; however, the clinical context including the offensive smelling stool together with administration of broad-spectrum antibiotic therapy in the form of co-amoxiclav and clarithromycin (both of which increase the risk of C. difficile infection) warrants further investigation for C. difficile to confirm or exclude this as a possible diagnosis.

Forbid the use of further antibiotics is incorrect. Whilst it would be sensible to withhold co-amoxiclav and clarithromycin which are the likely causes of C. difficile in this patient, a confirmed diagnosis of C. difficile (subject to a positive stool Clostridium antigen test) would necessitate immediate treatment with alternative antibiotic therapy – the first-line agent being vancomycin.

Further reading:

https://www.nice.org.uk/guidance/NG199

Question:

A 75-year-old woman is brought to the emergency department after being found confused at home. A collateral history is gained from her son, who reports that for the past month the patient has complained of worsening lethargy, nausea, and malaise. The patient also reports that they experienced an episode of hemoptysis two days ago.

Her past medical history is significant for asthma, and she has a 25-pack-year smoking history.

On examination, the patient’s GCS is 14/15 (E4, M5, V5). A respiratory examination is normal except for the presence of digital clubbing. Vital signs are ordinary except for a respiratory rate of 26 breaths per minute.

Investigations are performed:

Urea and electrolytes Result Normal range

Na+ 127 mmol/L 133-146

K+ 4.1 mmol/L 3.5-5.3

Ca2+ 2.4 mmol/L 2.2-2.6

Mg2+ 0.9 mmol/L 0.7-1.0

Chloride 102 mmol/L 98-106

Urea 7.5 mmol/L 2.5-7.8

Creatinine 65 mmol/L 45-84

What is the most likely underlying diagnosis?

A. Pulmonary embolism

B. Diabetes insipidus

C. Asthma exacerbation

D. Small cell lung cancer

E. Pneumonia

Correct Answer:Small cell lung cancer

Explanation:

Small cell lung cancers can secrete antidiuretic hormone (ADH), which leads patients to present with symptoms of syndrome of inappropriate ADH secretion (SIADH). This leads to hyponatraemia, which has a varied presentation but often includes symptoms such as lethargy, nausea, muscle weakness and confusion. Urine osmolality would be expected to be high in patients with SIADH, due to increased concentration of sodium ions in the urine. Also, the presence of digital clubbing is associated with lung cancer.

Pituitary gland dysfunction can lead to inappropriately low levels of ADH secretion, causing the development of diabetes insipidus. Patients with this condition would be expected to have an extremely high urine output, and due to fluid loss are more likely to present with hypernatremia rather than hyponatremia.

An asthma exacerbation may be considered given the presentation of dyspnea. However, asthma is generally not associated with haemoptysis or confusion, and would not account for the hyponatraemia in this case

Pneumonia can be associated with lethargy, confusion and an increased respiratory rate. However, pneumonia also typically presents with a fever as well as crackles on auscultation of the lung fields on respiratory examination.

Patients with a pulmonary embolism may also present with haemoptysis and dyspnea, but these symptoms are usually sudden-onset in nature and not associated with the development of hyponatraemia.

Further reading:

https://geekymedics.com/syndrome-of-inappropriate-antidiuretic-hormone-secretion-siadh/

Question:

A 30-year-old female presents to her general practitioner (GP) with a four-day history of a painful and red left breast. Since the birth of her first son five weeks ago, she has been exclusively breastfeeding. The patient denies fever or chills. She does not have other medical problems.

Physical examination reveals a warm, erythematous and tender left breast with no signs of masses or purulent discharge.

What is the most appropriate management plan for this patient?

A. Oral antibiotics and continuation of breast feeding

B. Oral anti-fungal agent

C. Oral antibiotics and cessation of breast feeding

D. Ultrasound of left breast

E. Non-steroidal anti-inflammatories (NSAIDs)

Correct Answer:Oral antibiotics and continuation of breast feeding

Explanation:

The patient above is suffering from infective lactational mastitis – a common condition that typically affects women in the first 3 months of breastfeeding. Initially, milk engorgement occurs due to poor milk drainage (likely due to nipple trauma), followed by milk stasis and infection. Clinical features include breast redness, tenderness, warmth, and systemic complaints may also be present (fever, chills and malaise). Most cases are caused by Staphylococcus aureus, and therefore, an oral antibiotic such as flucloxacillin for 10-14 days is indicated. NICE recommends prescribing antibiotics if the patient has a nipple fissure that is infected, symptoms have not improved (or are worsening) after 12–24 hours despite effective milk removal, and/or breast milk culture is positive. Women are advised to continue breastfeeding and complete the antibiotic course.

Women are advised to continue breastfeeding as this facilitates milk drainage. Cessation of breastfeeds is likely to lead to further milk stasis.

NSAIDs are an appropriate treatment for a plugged duct. Given the presence of erythema, warmth and pain, an underlying infectious process is more likely and therefore, oral antibiotics are indicated.

Ultrasound of the left breast would be indicated if a breast abscess was likely to be causing the above symptoms. The physical examination, however, was not remarkable for a tender fluctuant mass which would be more indicative of an abscess.

Although fungal infections can often coincide with lactational mastitis, there are no clinical features of this in the above question stem and therefore an anti-fungal agent is not indicated.

Further reading:

https://patient.info/doctor/puerperal-mastitis

Question:

A 23-year-old woman presents to the emergency department with severe shortness of breath. She reports being increasingly short of breath over the last day and she is now struggling to complete sentences. She has a past medical history of asthma.

Clinical examination reveals the following:

Respiratory rate 35/min

SpO2 94% on room air

Heart rate 140 bpm

Blood pressure 95/52 mmHg

She has been treated with oxygen, nebulised salbutamol, nebulised ipratropium and IV hydrocortisone. Although she has improved slightly she remains short of breath with significant wheeze.

What would be the most appropriate next management step?

A. IV aminophylline

B. Non-invasive ventilation

C. IV ketamine

D. IV magnesium sulphate

E. IV adrenaline

Correct Answer:IV magnesium sulphate

Explanation:

This patient is experiencing a severe exacerbation of asthma. All of these options are potential treatments for severe acute asthma, however, IV magnesium sulphate is the most appropriate and the only one listed in the BTS/SIGN 2019 guidelines.

IV aminophylline, although commonly used in practice, has a significant side effect profile and has been shown in a Cochrane review to cause more harm than benefit.

The use of non-invasive ventilation, IV ketamine or IV adrenaline should only be initiated under expert supervision and usually in a critical care environment.

Further reading:

https://www.brit-thoracic.org.uk/quality-improvement/guidelines/asthma/

Question:

A 29-year-old woman with a history of inflammatory bowel disease presents to the emergency department with diarrhoea. She is passing seven bowel motions a day with small amounts of blood in the stool.

Her observations are as follows:

Oxygen saturation: 98% on room air

Respiratory rate: 20 breaths per minute

Heart rate: 92 beats per minute

Blood pressure: 122/81 mmHg

Temperature: 38 °C

IV hydrocortisone is administered.

What is the most appropriate maintenance therapy?

A. Mesalazine

B. Ciclosporin

C. Infliximab

D. Oral prednisolone

E. Azathioprine

Correct Answer:Azathioprine

Explanation:

This patient is experiencing a severe flare of ulcerative colitis, according to Truelove and Witt’s criteria. Features that indicate this is a severe flare include passing >6 bowel motions a day, heart rate >90 beats per minute and temperature >37.8 °C. The most appropriate maintenance therapy for ulcerative colitis following a severe flare is azathioprine or mercaptopurine. If this fails, anti-TNF agents like infliximab may be considered.

Mesalazine is used to induce remission and as maintenance therapy in mild to moderate flares of ulcerative colitis.

Oral prednisolone is used to induce remission during mild to moderate flares of ulcerative colitis. It is not used as maintenance therapy.

Ciclosporin is used as rescue therapy during severe flares of ulcerative colitis if there is no response to IV hydrocortisone. It is not used as maintenance therapy.

Further reading:

https://geekymedics.com/ulcerative-colitis-uc/

Question:

A 35-year-old woman G5P5 presents with heavy, irregular menstrual bleeding, postcoital bleeding, dyspareunia, and non-radiating right flank pain. On examination, she is afebrile and apprehensive. She has a history of chlamydial infection. There is no history of routine cervical smear screening. Transvaginal ultrasound shows a hypoechoic vascular mass in the cervix, which extends into the parametrium and endocervical canal. MRI scan demonstrates a cervical mass lesion with poorly defined margins.

White cell count: 10 x 109/L (3.6 – 11.0).

What is the most likely cause of the right flank pain?

A. Pyelonephritis

B. Hydronephrosis

C. Renal infarction

D. Ureteric calculus

E. Renal abscess

Correct Answer:Hydronephrosis

Explanation:

The cause of right flank pain is secondary to compression of the distal ureter by a cervical malignant mass, causing right-sided hydronephrosis. The signs and symptoms mentioned in the question are consistent with cervical cancer. Usually, patients are asymptomatic in the early stages and develop symptoms later in the course of the disease. The most common early symptoms are the following:

Abnormal vaginal bleeding: irregular vaginal bleeding, heavy, irregular menstrual bleeding and postcoital spotting

Abnormal vaginal discharge: blood-stained/purulent, foul-smelling discharge (not necessarily accompanied by pruritus)

Dyspareunia

Pelvic pain

Late symptoms include hydronephrosis, lymphoedema’, and fistula formation.

Ureteric calculus is a major cause of typical colicky flank pain which radiates anteriorly to the groin; it can also result in hydronephrosis, but it is not the likely cause here as the pain is non-radiating and findings are suggestive of a cervical mass.

Pyelonephritis is an infection of the renal pelvis and parenchyma that is usually associated with an ascending bacterial infection of the urinary bladder. Clinical features include fever (this patient is afebrile as mentioned in the stem) with chills and dysuria. However, these symptoms are not among the presenting complaints of this patient.

Renal abscess mostly results as a complication of urinary tract infections, and is less likely in this case due to the lack of fever with chills, dysuria and a raised white cell count.

Renal infarction causes flank pain as the compromised blood supply results in necrosis of the renal parenchyma. Clinical features include fever and flank pain with associated hypertension. Laboratory findings include leucocytosis and raised creatinine. Given the findings of the cervical lesion and no specific risk factor for renal infarction, it is not the likely cause in this case scenario.

Further reading:

https://www.nice.org.uk/guidance/conditions-and-diseases/cancer/cervical-cancer

Question:

A 23-year-old woman presents to GP with a 3-week history of vaginal discharge and pelvic pain following unprotected sex with a new male partner. She is taking the combined oral contraceptive pill and has no significant past medical history.

Vital signs are normal and abdominal examination is unremarkable. Speculum examination reveals an inflamed cervix with thick green mucopurulent discharge. There is no evidence of cervical excitation. A pregnancy test is negative.

Her GP suspects a sexually transmitted infection and suggests she attends a genitourinary medicine (GUM) clinic, but she is unwilling to do this.

What is the most appropriate next step in the management of this patient?

A. Transvaginal ultrasound scan

B. High vaginal swab and nucleic acid amplification test (NAAT)

C. Referral to A&E

D. Azithromycin 2g orally (single dose)

E. Ceftriaxone 1g intramuscular injection (single dose)

Correct Answer:High vaginal swab and nucleic acid amplification test (NAAT)

Explanation:

In this patient with thick green mucopurulent vaginal discharge, the most likely diagnosis is gonorrhoea. All cases of suspected uncomplicated gonorrhoea must be investigated in the first instance with a high vaginal swab and nucleic acid amplification test (NAAT). Ideally, investigation and treatment would be in carried out in a genitourinary medicine (GUM) clinic, but if the patient refuses, it is reasonable to investigate and treat in primary care.

A transvaginal ultrasound scan would be unlikely to add anything to the management of this patient.

Ceftriaxone 1g intramuscular injection (single dose) is used as first-line treatment for gonorrhoea, but this would typically only be prescribed once the diagnosis is confirmed by NAAT.

Azithromycin 2g orally (single dose) is an alternative treatment for gonorrhoea, once the diagnosis is confirmed by NAAT.

Further reading:

https://cks.nice.org.uk/topics/gonorrhoea/management/management/

Question:

A 34-year-old man is referred to a respiratory clinic with a history of shortness of breath. Over the last 6 months, he has noticed intermittent shortness of breath with wheeze and nocturnal cough. He has a past medical history of eczema.

Which of the following would be the most useful next step in confirming the diagnosis?

A. Chest X-ray

B. Echocardiogram

C. Fractional exhaled nitric oxide (FeNO) testing

D. Measurement of peak expiratory flow rate in clinic

E. 6 week course of inhaled steroids

Correct Answer:Fractional exhaled nitric oxide (FeNO) testing

Explanation:

This man has symptoms highly suggestive of asthma. NICE is now recommending objective testing with spirometry, peak expiratory flow measurement (diary) or FeNO for most people (aged over 5) with suspected asthma. FeNO tests measure the levels of nitric oxide in the breath, with increased levels being associated with lung inflammation).

A 6 week trial of inhaled corticosteroids may be considered as a management option, however, this would not be the most appropriate method of confirming a diagnosis of asthma.

A single assessment of peak expiratory flow rate in the respiratory clinic would not be sufficient to diagnose asthma, however, a peak expiratory flow rate diary kept for a few weeks would be sufficient.

A chest X-ray would likely be normal outside of an acute asthma exacerbation.

Given his age and his symptoms, heart failure is much less likely and so an echocardiogram is likely to be normal.

Further reading:

https://www.nice.org.uk/guidance/ng80/chapter/Recommendations#initial-clinical-assessment

Question:

A 24-year-old student attends the gastrointestinal clinic for a follow-up for his Crohn’s disease, which was diagnosed 2 years ago. He is now managed on azathioprine and has had relatively few acute episodes since. However, he has suffered from increasing anal pain over the past few weeks.

On examination, there is an abnormal external opening on the perineum, from which purulent discharge is emerging. A fistula is suspected.

What rule may be used to determine the path of the fistula?

A. Naegele’s rule

B. Goodsall’s rule

C. Leibermeister’s rule

D. Monro-Kellie doctrine

E. Parkland rule

Correct Answer:Goodsall’s rule

Explanation:

Goodsall's rule can be used to project the trajectory of the tract of an anal fistula; the location of the external opening in relation to the transabdominal line is the key information required:

Opening posterior to the transverse anal line - the tract will have a curved course towards the posterior midline

Opening anterior to the transverse anal line - the tract will have a straight course towards the pectinate line

MRI is usually used to confirm the path of the fistula and management is principally surgical. Fistulotomy can be used to lay the tract open to allow healing, or a seton may be used to close the tract.

Parkland's formula (rather than 'rule') is used to calculate the fluid requirements of an individual who has suffered severe burns. The calculation of the total involves:

4ml x weight (kg) x % surface area affected by burns.

Half of this total should be given over the first 8 hours, with the remainder given over the following 16 hours.

Naegele's rule is used to estimate a woman's delivery date, assuming the classic 280-day gestational period. It involves adding 9 months and 7 days to the date of the last menstrual period. A more accurate expected delivery date will be calculated at the dating scan, carried out at around 10-12 weeks.

The Monro-Kellie doctrine states that the sum of the volumes of the brain, blood and cerebrospinal fluid within the cranial vault is constant. If the amount of one of these components increases, the other two should decrease to compensate. Intracranial pathology can disrupt this equilibrium cause a rise in intracranial pressure due to the fact that the skull is a 'closed box' and only a certain degree of compensation can take place.

Leibermeister’s rule states that for every one-degree increase in Fahrenheit of a patient's body temperature, the heart rate will increase by 18 beats per minute. It is not commonly used in clinical practice.

Further reading:

https://patient.info/doctor/crohns-disease-pro

Question:

A 40-year-old woman presents with a three-month history of fatigue and generalised pain. These symptoms usually last throughout the day, with nothing seeming to relieve them. More recently, she has experienced a constant, dull, but mild headache. She has noticed no visual disturbance.

On clinical examination, there is no evidence of muscle weakness or stiffness. There are no skin changes evident. Laboratory investigations are requested, and are demonstrated below:

TEST RESULT

C-reactive protein (CRP) 3 mg/L (<5mg/L)

Erythrocyte sedimentation rate (ESR) 5 (3 – 9)

Anti-Jo-1 autoantibody NEGATIVE

Anti-SRP autoantibody NEGATIVE

Anti-nuclear antibody (ANA) NEGATIVE

Creatinine kinase 100 U/L (25–200 U/L)

What is the most likely diagnosis?

A. Polymyalgia Rheumatica

B. Giant cell arteritis

C. Fibromyalgia

D. Polymyositis

E. Dermatomyosytis

Correct Answer:Fibromyalgia

Explanation:

The correct answer is fibromyalgia. This is a disease primarily defined by generalised pain and fatigue. There is a lack of stiffness or weakness on clinical testing. Its exact cause is unknown, however, it is non-inflammatory (hence the normal CRP and ESR), and there are no tests (antibody or otherwise) that can detect it. All test values are normal. Additional symptoms such as a headache are also common.

Polymyalgia rheumatica is a disease primarily defined by pain and stiffness that most commonly affects the proximal muscles of the shoulder and hip girdles. Pain is unlikely to be generalised. It causes raised inflammatory markers, which are not present in this case.

Giant cell arteritis has an association with polymyalgia rheumatica. It is a large vessel vasculitis. It usually causes a severe headache; a mild headache is unlikely. Additionally, without symptoms of polymyalgia and the common symptom of jaw claudication, this is an unlikely diagnosis. Over time it can cause visual disturbance, which is also not evident here. A raised ESR is also commonly found and is one of the first-line investigations if suspected.

Polymyositis and dermatomyositis are similar diseases both primarily characterised by weakness and wasting of proximal muscles in the shoulder and hip girdles. The difference between them is skin involvement being present in dermatomyositis in the form of a “shawl sign” or a purple per-orbital heliotrope rash. A lack of skin changes can rule this out. It causes raised inflammatory markers as well as raised creatinine kinase (due to muscle breakdown) and can be detected with a positive ANA (non-specific), anti-SRP and anti-Jo-1 antibodies (specific), none of which are present in this case.

Further reading:

https://patient.info/doctor/fibromyalgia-pro

Question:

A 7-year-old boy is brought to the GP by his parents due to concerns over his behaviour at school. He has been repeatedly interrupting others in his class and shouting out the answers to questions out of turn. The teacher has expressed her frustration at his concentration levels; he seems to lose interest in tasks that are given to him and becomes preoccupied with other activities.

Considering the most likely diagnosis, the GP makes a referral to a neurobehavioral psychiatrist. After a consultation with the boy, the specialist agrees with the GP and discusses treatment options with the parents. They explain that the condition is often managed with a combination of behavioural therapy and medications; and that these can be effective at improving symptoms.

Given the likely diagnosis, what is the mechanism of action of the medications being described?

A. NMDA antagonism

B. Potentiation of GABA

C. Increase serotonin levels

D. Antagonism of D2 receptors

E. Increase noradrenaline levels

Correct Answer:Increase noradrenaline levels

Explanation:

The correct answer, in this case, is increase noradrenaline levels - this is the mechanism of action of the drugs used to manage attention-deficit hyperactivity disorder (ADHD). The vignette describes a boy with a classical history of this condition, which is often referred to as a triad of symptoms:

Attention-deficit

Hyperactivity

Impulsivity

Once a diagnosis has been made (usually via the use of specialist questionnaires) the options for ADHD are behavioural therapy such as CBT, or family/parent educational training, and medication. The drugs used in the management of ADHD all act to increase levels of noradrenaline, principally through inhibition of the reuptake of the neurotransmitter. Methylphenidate, lisdexamfetamine and atomoxetine are all stimulant drugs that work via this mechanism, and these have been shown to improve concentration, cognition and short-term memory in those with ADHD. Care must be taken with the medications due to their mechanism of action; reduced appetite, increased blood pressure and insomnia are all common side effects. Regular monitoring of height, weight, pulse and blood pressure is required.

Increase serotonin levels describes the mechanism of action of many of the drugs used in the treatment of depression and anxiety; both selective serotonin reuptake inhibitors (SSRI's) and selective serotonin and noradrenaline reuptake inhibitors (SNRI's) work via this mechanism. Serotonin is not targeted by the drugs used to treat ADHD.

Antagonism of D2 receptors is the mechanism of action of antipsychotic medications, both typical and atypical. Methylphenidate can have an impact on dopamine alongside noradrenaline; however, it acts to block dopamine reuptake (thus increasing dopamine levels), it does not affect dopamine receptors.

NMDA antagonists include a variety of drugs. Ketamine, used frequently in anaesthesia, and memantine, a treatment for severe Alzheimer's disease both have this mechanism; NMDA is not targeted by drugs used in the management of ADHD however.

Potentiation of GABA is the mechanism of action of drugs such as benzodiazepines - the increase in this inhibitory neurotransmitter can be beneficial in terminating seizures. GABA is unaffected by the stimulants used in ADHD.

Further reading:

https://patient.info/doctor/attention-deficit-hyperactivity-disorder-pro

Question:

A 2-year-old child is brought to the emergency department by his father with a swollen right eye. His father first noticed the swelling this morning whilst the child was eating breakfast. He hasn’t noticed any discharge or exudate, and the child doesn’t appear to be particularly troubled with the eye. The father reports that his son has also had a two-day history of coryzal symptoms and a slight cough.

On examination, the child appears bright, alert and playful, he is cooperative with your examination. Observations are all within normal range, and he is afebrile. Pupils are reactive to light bilaterally. The image below shows the eye.

What is the most likely diagnosis?

Source: Wellcomecollection - Creative Commons Attribution 4.0 International Licence

A. Blepharitis

B. Chalazion

C. Dacryoadenitis

D. Hordeolum

E. Orbital cellulitis

Correct Answer:Dacryoadenitis

Explanation:

The most likely diagnosis is dacryoadenitis. This patient has presented with a rapid onset localised swelling of the right eye (distorting the upper lid to an S shape) with no systemic features or change in visual acuity. Dacryoadenitis is an infection of the lacrimal gland of the eye, which is situated superior-lateral to the orbit. The infection is often viral in aetiology, preceded by coryzal-type symptoms and is typically self-limiting. The acute onset, coupled with normal observations and an alert, playful and unaffected child, makes a diagnosis of dacryoadenitis most likely. This is managed conservatively.

A hordeolum (stye) is a reasonable differential diagnosis for this patient. Hordeolum can occur due to an acute bacterial infection of either the eyelash follicle or a meibomian gland. Clinically hordeolum presents with an acute tender lump in the eyelid associated with epiphora and local inflammation. Often pus will be visible, and the lump will discharge (commonly in the morning). The absence of a visible purulent collection or frank pus discharge makes hordeolum a less likely diagnosis.

Blepharitis is a local dermatitis of the eyelid and clinically appears as a crusty exudate around the eyelashes. Blepharitis It most commonly due to staphylococci but can also be caused by viruses, mites or lice. The absence of a demonstrable exudate in this patient makes blepharitis an unlikely diagnosis.

A chalazion is caused by chronic inflammation or blockage of a meibomian gland with subsequent cyst formation. Typically patients present with a chronic lump which has gradually increased in size and is not usually associated with pain or visible inflammation. The acute presentation of the lid-lump makes a chalazion a less likely diagnosis.

Orbital cellulitis is a serious condition associated with high morbidity and mortality. Orbital cellulitis should be on the list of differentials for every patient presenting with eye pain, swelling, or altered visual acuity. Clinical features of orbital cellulitis include proptosis, relative afferent pupillary defect in the affected eye, restricted painful eye movements, altered visual acuity and systemic symptoms such as tachycardia and pyrexia. None of these features is present, however, a low threshold to request a senior review is advised for junior clinicians.

Further reading:

https://www.rcemlearning.co.uk/references/atraumatic-red-eye/

Question:

A 42-year-old patient, Miss Branwen Jones, presents to the General Practitioner complaining of skin discolouration. Miss Jones states that she noticed her skin looked ‘yellowish’ this morning, she adds that she has ‘turned yellow’ on several occasions previously, particularly when she has been feeling ‘run down’ or has been ‘drinking too much alcohol’. She is experiencing some flu-like symptoms at the moment but is otherwise well with a good appetite, no weight loss, and no night sweats.

Miss Jones reports that her urine and stool has been ‘normal for her’ and that she has no abdominal pain or swelling. Miss Jones has a background of sciatica and irritable bowel syndrome. She has no known drug allergies and is taking paracetamol and mebeverine regularly. Miss Jones drinks in moderation and is a non-smoker.

On examination, there is a yellowish-tinge to her skin and conjunctiva. Respiratory examination reveals transmitted upper airway sounds. Abdominal examination is unremarkable with no evidence of organomegaly or stigmata of liver disease. Miss Jones’ vital signs are unremarkable, as are most of her blood tests (FBC, U&E, CRP, LFTs) other than an isolated rise in bilirubin (50 μmol/ L).

What is the most likely cause of this patient's presentation?

A. Gilbert’s syndrome

B. Sickle cell disease

C. Viral hepatitis

D. Alcoholic liver disease

E. Hepatocellular cancer

Correct Answer:Gilbert’s syndrome

Explanation:

The most likely diagnosis is Gilbert’s syndrome.

Gilbert's syndrome (GS) is an inherited metabolic disorder that causes intermittent, isolated raised unconjugated bilirubin levels, due to defective conjugating enzymes in the liver. Patients with GS have otherwise normal liver function tests and no evidence of haemolysis. Clinical examination reveals no hepatosplenomegaly or stigmata of chronic liver disease.

Viral hepatitis is a reasonable differential diagnosis for a patient presenting with jaundice, however, in hepatitis, you would expect to see a ‘hepatitic picture’ (i.e a raised AST and ALT to indicate hepatocellular damage). Moreover, there may be a degree of tenderness clinically on examination of the liver.

Alcohol-related liver disease is likely to present with deranged LFTs, a longstanding history of alcohol abuse, and stigmata of liver disease on examination including hepatomegaly. This patient drinks within moderation, and presents with an isolated raised bilirubin making GS a more likely diagnosis.

Hepatic malignancy may present with clinical jaundice and raised bilirubin, however commonly is associated with constitutional symptoms such as weight loss, lethargy and malaise, elevated transaminases on LFTs, and clinical signs of hepatosplenomegaly. This patient does not present with constitutional symptoms or deranged transaminases, making GS a more likely diagnosis.

Sickle cell disease (SCD) can cause jaundice and a raised bilirubin. The pathophysiology underlying SCD jaundice, however, is resultant of red blood cell haemolysis. This patient has a normal haemoglobin level and therefore is unlikely to have a diagnosis of SCD.

Further reading:

https://patient.info/doctor/gilberts-syndrome-pro

Question:

A 74-year-old man attends a respiratory clinic with shortness of breath. He was diagnosed with chronic obstructive pulmonary disease thirty years ago, he is treated with optimal medical management and he is an ex-smoker. He also has a history of ischaemic heart disease and had a heart attack 5 years ago.

On examination, he has reduced air entry bilaterally, a pan-systolic murmur over the left border of his sternum, and bilateral lower limb oedema. He has had a transthoracic echocardiogram which is reported as showing good left ventricular function but tricuspid regurgitation with raised right ventricular systolic pressure. An arterial blood gas in room air shows a PaO2 of 7.8 kPa and a PaCO2 of 5.2 kPa.

What is the most appropriate treatment for his pulmonary hypertension?

A. Ramipril

B. Pulmonary endarterectomy

C. Sildenafil

D. Bosentan

E. Long term oxygen therapy

Correct Answer:Long term oxygen therapy

Explanation:

The most likely cause of this patient's pulmonary hypertension is hypoxic vasoconstriction due to chronic obstructive pulmonary disease (type 3 pulmonary hypertension) commonly called cor pulmonale. The treatment for this involves optimisation of chronic obstructive pulmonary disease medication, smoking cessation and if their PaO2 on room air is less than 8 kPa, long term oxygen therapy.

Ramipril is an angiotensin-converting enzyme inhibitor used in the treatment of systemic hypertension and left ventricular failure, but not pulmonary hypertension or right ventricular failure.

Bosentan is an endothelin receptor antagonist, and Sildenafil (trade name Viagra) is a phosphodiesterase 5 inhibitor, they are both used in the treatment of primary pulmonary hypertension (type 1 pulmonary hypertension). NICE says not to use these treatments in the management of pulmonary hypertension due to chronic obstructive disease outside of clinical trials.

Pulmonary endarterectomy is a highly specialised surgical procedure used to treat patients with pulmonary hypertension due to chronic thromboembolic disease (type 4 pulmonary hypertension).

Further reading:

https://www.nice.org.uk/guidance/ng115/resources/chronic-obstructive-pulmonary-disease-in-over-16s-diagnosis-and-management-pdf-66141600098245

Question:

A doctor observes that many of her patients with liver fibrosis have had previous occupational exposure to vinyl chloride. She wishes to find out if occupational exposure to vinyl chloride increases the risk of developing liver fibrosis. She takes a random sample of 1053 people from the population and ascertains whether they have liver fibrosis then interviews them about their previous exposure to vinyl chloride. The results are shown below.

Liver fibrosis No liver fibrosis

Occupational exposure to vinyl chloride 1 2

No occupational exposure to vinyl chloride 50 1000

What is the odds ratio of having liver fibrosis in the exposed group compared to the unexposed group?

A. 100

B. 0.5

C. 0.05

D. 10

E. 0.005

Correct Answer:10

Explanation:

The odds ratio is 10.

The odds ratio is the ratio of the odds of having the condition in the exposed group compared to the odds of having the condition in the unexposed group. For example, an odds ratio of 10 means the odds of having the condition is 10 times greater in the exposed group than in the unexposed group.

To calculate the odds ratio, you need to divide the odds of having the condition in the exposed group (1/[1+2] ÷ 2/[1+2] = 1/2 = 0.5) by the odds of having the condition in the unexposed group (50/[50+1000] ÷ 1000/[50 + 1000] = 50/1000 = 0.05). This gives the calculation 0.5 ÷ 0.05 = 10.

This is summarised by the formula and table below:

Condition No condition

Exposure a b

No exposure c d

Further reading:

https://geekymedics.com/statistics-for-medical-students/

Question:

A 43-year-old woman presents with pain in her right hand and forearm which has been getting worse for the past few weeks. There is no history of trauma. The pain is concentrated around the thumb and index finger and is often worse at night. Shaking her hand seems to provide some relief. On examination, there is weakness of the abductor pollicis brevis and reduced sensation to fine touch at the index finger.

What is the most likely diagnosis?

A. Pancoast tumour

B. Cervical rib

C. C6 entrapment neuropathy

D. Carpal tunnel syndrome

E. Thoracic outlet syndrome

Correct Answer:Carpal tunnel syndrome

Explanation:

Carpal tunnel syndrome is a collection of symptoms and signs caused by compression of the median nerve in the carpal tunnel at the wrist.

The carpal tunnel is an anatomical compartment bounded on three sides by carpal bones and on the palmar side by the transverse carpal ligament. It contains the median nerve and the flexor tendons.

Reduction in the dimensions of the carpal tunnel or increase in the volume of its contents produces an intermittent or sustained high pressure in the tunnel which causes ischaemia of the median nerve and impairs nerve conduction leading to paraesthesia, pain and decreased function of the nerve.

Further reading:

https://cks.nice.org.uk/carpal-tunnel-syndrome#!backgroundsub

Question:

A 31-year-old lady presents with jaundice, amenorrhoea and fatigue. On examination, she has a normal BMI and a palpable liver 2cm below the costal margin. Blood results reveal raised liver transaminases, positive anti-smooth muscle antibodies and negative virology.

What is the most likely diagnosis?

A. Autoimmune hepatitis (AIH)

B. Hypothyroidism

C. Primary biliary cirrhosis (PBC)

D. Non-alcoholic steatohepatitis (NASH)

E. Primary sclerosing cholangitis (PSC)

Correct Answer:Autoimmune hepatitis (AIH)

Explanation:

The most likely diagnosis in this scenario is autoimmune hepatitis. The patient's symptoms, clinical signs and blood results are all in keeping with the diagnosis. Primary biliary cirrhosis and primary sclerosing cholangitis can both present with similar symptoms, however, the presence of anti-smooth muscle antibodies make autoimmune hepatitis a much more likely diagnosis.

Autoimmune hepatitis (AIH) is a chronic disease of unknown cause, characterised by hepatocellular inflammation, necrosis and eventual cirrhosis. Presenting features can include fatigue, myalgia, pruritis, nausea, upper abdominal pain, jaundice, anorexia, diarrhoea, oedema, amenorrhoea and weight loss.

There is no single specific marker for AIH, however a constellation of symptoms, signs, antibodies and findings on liver biopsy help to make the diagnosis. Autoantibodies associated with AIH include anti-smooth muscle antibody (ASMA), anti-LKM-1, anti-SLA, AMA and antiphospholipid antibodies. Liver biopsy typically reveals interface hepatitis.

Other than amenorrhoea and fatigue, there is nothing to suggest this lady has hypothyroidism. The presence of jaundice and hepatomegaly would not be explained by a diagnosis of hypothyroidism

Primary biliary cirrhosis (PBC) is a chronic liver disorder characterised by interlobular duct damage which causes cholestasis and cirrhosis. The autoantibody most specific to PBC is AMA, present in 90-95% of affected individuals. Given its absence in this scenario, PBC is a less likely diagnosis.

Primary sclerosing cholangitis is a biliary disease which is strongly associated with ulcerative colitis. It can present with cholestasis, right upper quadrant pain and fever. It more commonly affects males. It is typically associated with p-ANCA, anti-cardiolipin and anti-nuclear antibodies.

Non-alcoholic steatohepatitis (NASH) typically has no symptoms until the development of cirrhosis, at which point ascites and jaundice are common presenting features. It is typically associated with obesity and hepatomegaly is commonly found during clinical examination. LFTs are typically deranged (ALT, AST) and autoimmune studies may reveal positive ANA or ASMA. The presence of fatigue, jaundice, amenorrhoea, hepatomegaly and positive ASMA in a young, non-obese female is more likely to be associated with autoimmune hepatitis in this scenario.

Further reading:

https://patient.info/doctor/autoimmune-hepatitis-pro

Question:

A 40-year-old man presents to his GP after noticing a lump in his neck ~1 cm in diameter. He is otherwise fit and well. On examination, the lump is localised to the thyroid and rises with swallowing. The GP orders blood tests and ultrasound imaging.

Which of the following findings is a red flag that warrants a 2-week wait cancer referral?

A. Ultrasound shows the mass to be solid

B. More than 3 lumps present in the thyroid on ultrasound

C. Abnormal thyroid function tests

D. A history of sudden onset pain and tenderness within the lump

E. Bilateral cervical lymphadenopathy

Correct Answer:Bilateral cervical lymphadenopathy

Explanation:

Roughly 5% of the adult population have palpable thyroid masses, while ~40% have thyroid masses on ultrasound scanning. The overwhelming majority of these lumps are benign, however, ~5% of individuals presenting with thyroid lumps will have a malignancy. Indeed, this is how thyroid malignancies most commonly present. Patients with any cervical lymphadenopathy (unilateral or bilateral) should be referred to secondary care so that malignancy can be ruled out. Other red flags include slow-onset and persistent pain, voice changes, family history, or rapidly enlarging masses.

The presence of multiple lumps is associated with a smaller risk of malignancy than the presence of one solitary lesion. A history of sudden-onset pain within a lump usually signifies haemorrhage into a benign thyroid cyst; these patients can be given routine referrals.

Abnormal TFTs are typically not associated with malignancy, as most malignant masses do not produce thyroid hormone; these patients should be given a routine referral.

Benign masses can be solid or cystic, and the finding that a mass is solid is not by itself an indication for a 2-week referral (although there are other imaging characteristics that do suggest malignancy).

Further reading:

https://patient.info/doctor/thyroid-lumps-including-goitre

Question:

A 30-year-old man presents to his GP complaining of colicky abdominal pain, which started 4 hours ago in the right upper quadrant (RUQ). He reports experiencing a similar type of pain last weekend, after eating a large takeaway, which was relieved with the use of paracetamol. On examination, he is tender in the RUQ and epigastric regions. He elicits a negative Murphy's sign, and he does not appear to be jaundiced.

What is the most appropriate initial investigation to confirm the likely diagnosis?

A. Troponin I

B. Magnetic resonance cholangiopancreatography

C. Trans-abdominal ultrasound

D. Endoscopic retrograde cholangiopancreatography

E. Abdominal x-ray

Correct Answer:Trans-abdominal ultrasound

Explanation:

Trans-abdominal ultrasound is typically used first line to investigate suspected gallstone pathology. Ultrasound is a safe, non-invasive, and cost-effective imaging modality that can be performed quickly. Ultrasound is both sensitive and specific for gallstones. This patient is displaying signs of biliary colic, and performing an ultrasound would confirm the diagnosis. As a a side note - a positive Murphy's sign indicates an inflamed gallbladder. To elicit Murphy's sign, apply pressure in the RUQ whilst asking the patient to inspire. If Murphy's sign is positive, there will be a sudden halt in inspiration due to the pain, and the pain will not be reciprocated on palpation of the left upper quadrant (LUQ).

Magnetic resonance cholangiopancreatography (MRCP) is the gold standard investigation for gallstones, but is typically only used if results from the ultrasound are inconclusive.

Endoscopic retrograde cholangiopancreatography (ERCP) is the gold standard investigation for cholangitis, as it is both diagnostic and therapeutic. Some endoscopists may choose to do an MRCP prior to intervention with ERCP in order to obtain detailed imaging of the biliary system.

Troponin I is a vital investigation to be carried out in patients displaying signs and symptoms of acute coronary syndrome (ACS), and is an important differential to keep in mind for patients with epigastric pain. In this case, the patient is experiencing symptoms that are more in keeping with biliary colic as opposed to ACS, and so this would not be the most appropriate investigation to confirm the likely diagnosis.

Abdominal x-ray would not be indicated in this instance as very few gallstones are radio-opaque and so the likely diagnosis (biliary colic) is likely to be missed via this imaging modality.

Further reading:

https://patient.info/doctor/gallstones-and-cholecystitis

Question:

A 55-year-old man presents to the emergency department with severe pain in the left great toe. The pain started 48 hours ago and is now described as a "10/10" in severity. The pain is worse on moving the toe. He also complains of feeling feverish and has general malaise. He has no history of trauma. He has a past medical history of type 2 diabetes mellitus, psoriasis, and sickle cell anaemia. He has a BMI of 45. During the examination, he has tenderness over the left hallux, which is markedly swollen, tender on palpation, and erythematous.

Observations:

Respiratory rate: 20 breaths per minute

O2 saturation 96% on room air

Heart rate 120 beats per minute

Blood pressure 100/60 mmHg

Temperature 38.7° C

What is the most likely diagnosis?

A. Cellulitis

B. Sickle cell crisis

C. Osteomyelitis

D. Gout

E. Psoriatic arthropathy

Correct Answer:Osteomyelitis

Explanation:

Osteomyelitis is the most likely diagnosis. It classically presents with severe pain (often acutely but may be chronic) along with bacteraemia, fever, general malaise, and potentially sepsis. The affected joint is classically swollen, tender, and erythematous, and the severe pain is exacerbated by movement. Sickle cell anaemia and diabetes are risk factors for osteomyelitis. However, it may be challenging to differentiate osteomyelitis and septic arthritis from the history and examination alone. Gout will also present with acutely severe pain, classically in the large toe, but is unlikely to cause a septic-like appearance, general malaise, or fever.

Gout will also present with acutely severe pain, classically in the large toe. Gout is caused by high levels of uric acid, and commonly affects the distal ends of the body such as the hallux (big toe), fingers, or knees. This is because these areas are more likely to be exposed to colder temperatures, leading to vasoconstriction and ultimately pain and swelling. However, it is unlikely to cause a septic-like appearance, general malaise, or fever.

Cellulitis is an important differential but is rare to present with such excruciating pain, worse on movement, and it classically affects the legs or face. It is rare to occur in the toe. An acutely painful joint should point towards septic arthritis or osteomyelitis and should be ruled out urgently before managing as cellulitis. Cellulitis is typically treated with flucloxacillin which is often recommended for septic arthritis and osteomyelitis, and therefore you would be expected to perform the relevant investigations (imaging +- joint aspiration) while antibiotics are being administered.

Psoriatic arthropathy is unlikely to affect just the hallux as it often presents either symmetrically or asymmetrically but usually more than one joint is affected. It is also unlikely to cause excruciating pain or cause a septic-like picture. Classically, they also have psoriatic plaques (often in the scalp and extensors) as well as nail changes such as onycholysis or pitting. Rarer presentations include dactylitis (an acutely swollen digit) but this is also unlikely to cause a septic-like picture.

Sickle cell crises can also present as dactylitis, resulting in joint pain, swelling, and erythema. Other common presentations include jaundice, symptoms of severe anaemia (fatigue, breathlessness), fever, and sequelae of occluded vessels (e.g. priapism, stroke, or chest pain). It is caused by a sickle-shaped red blood cell (due to haemoglobin S replacing haemoglobin A) which is more likely to stick to the vascular endothelium, resulting in vaso-occlusion. Like gout, it is often triggered by colder temperatures due to vasoconstriction. However, while it can cause fevers, it is unlikely to cause a septic-like picture with low blood pressure. It classically causes one of the common presentations mentioned above rather than dactylitis, fever, and acute chest syndrome. Osteomyelitis and septic arthritis should be ruled out first as they can destroy the joint within 24 hours.

Further reading:

https://patient.info/doctor/osteomyelitis-pro

Question:

A 38-year-old aid worker is brought to A&E by his partner shortly after returning from a 3-month placement in Zambia, where he was helping to build waste disposal systems for the locals. She explains that shortly before returning to the UK he had told her that he was worried he may have consumed water that was contaminated.

He appeared well on the flight home, but since arriving back in the UK, he has had uncontrollable watery diarrhoea, opening his bowels almost every hour. He has been unable to drink any fluids, as he feels nauseous. His partner is worried, as he has become more lethargic, and is now complaining of headaches and dizziness. The patient has no past medical history of note and takes no regular medication.

On examination, the patient has cold peripheries, and his mucous membranes appear dry. His pulse is notably rapid with a low volume, and both central and peripheral skin turgor is poor.

Observations reveal the following:

Pulse rate - 132

Respiratory rate - 22

Temperature - 37.1 degrees

Capillary refill time - 4 seconds

Blood pressure 80/58

The doctor asks the nurse to insert a wide-bore cannula so that the patient can be given IV fluids. Before this can take place, the patient begins convulsing and develops tonic-clonic movements.

What is the most likely explanation for the patient’s seizure?

A. Underlying epilepsy

B. Taenia solium infection

C. Hypernatraemia

D. Hypoglycaemia

E. Encephalitis

Correct Answer:Hypernatraemia

Explanation:

This patient is clinically dehydrated, with evidence of progression to hypovolaemic shock as indicated by the low blood pressure and prolonged capillary refill time. This is due to the loss of significant amounts of fluid from diarrhoea, and a lack of oral intake to compensate for this. Given the history of contaminated water consumption in an endemic area and profuse watery diarrhoea, there should be a high suspicion of infection with Vibrio cholerae in this patient. The toxin produced by cholera causes an increased production of cyclic AMP (cAMP), which can, in turn, lead to the opening of chloride ion channels resulting in watery diarrhoea.

The patient has begun to show signs of central nervous system involvement alongside the classic dehydration symptoms, culminating in a seizure. The likely explanation for this is due to hypernatraemia; an abnormally high level of sodium can develop in extreme dehydration (likely in this patient given the progression towards hypovolaemic shock) due to the loss of free water. This will cause the osmolality to become raised and can result in brain shrinkage secondary to osmotic changes, which can, in turn, alter synaptic structure and nerve cell function. The result can be an encephalopathic state, with the possibility of confusion and seizures.

The patient will require rehydration therapy, ensuring to correct the sodium excess extremely slowly; decreasing sodium concentrations too rapidly may cause excessive osmotic shifts and cerebral oedema, worsening the central nervous system involvement.

Hypoglycaemia is a possible cause of seizures and can lead to fatigue and confusion. However, there are no features in the history that would indicate the likelihood of this being present, hypoglycaemia is relatively rare in non-diabetics, with Addison's disease, excessive alcohol consumption or exercise, liver failure, and insulin-producing tumours being possible causes.

Underlying epilepsy is unlikely in this case, as there is no previous medical history of seizures. By definition, epilepsy requires two or more unprovoked seizures for diagnosis.

Taenia solium is a pork tapeworm that can cause the disease referred to as cysticercosis. This can cause significant neurological morbidity, especially in low-income countries where the infection is prevalent; seizures are a common manifestation. The disease may be worth considering given the patient's travel history, however, there is no reported consumption of undercooked meat, and given the clinical picture of dehydration, it is not the most likely diagnosis.

Encephalitis can result in focal neurological features such as seizures; given the patient's travel history, there is a possibility for tropical infections such as West Nile virus to be implicated. However, given the clear clinical picture of dehydration, it is not the most likely diagnosis in this case.

Further reading:

https://patient.info/doctor/hypernatraemia

Question:

A 28-year-old man attends the emergency department complaining of a ‘scratchy’ sensation and blurred vision in his right eye. He states that he was grinding some metal when the problem began. He is usually fit and well, he does not require visual aids routinely.

On examination, the patient looks well but he is struggling to keep his right eye open and it is very watery. His visual acuity is reduced and on slit-lamp examination, you see the image below.

What is the next most appropriate management step for this patient?

Source: E van Herk [CC BY-SA 3.0]

A. Removal of foreign body with a needle

B. Tetanus prophylaxis

C. Radiograph of the orbit

D. CT head

E. Topical steroid treatment

Correct Answer:Removal of foreign body with a needle

Explanation:

The most appropriate next step is to attempt removal of the foreign body using a needle.

This patient has presented with a corneal foreign body following a low-velocity grinding injury. Ophthalmologic injuries are common and most prevalent in young males, usually during work. After a full assessment of the patient’s eye, including visual acuity, an examination of the subtarsal component (underneath the eyelid) and slit-lamp examination, most patients simply require topical anaesthetic and either a needle or a cotton bud to remove the foreign body. In the case of a metal foreign body, there is likely to be some rust ring remaining and therefore the patient should be advised to use an antibiotic ointment such as chloramphenicol 1% and referred to ophthalmology for further removal of rust ring.

The majority of Emergency Medicine clinicians should be able to remove simple corneal foreign bodies without referral using a topical anaesthetic and either a needle or a cotton bud. In some circumstances such as a remaining rust ring, deeply penetrating foreign body or a patient who is unable to tolerate the procedure, referral to ophthalmology is an appropriate next step.

Radiographs are sometimes required if metallic foreign bodies penetrate the eye at a high velocity such as during welding, however, a radiograph of the orbit would not be indicated for this patient.

Topical steroids are not routinely used in the management of corneal foreign bodies and should only be initiated by a specialist.

Tetanus prophylaxis is not routinely recommended for corneal foreign bodies.

A CT head would not be appropriate in this scenario.

Further reading:

https://www.rcemlearning.co.uk/modules/corneal-injuries/management/corneal-abrasions/

Question:

An 80-year-old man is being reviewed for behavioural problems. Over the past six months, he has become more verbally abusive towards his wife. His wife has noticed that his memory has deteriorated significantly and has noticed that he has become lost on several occasions whilst driving and when doing the shopping.

Physical examination is unremarkable.

Initial blood tests and CT scans are unremarkable. An MRI scan is performed, which demonstrates atrophy of the medial temporal lobes.

What is the most appropriate first-line pharmacological management for this patient?

A. Citalopram

B. Memantine

C. Haloperidol

D. Risperidone

E. Donepezil

Correct Answer:Donepezil

Explanation:

The patient has features of Alzheimer's dementia (cognitive impairment evidenced by reported deterioration in memory and attention and change in behaviour). The MRI findings of generalised atrophy of the medial temporal lobes are associated with Alzheimer's dementia. Management of Alzheimer's dementia takes on a multi-disciplinary approach and is tailored towards the patient's specific cognitive impairments. Donepezil is a cholinesterase inhibitor used in treating Alzheimer's dementia of all stages. Other cholinesterase inhibitors used include rivastigmine and galantamine.

Memantine is an NMDA receptor antagonist used second-line or as adjunctive therapy in Alzheimer's disease if first-line cholinesterase inhibitors are contraindicated, poorly tolerated, or ineffective. Cholinesterases are more effective in treating Alzheimer's disease, particularly in the milder stages.

Citalopram is an SSRI used to treat depression and other mood disorders. Citalopram may be used as an adjunctive medication if the patient also experiences depressive symptoms; however, there is no explicit mention of this in the vignette.

Haloperidol is a conventional antipsychotic used in the management of agitation and psychosis. Although the patient has been verbally abusive towards his wife, non-pharmacological de-escalation strategies must be trialled in the first instance before escalating to more aggressive approaches such as pharmacological sedation.

Risperidone is an atypical antipsychotic used in the management of psychosis and mania. Although the patient has been verbally abusive towards his wife, non-pharmacological de-escalation strategies must be trialled in the first instance before escalating to more aggressive approaches such as pharmacological sedation.

Further reading:

https://app.pulsenotes.com/medicine/neurology/notes/alzheimer-s-disease

Question:

A 34-year-old man presents with a 4-hour history of facial weakness. He first noticed this when he woke up and says there has been no improvement. He has a past medical history of type 2 diabetes and takes metformin daily.

On examination, he cannot purse his lips, scrunch his eye, or frown on his right side. The left side of his face is unremarkable, and both pupils are equal and reactive to light, with no visual field defects. There is no limb weakness, and all vital signs are within the normal range.

Given the likely diagnosis, what is the most common associated sensory finding?

A. Ipsilateral loss of taste

B. Mydriasis

C. Ispilateral pruritus

D. Hypoacusis

E. Anosmia

Correct Answer:Ipsilateral loss of taste

Explanation:

Bell's palsy is the most common cause of unilateral facial weakness, caused by a facial nerve (cranial nerve VII) palsy. Critical differentials to consider include a stroke, a transient ischaemic attack, brain tumours, and infection (herpes zoster virus or Lyme disease). On examination, the lack of forehead sparing, given the inability to frown, indicates a lower motor neurone lesion. There is no past medical history of infection, pain, or rash.

Bell's palsy is a facial nerve palsy, that can result in ipsilateral loss of taste. Specifically, the anterior 2/3 of the tongue is supplied by the facial nerve, and thus there will be an altered taste sensation on the same side as the lesion.

Hypoacusis, or partial loss of hearing, is incorrect. The facial nerve innervates the stapedius muscle in the inner ear and thus loss of function would result in hyperacusis. This is less common than partial loss of taste.

Anosmia, or loss of smell, is not a feature of Bell's palsy and would occur in olfactory nerve (cranial nerve I) damage, not facial nerve damage.

Pruritus, or itchiness, is not a feature of Bell's palsy. However, pain or numbness to the affected side may occur.

Mydriasis, or large pupils, may occur if there is oculomotor nerve damage. Dry eyes from lack of tear secretion or inability to close the eye on the affected side may be seen in Bell's palsy.

Further reading:

https://geekymedics.com/a-lady-with-a-drooping-face/

Question:

A 30-year-old woman attends her GP with recurrent nosebleeds. She has suffered 6 episodes of nose bleeding over the past 4 days. Each episode started spontaneously without any precipitating factors. The patient also reports a preceding flu-like illness (fever, fatigue and arthralgia) for 3 days prior to the onset of her nose bleeds. She has also developed a few seemingly spontaneous bruises and some bleeding from her gums when brushing her teeth. The patient gave birth to her first child 5 weeks ago, via vaginal delivery, with no complications.

Clinical examination findings include:

temperature - 38.5 oC

mildly yellow sclera

pallor

facial petechiae

gingival bleeding

multiple bruises

Relevant investigation findings include:

Urinalysis - blood (++) / protein (++)

Hb - 75 g/ L

Platelets - 42 x 109/ L

Blood film - schistocytes

Creatinine - 110 μmol/ L

LDH - 900 U/ L

Bilirubin - 60 μmol/ L

Reticulocyte count - raised

Which of the following is the most appropriate FIRST-LINE management for the condition described?

A. Transfusion of platelets

B. Watch and wait approach

C. Intravenous plasma exchange

D. Silver nitrate cauterisation of Little’s area

E. Splenectomy

Correct Answer:Intravenous plasma exchange

Explanation:

The most likely diagnosis, in this case, is thrombotic thrombocytopenic purpura (TTP). This condition can be defined as the combination of thrombocytopaenia, renal dysfunction, fever, microangiopathic haemolysis and occasionally neurological dysfunction. Risk factors for this condition include pregnancy, the post-partum period, HIV infection, malignancy and autoimmune disease. It is caused by a deficiency in the von Willebrand factor cleaving protein ADAMTS1, leading to platelet aggregation and micro-thrombi formation.

Clinical features for this condition are varied and may include:

a prodromal, flu-like illness

thrombocytopaenia (e.g. epistaxis, bruising, petechiae)

neurological features (e.g. confusion, headache, paresis, aphasia)

fever

hypertension

pallor

jaundice

fatigue

proteinuria

haematuria

chest pain

abdominal pain

Investigations for TTP include:

Full blood count (elevated reticulocyte count and low platelet count)

Blood smear (schistocytes)

U&Es (raised creatinine)

LDH (raised)

Liver function tests (raised bilirubin levels)

Urinalysis (proteinuria and haematuria)

First-line management for TTP is usually plasma exchange. Rituximab, corticosteroids, folate supplementation and glucocorticoids also play a role in the management of TTP and may be used in combination with plasma exchange.

Transfusion of platelets is not appropriate in this case and may exacerbate the disease. Platelet transfusion may be used in TTP but only in the presence of life-threatening haemorrhage.

A watch and wait approach is not appropriate in this case. TTP may progress to life-threatening haemorrhage if left untreated.

Splenectomy is indicated in the management of TTP when a patient does not respond to plasma exchange or in those who chronically relapse.

Cauterisation is indicated for active epistaxis that has not responded to first-line measures (e.g. manual pressure) but is not first-line management for TTP.

Further reading:

https://patient.info/doctor/thrombotic-thrombocytopenic-purpura-pro

Question:

A 45-year-old man presents to the emergency department complaining of chest pain. Whilst in the waiting room, he collapses. On assessment, he is not breathing and a central pulse is not palpable. CPR is started and a defibrillator is attached, which shows pulseless electrical activity. IV access is obtained and adrenaline 1:10,000 is drawn up.

What volume of IV adrenaline should be administered to this patient?

A. 10 mL

B. 1 mL

C. 0.1 mL

D. 0.5 mL

E. 5 mL

Correct Answer:10 mL

Explanation:

This patient is in cardiac arrest with a non-shockable rhythm. The Resuscitation Council states that 1 mg of adrenaline should be administered as soon as possible in cardiac arrest with a non-shockable rhythm. Adrenaline 1:10,000 contains 1 mg/10mL. therefore, 10 mL is the correct answer.

Further reading:

https://www.resus.org.uk/library/2021-resuscitation-guidelines/adult-advanced-life-support-guidelines

Question:

You are an SHO working in Accident and Emergency. A 12-year-old female patient attends the department with vomiting and drowsiness accompanied by her parents. It is discovered that the patient has been vomiting around 4 times per day for the past 2 days and has now become very drowsy. Her parents report that she had been suffering from a cough and cold about a week ago, but had steadily been improving until the onset of vomiting. Her parents also admit to you that their daughter had been taking aspirin throughout her cough and cold thinking it was paracetamol. On examination, you note a GCS of 13, a blood pressure of 90/40mmHg and a heart rate of 150 beats per minute. You send off routine blood tests and later discover that the patient's liver function is deranged.

What is the MOST LIKELY diagnosis?

A. Meningitis

B. Acute hepatitis

C. Reye’s syndrome

D. Head injury

E. Sepsis

Correct Answer:Reye’s syndrome

Explanation:

The most likely diagnosis is Reye’s syndrome. This condition can be defined as cerebral oedema and liver derangement with little or no clinical features of liver involvement. The pathology underlying Reye’s syndrome is yet indeterminate. Risk factors for this condition include a preceding, mild viral infection 3-5 days previously, the use of salicylates (including aspirin), winter months and children aged between 5 and 14 years of age. Clinical features for this condition include vomiting, drowsiness, liver derangement (in the absence of jaundice) and later, life-threatening features (e.g. visual hallucinations, delayed pupillary responses, seizures, coma, decerebrate posturing). No definitive investigations or management exists for Reye’s syndrome.

Meningitis usually presents with a temperature, headache, neck stiffness, positive Kernig’s sign and purpuric rash.

Acute hepatitis is less likely in this case as there is an absence of right upper quadrant pain or jaundice.

Despite the decline in the patient’s GCS, head injury is not likely in this case given the lack of a history of head trauma.

Sepsis is not likely in this case given the absence of pyrexia, duration of symptoms and normal white cell count.

Further reading:

https://patient.info/doctor/reyes-syndrome-pro

Question:

You are part of the on-call team covering a busy district general hospital overnight and the crash call has gone out; a 50-year-old gentleman who was admitted for a routine knee operation has gone into cardiac arrest. When you arrive the team have already commenced CPR at a rate of 30:2 and from the cardiac monitor you diagnose that this man is in asystole.

As well as continued CPR and airway support, what would be the next most appropriate step in management?

A. Administer 200 mg IV Hydrocortisone

B. Administer a shock of 150J via the defibrillator

C. Arrange a thrombolytic drug as PE is the most likely cause of this man's arrest

D. Administer 10 ml of 1:10,000 Adrenaline IV

E. Administer 0.5 ml of 1:1000 Adrenaline IV

Correct Answer:Administer 10 ml of 1:10,000 Adrenaline IV

Explanation:

The most appropriate next management step is to administer 10 ml of 1:10,000 Adrenaline IV.

You do not need to have an in-depth knowledge of advanced life support to answer this question. Asystole is a non-shockable rhythm and therefore administering a shock can be ruled out. Administering a shock and administration of thrombolytic drugs may be relevant further down the line, but from the above information, it is currently unclear as to what has caused this man’s arrest. Administering 0.5 ml of 1:1000 adrenaline is incorrect, this is the dose used to treat anaphylaxis and it is administered intramuscularly, not intravenously.

Further reading:

https://www.resus.org.uk/resuscitation-guidelines/adult-advanced-life-support/

Question:

A 26-year-old female attends her GP complaining of pain in her right breast. She describes the pain as throbbing and comments that it has developed over the past 2 days. The patient is 10-weeks post-partum and is currently breastfeeding her infant. She explains that breastfeeding has become more difficult for her due to breast tenderness and decreased milk production. There is no history of trauma.

On examination, the GP notes an erythematous, swollen, wedge-shaped region in the upper inner quadrant of the right breast. On palpation, the region is hot and tender to touch with no underlying masses felt in the tissue. The left breast is normal.

Which of the following is the most likely diagnosis?

A. Mastitis

B. Mammary duct ectasia

C. Breast cancer

D. Fibroadenoma

E. Fat necrosis

Correct Answer:Mastitis

Explanation:

Patients who are currently breastfeeding are at risk of developing lactational mastitis, a painful inflammation of the breast often accompanied by an infection. It characteristically presents with a painful breast that has a tender, erythematous wedge-shaped swelling in the peripheral regions of the breast tissue. More severe cases may develop into a breast abscess.

Fat necrosis usually occurs following trauma to the breast tissue and presents with a firm, irregular lump in the affected region that may be tender to touch.

A fibroadenoma is a common cause of a benign breast mass in young patients. It typically presents as a painless, firm, highly mobile lump that may change with the menstrual cycle.

Mammary duct ectasia describes an age-related process where the mammary ducts widen and their walls become thicker. This can lead to the accumulation of fluid in the mammary ducts and presents with a nipple discharge that may be associated with breast pain. It mostly affects women near and after menopause.

Breast cancer is an important differential in this case, as it can have a wide variety of clinical presentations including breast pain and skin changes. However, the patient’s young age and the fact that the onset of symptoms was related to lactation suggest that mastitis is the more likely diagnosis.

Further reading:

https://patient.info/doctor/puerperal-mastitis

Question:

A 22-year-old woman presents to the emergency department with abdominal pain. She is 5 days post appendicectomy but otherwise fit and well. On clinical examination, the following are noted:

Temperature: 38.9 oC

Heart rate: 105 bpm

Blood pressure: 104/73

Which of the following is the most appropriate first step in her management?

A. Refer to critical care

B. Blood cultures

C. Pregnancy test

D. Refer to medicine

E. Broad spectrum antibiotics

Correct Answer:Blood cultures

Explanation:

This lady likely has sepsis post-surgery. Blood cultures should ideally be taken before broad-spectrum antibiotics are initiated to improve the chances of identifying the causative organism (however if it is not practical to quickly take blood cultures, IV antibiotics should not be delayed).

If she remains hypotensive and tachycardic after resuscitation and initial management (i.e in septic shock), it would be appropriate to refer the patient to critical care.

If she stabilises she should be admitted under general surgery (as she probably has an infective complication of her surgery), rather than under medicine. If she remains in septic shock informing the surgeons, as well as critical care, would be appropriate.

A pregnancy test would not be immediately indicated here, as she would have already performed as test before the appendectomy.

Further reading:

https://www.nice.org.uk/guidance/ng51

Question:

A 60-year-old farmer is referred to the dermatology clinic with several white, crusted lesions on his scalp and the dorsal surfaces of both hands. He is diagnosed with multiple actinic keratoses and commenced on fluorouracil cream.

If left untreated, which type of cancer are these lesions most likely to develop into?

A. Superficial spreading melanoma

B. Acral lentiguous melanoma

C. Squamous cell carcinoma

D. Basal cell carcinoma

E. Nodular melanoma

Correct Answer:Squamous cell carcinoma

Explanation:

The correct answer is squamous cell carcinoma. Though sun exposure is a risk factor for all the above types of skin cancer, actinic keratoses are precancerous lesions that may only develop into squamous cell carcinomas. Bowen’s disease is another predisposing factor for the development of an SCC.

Basal cell carcinoma (BCC) is incorrect as actinic keratoses do not develop into this type of skin cancer.

Nodular melanoma is incorrect as actinic keratoses do not have the potential to develop into melanomas. Nodular melanomas may arise from pre-existing melanocytic naevi.

Superficial spreading melanoma is incorrect as actinic keratoses do not have the potential to develop into melanomas. Melanomas develop from melanocytes, whereas actinic keratoses and SCCs arise from squamous epithelial cells.

Acral lentiginous melanoma is incorrect as actinic keratoses do not have the potential to develop into melanomas for the reason outlined above. Though acral lentiginous melanomas may be found on the hands, they are typically seen on the palmar surface rather than the dorsal surface, as described in this scenario.

Further reading:

https://dermnetnz.org/topics/actinic-keratosis

Question:

A 20-year-old male presents to his GP because of issues with his sight. For the past few months, he has had difficulty seeing in low light settings. When walking outside at night he struggles to see where he is going even if others can see normally. In the last 2 weeks, he has also noticed he is struggling to see out of his peripheral vision.

His vision is normal during the day and he can read books without any issues. He has no significant past medical history or family history. On ophthalmoscopy, you see the image below.

Christian Hamel [CC BY 2.0]

What is the most likely diagnosis?

A. Age-related macular degeneration

B. Glaucoma

C. Macular dystrophy

D. Papilloedema

E. Retinitis pigmentosa

Correct Answer:Retinitis pigmentosa

Explanation:

The most likely diagnosis is retinitis pigmentosa. The condition can occur as a simplex (sporadic) or be inherited in an autosomal dominant, autosomal recessive or x-linked fashion. The two main symptoms are night blindness and loss of peripheral vision. On ophthalmoscopy, characteristic hyper-pigmentary changes (bone spicules) are seen in the peripheral retina . Although there is no cure at present, gene therapy has shown promising results in early trials.

Glaucoma would indeed cause a loss of peripheral vision and may result in relative night blindness. It would be unlikely in this age group and there is lack of risk factors (such as family history or elevated intraocular pressure).

Age-related macular degeneration would cause a loss of central vision rather than peripheral. Macular degeneration does not cause night blindness and it is seen in an older age group.

Macular dystrophy is also genetic and could affect patients of this age group. However this condition typically presents with central visual loss and it wouldn’t cause night blindness.

Papilloedema would present with blurred optic disc margins bilaterally. It does not fit the clinical symptoms and the appearance of the optic nerve is healthy with clear disc margins.

Further reading:

https://patient.info/doctor/retinitis-pigmentosa

Question:

A 52-year-old female attends the GP complaining of feeling excessively lethargic. Over the past few months, she has also noticed increased pain and stiffness in her shoulders and hips and finds it difficult to stand up after sitting in a chair.

She has a past medical history of giant cell arteritis, which was treated 20 years ago with a course of steroids.

On examination her observations are stable. She has notable difficult getting on and off the examination couch, with a limited range of movement in her shoulders and hips bilaterally.

What would be the most appropriate initial investigation to support a diagnosis for her shoulder and hip pain?

A. Serum IL-6

B. CRP

C. Temporal artery ultrasound scan (USS)

D. Hip and shoulder X-rays

E. ESR

Correct Answer:ESR

Explanation:

The most appropriate initial investigation to support diagnosis is ESR. The most likely underlying cause of her shoulder pain is polymyalgia rheumatica (PMR). This is a condition in which there is inflammation around the neck and shoulder girdle which manifests typically as morning stiffness. It may be isolated, or it may be associated with temporal arteritis in which there is tenderness in the temporal region of the scalp that is typically exacerbated by a patient combing their hair. On examination, there is usually a limited range of movement in the shoulder girdle. ESR and CRP are typically raised. PMR will usually respond well to a short course of corticosteroids (such as prednisolone), which will usually be started at a dose of 12.5-25mg once daily then gradually reduced to a smaller dose over 1-2 months.

CRP is typically elevated in PMR but it is a less specific marker than ESR and is raised in a wide range of inflammatory conditions.

A temporal artery USS is useful in diagnosing temporal arteritis, which is linked to PMR, but this patient appears to have been treated for temporal arteritis previously and is not currently demonstrating any symptoms of this condition (e.g. scalp tenderness).

Serum IL-6 is a sensitive marker for PMR (i.e. in most cases of PMR levels will be elevated) but it is not very specific for PMR and not widely tested for.

Hip and shoulder X-rays may be useful if a bony injury is suspected, such as if the patient presents following trauma or asymmetrical pain/reduced range of motion.

Further reading:

https://patient.info/doctor/polymyalgia-rheumatica-pro

Question:

A 40-year-old male patient attends his GP practice with a left-sided neck swelling. He reports that this has been present for around four years and has been slowly growing since its appearance. Within the last few months, he has developed difficulty in swallowing, first with solid foods and then liquids. He reports some hoarseness in his voice. The patient recently moved to the UK from Peru.

Clinical examination reveals a 3 x 2-inch left-sided neck swelling located in the anterior triangle. The swelling is vertically fixed and associated with a carotid bruit, left-sided miosis, ptosis and anhidrosis.

What is the most likely diagnosis?

A. Branchial cleft cyst

B. Carotid body tumour

C. Cystic hygroma

D. Papillary thyroid carcinoma

E. Anaplastic thyroid carcinoma

Correct Answer:Carotid body tumour

Explanation:

The most likely diagnosis, in this case, is a carotid body tumour. This condition is rare and can be defined as a paraganglioma that develops within the medial side of the carotid bifurcation. The carotid body is a structure that is involved in the body’s short-term adaption to varying levels of carbon dioxide, oxygen and pH.

There are 3 main types of carotid body tumour:

Familial (most common in younger patients)

Sporadic (most common form)

Hyperplastic (due to chronic hypoxia e.g. living at high altitude in Peru)

This condition usually presents as an asymptomatic, slow-growing neck mass located in the anterior triangle of the neck that is vertically fixed. A carotid bruit can sometimes be heard on auscultation .

As the mass enlarges, additional features may develop due to compression of surrounding structures in the neck, including pain, hoarseness, Horner’s syndrome (miosis, anhidrosis, ptosis) and dysphagia.

Anaplastic thyroid carcinoma usually affects female patients. This condition most commonly presents with a rapidly growing neck mass associated with dysphagia, cough, neck pain and lymphadenopathy.

A branchial cleft cyst is less likely in this case. This condition typically presents in children or young adults as a solitary, asymptomatic mass that swells intermittently. Branchial cleft cysts present as even, fluctuant masses palpable on the anterior border of the lower one-third of the sternocleidomastoid muscle in the neck.

A cystic hygroma (a form of lymphatic malformation) is a condition that typically presents by the age of 2 years. Cystic hygromas are typically located in the posterior triangle of the neck and present as a 'doughy' painless mass that transilluminates.

Papillary thyroid carcinoma typically presents in female patients as an asymptomatic thyroid mass. In later stage disease, symptoms can include cough, dysphagia, hoarseness and weight loss. Typical clinical findings include a hard, fixed thyroid lump with ill-defined borders and cervical lymphadenopathy.

Further reading:

https://patient.info/doctor/glomus-jugulare-tumours

Question:

A 36-year-old woman presents with a 1-year history of a bilateral tremor of her hands and forearms. This has been progressive over this time, to the extent that she is now struggling to complete daily tasks such as dressing. The tremor is absent at rest and worsened when attempting to perform tasks. There are no other neurological symptoms noted, and a full neurological examination is otherwise normal. She says that when she is tired or stressed her symptoms worsen, but she finds that when she drinks alcohol her symptoms improve. Family history reveals that her mother suffered from the same problem.

What is the most appropriate next step in the management of this patient?

A. Alprazolam

B. Levodopa

C. Sodium valproate

D. Penicillamine

E. Propranolol

Correct Answer:Propranolol

Explanation:

This patient is suffering from an essential tremor. Some texts may refer to this condition as benign essential tremor, though this is now considered outdated, as it is recognised that, while there may be no underlying pathological ­cause of the tremor, it can be functionally debilitating for sufferers. There is no definitive cure for essential tremor, but first-line treatment for patients who are functionally impaired by their symptoms is a beta-blocker such as propranolol, or primidone, an anti-epileptic agent.

Levodopa is the first-line treatment for tremor associated with Parkinson’s disease. In contrast to essential tremor, the tremor of Parkinson’s disease is often unilateral, and present at rest. This patient’s young age would also argue against Parkinson’s disease in this case.

Penicillamine can be used as a chelating agent in the treatment of patients with Wilson’s disease. While Wilson’s disease may be associated with tremor, the absence of resting tremor, and otherwise normal neurological examination, argue against this diagnosis.

Sodium valproate is an anti-epileptic medication that can be used in the treatment of all forms of epilepsy. This patient’s history is consistent with essential tremor rather than epileptic seizures. Sodium valproate has no place in the management of essential tremor and, indeed, is known to be a cause of drug-induced tremor.

Alprazolam is a benzodiazepine, it can be considered as a second-line treatment agent if there is no improvement with the use of bisoprolol or primidone. Gabapentin and topiramate are alternative second-line agents.

Further reading:

https://bestpractice.bmj.com/topics/en-gb/1089/treatment-algorithm#drugDbPop\_2d6d5b5b-4506-4f1f-9cc7-51bcb0ac481c\_en-gb

Question:

An 87-year-old woman presents to the emergency department with a six-hour history of generalised, colicky abdominal pain and vomiting. She has a past medical history of atrial fibrillation, peripheral vascular disease and hypertension, and takes a number of medications including warfarin.

On examination, she is hypotensive, tachycardic and peritonitic, with melaena found on digital rectal examination. Blood tests reveal an INR of 1.2, white cell count of 24 x109/L, pH 6.8, bicarbonate 8mmol/L and lactate12mmol/L. CT scan reveals superior mesenteric arterial occlusion with evidence of end-organ ischaemia and free intra-peritoneal contamination.

Which of the following structures are most likely to be affected?

A. Ileum, ascending colon, transverse and descending colon, rectum

B. Jejunum, ileum, caecum, ascending and transverse colon

C. Liver, duodenum, jejunum, ileum, caecum

D. Transverse colon, descending and sigmoid colon, rectum

E. Stomach, duodenum, liver, pancreas, spleen

Correct Answer:Jejunum, ileum, caecum, ascending and transverse colon

Explanation:

The abdominal viscera are broadly supplied by three arteries originating from the descending aorta.

The superior mesenteric artery (SMA) originates at the level of the first lumbar vertebra (L1) to supply the structures of the midgut. These broadly include the third segment of the duodenum along with the head of the pancreas, the jejunum, ileum, caecum, ascending and proximal two-thirds of the transverse colon to the watershed line

The coeliac trunk originates at the level of the superior endplate of L1, just above the SMA, and gives rise to the left gastric, splenic and common hepatic arteries to supply the structures of the foregut. These include the distal oesophagus, stomach, first and second parts of the duodenum, liver, gallbladder, tail of the pancreas and the spleen.

The inferior mesenteric artery (IMA) originates at the level of the third lumbar vertebra (L3) and supplies the structures of the embryological hindgut. These include the distal third of the transverse colon beyond the watershed line, descending and sigmoid colon, and rectum.

Acute mesenteric ischaemia is a condition with high morbidity and mortality, characterised by thrombo-embolic or non-occlusive infarction of intra-abdominal organs. A downward spiral of sepsis and shock may ensue, which serves to worsen ischaemia and propagate the cycle. Presenting signs and symptoms may be vague, but the classical presentation is colicky abdominal pain associated with rectal bleeding and shock in an elderly patient with atrial fibrillation or peripheral vascular disease. Treatment depends on the underlying cause: emboli can be retrieved, occlusive thrombi can be bypassed, and necrotic gut must be resected. Multiple operations are often required, with a ‘second-look’ to re-assess the viability of bowel that appears unhealthy but not overtly necrotic. Risk-stratification tools such as P-POSSUM (see link) can be helpful in informing shared decision making with the patient and their significant others before embarking on potentially unsurvivable emergency surgery.

Source

Further reading:

https://teachmesurgery.com/vascular/peripheral/mesenteric-ischaemia/

Question:

A 4-year-old boy is brought to the GP by his mother, who is worried about recent symptoms that he has developed. He was sent home from school 6 days ago, as he complained of feeling hot; his temperature was taken by the teacher, and he was noted to have a fever. A COVID-19 test was taken as recommended but this was negative. He has been unable to return to school, as his temperature has remained high; he has now developed a rash over his trunk, and his mother reports that he is frequently rubbing his eyes and complaining that they are painful.

The GP carries out an examination of the child, who appears quiet and teary. The rash is visible over the entirety of the trunk and limbs, this is maculopapular and blanches with pressure. His temperature is taken, with a reading of 38.6, with pulse rate, respiratory rate and capillary refill time all being normal. No obvious sources of infection are identified, although there is significant lymphadenopathy in the left anterior cervical chain, with several lymph nodes exceeding 2cm in diameter. The boy's eyes appear painful and red.

The GP is concerned about the child and makes a hospital referral so that further investigations can be carried out. He explains to the boy's mother that blood tests will likely be taken and that he thinks it likely that an ultrasound of the heart may be necessary.

Given the likely diagnosis, which of the following is likely to be used as part of the management plan?

A. Imipramine

B. Doxycycline

C. Promethazine

D. Codeine

E. Aspirin

Correct Answer:Aspirin

Explanation:

The most likely diagnosis in this child is Kawasaki's disease, a vasculitis affecting medium-sized vessels that can give a number of systemic features. A prolonged fever (greater than 5 days) is a common manifestation of the disease; a prolonged fever of unknown origin as is present in this child should warrant further consideration. Whilst infective causes are still the most common culprit, it is worth thinking about inflammatory disorders (such as vasculitis in this case), autoimmune conditions such as juvenile idiopathic arthritis (the acute-onset form of this condition is another worthwhile differential in this boy) and malignancy.

Symptoms of Kawasaki's disease can vary, but a diffuse maculopapular or morbilliform rash, conjunctivitis (an explanation for the sore eyes described by the child) and lymphadenopathy are all frequently seen. Desquamation of the palms and soles may also arise, and the classical 'strawberry tongue' (also seen in scarlet fever) may be noted. A useful mnemonic to remember the important features of the condition is 'CRASH and BURN ('Burn' referring to the prolonged fever):

Conjunctivitis

Rash

Adenopathy

Strawberry tongue

Hand and foot desquamation

The diagnosis of Kawasaki's disease is made clinically, although raised inflammatory markers can aid the diagnostic process. The most important complication of the condition is the development of coronary artery aneurysms; an echocardiogram will usually be ordered to rule this out.

Aspirin is usually contraindicated in children due to the risk of Reye's syndrome (a disease that can cause hepatic toxicity and encephalopathy); however, it still forms part of the management of Kawasaki's disease alongside intravenous immunoglobulin; this is the only indication for the use of this drug in the paediatric population.

The other medications listed as options are also drugs that are contraindicated in children, none are used in the treatment of Kawasaki's disease. Tetracyclines such as doxycycline have a risk of causing tooth discolouration and growth impairment and therefore should be avoided in children. Codeine is not suitable for those under 12 years old, as there is an increased risk of respiratory depression. There is an increased risk of acute dystonic reactions in children given promethazine, and imipramine should be avoided due to the risk of cardiac arrhythmias in the young.

Further reading:

https://patient.info/doctor/kawasaki-disease-pro

Question:

A 36-year-old male is brought in via A&E following been knocked over by a car. On initial assessment he is found to be withdrawing his arm from a painful stimulus, mumbling inappropriate words and only opening his eyes to pain.

What is his Glasgow Coma Scale score?

A. E3 V3 M4 (10/15)

B. E1 V2 M3 (6/15)

C. E2 V2 M3 (7/15)

D. E2 V3 M4 (9/15)

E. E2 V3 M3 (8/15)

Correct Answer:E2 V3 M4 (9/15)

Explanation:

The Glasgow Coma Scale is a neurological scale aimed at assessing patients with traumatic head injury to ascertain their conscious level. It is a 15 point scale based on eye, verbal and motor responses, as described below.

The patient in the scenario was:

Eyes open to pain = 2

Inappropriate words = 3

Normal flexion to pain = 4

Leading to a GCS of 9/15 (E2 V3 M4)

Eyes (E):

4 - Open spontaneously

3 - Open to voice

2 - Open to pain

1 - None

Voice (V):

5 - Orientated speech

4 - Confused

3 - Inappropriate words

2 - Incomprehensible sounds

1 - None

Motor:

6 - Obeys commands

5 - Localises to pain

4 - Normal flexion to pain

3 - Abnormal flexion to pain

2 - Extension from pain

1 - None

Further reading:

https://geekymedics.com/glasgow-coma-scale-gcs/

Question:

An 11-month-old child is brought to the paediatric clinic by his mum, who has been concerned that he is not growing as much as other children and was referred by the GP. He has a good appetite and is currently weaning onto solid foods from breast-feeding. She has also noted that he passes stool into his nappy around 5 times a day and has a persistent wet cough.

He was born at 39+5 weeks and weighed 3.5kg. He is up to date with all of his routine vaccinations. There is no known family history of any medical conditions. The family moved to the UK from Haiti 9 months ago.

On examination, he weighs below the fourth percentile for his weight. He appears malnourished and on auscultation of the chest, crackles are audible.

What would be the most appropriate initial test to investigate the suspected diagnosis in this child?

A. Chest X-ray

B. CFTR genetic testing

C. Abdominal X-ray

D. Throat swab with microscopy, culture and sensitivity (MC+S)

E. Pilocarpine iontophoresis (sweat) test

Correct Answer:Pilocarpine iontophoresis (sweat) test

Explanation:

The most appropriate test to investigate diagnosis in this child is a pilocarpine iontophoresis test, which is also known as a ‘sweat test’. In infants suspected of having cystic fibrosis (as is suggested by this child’s malnourished state despite optimal feeding, frequent stools and persistent wet cough, in combination with the lack of newborn screening test), a sweat test is considered best to initially conduct to confirm a diagnosis. A positive sweat test is defined as a chloride concentration of >60mmol/L; it is considered negative if chloride concentration is <30mmol/L, and if the chloride concentration is 30-60mmol/L further testing is required to confirm a diagnosis.

Although it would be appropriate to conduct CFTR genetic testing to confirm the diagnosis, this would not be the initial test performed. Usually, a screen for the most common mutations of CFTR will be performed; if not detected the whole CFTR gene can be sequenced.

A throat swab MC+S could be performed to further investigate the persistent wet cough and may be conducted if the sweat test produces a chloride concentration measurement within the intermediate range. However, it is not a specific test for cystic fibrosis and would not be the most appropriate initial test.

A chest X-ray would likewise be of possible help if the sweat test were negative or in the intermediate range to further investigate the persistent wet cough but would not be the most appropriate initial test.

An abdominal X-ray would not be indicated at this stage as it is unlikely to add much clinical value.

Further reading:

https://patient.info/doctor/cystic-fibrosis-pro

Question:

A 40-year-old woman presents with a 2-day history of fatigue and positional dyspnoea worsened on exertion and lying flat. She reports that she had a flu-like illness a few weeks ago with fever and muscle aching. She has had two episodes of chest pain and palpitations over the last 2 days but is not currently experiencing chest pain.

She has a past medical history of type 1 diabetes mellitus and sarcoidosis.

On examination, she has a raised JVP, an audible S3 gallop rhythm and a pericardial friction rub. There is also palpable lymphadenopathy in the axillary lymph nodes. Her observations demonstrate that she is tachycardic (122bpm) and tachypnoeic (25bpm). Otherwise, her observations are stable.

A 12-lead ECG is performed which demonstrates ST-segment depression. Blood tests demonstrate creatinine kinase 250U/L and troponin 40ng/mL. An echocardiogram is requested which demonstrates left ventricular motion abnormality with mild dilatation. No abnormalities are obvious on a chest X-ray.

What is the most likely diagnosis in this patient?

A. Pericarditis

B. Myocarditis

C. Pneumothorax

D. Acute coronary syndrome (ACS)

E. Pulmonary embolism (PE)

Correct Answer:Myocarditis

Explanation:

The most likely diagnosis in this patient is myocarditis. The history of a viral prodrome (‘flu-like illness’) a few weeks ago before the onset of chest pain and dyspnoea is typical of myocarditis, as well as the positional/exertional dyspnoea and the onset of fatigue. This patient also has a history of auto-immune disease, which can also be a trigger for inflammatory myocarditis. On examination, an S3 gallop and typical pericardial friction rub are common findings. ECG can reveal non-specific ST and T wave abnormalities, and therefore the finding of ST-segment depression is consistent with this diagnosis; as is the mild elevation of troponin and creatinine kinase. Echocardiogram findings are variable but can show a variety of left ventricular abnormalities (including dilatation and motion irregularities).

Pericarditis can present similarly to myocarditis but is unlikely to impair LV function.

ACS is a possible diagnosis and should be ruled out in a patient presenting with chest pain, breathlessness, dynamic ST changes and a raised troponin. However, the pattern of breathlessness, evidence of a viral prodrome, history of auto-immune disease and patient age are more in keeping with a diagnosis of myocarditis.

Pulmonary embolism is a potential differential diagnosis in patients presenting with chest pain and breathlessness, but is not typically associated with a rise in troponin or CK, and would not produce a pericardial friction rub.

Pneumothorax is an important differential to rule out when a patient presents with breathlessness but is not supported by the CXR findings.

Further reading:

https://patient.info/doctor/myocarditis-pro

Question:

A 4-year-old boy is brought to the GP by his mother, who is worried about recent symptoms that he has developed. He was sent home from school 6 days ago, as he complained of feeling hot; his temperature was taken by the teacher, and he was noted to have a fever. A COVID-19 test was taken as recommended but this was negative. He has been unable to return to school, as his temperature has remained high; he has now developed a rash over his trunk, and his mother reports that he is frequently rubbing his eyes and complaining that they are painful.

Examination revealed significant lymphadenopathy in the anterior cervical chain, and the child's tongue appeared swollen. The GP was concerned that the child may have developed Kawasaki's disease, and made a hospital referral. Further investigations did not disprove this diagnosis, and traditional therapy for the condition was started, including aspirin and intravenous immunoglobulin.

2 days later, the paediatric consultant is called to see the child, as his condition appears to be deteriorating. He has begun vomiting and has a reduced level of consciousness. Examination reveals hyperreflexia, hypertonia and an upgoing plantar response, and the liver appears enlarged on abdominal palpation. The consultant orders an urgent serum ammonia measurement alongside other blood tests and tells the nurses to increase the frequency of observations recorded.

What is the most likely diagnosis?

A. Hypoglycaemia

B. Pituitary apoplexy

C. Reye's syndrome

D. Medium-chain acyl-CoA dehydrogenase deficiency

E. Cerebral aqueduct stenosis

Correct Answer:Reye's syndrome

Explanation:

Reye's syndrome is a recognised complication of aspirin provision in children. The exact pathophysiology remains unknown but is thought to involve metabolic failure within the liver, resulting in an accumulation of ammonia, which can lead to cerebral oedema and signs of raised intracranial pressure. This child has hepatomegaly and signs of an upper motor neuron lesion (hyperreflexia, hypertonia and positive Babinski sign), in keeping with the diagnosis.

Due to the risk of Reye's syndrome, aspirin is now contraindicated in all patients under the age of 16. The only exception is in Kawasaki's disease, the drug is still part of the traditional therapy for this vasculitis, and its benefits are thought to outweigh the risk of Reye's. Whilst there are very few cases of this specific treatment complication in children with Kawasaki's, it is still worth considering in any patient who acutely deteriorates. Management of Reye's syndrome is largely conservative; aspirin should be stopped, and mannitol may be given to reduce intracranial oedema.

Hypoglycaemia can cause reduced consciousness and possibly vomiting as in this child. However, it is far less likely to cause the upper motor neuron signs that he is exhibiting, and there is nothing in the history that would suggest a reason behind hypoglycaemia; the patient's blood glucose levels are more likely to be slightly elevated due to the stress response to the ongoing inflammation of the vasculitis.

Cerebral aqueduct stenosis is a possible cause of hydrocephalus in children; the blockage prevents cerebrospinal fluid from passing into the fourth ventricle from the third ventricle, which can raise intracranial pressure. The condition is often congenital, or due to an underlying tumour causing compression; neither of which would explain the acute onset of symptoms in this case.

Pituitary apoplexy refers to pituitary gland haemorrhage or infarction. This can present acutely and give a sudden onset of neurological symptoms and signs; the most common cause is an underlying brain malignancy, however, there are no features in the history that point to this as a likely diagnosis.

Medium-chain acyl-CoA dehydrogenase deficiency (MCADD) is an inherited metabolic disorder that results in issues with lipolysis. The condition results in children being unable to compensate for periods of illness when the breakdown of fats is required for the generation of energy. As a result, in the setting of otherwise minor illnesses, children can become extremely unwell, and require urgent treatment with glucose (which can be metabolised). The condition can cause neurological involvement in severe cases, but the disease is now almost always detected on newborn screening (heel prick test). There are no previous episodes or features in the history that point towards this as a likely diagnosis.

Further reading:

https://patient.info/doctor/reyes-syndrome-pro

Question:

A 17-year-old with sickle cell disease is brought into A&E in significant pain and distress. He explains that he has had a persistent uncomfortable erection of the penis for the last 4 hours. It is becoming progressively more painful. The episodes are not linked to sexual desire or stimulation, and there does not seem to have been a precipitating event.

He has previously experienced transient episodes of similar unwanted erections, but these have all occurred at night and self-resolved within a couple of hours. He attends regular clinic appointments with the haematology team and otherwise, his sickle cell disease is well controlled. He has no other medical conditions and no allergies.

On examination, his basic observations demonstrate a blood pressure of 115/85mmHg, heart rate of 84bpm and temperature of 37.5⁰C. He is seen by the urology and haematology teams, who explain that he is experiencing an episode of priapism. Doppler studies are performed and confirm that the priapism is ischaemic.

What is the most appropriate management of this episode of priapism?

A. Provide analgesia and review in 2 hours

B. Administer phenylepinephrine

C. Aspiration of blood from the corpus cavernosum

D. Immediate shunt surgery

E. Arrange a routine repeat Doppler ultrasound

Correct Answer:Aspiration of blood from the corpus cavernosum

Explanation:

The correct answer is aspiration of blood from the corpus cavernosum. Priapism is a term used to describe painful erections persisting over 4 hours and maintained without sexual stimulation. There are two main sub-types – ischaemic, which is typically progressively painful and a medical emergency requiring urgent intervention, and non-ischaemic, which is typically less painful and can usually be managed more conservatively in the initial stages. Doppler USS is useful for distinguishing between the two. In patients with sickle cell disease, recurrent self-limiting episodes of priapism are common and may be referred to as ‘stuttering priapism’; however it is important to distinguish these self-limiting episodes from an acute episode that does not resolve. Management of ischaemic priapism depends upon the duration of the episode and should proceed in a stepwise manner, but typically aspiration is the optimal initial step in management. Anaesthetic is administered and blood is aspirated from the corpus cavernosum.

If aspiration is unsuccessful at terminating the priapism, phenylephrine can be instilled into the corpus cavernosum of the penis. However this would not be an initial step in management, and aspiration would be attempted before administering phenylephrine.

Shunt surgery is used to direct blood away from the corpus cavernosum to resolve priapism, but it is not an immediate step in management and the more conservative approaches of aspiration and phenylephrine administration should be attempted before surgical intervention. Shunts create a distal fistula between the corpus cavernosum and glans penis to encourage drainage of blood and resolution of the priapism.

It would not be appropriate to provide analgesia and review in 2 hours. Based on the clinical history and confirmatory Doppler studies this is an episode of ischaemic priapism and as a result, requires urgent aspiration. Without prompt intervention, long-term erectile function can be compromised.

Doppler ultrasound is useful for distinguishing between ischaemic and non-ischaemic priapism, and should be arranged urgently (rather than routinely) in patients presenting with an acute priapism episode. It should be noted however that aspiration should not be delayed to perform Doppler studies if acute ischaemic priapism is suspected.

Further reading:

https://www.baus.org.uk/\_userfiles/pages/files/professionals/sections/andrology/Priapism.pdf

Question:

A 64-year-old female presents to her GP with a pruritic rash on both legs. She also complains of aching in the legs. She has a history of varicose veins, which have been managed conservatively. The rash is shown below.

What is the most likely cause of the skin discolouration?

James Heilman, MD, CC BY-SA 4.0, via Wikimedia Commons

A. Lipodermatosclerosis

B. Venous ulcer

C. Haemosiderin deposition

D. Vitiligo

E. Atrophie blanche

Correct Answer:Haemosiderin deposition

Explanation:

This image shows hyperpigmentation of the legs and feet in this patient with a history of varicose veins; known as venous eczema. Haemosiderin deposition is the most likely cause of this hyperpigmentation and is a breakdown product of haemoglobin. This is commonly seen in varicose veins, where venous hypertension leads to venous leakage.

Atrophie blanche is scarring which occurs after skin injury with poor vascular supply. It is also associated with venous insufficiency and varicose veins. It would cause hypopigmentation rather than hyperpigmentation.

Lipodermatosclerosis is subcutaneous fibrosis caused by chronic inflammation, leading to hardening of the skin. It's associated with venous insufficiency, and it is commonly seen as a progression from venous eczema. However, it does not cause hyperpigmentation of the skin.

Venous ulcers are caused by venous insufficiency and can be associated with varicose veins. However, they generally appear as shallow and irregular lesions with a granulating base.

Vitiligo is caused by progressive loss of melanocytes in the epidermis, resulting in depigmentation of the skin. It can be localised or widespread. This image shows hyperpigmentation, and so vitiligo is incorrect.

Further reading:

https://cks.nice.org.uk/topics/venous-eczema-lipodermatosclerosis/

Question:

A 49-year-old woman presents with a 3-hour history of right upper quadrant pain that started after breakfast this morning. She experienced a similar pain 1 week ago, which resolved spontaneously after a few hours. The pain is non-radiating, constant and she rates it as 6/10 in terms of severity.

She has a past medical history of type 2 diabetes mellitus for which she is prescribed metformin 500mg PO BD. Her BMI is 24.

On examination her observations are stable. On palpation of the abdomen, there is marked tenderness in the right upper quadrant but no guarding or rebound tenderness.

Routine blood tests are requested which demonstrate that her amylase and inflammatory markers are within the normal range. Liver function tests reveal a slightly elevated ALP but are otherwise normal. An abdominal USS demonstrates some gallstones present in the gallbladder, but there is no evidence of stones in the bile duct or any bile duct dilatation.

What is the most appropriate immediate management of this patient?

A. Perform emergency cholecystecomy

B. Discharge with analgesia and arrange for outpatient MRCP

C. Provide analgesia, an anti-spasmodic agent and book an elective cholecystectomy

D. Provide analgesia

E. Arrange for elective cholecystectomy

Correct Answer:Provide analgesia, an anti-spasmodic agent and book an elective cholecystectomy

Explanation:

The most appropriate immediate management of this patient would be to provide analgesia, an anti-spasmodic agent and book an elective cholecystectomy. In the presence of uncomplicated recurrent gallstone disease, it is best to provide symptomatic relief, and as it is a persistent problem and gallstones have been identified within the gallbladder it is appropriate to book them for non-emergency removal of the gallbladder (and the gallstones within it). Typically analgesia such as diclofenac or paracetamol are suitable for pain relief. Anti-spasmodics are not always indicated but agents such as hyoscine may be given for relief of symptoms if required. Cholecystectomy is performed to prevent recurrence and further complications from the gallstones (e.g. cholecystitis, cholangitis, gallbladder perforation, pancreatitis).

It would not be appropriate to just arrange for elective cholecystectomy, as this patient is in pain and symptomatic relief is required.

Emergency cholecystectomy is not indicated in the setting of uncomplicated gallstone disease – there are no symptoms or investigation findings suggestive of acute pathology that requires an immediate operation. Surgery may be expedited if there was ‘choledocholithiasis’ (presence of gallstones within the common bile duct).

Although it is important to provide symptomatic relief, just providing analgesia or discharging for outpatient MRCP is not sufficient in itself and an elective cholecystectomy needs to be booked in the long term.

Further reading:

https://patient.info/doctor/gallstones-and-cholecystitis

Question:

A 28-year-old woman presents to the GP with an 8-month history of worsening fatigue. She reports that she feels tired every morning, despite long periods of rest. She says she has recently found commuting to work difficult and has given up her active hobbies, including dance and weightlifting, as she feels exhausted after a few minutes of exercise.

She believes the trigger to her symptoms was a sudden-onset flu-like illness that did not resolve for many weeks.

The patient does not report any low mood, anhedonia or suicidal thoughts.

She does not drink or smoke and eats a balanced diet. She has no significant past medical history and does not take any regular medication. She does not have any drug allergies.

Physical examination is normal. A comprehensive set of blood tests including FBC, ESR, CRP, TFTs, LFTs, ANA, RF and HIV antibodies do not reveal any abnormalities.

Which of the following is the most appropriate initial screening tool to use in this patient?

A. Fibromyalgia Rapid Screening Tool

B. SCOFF questionnaire

C. DePaul symptom questionnaire

D. Alcohol Use Disorders Identification Test

E. Patient Health Questionnaire

Correct Answer:DePaul symptom questionnaire

Explanation:

The most likely diagnosis in this patient is chronic fatigue syndrome (CFS), also known as myalgic encephalomyelitis (ME). CFS/ME is characterised by persistent and disabling fatigue, post-exertional malaise (PEM), unrefreshing sleep, cognitive dysfunction and headaches. The symptoms in CFS/ME are not related to other medical or psychiatric conditions. The DePaul symptom questionnaire is a validated screening tool used to support a diagnosis of CFS/ME; it generates two scores based on the frequency and severity of symptoms to form an overall indicator for each symptom experienced. Therefore, this would be the most appropriate initial screening tool for this patient.

Clinically, it is challenging to distinguish between fibromyalgia and CFS/ME. However, patients with fibromyalgia typically present with widespread body pain or tenderness, in addition to fatigue, cognitive dysfunction and sleep disturbance. In patients with suspected fibromyalgia, the Fibromyalgia Rapid Screening Tool (FiRST) can be used to detect symptoms indicative of fibromyalgia. However, the absence of pain in this patient makes fibromyalgia a less likely diagnosis; therefore, the FiRST would not be the most appropriate initial screening tool.

The Patient Health Questionnaire (PHQ-9) is a screening tool used to diagnose and manage depression. However, this patient does not report any low mood, anhedonia, or suicidal thoughts, making a diagnosis of depression less likely. Therefore, the PHQ-9 would not be the most appropriate initial screening tool.

The Alcohol Use Disorders Identification Test (AUDIT) is a basic screening tool used to detect early signs of hazardous and harmful drinking. This patient does not report any features consistent with alcohol use disorder; therefore, this would not be the most appropriate initial screening tool.

The SCOFF questionnaire is a screening tool used to assess for the presence of eating disorders, including anorexia nervosa and bulimia nervosa. This patient's history is not suggestive of an eating disorder; therefore, this would not be the most appropriate initial screening tool.

Further reading:

https://patient.info/doctor/myalgic-encephalomyelitischronic-fatigue-syndrome-mecfs-pro

Question:

David is a 69-year old gentleman with symptoms of fatigue and mild diarrhoea. His symptoms started 6 weeks ago and have gradually gotten worse, prompting him to see his GP. He has a past medical history of Crohn’s disease but states that he has not had a flare-up for many years. Blood tests reveal an iron deficiency anaemia.

What is the most appropriate step the GP should take in managing this patient?

A. Organise a routine referral to gastroenterology

B. Organise a barium enema

C. Organise an urgent referral to gastroenterology for investigation

D. Advice David to maintain an adequate balanced intake of iron-rich foods such as dark green vegetables and meat

E. Prescribe oral ferrous sulfate 200mg tablets two or three times daily and organise a follow up appointment in one month

Correct Answer:Organise an urgent referral to gastroenterology for investigation

Explanation:

Individuals aged 60 years or over presenting with iron deficiency anaemia should be urgently referred to gastroenterology for further investigation to rule out malignancy (i.e. colonoscopy/endoscopy). Iron deficiency anaemia may be the first sign of gastrointestinal malignancy. Urgent referral should also be considered in individuals below the age of 50 who have iron deficiency anaemia and rectal bleeding.

Iron supplements and dietary changes are often used for the treatment of iron deficiency anaemia. However, these two options treat the symptom and not the cause of the anaemia. It is vital to rule out a possible malignancy via an urgent referral.

A routine referral to gastroenterology is insufficient in this case. The patient requires an urgent referral under the 2-week wait pathway to colorectal services.

A barium enema is not a useful investigation in this scenario.

Further reading:

https://cks.nice.org.uk/anaemia-iron-deficiency#!scenario

Question:

A 66-year-old female patient attends her GP with a 6-month history of abdominal bloating and fatigue. The patient comments that she has also begun to experience abdominal pain, and explains that she has little appetite for food. She adds that she feels the need to pass urine more frequently and that the urge to do so often arrives suddenly.

Her past medical history is significant for surgically-cured breast cancer 12 years ago. The patient has never been pregnant and has a 40-pack-year smoking history.

The GP records her weight at 71.4 Kg, a decrease from 79.2 Kg 12 months ago. On bimanual examination, she notes the presence of an adnexal mass at the left adnexa. The GP completes an urgent referral for an ultrasound.

Which additional investigation is most appropriate?

A. Beta hCG (human chorionic gonadotropin)

B. CEA (carcinoembryonic antigen)

C. CA19-9 (cancer antigen 19-9)

D. CA125 (cancer antigen 125)

E. AFP (alpha-fetoprotein)

Correct Answer:CA125 (cancer antigen 125)

Explanation:

Ovarian cancer is a relatively common cancer that typically presents with vague, generalised symptoms such as bloating, fatigue, early satiety and urinary urgency. If ovarian cancer is suspected patients should have their CA125 (cancer antigen 125) levels measured. Patients with a palpable adnexal mass on examination should additionally be referred urgently for an ultrasound.

CA19-9 (cancer antigen 19-9) is a tumour marker that is commonly used in the diagnosis and management of pancreatic cancer. Raised levels of CA19-9 are also associated with bowel cancer as well as inflammatory bowel disease.

Raised AFP (alpha-fetoprotein) levels are associated with a hepatocellular carcinoma, as well as non-seminoma testicular cancer.

CEA (carcinoembryonic antigen) levels are used to monitor disease progression in patients with a colorectal carcinoma, as well as some other gastrointestinal cancers.

Beta hCG (human chorionic gonadotropin) is a hormone produced by the syncytiotrophoblastic cells of the placenta during pregnancy and therefore is commonly used to assess pregnancy status. Elevated levels of beta hCG can also occur in males presenting with a non-seminoma testicular cancer.

Further reading:

https://geekymedics.com/ovarian-cancer/

Question:

An 8-year-old boy is brought into the emergency department with a painful and swollen red eye. The right eyelid and surrounding skin are grossly swollen, and the right eye appears to bulge outwards. Apart from a recent upper respiratory tract infection, he usually is well.

On examination of the right eye, eye movements are painful in all directions and visual acuity is reduced to hand movements. Both pupils appear to dilate when a light is rapidly shone from the left to the right eye. He has a temperature of 38.3oC.

What is the most appropriate management option?

A. Topical tropcamide

B. Nasal decongestant

C. High dose oral steroids

D. IV antibiotics

E. Oral antibiotics

Correct Answer:IV antibiotics

Explanation:

This case demonstrates orbital cellulitis, which is defined as an infection posterior to the orbital septum. It is more common in children and can spread from a recent sinus/upper respiratory tract infection. It is an ophthalmological emergency and an important differential of periorbital cellulitis.

IV antibiotics are the mainstay of management, alongside surgical intervention if a collection of pus is identified on imaging.

Oral antibiotics are suitable in periorbital cellulitis but not as initial treatment of orbital cellulitis.

Nasal decongestants are typically used as supportive treatment but they are not the mainstay of treatment.

Topical tropicamide is an antimuscarinic that dilates the pupil. It is commonly used during fundoscopy.

High dose oral steroids are not indicated in the management of orbital cellulitis.

Further reading:

https://geekymedics.com/orbital-and-periorbital-cellulitis/

Question:

A 67-year-old woman, with no past medical history, presents with a history of bilateral upper limb tremor which she states has bothered her for the last 3 years. It is worsened by action, such as trying to hold cutlery, but is improved by alcohol. She is concerned because lately, she is less able to perform fine tasks such as doing up buttons.

Exploration of her family history reveals that her mother suffered from similar symptoms.

A physical examination, including neurological examination, is otherwise normal.

What is the most likely diagnosis?

A. Physiological tremor

B. Huntington’s disease

C. Wilson’s disease

D. Parkinson’s disease

E. Essential tremor

Correct Answer:Essential tremor

Explanation:

Essential tremor is usually a bilateral tremor of the upper limbs, exacerbated by action. A significant proportion of cases are associated with a family history, and in contrast to other causes of tremor, there are no other neurological signs (e.g. ataxia, dystonia) found on examination. In addition, patients will often give a history of improvement upon drinking alcohol (or taking other suppressant medications such as benzodiazepines).

Unlike essential tremor, the tremor of Parkinson’s disease is most commonly unilateral initially, often described as ‘pill-rolling’ in nature, and markedly worse at rest, as opposed to essential tremor which is worsened by action. The otherwise normal neurological examination, with no features of rigidity or bradykinesia, would also argue against this diagnosis.

Physiological tremor is a normal finding in all individuals but, if enhanced by an underlying condition such as hyperthyroidism, or substance use/withdrawal, can lead to functional limitation. Physiological tremor would not be expected to worsen over time, as seen in this case. There is no suggestion of an underlying pathology in this case, and the improvement with alcohol and positive family history would argue in favour of essential tremor.

Huntington’s disease is an autosomal dominant condition caused by a trinucleotide CAG repeat on chromosome 4. It demonstrates a phenomenon known as anticipation, whereby symptoms appear at a younger age in successive generations. It typically presents with chorea (jerky, involuntary movements), with the development of behavioural/cognitive symptoms, which are not seen in this case.

Wilson’s disease is an inherited disorder of excess copper accumulation, characterised by neurological and hepatic signs and symptoms. This patient’s age argues against this diagnosis, as Wilson’s disease tends to present significantly earlier in life. In addition, the otherwise normal neurological exam, and absence of behavioural/cognitive features, also argues against this diagnosis.

Further reading:

https://bestpractice.bmj.com/topics/en-gb/1089

Question:

A 75-year-old man is brought to the emergency department with a 1-month history of worsening confusion and weakness. During this timeframe, he has had frequent falls due to difficulty walking and has been dropping items from his right hand. Although his confusion comes in episodes, the they are becoming more frequent.

He has a past medical history of type 2 diabetes and stroke and takes metformin, empagliflozin, atorvastatin, and clopidogrel.

On examination, his pupils are both equal and reactive to light. His right upper limb strength is 3/5 compared to the left, which is 5/5. He has a shuffling gait, however, lower limb strength is intact. Sensation, temperature, pain sense, and vibration are all intact. He has poor concentration and attention, and both his short- and long-term memory are impaired.

His blood glucose concentration and oxygen are normal. A CT head is requested.

What is the most likely diagnosis?

A. Normal pressure hydrocephalus

B. Dementia with Lewy bodies

C. Epidural haematoma

D. Subarachnoid haemorrhage

E. Subdural haematoma

Correct Answer:Subdural haematoma

Explanation:

Subdural haematoma is correct. This elderly patient has a history of progressively worsening neurological defects and confusion, which should raise suspicion of raised intracranial pressure (ICP). This history can be used to identify the most likely underlying cause of his raised ICP. This patient has a history of stroke and is taking clopidogrel (antiplatelet therapy), which increases the risk of spontaneous or traumatic intracranial haemorrhages. Of the types in the question, the most likely type is a chronic subdural haematoma, as it can present insidiously and in this manner, with progressively worsening confusion and neurological deficits due to the bleed being much slower. Subdural haematomas are commonly caused by rupture of the bridging veins, which run between the dura and surface of the brain. It is likely that the combination of his antiplatelet therapy, his age, and his falls have contributed to the development of his subdural haematoma.

Epidural haemorrhage (extradural haematoma) typically occurs acutely following low-impact trauma such as a hit to the head or fall, and it is unlikely this patient would have had one for a month as the bleeding is not as slow. As well as this, patients classically present with initially losing consciousness, then briefly regaining it (lucid interval), and then losing it again due to the expansion of the haematoma and subsequent brain herniation. This middle meningeal artery is the most common site of injury.

Subarachnoid haemorrhage (SAH) usually presents with a sudden-onset 'thunderclap' occipital headache that the patient describes as the worst headache of their life. There are often features of meningism as well, such as photophobia and neck stiffness. Again, due to the relatively faster bleeding seen in SAH, it is unlikely that this patient would have had one for a month.

Normal pressure hydrocephalus (NPH) may occur due to SAH or reduced cerebrospinal fluid absorption, however, it classically presents with a triad of gait abnormality (often shuffling), dementia, and urinary incontinence. Although this patient has had some shuffling and confusion, there is no suggestion of urinary incontinence. This diagnosis would also not explain the weakness.

Dementia with Lewy bodies presents with progressive confusion and memory loss that can be fluctuating, i.e. on some days, symptoms are not present, but on others, they are worse, but still progressive overall. Features of Parkinsonism also develop (tremors, rigidity, bradykinesia, postural instability), along with visual hallucinations. Although this patient's confusion has come in episodes and they have a shuffling gait, the progression of the symptoms is much faster than to be expected in Lewy body dementia, and visual hallucinations are not present. This diagnosis would also not explain the weakness.

Further reading:

https://geekymedics.com/subdural-haemorrhage-an-overview/

Question:

A 46-year-old woman presents to her general practice for routine cervical screening. She is up to date with all previous cervical screenings, and her results have been normal. Her last menstrual period was 13 days ago. She has one child, age 7, delivered at 39 weeks gestation by vaginal delivery with no complications. In the past three months, she has had two different male sexual partners. She takes the combined oral contraceptive pill.

Two weeks later the results are returned. The sample is positive for human papillomavirus (HPV), and cytology reveals low-grade dyskaryosis.

What is the best course of action to take for this patient?

A. Repeat screening in three months time

B. Colposcopy

C. Return to routine screening

D. HPV vaccination

E. Radical trachelectomy

Correct Answer:Colposcopy

Explanation:

This patient has tested positive for human papillomavirus (HPV), and cytology reveals low-grade dyskaryosis. Dyskaryosis of any grade is abnormal, and therefore, this patient requires an urgent referral for colposcopy. Colposcopy involves visualising the cervix, applying acetic acid or iodine to stain the abnormal epithelium and taking a punch biopsy for histological analysis.

The sample is collected using a speculum and a smear brush to sample the transformation zone of the cervix. This is where the squamous epithelium of the vagina undergoes metaplasia to become the columnar epithelium of the cervical canal. In the UK, samples undergo a two-stage process:

Primary HPV screening: cervical cells are screened for HPV. If positive for HPV, cytology is carried out. If negative, then the sample will be discarded.

Liquid-based cytology: results are categorised as normal, abnormal (dyskaryosis) or inadequate.

We do not know if this patient has previously received the HPV vaccine or not. However, further vaccination would be ineffective as she has already contracted the virus.

Radical trachelectomy may form part of this patient's further management, but biopsy and histopathology should be performed first to determine the nature and extent of the dyskaryosis.

Returning to routine screening or repeating at a later date would be inappropriate. This sample has shown abnormal epithelium in the cervical transformation zone, so urgent colposcopy is required to evaluate the degree of dyskaryosis and guide further management.

Further reading:

https://cks.nice.org.uk/topics/cervical-screening/

Question:

A 55-year-old man presents to his GP complaining of new-onset facial pain. He reports that the pain is sharp, severe, and only involves the right side of his face. On examination, he is extremely tender to palpation of the forehead, maxilla, and mandible on the right side. He has no other examination findings. He has no significant past medical history.

Given the most likely diagnosis, what is the most appropriate first-line management?

A. Codeine

B. Rhizotomy

C. Amitriptyline

D. Gabapentin

E. Carbamazepine

Correct Answer:Carbamazepine

Explanation:

This patient’s constellation of symptoms most likely points to trigeminal neuralgia, the first-line treatment for which is carbamazepine.

Anticonvulsants such as gabapentin and pregabalin have been shown to be effective in the management of trigeminal neuralgia but carbamazepine has the most evidence for efficacy and so is the preferred first-line option.

Traditional first-line analgesics like NSAIDs and weak opioids like codeine are not effective in trigeminal neuralgia and there is limited data to support the use of tricyclic antidepressants like amitriptyline.

Surgical severance of the trigeminal nerve (i.e. Rhizotomy) is an inappropriate first-line option and should only be sought if medical management is ineffective or inappropriate.

Further reading:

https://patient.info/doctor/trigeminal-neuralgia-pro#nav-5

Question:

A 25-year-old woman presents to the GP with muscle pain, tingling in her mouth, and numbness in her hands and feet that have gradually developed over the last few months.

On examination, her tendon reflexes appear to be accentuated, and when the GP takes her blood pressure her wrist appears to flex uncontrollably. She has reduced sensation in the extremities of her hands and feet, but otherwise her neurological examination is normal. Her basic observations are all within normal limits.

She works in an office, has no past medical history and she is not taking any regular medications. She does not have any allergies.

Blood samples are obtained and tests ordered.

Given the likely diagnosis, what abnormality is most likely to be detected?

A. Low calcium, low vitamin D, raised parathyroid hormone (PTH)

B. Low calcium, low vitamin D, low parathyroid hormone (PTH)

C. Raised calcium, low vitamin D, low parathyroid hormone (PTH)

D. Raised calcium, low vitamin D, raised parathyroid hormone (PTH)

E. Normal calcium, raised vitamin D, raised parathyroid hormone (PTH)

Correct Answer:Low calcium, low vitamin D, raised parathyroid hormone (PTH)

Explanation:

The most likely diagnosis in this woman is hypocalcaemia, and the most likely abnormality seen on her blood results is low calcium, low vitamin D, raised parathyroid hormone (PTH). Myalgia (muscle pain) and paraesthesia in the extremities (i.e. the hands and feet), as well as the mouth, are typical symptoms of hypocalcaemia. On examination, patients with hypocalcaemia may also present with generalised tetany (unrelieved muscle contraction) and two classic signs that may be elicited are Trousseau’s (as described above, in which there is a carpal spasm in response to blood pressure cuff inflation) and Chvostek’s (in which there is a facial spasm in response to tapping the facial nerve). Hyperreflexia is also a common finding. Working in an office is a risk factor for hypocalcaemia – office work limits sunlight exposure required for vitamin D activation (a key regulator of calcium metabolism). Vitamin D deficiency is common in the UK population and is likely to be contributing to this patient’s hypocalcaemia. Parathyroid hormone (PTH) has three principal actions regarding calcium metabolism – stimulating vitamin D activation, renal calcium re-absorption and calcium release from bone. In vitamin D deficiency low levels of calcium stimulate PTH release from the parathyroid gland by negative feedback resulting in secondary hyperparathyroidism.

Low calcium, low vitamin D, low PTH is incorrect. Although low calcium and low vitamin D are correct given the clinical picture, PTH would be raised as vitamin D deficiency causes secondary hyperparathyroidism. PTH is not always raised significantly but you would not expect it to be low. Note that hypocalcaemia with a low PTH would be primary hypoparathyroidism, which can occur in patients who have had a thyroidectomy (the parathyroid glands sit just superiorly to the thyroid gland so are often removed during surgery), Di George syndrome (congenital abnormality of the parathyroid glands) and auto-immune parathyroid atrophy.

Raised calcium, low vitamin D, low PTH is incorrect as the symptoms described are typical of hypocalcaemia rather than hypercalcaemia. Hypercalcaemia typically results in symptoms such as abdominal pain, bone pain, confusion, constipation and muscle weakness, with possible complications such as kidney stones and cardiac arrhythmias. The symptoms of hypercalcaemia are often remembered using the following mnemonic – stones (kidney stones), bones (bone pain), groans (abdominal pain), thrones (constipation), muscle tone (muscles weakness) and psychiatric overtones (depression and confusion).

Normal calcium, raised vitamin D, raised PTH is incorrect as the patient’s symptoms are typical of hypocalcaemia and the calcium is therefore unlikely to be normal. If the calcium is normal, PTH is unlikely to be raised as negative feedback exists between calcium and PTH. As a result, if calcium is normal PTH release from the parathyroid glands is suppressed to prevent hypercalcaemia.

Raised calcium, low vitamin D, raised PTH is incorrect as a low vitamin D will typically cause low calcium. Raised PTH and a raised calcium can occur in the context of primary hyperparathyroidism (usually caused by an adenoma of the parathyroid gland), but given the symptoms of hypocalcaemia, this is incorrect in this case.

Further reading:

https://patient.info/doctor/hypocalcaemia

Question:

A 43-year-old man presents with a 4-day history of non-productive cough, loss of appetite and increasing shortness of breath. He has worked in a pet shop for the past 15 years but otherwise has no significant past medical history. His travel history is unremarkable.

On examination, he is afebrile with a pulse of 110 bpm and a respiratory rate of 36/min. Auscultation of his chest is normal, but a chest x-ray shows widespread bilateral airspace shadowing consistent with pneumonia.

Serology for which organism would be most important to request?

A. Mycoplasma pneumoniae

B. Legionella pneumophila

C. Chlamydophila psittaci

D. Chlamydophila pneumoniae

E. Pneumocystis jiroveci

Correct Answer:Chlamydophila psittaci

Explanation:

Given the history, the most important serological investigation to request in this scenario would be Chlamydophila psittaci (previously called Chlamydia psittaci). Although a zoonosis of birds, it does infect parrots (hence the species name “psittaci” and the name “psittacosis” given to the disease it causes in humans) and can be acquired from other birds, so strictly speaking, it is an ‘ornithosis’. Pet shop owners, bird keepers and poultry industry workers are at particularly high risk (and such occupations should be reviewed thoroughly when taking any respiratory history). It often causes severe pneumonia, with headache, arthralgia and painful myalgia (especially in the head and neck) being prominent features, alongside a dry non-productive cough. Chest pain and dyspnoea are present with extensive pulmonary involvement, but in some cases, auscultation may be normal and therefore underestimate the extent of the underlying disease. In severe cases, disseminated infection leads to infection at distant sites, including the central nervous system (meningoencephalitis), joints (arthritis) and heart (endocarditis, myocarditis and/or pericarditis). Radiological features are usually in keeping with lobar consolidation or interstitial changes. A patient has C.psittaci infection if clinical signs are compatible with psittacosis infection and diagnosis is confirmed by isolation of C.psittaci from sputum, or swabs of the nasopharynx and oropharynx. Treatment is with doxycycline, so it is important to confirm the diagnosis since doxycycline is not typically part of first-line empiric treatment regimens for community-acquired pneumonia. Without treatment, the mortality may be as high as 20%. Legionella pneumophila, Mycoplasma pneumoniae, and Chlamydophila pneumonia are all non-zoonotic causes of atypical pneumonia in humans and should all be covered by a macrolide, although fluoroquinolones or tetracyclines are also effective.

The absence of any significant travel history makes Legionella pneumophila, which has a propensity for growth in warm water and is associated with exposure to contaminated water sources, including hotel air conditioning systems (as well as hot tubs and industrial cooling towers), a less likely diagnosis. In confirmed cases, hyponatremia, lymphopenia and deranged liver function tests can all be observed on routine blood tests. Diagnosis is usually confirmed with a positive legionella urinary antigen test.

Mycoplasma pneumoniae is commonly seen in young adults and is exposure associated with autoimmune haemolytic anaemia and erythema multiforme. Diagnosis is made by PCR from swabs of the naso/oropharynx.

Chlamydophila pneumoniae infection often causes lower respiratory tract infection leading to bronchitis and wheezing episodes that differentiate it from other causes of atypical pneumonia, However, chronic infections may develop into adult-onset asthma. Diagnosis is confirmed with cultures from oro/nasopharyngeal swabs or a sputum sample.

Pneumocystis jiroveci usually causes pneumonia (PCP) in patients with poor cell-mediated immunity, such as HIV infection. The absence of risk factors for HIV infection, which include unprotected anal/vaginal intercourse with an infected individual, needlestick injuries or sharing needles, and previous blood transfusions, suggest this is less likely as a diagnosis. HIV serology would be the most useful investigation to confirm the diagnosis.

Further reading:

https://patient.info/doctor/psittacosis-pro

Question:

A 54-year-old patient presents to her general practitioner with a 1-year history of dyspareunia, vaginal itching and dryness. She has been post-menopausal for 3 years now and is not currently taking any medication. She has no significant past medical history. On examination, the general practitioner finds the following:

Given this history and the examination findings, what is the most likely diagnosis?

Image taken from (Stika 2010)

A. Vulva candida infection

B. Lichen sclerosus et atrophicus

C. Vulva squamous cell carcinoma

D. Herpes simplex 2 infection

E. Atrophic vulvovaginitis

Correct Answer:Atrophic vulvovaginitis

Explanation:

The correct answer is Atrophic vulvovaginitis. This patient's history of ongoing dyspareunia, vaginal itching and dryness post menopause coupled with the examination findings will point to this diagnosis above the others. On examination, typical signs of atrophic vulvovaginitis will include: shortening of the vaginal canal, loss of the labia majora, generalised vulval pallor and loss of the clitoral hood. This is due to a multifactorial process which stems from a reduced oestrogen concentration post-menopause. Reduced lactobacili in the vaginal flora leads to a raised pH and colonisation by opportunistic infection as well as a changes to the connective tissue physiology (Stika 2010). Treatment involves local oestrogen replacement.

Lichen sclerosus et atrophicus is an important differential to exclude as this can also occur in peri/post-menopausal women. However, this is the incorrect answer in this circumstance. This is a chronic inflammatory autoimmune condition which produces autoantibodies against extracellular matrix protein 1 found in the vulva. It presents with similar symptoms but tends to leave blanched, thickened areas in the non-hair producing regions of the vulva. Crucially it spares the vaginal mucosa itself and frequently spreads to the surrounding skin and perianal area. It is important to distinguish against atrophic vaginitis as its treatment involves the use of corticosteroids to dampen the autoimmune response rather than topical oestrogen replacement.

Vulvar squamous cell carcinoma is also incorrect. Lichen sclerosus can be a risk factor for developing a SCC.

Vulva candida infection is also unlikely given the lack of discharge or other suggestive symptoms.

Herpes simplex 2 infection is incorrect. This would be characterised by blistering sores if any symptoms are noted.

Further reading:

https://onlinelibrary.wiley.com/doi/10.1111/j.1529-8019.2010.01354.x

Question:

A 29-year-old, 32-weeks pregnant female attends her GP complaining of a severe headache. She explains that it came on gradually over the past few hours, and describes the pain as over the frontal region of her head. The patient also comments that she has experienced some flashes of light in her visual field.

She is gravida 1, para 0 with a past medical history significant for moderate asthma.

The GP records her blood pressure as 146/104 mmHg, a rise from 112/74 mmHg before her pregnancy. Urinalysis shows 3+ for protein.

Given the likely diagnosis, which is the most appropriate initial management?

A. Nifedipine

B. Emergency Caesarian section

C. Amlodipine

D. Ramipril

E. Labetalol

Correct Answer:Nifedipine

Explanation:

The presence of new-onset hypertension and proteinuria in a patient after 20 weeks gestation indicates a diagnosis of pre-eclampsia. Many patients with pre-eclampsia are asymptomatic, but clinical presentations can include a frontal headache, abdominal pain and visual disturbances. As this patient has asthma, labetalol is contraindicated and nifedipine is the recommended treatment.

Labetalol is the first-line treatment for patients with pre-eclampsia, except for those with asthma or of Afro-Caribbean origin, for whom nifedipine is first-line. The aim of anti-hypertensive therapy is to keep the blood pressure below 135/85mmHg and it should be continued for up to 6-12 weeks postpartum.

Ramipril is an angiotensin-converting enzyme (ACE) inhibitor that is frequently prescribed to treat essential hypertension in patients under 55 years of age. All ACE inhibitors are contraindicated in pregnancy due to teratogenicity.

Amlodipine is a calcium channel blocker that is often used in the management of hypertension in adults. While it is not absolutely contraindicated in pregnancy, amlodipine is not currently recommended for the treatment of pre-eclampsia.

An emergency Caesarian section would not be appropriate at this stage as medical management must be trialled first. Severe or persistent cases of pre-eclampsia should be referred to secondary care, where a decision about delivery can be made.

Further reading:

https://geekymedics.com/pre-eclampsia/

Question:

A 55-year-old man presents to the emergency department with a short history of difficulty in breathing. He has experienced a sore throat for the last 24 hours but is now unable to lie flat. He feels better when sitting forward. He is unable to swallow his saliva, instead spitting it out into a bowl. He has a background of hypertension and type 2 diabetes mellitus.

ENT are on their way to perform a fine nasal endoscopy.

Which of the following investigations can be performed safely in this patient to help determine the cause of his presentation?

A. Lateral neck x-ray

B. Peak flow

C. Chest x-ray

D. Arterial blood gas

E. CT neck

Correct Answer:Lateral neck x-ray

Explanation:

The patient has presented with signs and symptoms of epiglottitis. The patient is unable to lie flat due to airway obstruction as the swollen epiglottis falls backwards and covers the vocal cords. Therefore CT is not appropriate.

A lateral x-ray can be used safely in many patients, as the patient can remain sat upright and it can be performed in resus. A thumb sign can seen due to the swollen epiglottis. The image below shows a normal epiglottis on the left and a swollen epiglottis on the right. The patient will need a fine nasal endoscope and will likely require urgent intubation.

A peak flow measurement, chest x-ray or arterial blood gas will not help to diagnose epiglottitis in this patient.

Further reading:

https://radiopaedia.org/articles/thumb-sign-epiglottitis-1?lang=gb

Question:

You are a junior doctor working in the acute medical unit. You have been asked to review a type 1 diabetic who presented yesterday in diabetic ketoacidosis (DKA) and is awaiting today's senior review. The patient is 26, usually uses long-acting insulin and is known to the diabetic team. Blood tests taken by the night shift team show the following:

pH 7.38

Bicarbonate: 22 mmol/L

Glucose: 6.3 mmol/L

Ketones: 0.1 mmol/L

The patient has tolerated her breakfast this morning. She has been on her usual long-acting insulin throughout the admission at the advice of the diabetes team and is currently following the local DKA treatment protocol for insulin infusion and fluids.

What is the most appropriate next step in management?

A. Decrease her long-acting insulin dose

B. Discontinue the intravenous insulin and intravenous fluids

C. Leave the intravenous insulin and fluids running

D. Administer 100 ml of 1.26% sodium bicarbonate intravenously

E. Increase her long-acting insulin dose

Correct Answer:Discontinue the intravenous insulin and intravenous fluids

Explanation:

This patient has resolved the metabolic disturbance caused by her DKA with normal pH, normal ketones and normal bicarbonate. In addition, she has continued throughout the admission on her usual insulin regimen and has eaten a meal. Therefore, once it is confirmed that the patient has actually received her usual insulin dose, she can safely have her DKA protocol fluids and insulin discontinued.

There is no benefit to leaving her insulin and fluids running.

Her long-acting insulin dose should not be altered unless advised to do so by the diabetic team.

Bicarbonate is not needed. DKA management should involve the inpatient diabetes team and advice should be sought from them if required.

Further reading:

https://www.diabetes.org.uk/professionals/position-statements-reports/specialist-care-for-children-and-adults-and-complications/the-management-of-diabetic-ketoacidosis-in-adults

Question:

A 27-year-old lady presents with regular, painful contractions at 39 weeks gestation. On vaginal examination, her cervix is 5cm dilated. This is her first pregnancy, which has been midwife-led and she has had no problems other than some reflux and back pain over the last few weeks. She progresses well at first but starts to tire in the second stage of labour after nearly two hours of pushing. A forceps delivery is performed. During a newborn baby check the following morning, the infant is well despite a large, fluctuant swelling on the side of the head. The swelling does not cross the suture line.

Which of the following is the most likely cause of the swelling?

A. Caput succedaneum

B. Chignon

C. Cephalohaematoma

D. Haematoma caused by non-accidental injury

E. Subgaleal haemorrhage

Correct Answer:Cephalohaematoma

Explanation:

This swelling is most likely to be a cephalohaematoma. This is caused by a haemorrhage of blood between the skull and periosteum, due to a prolonged second stage of labour or forceps delivery. It may take several weeks to resolve but does not require active management. It can be distinguished from a caput succedaneum as the swelling is limited to individual bones and does not cross the suture lines.

A caput succedaneum would usually extend across the midline and should resolve in days rather than weeks. It is caused by the pressure of the presenting part against the cervix during delivery. The bleeding in a caput succedaneum is above the periosteum and below the scalp.

A chignon is a swelling associated with ventouse delivery, due to the application of the suction cup. It may disappear within two hours or take up to two weeks to fade.

Although non-accidental injury should always be considered when a child presents with an injury, due to the history and the nature of the swelling, this is likely to be a cephalohaematoma.

A subgaleal haemorrhage is an important diagnosis to rule out, as it can lead to haemorrhagic shock and seizures. It is caused by bleeding into the potential space between the periosteum and the galea aponeurosis. It presents as a boggy mass which can spread insidiously, usually following ventouse delivery or head trauma. It is less likely in this case due to the confined nature of the swelling and the lack of other symptoms.

Further reading:

https://patient.info/doctor/birth-injuries-to-the-baby

Question:

A 70-year-old man presents to his GP with worsening chest pain on exertion and syncope. Examination of the precordium reveals an ejection systolic murmur which can be heard over the carotid arteries.

What is the most likely finding on examining the patient's pulse?

A. Slow rising pulse

B. Collapsing pulse

C. Bounding pulse

D. Irregularly, irregular pulse

E. Pulsus paradoxus

Correct Answer:Slow rising pulse

Explanation:

The history and examination findings are consistent with a diagnosis of aortic stenosis (chest pain on exertion, syncope and an ejection systolic murmur which radiates to the carotid arteries). As a result, a slow rising pulse is the most likely finding on clinical examination.

A collapsing pulse is associated with aortic regurgitation.

A bounding pulse is associated with sepsis and hypercapnia.

An irregularly irregular pulse is typically associated with atrial fibrillation.

Pulsus paradoxus involves a large decrease in pulse pressure (>10mmHg) during inspiration. This findings is associated with several conditions, including cardiac tamponade, constrictive pericarditis, pulmonary embolism and acute asthma.

Further reading:

https://www.youtube.com/watch?v=Z9cuXSaiZnw

Question:

A 29-year-old woman is seen by her GP for facial asymmetry. This came on over the last 48 hours and affects only the left side of her face. Prior to the visible change, she had a mild ache on the same side behind her ear. On examination, she has a visible droop at the left corner of her mouth and left brow, weakness of left eye closure and involvement of the frontalis muscle on the left side. She has no rash or other lesions present on examination. She is systemically well and has no other symptoms and has never had any similar previous episodes.

What is the most likely diagnosis?

A. Lyme disease

B. Myasthenia gravis

C. Cerebrovascular disease

D. Multiple sclerosis

E. Bell’s palsy

Correct Answer:Bell’s palsy

Explanation:

The description here is of a left-sided lower motor neuron lesion affecting the facial nerve. When occurring idiopathically, as is the case here, this is known as Bell’s palsy. Post-auricular pain is a common feature due to the facial nerve’s general somatic sensory fibres supplying this region.

Multiple sclerosis and cerebrovascular disease cause upper motor neuron lesions characterised by sparing of the frontalis muscle, which has bilateral cortical innervation.

Lyme disease may cause a facial nerve palsy but would often have other features or a typical rash/evidence of tick bite.

Myasthenia gravis would be less common in this age group and typically yields fatiguable weakness affecting multiple muscles rather than a specific nerve distribution.

Further reading:

https://patient.info/doctor/facial-nerve-palsy

Question:

A 60-year-old man is brought to the GP by his wife as he has had a series of recent falls, and has begun to have difficulty buttoning up his shirts. The GP decides to examine him. The patient is slow to begin walking, and his gait is also slow and shuffling. One sign elicited by the GP is that upon repeatedly tapping the patient’s forehead, the patient continues to blink each time.

Given the most probable diagnosis, which other finding is most likely in this patient?

A. Micrographia

B. Velocity dependent hypertonia

C. Nystagmus

D. Intention tremor

E. Dysdiadochokinesia

Correct Answer:Micrographia

Explanation:

This patient is showing signs of Parkinsonism. Patients often present insidiously; early signs include reduced dexterity, drooling saliva and quiet speech. Their face may become expressionless (hypomimia). The GP here demonstrates a positive glabellar tap test, which is a sign of Parkinsonism. Though not mentioned in this patient, other possible signs in the gait include stooped posture, reduced arm swing (which is often begins unilaterally in idiopathic Parkinson’s disease), freezing, and slow speed of turning. Small handwriting, also called micrographia, is another common finding in these patients.

Nystagmus, dysdiadochokinesia and intention tremor are more likely to be seen in patients with cerebellar disorders.

Velocity dependent hypertonia describes spasticity; the lead pipe rigidity of Parkinsonism is velocity independent.

Further reading:

https://patient.info/doctor/parkinsonism-and-parkinsons-disease

Question:

A 50-year-old man presents to the GP with lethargy, tiredness and difficulty walking. Examination reveals loss of proprioception and vibration sensation in both feet, with upgoing plantars.

Blood tests reveal the following:

Hb = 92g/L (115-160)

MCV = 125fL (76-96)

WCC = 10.3 x109/L (4.0-11.0)

Neutrophils = 6.1x109/L (1.5-8.0)

Platelets = 160 x109/L (150-400)

Which test would be most useful in determining the cause?

A. Direct Coombs test

B. Folate level

C. Urea and creatinine level

D. Vitamin B12 level

E. Ferritin level

Correct Answer:Vitamin B12 level

Explanation:

The patient most likely has a diagnosis of subacute combined degeneration of the spinal cord secondary to vitamin B12 deficiency (given the patient's symptoms and the presence of a macrocytic anaemia). As a result, the most useful investigation of those presented would be a vitamin B12 level.

Subacute combined degeneration of the spinal cord presents loss of peripheral proprioception and vibration sensation. In more advanced disease the patient becomes ataxic and develops upgoing plantars. The lower limbs are most commonly affected first, but eventually, all limbs are affected.

Other causes of macrocytic anaemia include folate deficiency and alcohol excess.

Folate deficiency can cause mild peripheral neuropathy and psychiatric conditions such as depression, however, the clinical findings in this scenario are much more likely to be caused by vitamin B12 deficiency.

The direct Coombs test is used in the investigation of autoimmune haemolytic anaemia. This condition is not typically associated with the neurological signs present in this scenario.

A ferritin level can be useful in confirming the presence of iron deficiency, which typically causes a microcytic anaemia. Iron deficiency would not account for the neurological symptoms or the macrocytic anaemia.

A urea and creatinine level would be useful when considering chronic kidney disease. However, chronic kidney disease (CKD) would not account for the neurological symptoms or the macrocytic anaemia. CKD is more commonly associated with normocytic anaemia.

Further reading:

https://patient.info/doctor/pernicious-anaemia-and-b12-deficiency#nav-2

Question:

A 42-year-old woman presents as an emergency to her GP, having woken yesterday morning with a left-sided facial droop. It has been progressively worsening, and she now describes difficulty closing her eye, tenderness around her left ear, and sensitivity to sounds.

On examination, she is unable to wrinkle her forehead on the left. Neurological examination of the limbs, and assessment of vision, is normal. Otoscopy is unremarkable. She is otherwise systemically well.

What is the most likely diagnosis?

A. Lyme disease

B. Acute ischaemic stroke

C. Bell’s palsy

D. Cholesteatoma

E. Ramsay Hunt syndrome

Correct Answer:Bell’s palsy

Explanation:

Bell’s palsy is an acute onset, idiopathic facial nerve (cranial nerve VII) mononeuropathy. While idiopathic, it is seen more commonly in pregnancy, and patients with diabetes mellitus. It is associated with facial droop with forehead involvement (as Bell’s palsy is a lower motor neuron lesion), hyperacusis due to paralysis of the stapedius muscle, and loss of taste sensation. Physiological parameters and the remainder of a neurological examination would be expected to be normal.

Acute ischaemic stroke would be expected to demonstrate upper motor neuron features, rather than the lower motor neuron features seen here. Forehead and eye sparing would be expected, due to the dual innervation of the upper half of the face. In addition, stroke may be expected to demonstrate other associated visual and limb impairments (e.g. arm weakness), which are not seen here.

Lyme disease, caused by Borrelia infection following a tick bite, may present with a facial nerve palsy, and in cases of bilateral palsy, it should be strongly considered. However, this patient gives no features of tick exposure/bite, and there is no evidence of a classical rash (erythema migrans, which typically appears 1-2 weeks after exposure), or systemic upset, making Bell’s palsy a more likely diagnosis in this case.

Ramsay-Hunt syndrome, or herpes zoster oticus, describes the reactivation of the varicella-zoster virus in the facial nerve. It is often associated with deep ear pain and a herpetic rash. While Ramsay-Hunt can be associated with facial droop, loss of taste, and hyperacusis, the absence of rash or deep pain makes Bell’s Palsy a more likely diagnosis here.

Cholesteatoma is an abnormal collection of epithelial tissue and keratin within the middle ear. It is associated with hearing loss/tinnitus, and there may be a purulent discharge which does not clear with antibiotic therapy. Facial nerve involvement typically signals a more advanced disease. Otoscopy will classically show crusting in the attic.

Further reading:

https://cks.nice.org.uk/topics/bells-palsy/

Question:

A 56-year-old woman who was seen by her GP with a several-month history of dyspepsia sees her GP for the results of an urgent upper GI endoscopy. The GP reassures her that her endoscopy showed no abnormality and explains that the stool sample she handed in was negative for H. pylori. Despite taking regular antacids, cutting caffeine and alcohol out of her diet and stopping smoking, her indigestion is persistent and is disrupting her sleep.

What is the most appropriate course of action?

A. Continue with antacids

B. Advice regarding diet and smoking cessation

C. Trial of amoxicillin, clarithromycin and an oral proton pump inhibitor (PPI)

D. Intravenous proton pump inhibitor (PPI)

E. 4 week trial of an oral proton pump inhibitor (PPI)

Correct Answer:4 week trial of an oral proton pump inhibitor (PPI)

Explanation:

This lady has functional dyspepsia, that is, symptoms of indigestion in the absence of endoscopic findings. NICE guidance suggests a 4 week trial of a proton pump inhibitor (PPI) such as omeprazole or lansoprazole is appropriate for cases of functional dyspepsia.

Whilst advice regarding diet and smoking cessation is relevant, the patient has already made significant lifestyle changes concerning alcohol and caffeine intake without improvement of her symptoms. Lifestyle advice should, therefore, be reiterated, but it would be reasonable to offer a trial of a PPI at this stage.

As testing for H. pylori was negative, eradication therapy with a PPI + antibiotics (amoxicillin plus either clarithromycin or metronidazole) would not be indicated.

Intravenous PPI is reserved for cases of upper gastrointestinal variceal haemorrhage.

Antacids are not relieving this woman's symptoms nor treating the cause. They should only be used short term and a trial of a PPI at this point is more appropriate.

Further reading:

https://cks.nice.org.uk/topics/dyspepsia-proven-functional/

Question:

Mrs Bing, a 52-year-old woman, presents to her GP complaining of a three-month history of dry mouth and itchy eyes. She has not had any rashes or joint pain but has been feeling quite tired recently.

She has a past medical history of hypothyroidism and hypertension for which she takes levothyroxine and ramipril. Her mother had hypothyroidism as well.

On examination, you note she has swelling bilaterally at the angle of the jaw. Otherwise, the chest is clear on auscultation and heart sounds are normal. There is no joint swelling, rashes or hair loss.

Which antibody is most likely to help confirm the diagnosis in this patient?

A. cANCA

B. Anti-La

C. Anti-nuclear antibody

D. Anti-GBM

E. pANCA

Correct Answer:Anti-La

Explanation:

This patient's history is very suggestive of Sjogren’s syndrome. She has parotid swelling and exocrine dysfunction secondary to autoimmune infiltration of the parotid glands. She might also have vaginal dryness. Anti-Ro and anti-La are the antibodies most associated with Sjogren’s syndrome, with anti-La being the antibody most specific for Sjogren’s.

cANCA is associated with granulomatosis with polyangiitis (previously known as Wegener’s granulomatosis); a small vessel vasculitis that can present systemically with alveolar haemorrhage, glomerulonephritis, scleritis and mononeuritis multiplex. It can also present locally with upper respiratory tract and sinus inflammation, as well as episcleritis. cANCA can also be present in cystic fibrosis, inflammatory bowel disease, primary sclerosing cholangitis and rheumatoid arthritis.

pANCA is associated with microscopic polyangiitis (50%) and eosinophilic granulomatosis with polyangiitis (previously known as Churg Strauss syndrome). This is a medium and small-vessel vasculitis, commonly associated with asthma. Patients can present with glomerulonephritis, mononeuritis multiplex, polyneuropathy and paranasal sinusitis. Classically eosinophilia is noted on full blood count. pANCA can also be present in inflammatory bowel disease, rheumatoid arthritis and autoimmune liver disease.

Anti-GBM (anti-glomerular basement membrane) is most associated with Goodpasture’s syndrome. Goodpasture's typically presents with pulmonary haemorrhage (causing haemoptysis) and rapidly progressive glomerular nephritis as the anti-GBM targets type IV collagen in the glomerular basement membrane and alveoli.

Anti-nuclear antibodies are often positive - even without SLE - and there may be positive antiphospholipid antibodies.

Further reading:

https://patient.info/doctor/sjogrens-syndrome-pro

Question:

A 60-year-old man presents to his general practitioner with chest pain. This pain has been present intermittently for the past 4-months, occurring while gardening and walking his dog. He describes the pain as heavy. There is no radiation, nausea, vomiting, shortness of breath, or sweating. The pain is relieved by a few minutes of sitting.

He has a past medical history of hypertension. His only regular medication is ramipril, with no known drug allergies.

On examination, his BP is 132/88 mmHg. Cardiovascular, respiratory, and abdominal examinations are all normal. His BMI is 24.8 kg/m2.

Which of the following investigations would be most useful in reaching a definitive diagnosis?

A. Transthoracic echocardiogram

B. Chest X-ray

C. Resting ECG

D. Exercise ECG

E. CT coronary angiography

Correct Answer:CT coronary angiography

Explanation:

This gentleman is presenting with a history suggestive of angina.

The correct answer is CT coronary angiography (CTCA). This test allows for the visualisation of the coronary arteries by using intravenous contrast. In angina, you would expect to find narrowing of the affected arteries. The UK guidelines recommend CCTA for initial diagnosis of stable ischaemic heart disease, whereas US and European guidelines recommend functional testing for this purpose.

Transthoracic echocardiogram would not confirm a diagnosis of angina. Echocardiography is used to assess the structure and function of the heart - so is often used in valvular disease and heart failure. It may be completely normal in the context of ischaemic heart disease. NICE does recommend stress echocardiography is some patients with previous coronary artery disease, but this is not the case with this patient and would not be first line.

A chest X-ray is usually normal in angina. It may show features of heart failure, but this gentleman's history and examination is not suggestive of this.

A resting ECG would be completed initially for this man to look for evidence of ischaemia or previous infarction (baseline abnormalities), and would certainly be of use if this were an acute episode of chest pain. However, in angina, an ECG may be normal and therefore would be less useful in reaching a definitive diagnosis.

NICE recommend that an exercise ECG can be used in patients with known coronary artery disease to investigate angina. However, this gentleman does not have known coronary artery disease and therefore a CT coronary angiography is more appropriate. Exercise ECGs are recommended in US guidelines. Not routinely recommended in European or UK guidelines.

Further reading:

https://www.nice.org.uk/guidance/cg95/chapter/recommendations#people-presenting-with-stable-chest-pain

Question:

A 63-year-old man presents with a 2-week history of increasing back pain with reduced mobility over the past 24 hours. He localises the pain to his mid-lumbar spine.

Vital signs include a heart rate 88 bpm, blood pressure 125/70 mmHg, respiratory rate 15/min, SpO2 98% and a temperature of 38.4oC. On examination, there is no obvious spinal deformity or point tenderness, and an abdominal exam reveals a palpable bladder. Neurological examination reveals weakness in both legs with reduced reflexes and down-going plantars bilaterally. Peri-anal sensation and anal tone are both reduced.

What is the most appropriate next investigation?

A. Blood cultures

B. CT whole spine

C. Chest x-ray

D. Lumbar puncture

E. MRI whole spine

Correct Answer:MRI whole spine

Explanation:

The most appropriate next course of action would be to request an urgent MRI whole spine. This man presents with cauda equina syndrome. The differential diagnosis includes lumbar disc prolapse (the most common cause), malignancy (both primary and metastatic), vertebral fractures (due to traumatic injury or malignant infiltration of the vertebrae), and infection. The presence of fever combined with rapidly progressive symptoms, in this case, strongly suggests an underlying infectious cause. Infections most commonly lead to spinal cord compression (above T1/T2) or cauda equina syndrome (below T1/T2) by causing extrinsic compression of the cord/cauda equine (e.g. epidural abscess). Cauda equina syndrome is a neurological emergency. Unless the compression is long-standing (in which case nerve damage is unlikely to be reversible), urgent surgery is required to decompress the cauda equina. An MRI scan is therefore urgently required to confirm the diagnosis, define the cause, and to inform the spinal or neurosurgeon in planning the operation.

In the case of infection, sending off blood cultures is important for a febrile patient. However, the foremost priority here is an MRI scan to identify the cause of spinal compression. Cultures can then be sent to help facilitate a definitive microbiological diagnosis which is important for refining antibiotic treatment.

A chest x-ray would help to localise a source of infection if unknown. However, the presence of fever with rapidly progressive neurological symptoms, including bilateral lower limb weakness and urinary incontinence, strongly indicates an infection localised to the spinal cord.

While CT is sometimes performed to evaluate osseous integrity in patients with cauda equina syndrome, the accuracy of CT in detecting significant spinal stenosis and impingement of the cauda equina is currently not well defined. Requesting an urgent CT whole spine should not be prioritised above requesting an urgent MRI scan which is the first-line investigation for confirming the diagnosis.

Performing a lumbar puncture is not indicated for cauda equina syndrome and might be dangerous in the presence of a suspected lumbar spinal infection.

Further reading:

https://geekymedics.com/cauda-equina-syndrome-ces/

Question:

Dinah is a 22-year-old woman who has presented to the sexual health clinic complaining of abnormal vaginal discharge. She describes her discharge as ‘thicker than normal’ and yellow in colour, without any foul smell. She is otherwise well. She had unprotected sexual intercourse (UPSI) with a new partner 10 days ago and has had no other partners in the last 6 months. She takes the combined oral contraceptive pill and has not missed any tablets.

What is the most appropriate initial management option?

A. Partner notification

B. Ask the patient to return in 4 days for a full STI screen

C. Azithromycin

D. Doxycycline

E. Full STI screen

Correct Answer:Full STI screen

Explanation:

This patient is at risk of an STI due to recent unprotected sexual intercourse with a new partner. As such, this patient should have a full STI screen including swabs for Chlamydia trachomatis and Neisseria gonorrhoea PCR, Neisseria gonorrhoea cultures, and testing for Trachomatis vaginalis. Swabs should also be taken for Candida albicans and bacterial vaginosis. Blood tests should be taken for HIV, syphilis, and depending on risk factors for Hepatitis B, C and A.

Asking the patient to return for a screen in 4 days, or to carry out a home testing kit, is also entirely appropriate. This is because PCR testing for Chlamydia and Gonnorhoea is only reliably negative 14 days post-exposure. However, a patient with either infection could return a positive test within the 14-day window. Additionally, an STI screen should be taken opportunistically on the day of presentation to clinic as patients may be disinclined to re-present or to return home test kits.

Partner notification is only relevant when a diagnosis is made.

Both doxycycline and azithromycin are recognized treatments of chlamydia but would only be prescribed following a positive screen, or alternatively in patients with symptoms who are known contacts of Chlamydia.

Further reading:

https://patient.info/doctor/sexually-transmitted-infections-pro#nav-5

Question:

A 54-year-old man attends the GP complaining of persistent fatigue. He explains that he often wakes up feeling unrefreshed, and struggles to concentrate on his work. The patient describes involuntarily falling asleep for short episodes during the day when resting, but comments that this does not involve a sudden collapse. He also denies any history of nightmares, sleep paralysis or hallucinations as he is falling asleep.

The patient explains that it takes him around 15 minutes to fall asleep at night, but that he often wakes up during the night. On further questioning, he mentions that his wife comments that he snores very loudly, and occasionally wakes up during the night gasping for air.

The GP records a body mass index (BMI) of 35.2.

Which of the following is the most likely diagnosis?

A. Hypothyroidism

B. Obstructive sleep apnoea (OSA)

C. Primary insomnia

D. Central sleep apnoea

E. Narcolepsy

Correct Answer:Obstructive sleep apnoea (OSA)

Explanation:

A history of daytime sleepiness accompanied by episodes of gasping for air during the night in an obese patient are strongly suggestive of a diagnosis of obstructive sleep apnoea (OSA). This condition describes the complete or partial obstruction of the upper airway during sleep, which can lead to frequent waking during the night and unrefreshing sleep.

Narcolepsy is a neurological condition that characteristically presents with daytime sleepiness, sleep paralysis and hallucinations that can be hypnagogic or hypnopompic. Narcolepsy frequently occurs with cataplexy, which describes a sudden collapse typically triggered by emotional intensity. Narcolepsy usually presents for the first time in adolescence.

While hypothyroidism can present with fatigue, it would not account for the patient’s night-time waking and episodic gasping. It is therefore unlikely to be the correct diagnosis in this case.

Primary insomnia refers to a difficulty in initiating or maintaining sleep that is not explained by the presence of another condition or otherwise identifiable cause. In this case, the patient’s presentation suggests that his symptoms are secondary to OSA.

Central sleep apnoea has a similar presentation to OSA but occurs due to a diminished respiratory effort that is secondary to a lack of signalling from the brain. It is a much rarer cause of sleep apnoea than OSA and therefore is less likely to be the correct diagnosis in this case.

Further reading:

https://geekymedics.com/obstructive-sleep-apnoea/

Question:

A 19-year-old woman presents to her GP with a 2-month history of worsening period cramps. She reports she has also recently experienced bleeding after sex.

During the consultation, the girl becomes tearful; she explains she is worried that her partner may have recently been unfaithful by having sexual contact outside of their relationship.

She reports good adherence to the combined oral contraceptive pill as she does not use condoms with her partner. She has no significant past medical history and has no known drug allergies.

Examination of the external genitalia is unremarkable. Examination with a speculum reveals scanty mucoid discharge from the cervical os and a friable cervix. Her manual pelvic examination is normal.

Which of the following investigations is most appropriate to perform next in this patient?

A. Vaginal pH testing

B. Nucleic acid amplification testing

C. Potassium hydroxide wet mount preparation

D. Smear test

E. Saline wet mount preparation

Correct Answer:Nucleic acid amplification testing

Explanation:

The most likely diagnosis in this patient is a genital tract chlamydia infection - one of the most frequently reported sexually transmitted infections (STIs), caused by Chlamydia trachomatis serotypes D-K. The preferred diagnostic method in suspected genital tract chlamydia infection is nucleic acid amplification testing (NAAT), which allows for rapid and accurate identification of chlamydial DNA. NAAT is possible with non-invasive sampling (urine) and invasive sampling (vagina, penile urethra), which can be self-collected by patients at home or clinician-collected in clinics. NICE recommends NAAT should be used to screen for chlamydia in asymptomatic people at high risk of infection, as well as confirm a diagnosis in symptomatic patients. The patient is symptomatic with postcoital bleeding, mucoid cervical discharge and a friable cervix.

A saline wet mount preparation is only typically recommended in patients with suspected trichomonas vaginitis or bacterial vaginosis. This preparation allows for the detection of flagellated protozoa (trichomonas vaginitis) or clue cells (bacterial vaginosis) on microscopy.

A smear test is recommended as part of the NHS cervical cancer screening programme in all women and people with a cervix aged 25-64 years old. The sample taken from the cervix is checked for human papillomavirus (HPV). A smear test cannot be used to make a diagnosis of genitourinary chlamydia.

A potassium hydroxide (KOH) wet mount preparation is a suitable initial investigation in patients with suspected vaginal candidiasis. Patients with vaginal candidiasis typically have hyphae and budding yeast which can be seen under microscopy.

The normal vaginal pH in a woman of childbearing age is ~4.5. An elevated pH is often seen in bacterial infection; however, measuring the vaginal pH is not recommended in the workup of patients with suspected chlamydia and cannot be used to make a formal diagnosis.

Further reading:

https://cks.nice.org.uk/topics/chlamydia-uncomplicated-genital/

Question:

A 30-year-old female presents to the emergency department with a 2-week history of colicky abdominal pain in the right upper quadrant (RUQ) after eating large meals, which is relieved with the use of paracetamol. Her abdominal examination is unremarkable, and she is currently asymptomatic. Her body mass index (BMI) is 21.5 kg/m2. She denies any family history of similar symptoms. Ultrasound findings reveal the presence of gallstones, and she is subsequently listed for an elective laparoscopic cholecystectomy.

What advice should be given to this patient to limit the frequency of these symptoms while she awaits surgery?

A. Lose weight

B. Intermittent fasting

C. Low fat diet

D. Decrease exercise

E. Topical ibuprofen

Correct Answer:Low fat diet

Explanation:

Patients with gallstone disease are advised to go on a low-fat diet while awaiting elective laparoscopic cholecystectomy. Eating a low-fat diet can help to reduce the amount of bile being stored in the gallbladder, thereby reducing the frequency of symptoms of biliary colic.

Losing weight is only advised in patients with a BMI >25 kg/m2 (overweight). As this patient is of a healthy body weight, it would be unwise to advise her to lose weight, as this is likely to have minimal impact on her symptoms.

Patients should be advised to increase their exercise, as this has been shown to improve symptoms in those with gallstone disease. Advising patients to decrease their exercise is likely to make the symptoms worse.

Topical ibuprofen is not indicated in the management of biliary colic. Patients should be prescribed oral paracetamol and/or NSAIDs (non-steroidal anti-inflammatory drugs) such as ibuprofen.

Intermittent fasting is not typically advised in patients with gallstone disease, though it could help this patient achieve longer periods of time where she is symptom-free. It is important to note that intermittent fasting can be dangerous for some patients, such as those with diabetes, as it can increase the risk of hypoglycaemia.

Further reading:

https://patient.info/doctor/gallstones-and-cholecystitis

Question:

You are a junior doctor working in the Emergency Department. Your next patient is a 52-year-old male. He describes a severe pain at the back of his head and is clutching at his head with his left hand. The headache came on suddenly around 3 hours ago whilst he was watching television and reached its maximum severity almost instantly. It has been helped a little by paracetamol and codeine given in triage; at its maximum intensity, the headache was 7 out of 10 severity and since taking analgesia it has improved to 5 out of 10. He also complains that the light hurts his eyes and that he has a stiff neck and lower back.

On examination he is photophobic and has neck stiffness. He is apyrexial. His neurological examination is otherwise normal with no focal neurological deficit.

What is the most appropriate initial diagnostic investigation?

A. Carotid ultrasound scanning

B. Full blood count

C. CT brain

D. Serum lactate

E. MRI brain

Correct Answer:CT brain

Explanation:

The suspicion here is of subarachnoid haemorrhage (SAH). The patient describes a thunderclap headache, which is defined as a 'sudden onset headache reaching maximum intensity within 5 minutes'. CT brain is therefore indicated and visible subarachnoid blood would confirm the diagnosis. CT brain could also exclude some other causes of headache such as intracerebral haemorrhage and rule out raised intracranial pressure prior to conducting a lumbar puncture, if necessary.

Full blood count and lactate may be helpful in the overall workup of the patient but will not yield a specific diagnosis. MRI brain is not the first-line imaging in SAH due to the high sensitivity of CT scanning and relative availability of each. Carotid ultrasound scanning is primarily done in anterior circulation stroke and transient ischaemic attack to determine the need for carotid endartarectomy in stroke prevention. As such, it has no place here.

Further reading:

https://patient.info/doctor/subarachnoid-haemorrhage-pro

Question:

A meta-analysis is conducted to investigate whether resistance exercise reduces mortality in patients with severe liver cirrhosis. However, it is found that different studies used in the meta-analysis used different criteria for defining the severity of liver cirrhosis.

What form of bias is most likely to be present here?

A. Central tendency bias

B. Misclassification bias

C. Confounding bias

D. Observer bias

E. Procedure bias

Correct Answer:Misclassification bias

Explanation:

The use of inconsistent criteria for defining severe liver cirrhosis may lead to misclassification bias. This is the bias that arises from incorrectly classifying study participants.

Central tendency bias is the bias that arises from people’s tendency to rate items towards the middle of a scale.

Confounding bias is the bias that arises when an additional factor is independently associated with both the exposure and the outcome. This leads to an apparent correlation between the exposure and outcome.

Observer bias is the bias that arises due to a researcher’s expectations or preconceptions affecting the way they perceive and record a variable.

Procedure bias is the bias that arises from the conditions in which a study is undertaken, for example not giving participants enough time to complete a questionnaire or interviewing participants in a non-private room.

Further reading:

https://geekymedics.com/statistics-for-medical-students/

Question:

A 25-year-old man presents to the emergency department after being attacked with a knife. After being stabilised, an examination demonstrates weakness in extension and flexion of the left knee, a loss of proprioception and vibration in the left leg and a loss of pain and temperature sensation in the right leg. His heart rate is 85 bpm, blood pressure is 128/86 mmHg, temperature is 37.2 °C and SpO2 is 96% on room air.

What is the most likely diagnosis?

A. Posterior cord syndrome

B. Brown-Séquard syndrome

C. Spinal shock

D. Anterior cord syndrome

E. Complete cord injury

Correct Answer:Brown-Séquard syndrome

Explanation:

Brown-Séquard syndrome is correct. This patient has ipsilateral left leg paresis (implying damage to the corticospinal tract) and a loss of proprioception and vibration (implying damage to the dorsal columns), and a contralateral loss of pain and temperature (implying damage to the spinothalamic tracts). Brown-Séquard syndrome occurs due to hemisection of the cord, leading to these features being present. The ipsilateral motor, proprioception and vibration impairment occurs because the dorsal columns and corticospinal tracts have already decussated higher up in the medulla. The spinothalamic tracts decussate around 1-2 spinal nerve segments above the point of entry, meaning anything below has yet to decussate, leading to contralateral pain and temperature loss.

Anterior cord syndrome is incorrect. This would affect the tracts at the anterior side of the spinal cord, which are the spinothalamic tracts (leading to a loss of pain and temperature sensation) and corticospinal tracts (leading to spastic paralysis) bilaterally.

Posterior cord syndrome is incorrect. This would affect the tracts at the posterior side of the spinal cord, which are the dorsal columns. This would lead to a bilateral loss of proprioception and vibration.

Complete cord injury is incorrect. In this case, there would be a complete interruption of all ascending and descending tracts bilaterally, leading to a bilateral loss of motor function and complete loss of all sensory modalities below the lesion.

Spinal shock is incorrect. This is characterised by immediate bilateral flaccidity, paralysis, absent reflexes, and a loss of sensation bilaterally below the level of the spinal cord lesion. Some reflexes tend to return after a few days, and hyperreflexia and spasticity are seen after a few weeks.

Further reading:

https://geekymedics.com/approaching-spinal-cord-lesions

Question:

A 15-month-old girl is brought to the GP by her mother with a two-day history of coryzal symptoms and high fever (~38.4°C).

While waiting in the reception area, the girl becomes unresponsive, stiff, and then jerks her limbs. The mother is panicked as she reports this has never happened before. By the time you arrive, the seizure has been ongoing for 1 minute.

She has no significant past medical history and no known drug allergies. The girl is up to date on all her childhood vaccinations.

Which of the following is the most appropriate initial management of this child?

A. Administer buccal midazolam

B. Administer rectal paracetamol

C. Call an emergency ambulance

D. Administer rectal diazepam

E. Provide first aid measures

Correct Answer:Provide first aid measures

Explanation:

The most likely diagnosis in this patient is a febrile seizure - a seizure occurring in infants in the context of febrile illness, without central nervous system involvement, and fever (any temperature higher than 38°C). NICE guidelines suggest that clinicians and parents/carers should provide immediate first aid in children presenting with a febrile seizure. The key aspects of first aid include monitoring the duration of the seizure, protecting the child from injury during the seizure (e.g. cushioning their head, removing harmful objects), checking their airway and placing the child in the recovery position once the seizure has terminated.

NICE guidelines recommend that if tonic-clonic movements last for more than 5 minutes, several courses of action should be taken depending on the location of the seizure. Outside a clinical setting, parents/carers should be instructed to call an emergency ambulance if the episode does not terminate within 5 minutes. In a clinical setting, patients with a febrile seizure lasting more than 5 minutes may be given benzodiazepine rescue medication, including rectal diazepam or buccal midazolam. It is important to note that benzodiazepine rescue medication should only be initiated in prolonged seizures or recurrent seizures and under specialist advice. In a clinical setting, if benzodiazepine rescue medication does not terminate the seizure after a further 5 minutes, an ambulance should be called.

After a febrile seizure, antipyretic therapy, such as paracetamol should be initiated to help restore thermoregulation. However, antipyretic therapy is not considered useful in terminating a seizure. Therefore, as this child has an ongoing seizure, it would not be recommended to begin antipyretic medication until the episode has terminated.

Further reading:

https://cks.nice.org.uk/topics/febrile-seizure/

Question:

A 66-year-old female presents to the emergency department with a headache and jaw pain. The headache affects the left temporal region and is tender to touch. The pain in her jaw is worse when talking and eating. She has no changes in vision, no nausea, and has not collapsed. She has no relevant past medical history.

Her temperature is 36.7°C, heart rate is 82 bpm, and her blood pressure is 130/84 mmHg. On examination, the left side of the scalp is tender to palpate, with a thickened and pulseless temporal artery.

What is the definitive investigation for diagnosing this condition?

A. CRP

B. Temporal artery biopsy

C. CT head

D. Lumbar puncture

E. Temporal vein ultrasound

Correct Answer:Temporal artery biopsy

Explanation:

Temporal arteritis (also known as giant cell arteritis (GCA)) is a systemic vasculitis. Temporal arteritis can present as a subacute onset unilateral headache, with tongue and jaw claudication, scalp tenderness, or painless visual loss. Investigations for temporal arteritis include blood tests such as FBC, CRP, and ESR. The definitive investigation is a temporal artery biopsy, which typically demonstrates mononuclear cell infiltration or granulomatous inflammation, usually with multinucleated giant cells.

Temporal artery ultrasound may show thickening of the wall of the affected blood vessel (known as a halo sign) and is first line to diagnose suspected GCA if local services are available. Temporal vein ultrasound provides no diagnostic benefit.

CRP would likely be raised in temporal arteritis, however, CRP rise alone is non-specific as it can be raised in many conditions.

A CT head can be helpful (when indicated) in excluding some causes of a headache, including intracranial haemorrhage and trauma, but has no role in the diagnosis of GCA.

A lumbar puncture is often used when investigating headaches suspicious of meningitis or idiopathic intracranial hypertension. It is not helpful in diagnosing temporal arteritis.

Further reading:

https://geekymedics.com/temporal-arteritis/

Question:

A 60-year-old man presents to his general practitioner with unilateral facial weakness involving the upper and lower parts of the face. The onset was around 12 hours ago. He feels otherwise well. On examination, there is reduced movement on the left side of the face, with drooping of the eyebrow and corner of the mouth. He has no other neurological signs, and his basic observations are normal.

What is the most appropriate management option at this stage?

A. Prescribe dexamethasone 10 mg daily for 7 days

B. Prescribe aciclovir 200 mg five times daily for five days

C. Immediate referral to the acute stroke unit

D. Prescribe lubricating eye drops and advise using micropore tape at night to keep the eye closed

E. Prescribe aspirin 300 mg PO STAT

Correct Answer:Prescribe lubricating eye drops and advise using micropore tape at night to keep the eye closed

Explanation:

The most likely diagnosis of unilateral facial weakness affecting both the upper and lower parts of the face is Bell’s palsy. This is usually a self-limiting illness of viral origin. The prognosis is good, and most patients make a full recovery within 3-4 months. Treatment is focused on preventing ocular complications by keeping the eye lubricated and using micropore tape at night to keep the eye closed.

A systematic review and meta-analysis comparing standard-dose corticosteroids with higher-dose corticosteroids found that higher-dose corticosteroids reduced non-recovery in patients with Bell’s palsy but did not identify a suitable dose. However, according to NICE, a prescription of prednisolone (not dexamethasone) can be considered for patients presenting within 72 hours (e..g, 50 mg daily for 7 days).

The use of antiviral medications such as aciclovir is not recommended.

As the forehead receives motor innervation from both cerebral hemispheres, a stroke would present with forehead sparing and is also excluded by the absence of other neurological signs.

Further reading:

https://cks.nice.org.uk/topics/bells-palsy/

Question:

A 50-year-old man presents to A&E with acute onset leg pain. He tells you that he was sitting and watching television when he felt severe pain in his entire left lower leg. The pain is sharp and constant. Past medical history is significant for high blood pressure, atrial fibrillation, high cholesterol and diabetes.

He is afebrile, and vitals include a blood pressure of 130/85 mmHg, an irregularly irregular heart rate of 105/min, and respiratory rate of 15/min. Physical examination reveals a cool, pale left leg. Distal pulses are present in the right leg, and absent in the left leg.

What is the next most appropriate step in the management of this patient?

A. Left lower extremity angiogram

B. IV heparin

C. Order a CT with contrast

D. Metoprolol

E. Emergency embolectomy

Correct Answer:IV heparin

Explanation:

The patient in this scenario most likely has acute limb ischaemia due to arterial embolism. Acute limb ischemia more commonly affects the lower extremities. Arterial embolism can occur in patients with underlying atrial fibrillation. A clot in the heart is dislodged and travels to distal arteries, where it becomes lodged and prevents distal blood flow. Other causes of acute limb ischemia include arterial thrombosis from atherosclerotic plaque rupture.

Signs and symptoms of acute limb ischaemia include the “6 P’s”:

• Pain that is sudden in onset, severe, and constant

• Pulselessness that is unilateral and distal to the site of occlusion

• Paralysis that reflects the degree of neural or muscle ischemia

• Pallor of the skin

• Paresthesias of the affected extremity that reflects peripheral nerve ischemia

• Poikilothermia or skin that is cold distal to the site of occlusion

Diagnosis can be made clinically based on history and physical examination. An ankle-brachial index (ABI) of < 0.4 can be used to support the clinical picture. Initial management should include anticoagulation to prevent further thrombus formation, such as the administration of intravenous heparin. Further management depends on the severity of limb ischemia and may include an emergency referral to vascular surgery for intervention.

The first step in management should be anticoagulation with heparin. Fogarty balloon catheter embolectomy is the surgical procedure of choice in patients with acute arterial limb ischemia. Fasciotomy may also be necessary to prevent compartment syndrome, which can occur if there is significant oedema of the muscle following reperfusion.

Order a CT with contrast

Vascular imaging such as digital subtraction arteriography may be useful in some case of acute limb ischemia. CT with contrast would not be the best imaging modality in acute limb ischemia.

Administer metoprolol

Although this patient has atrial fibrillation that may have led to his presentation, rate control of his atrial fibrillation is not the best initial management for acute limb ischemia.

Order a lower extremity angiogram

A lower extremity angiogram may be appropriate if the diagnosis is uncertain, but this should not delay starting anticoagulation.

Schedule an emergency embolectomy

Fogarty balloon catheter embolectomy is the surgical procedure of choice in patients with acute arterial limb ischemia. However, anticoagulation should be the initial management to reduce further thrombus formation.

Further reading:

https://patient.info/doctor/limb-embolism-and-ischaemia

Question:

A 28-year-old man presents to the emergency department with pain in his right eye, photophobia and blurred vision. He is a construction worker and felt something enter his eye around two hours ago.

On examination of the right eye, there is mild erythema and lacrimation but no swelling. His temperature is 36.7°C, heart rate is 68 bpm, and his blood pressure is 122/80 mmHg.

What is the next most appropriate investigation?

A. Slit lamp examination with fluorescein stain

B. CT head and orbits

C. Electroretinography

D. Optical coherence tomography

E. Tonometry

Correct Answer:Slit lamp examination with fluorescein stain

Explanation:

Corneal abrasion can present with erythema of the eye/eyelid, pain, excessive lacrimation, or photophobia. A corneal abrasion refers to a break in the epithelial surface of the cornea, similar to a graze on the skin. Epithelial defects can be very hard to see with the naked eye but stain brightly with fluorescein drops and a cobalt blue light.

A CT of the head and orbits is required when considering orbital cellulitis, to exclude posterior extensions such as an abscess or cavernous sinus thrombosis. CT head and orbits is not appropriate here, as it will not aid the diagnosis of a corneal abrasion.

Optical coherence tomography (OCT) provides high-resolution images of the retina, and is typically utilised in conditions such as age-related macular degeneration, and diabetic retinopathy. As this is a suspected defect of the cornea, OCT would not aid the diagnosis and further management.

Tonometry is used to determine the intraocular pressure and is typically used in to monitor these pressures in glaucoma. The ocular pressure is not typically affected by a corneal abrasion.

Electroretinography allows the examination of photoreceptors in the retina. It is useful in evaluating conditions such as retinitis pigmentosa but does not help diagnose corneal abrasions.

Further reading:

https://geekymedics.com/painful-red-eye/

Question:

A 67-year-old man presents to the GP with urinary problems lasting 3-months. He describes progressively worsening urinary frequency, causing him to urinate almost every hour. He explains the problem is now affecting his quality of life as it interferes with his sleep. He denies any pain or burning associated with urination.

He has a past medical history of hypertension, hypercholesterolaemia and type 2 diabetes mellitus, which is managed with losartan, atorvastatin and metformin. He has no family history of prostate cancer.

On examination, the patient appears well; his vital signs are all within normal limits. Digital rectal examination reveals a non-tender but severely enlarged prostate without nodules; the rectal tone is normal.

What is the most appropriate initial investigation?

A. Transrectal prostate ultrasonography

B. Multiparametric MRI

C. Serum prostate-specific antigen level

D. Urine dipstick

E. Urine cytology

Correct Answer:Urine dipstick

Explanation:

The most likely diagnosis in this patient is benign prostatic hyperplasia (BPH) - glandular and stromal hyperplasia of the transitional zone of the prostate. BPH typically causes lower urinary tract symptoms (LUTS). In patients with BPH, digital rectal examination classically reveals a firm, smooth, enlarged and non-tender prostate. NICE guidelines suggest a urine dipstick test should be offered to all men with LUTS to detect urinary blood, glucose, protein, leukocytes and/or nitrites, as this can guide further management.

NICE guidelines recommend serum prostate-specific antigen level (PSA) testing if the prostate feels abnormal, the patient or clinician is concerned about prostate cancer or if symptoms suggest bladder outlet obstruction secondary to BPH. Therefore, PSA testing is not typically recommended in every patient with suspected BPH.

Transrectal prostate ultrasonography (TRUS) may be used to assess changes in the prostate; however, it is not typically recommended in the workup of BPH alone unless there are concerns of prostate cancer. In patients with suspected prostate cancer, TRUS is often used to guide biopsy. This patient most likely has BPH; therefore, this would not be the most appropriate initial investigation.

Urine cytology is typically recommended in the workup of patients with suspected urothelial carcinoma. Typical symptoms of urothelial carcinoma include gross or microscopic haematuria, irritative voiding symptoms and suprapubic or flank pain. This patient has presented with symptoms suggestive of BPH; therefore, this would not be the most appropriate initial investigation.

In patients with suspected prostate cancer, multiparametric MRI may be warranted to confirm a diagnosis and assess tumour grade using the 5-point Likert scale. This patient does not have any features to suggest prostate cancer as the most likely diagnosis; therefore, this would not be the most appropriate initial investigation.

Further reading:

https://cks.nice.org.uk/topics/luts-in-men/

Question:

A 60-year-old man who is a current smoker with a BMI of 30 is found to have a clinic blood pressure reading of 145/87 mmHg during a routine health check. Ambulatory blood pressure monitoring confirms hypertension, and he is started on amlodipine and a statin. He is also given advice on reducing his cardiovascular risk factors, including smoking cessation and weight loss. He has no significant past medical history.

What is the most appropriate next step in his management?

A. Refer for specialist assessment

B. Re-evaluate cardiovascular risk factors at the next appointment

C. Refer for bariatric surgery

D. Conduct investigations for target organ damage

E. Echocardiogram

Correct Answer:Conduct investigations for target organ damage

Explanation:

According to NICE guidelines, all patients with newly diagnosed hypertension should have investigations for target organ damage conducted within a month, including a urine dip, ECG, fundoscopy, urinary albumin:creatinine ratio, HbA1c, U&Es and serum cholesterol levels. This allows the identification of secondary causes of hypertension, as well as the assessment of the severity of hypertension.

Re-evaluating cardiovascular risk factors at the next appointment is important, however, conducting investigations for target organ damage is the more urgent action.

An echocardiogram may reveal complications of hypertension, however an ECG is preferred as a first-line investigation for target organ damage in hypertension.

Referring for bariatric surgery is not appropriate; the cut-off for a referral for bariatric surgery in someone with hypertension that could be improved by weight loss is 35, and the most urgent next step is to look for target organ damage.

Referring for specialist assessment is not indicated at this stage. If the hypertension were found to be secondary, severely complicated, or resistant, then a referral would be appropriate.

Further reading:

https://www.nice.org.uk/guidance/qs28/chapter/Quality-statement-2-Investigations-for-target-organ-damage

Question:

A 25-year-old woman is seen by her GP after suffering worsening anxiety over the last several months. She describes being unable to sleep at night due to worrying she may have forgotten to lock the doors and set the burglar alarm. She feels she needs to get up repeatedly to double-check the windows are closed and the lights are off, but on returning to bed does not feel reassured and tends to repeat this routine multiple times. This is starting to impact her work due to an inability to concentrate and is affecting her relationship with her partner.

Which of the following is true regarding obsessive compulsive disorder (OCD)?

A. Obsessions and/or compulsions must be present on most days for a period of 2 weeks for diagnosis

B. Obsessions are generally egosyntonic

C. Age of onset is generally younger in females than in males

D. SSRIs are first line for management

E. Eye movement desensitisation and reprocessing (EMDR) forms a central part of treatment

Correct Answer:Obsessions and/or compulsions must be present on most days for a period of 2 weeks for diagnosis

Explanation:

The correct answer is that obsessions and/or compulsions must be present on most days for a period of 2 weeks for a diagnosis of OCD. This is according to criteria laid out by the ICD-10.

Obsessions can be described as intrusive and recurrent despite attempts to suppress them.

Compulsions are also present and involve repetitive behaviour or mental actions in order to relieve the anxiety brought on by obsessions.

Thoughts and behaviours are time-consuming and/or result in significant distress or impairment to daily life.

The obsessions are not due to substance use, another medical condition or due to other mental disorders (e.g. eating disorders).

The average age of onset of obsessive-compulsive behaviours is younger in males rather than females. The long-term prognosis in males is also generally poorer.

EMDR is an approach typically used in the management of post-traumatic stress disorder (PTSD). Cognitive behavioural therapy (CBT) is more commonly used in OCD.

Egosyntonic behaviours refer to those that are in line with the individual’s feelings, values, and beliefs, whether these are positive or negative. For example, many behaviours in some personality disorders can be described as egosyntonic as the individual may perceive their feelings or behaviour to be reasonable, even if they are abnormal or irrational. Behaviours in OCD tend to be egodystonic; the individual realizes their compulsions are irrational and are often distressed by them as a result.

SSRIs may be used in medical management of OCD but are not first-line. They can be used if self-help resources or CBT have failed to have an adequate effect.

Further reading:

https://patient.info/doctor/obsessive-compulsive-disorder-pro

Question:

A 62-year-old woman is admitted to hospital following a fall and subsequently diagnosed with a right fractured neck of femur. The morning after her admission she begins to complain of tremors and palpitations. Her admission blood tests were normal and her only past medical history is osteoarthritis but she tells you that she drinks a bottle of wine most nights at home.

Which of the following would be the most appropriate first-line management of her symptoms?

A. Decreasing doses of chlordiazepoxide

B. Decreasing doses of lorazepam

C. Increasing doses of lorazepam

D. Increasing doses of chlordiazepoxide

E. Phenytoin infusion

Correct Answer:Decreasing doses of chlordiazepoxide

Explanation:

The correct answer is decreasing doses of chlordiazepoxide. This patient regularly consumes alcohol at above the recommended limits and so is at risk of alcohol withdrawal while in hospital - her symptoms of tremor and palpitations suggest that she has already begun to experience this. The first-line management for these patients is a long-acting benzodiazepine such as chlordiazepoxide, given as a reducing dose protocol. Decreasing doses should be used to aid the withdrawal and detoxification process.

Lorazepam is a short-acting benzodiazepine and so a decreasing dose of lorazepam is typically only used for patients experiencing alcohol withdrawal who also have liver failure. This patient's admission blood tests were normal, ruling out the possibility of liver failure. An increasing dose of lorazepam would clearly not be appropriate and would risk worsening the patient’s dependence.

Increasing doses of chlordiazepoxide is incorrect as the benzodiazepines should be prescribed in a reducing dose protocol. If increasing doses were used it could worsen her dependency.

Phenytoin infusion is incorrect as this patient is not experiencing alcohol withdrawal seizures. While phenytoin can be used as part of the treatment of alcohol withdrawal seizures, it is not particularly effective.

Further reading:

https://bnf.nice.org.uk/treatment-summary/alcohol-dependence.html

Question:

Jared Jackson is a 47-year-old man who presents to the GP with drooping of his upper eyelids. He also reports a general feeling of weakness and sometimes experiences difficulty swallowing. Clinical examination reveals reduced proximal muscle strength and deep tendon reflexes. The GP asks the patient to perform repetitive blinking, which reveals an initial slowing of frequency and the blinking speeds up.

Given the likely diagnosis, which of the following tests is also important to perform in patients presenting with this condition?

A. CT neck

B. MRI spine

C. Fundoscopy

D. Chest X-ray

E. Pelvic X-ray

Correct Answer:Chest X-ray

Explanation:

This question is a bit tricky. First, you have to deduce the diagnosis as Lambert-Eaton syndrome – differentiated from myasthenia gravis by the initial improvement of motor symptoms during rapid blinking and reduced deep tendon reflexes.

The question then asks you ‘what else is an important investigation to carry out in such patients’. Small cell lung cancer is strongly associated with Lambert-Eaton syndrome (about 50% of patients) and therefore it would be most appropriate to perform an inial chest x-ray to look for an obvious lung malignancy. A CT chest would then be performed to confirm the presence of lung malignancy.

None of the other investigations are particularly relevant to Lambert-Eaton syndrome.

Lambert-Eaton syndrome is a disorder of neuromuscular transmission caused by an impaired presynaptic release of acetylcholine. The disease is caused by an autoimmune attack directed against the voltage-gated calcium channels on the presynaptic motor nerve terminal. Typical presenting symptoms include the insidious onset of weakness of the proximal muscles (particularly the lower limbs, resulting in gait abnormalities). Clinical signs include proximal muscle weakness, waddling gait, ptosis and absent deep tendon reflexes. Patients may demonstrate an initial improvement in strength during repetitive movements, but this will then lessen as exercise is sustained.

Further reading:

https://patient.info/doctor/lambert-eaton-myasthenic-syndrome

Question:

A 62-year-old male presents to the emergency department after several episodes of vomiting bright red blood. He has presented to the same hospital in the past for alcohol intoxication and hepatic encephalopathy.

His observations are as follows:

Temperature: 36.5 degrees Celsius

Blood pressure: 106/69 mmHg

Respiratory rate: 19 breaths/minute

Heart rate: 101 beats/minute

SpO2: 97% on room air

Physical examination is significant for hepatomegaly. The patient is aggressively resuscitated with intravenous fluids. Bleeding oesophageal varices is thought to be the cause of the patient’s bleeding and the patient is commenced on intravenous terlipressin.

Which adverse effect is most likely to occur secondary to taking this medication?

A. Hyperkalaemia

B. Hypokalaemia

C. Hypomagnesaemia

D. Hyperprolactinaemia

E. Hyponatraemia

Correct Answer:Hyponatraemia

Explanation:

Hyponatraemia is a known side effect of terlipressin use and therefore serum sodium levels should be monitored in patients who are prescribed this medication. Other medications which cause hyponatraemia include thiazide diuretics.

Low magnesium levels are associated with chronic proton pump inhibitor use and loop diuretic use. Hypomagnesaemia is unlikely to be seen in patients who are prescribed terlipressin.

Hyperkalaemia is not associated with the use of terlipressin. Medications that can cause hyperkalaemia include potassium-sparing diuretics (spironolactone, eplerenone, triamterene and amiloride), angiotensin-converting enzyme inhibitors, angiotensin II receptor blockers and heparin derivatives.

Medications with anti-dopaminergic properties like antipsychotics, bowel motility agents (metoclopramide) and H2 receptor blockers can cause hyperprolactinaemia. Hyperprolactinaemia is unlikely to be caused by terlipressin.

Hypokalaemia is a common electrolyte abnormality seen in patients using salbutamol and insulin.

Further reading:

https://bnf.nice.org.uk/drug/terlipressin-acetate.html

Question:

A 42-year-old lady presents to her GP, complaining of involuntary urinary leakage. On questioning, she reveals that this typically occurs if she is exercising, coughing or laughing. She finds this extremely embarrassing and often has to wear incontinence pads. She denies nocturia and has no symptoms of urinary urgency. She is gravida 5 para 3, all of which were normal vaginal deliveries. She has a BMI of 26. Since the age of 17, she has smoked 10-15 cigarettes a day and has a pronounced 'smokers cough'. She has a fluid intake averaging 1500ml per day which includes one 200ml cup of coffee each morning. She has no relevant past medical or surgical history. Her urine dip and STI screen are negative. Examination of the abdomen and pelvis is unremarkable. Examination of the genital tract reveals a grade 1 anterior vaginal wall prolapse.

What is the most appropriate advice in the initial management of this patient?

A. Smoking cessation

B. Reduce caffeine intake

C. Increase intake of cranberry juice

D. Reduce fluid intake

E. Weight loss

Correct Answer:Smoking cessation

Explanation:

The most appropriate initial advice would be to stop smoking. This patient has stress urinary incontinence (SUI) evidenced by a history of leakage when she experiences an increase in intra-abdominal pressure. She has several potential causes of SUI including: pregnancy, vaginal deliveries, vaginal wall prolapse and being a smoker. Other notable causes include: obesity, post menopause (being in a hypo-oestrogenic state) and collagen disorders.

The bladder is supported by the pelvic floor muscles at the level of the neck of the bladder where the proximal urethral sphincter is located. This allows for intra-abdominal pressure to be transmitted equally to the bladder and the proximal urethral sphincter - maintaining continence. If the pelvic floor muscles are weakened, the bladder slips inferiorly and an increase in intra-abdominal pressure will not be transmitted to the proximal urethral sphincter. The pressure exerted on the bladder will then be greater than the pressure on the sphincter so leakage of urine occurs. This is the pressure transmission theory of SUI.

The most important advice that this patient should be given as part of her initial management is to stop smoking. Smoking often leads to a chronic cough which weakens the pelvic floor muscles further. Additionally it alters the performance of collagen in the pelvic floor. Some studies have suggested that smoking has an anti-oestrogenic effect which contributes towards the change in integrity of the pelvic floor muscles and urethra. Smoking cessation may reduce the frequency of her need to cough and therefore reduce her symptoms, it may also result in normalisation of the collagen in the pelvic floor allowing for better support of the bladder and urethra.

Weight loss is only advised if the BMI is greater than 30 as beyond this point there is a significant increase in intra-abdominal pressure. The patient has an average daily fluid intake and a reduction in fluid intake should only be advised if fluid intake is excessive. Similarly, the patients caffeine intake is acceptable. Caffeine reduction is only recommended for patients with symptoms of an overactive bladder/urinary urgency to prevent irritability of the detrusor muscle, which she does not have.

There is no evidence that cranberry juice improves the symptoms of women with involuntary urinary leakage without a urinary tract infection.

Further reading:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3296387/

Question:

A 62-year-old man presents following two episodes of blood in his urine. There is no associated frequency, hesitancy, urgency, or dysuria. He has not noticed any weight loss, pain, or fever, and feels otherwise well. He works in a clothing factory, drinks three pints of beer on a Saturday, and has smoked 30 cigarettes daily since age 16. He is sexually active with his wife of 25 years.

His basic observations are within normal ranges, and the only significant finding on urinalysis is +++ for blood. On digital rectal examination, his prostate is normal with no palpable masses.

What is the most likely diagnosis?

A. Chlamydia trachomatis infection

B. Renal calculi

C. Transitional cell carcinoma of the bladder

D. Prostate cancer

E. Urinary tract infection

Correct Answer:Transitional cell carcinoma of the bladder

Explanation:

The correct answer is transitional cell carcinoma (TCC) of the bladder. Bladder cancer typically presents with painless macroscopic haematuria. The major risk factor for TCC of the bladder is smoking, and this patient has a significant smoking history. Exposure to aniline dyes also increases the risk of bladder cancer and is a common risk factor used in exam questions; working in a clothing factory may expose him to these dyes. This man should be referred to urology under the two-week suspected cancer referral pathway.

Urinary tract infection (UTI) is incorrect as this patient is not experiencing dysuria or urgency, two of the key presenting symptoms of a urinary tract infection. Though urinalysis may show blood in a UTI, there would also be nitrites, which have not shown up in this sample. Lower UTIs can also present with a low-grade fever and pain. Thus, UTI is a less likely diagnosis.

Prostate cancer can present with haematuria and is an important differential to consider in men presenting with haematuria. However, it is usually associated with other urinary symptoms such as terminal dribbling or increased frequency. Additionally, a mass would likely be palpable on digital rectal examination. Though prostate cancer is an important differential to exclude, it is not the most likely diagnosis in the case.

Chlamydia trachomatis infection is incorrect. This would typically present in men with dysuria and urethral discharge, as opposed to haematuria. It is important to remember that being married does not rule out a sexually transmitted infection. It could be excluded by sending a first-pass urine sample for nuclear acid amplification tests (NAAT).

Renal calculi are unlikely to be the cause of this man’s haematuria. They typically present acutely with severe colicky loin-to-groin pain with or without systemic upset, such as nausea and vomiting. An acute presentation of haematuria with severe colicky back pain would be more indicative of renal calculi.

Further reading:

https://cks.nice.org.uk/topics/urological-cancers-recognition-referral/

Question:

A 60-year-old man attends his GP with complaints of fatigue and frequent urination. He states he has been feeling thirstier than usual.

A routine blood test is performed, which reveals:

HbA1c: 66 mmol/mol (<42 mmol/mol)

Random capillary blood glucose: 12.7 mmol/L

The decision was made to start the man on anti-diabetic medication.

What is the first-line medication used in type 2 diabetes?

A. Metformin

B. Liraglutide

C. Empagliflozin

D. Gliclazide

E. Insulin

Correct Answer:Metformin

Explanation:

Type 2 diabetes is treated first-line with metformin, which works by decreasing the liver’s production of glucose. It also activates an enzyme, AMPK, which helps cells respond more effectively to insulin, taking in more glucose from the blood.

Empagliflozin is a sodium-glucose co-transporter 2 (SGLT-2) inhibitor, which blocks the reuptake of glucose in the renal tubules, promoting the loss of glucose in the urine. SGLT-2 inhibitors may be suitable when first-line options are not tolerated.

Liraglutide is a glucagon-like peptide-1 (GLP-1) mimetic. These drugs are used in combination therapy when other treatment options have not been effective.

Insulin is not often used for type 2 diabetes in the initial years of treatment. It is utilised when other medications are no longer effective.

Gliclazide is a sulfonylurea. If first-line treatment does not control the HbA1c level, a sulfonylurea can be used along with metformin.

Further reading:

https://bnf.nice.org.uk/treatment-summary/type-2-diabetes.html

Question:

A 45-year-old woman has noticed 6 kg of unintentional weight loss, fatigue and increased skin pigmentation over the past 4 months with no previous medical history. Her mother and sister both have Hashimoto’s thyroiditis. Her blood pressure is 100/80 mmHg (supine) and 78/65 mmHg (sitting). Inspection reveals a cachectic figure with diffuse hyperpigmentation of the skin and muscle wasting. Lab testing reveals serum cortisol levels 84 nmol/L (137 - 429) and ACTH 25.3 pmol/L (3.3–15.4).

Which of the following is the most important risk factor for this disease in developed countries?

A. Other autoimmune disease

B. Adrenal adenoma

C. Tuberculosis

D. Adrenocortical autoantibodies

E. Exogenous corticosteroid use

Correct Answer:Adrenocortical autoantibodies

Explanation:

The patient has Addison's disease (primary adrenal insufficiency).

The most important risk factor is the presence of adrenocortical autoantibodies. 70-80% of cases of Addison’s disease in developed countries are due to autoimmune adrenalitis and there is a 50-90% risk of Addison’s disease if adrenocortical autoantibodies are detected.

Worldwide, infective causes such as tuberculosis, fungal infections (e.g. histoplasmosis), human immunodeficiency virus, cytomegalovirus remain important risk factors.

Patients with other autoimmune diseases are at risk of developing autoantibodies against the adrenal cortex but it is relatively uncommon to develop clinical adrenal insufficiency in this way.

Exogenous corticosteroids are used to treat Addison’s disease (as there is an insufficiency of adrenal hormones) but are a risk factor for its clinical antagonist - Cushing’s syndrome (hypercortisolism).

An adrenal adenoma is likely to result in an overproduction of adrenal hormones leading to Cushing’s syndrome as opposed to Addison’s disease. In contrast, a malignant metastasis to the adrenal gland may destroy adrenal tissue resulting in Addison’s disease.

Further reading:

https://cks.nice.org.uk/topics/addisons-disease/

Question:

A 35-year-old female attends her GP thickening of the skin on her right breast. The patient describes the thickening as painless, dimpled and firm to touch. The patient's mother died of breast cancer at age 40.

On examination, there is a 2 x 2-inch patch of thickened skin located in the right upper quadrant of the right breast. The skin in this region is firm to touch, painless, dimpled and associated with nipple retraction. You urgently refer the patient to a triple assessment breast clinic and later discover that she has been diagnosed with infiltrating lobular carcinoma.

Which of the following is the MOST APPROPRIATE statement relating to infiltrating lobular carcinoma?

A. Men cannot suffer from infiltrating lobular carcinoma

B. Infiltrating lobular carcinoma is the most common form of breast cancer

C. Histological subtype is not an important factor in the therapeutic decision making process for infiltrating lobular carcinoma versus other forms of breast cancer

D. Surgery (e.g. wide local excision, lobectomy or mastectomy) is not usually the first-line therapy used to treat infiltrative lobular carcinoma

E. Infiltrating lobular carcinoma is most common in postmenopausal women

Correct Answer:Histological subtype is not an important factor in the therapeutic decision making process for infiltrating lobular carcinoma versus other forms of breast cancer

Explanation:

Infiltrating lobular carcinoma (ILC) is the second most common type of breast cancer after invasive ductal carcinoma. ILC comprises around 8-14% of all breast cancers.

Risk factors for this condition include:

premenopausal females

previous history of breast cancer

family history of breast cancer

presence of a BRCA gene mutation

no previous pregnancies

early menarche and late menopause

use of the combined oral contraceptive pill

high alcohol consumption

Clinical features of ILC are similar to other breast cancer variants including breast lump, nipple changes (e.g. inversion, discharge) and skin changes (e.g. peau d’orange). ILC more commonly presents with skin thickening compared to ductal carcinoma (which often presents with a painless lump).

Investigations may include mammography, ultrasound, biopsy and sometimes staging scans (e.g. MRI).

The management of this condition is not driven by histological subtype, but instead by factors which drive the treatment of all breast cancer subtypes (e.g. metastases, anatomical location, oestrogen receptor positivity).

Ductal carcinoma of the breast is the most common histological form of breast cancer.

ILC is most common in premenopausal women with an average age of onset of 45 years.

Men can indeed suffer from ILC (however it is rare).

Further reading:

https://www.cancerresearchuk.org/about-cancer/breast-cancer/stages-types-grades/types/invasive-lobular-breast-cancer

Question:

A 24-year-old woman presents to the GP with some vaginal discharge and irritation lasting 1-week. She also reports some intermittent 'spotting' over the last two weeks, despite taking the same oral contraceptive pill for three years.

She was recently treated for genital thrush with topical clotrimazole. She reports good adherence to the combined oral contraceptive pill. She does not take any other medications and has no known drug allergies.

She has been with her current partner for one month and reports intermittent use of condoms.

Examination of the external genitalia and manual pelvic examination is unremarkable. Speculum examination reveals a clear, watery and odourless discharge from the cervical os. A swab is taken, leading to some cervical bleeding. A pregnancy test performed in the clinic is negative.

What is the most likely diagnosis in this patient?

A. Bacterial vaginosis

B. Trichomonas vaginitis

C. Genital tract gonorrhoea infection

D. Genital tract chlamydia infection

E. Lymphogranuloma venerum

Correct Answer:Genital tract chlamydia infection

Explanation:

The most likely diagnosis in this patient is a genital tract chlamydia infection - one of the most frequently reported sexually transmitted infections (STIs), caused by Chlamydia trachomatis serotypes D-K. Characteristic clinical features of genitourinary chlamydia infection in women include vaginal discharge that is yellow/cloudy, mucoid and odourless and symptoms such as intermenstrual or postcoital bleeding and pelvic pain. However, it is essential to note that many patients are asymptomatic. Classic examination findings in patients with chlamydia include a friable cervix and cervical discharge. In addition to the clinical features, it is also important to consider the social history in patients presenting with genitourinary symptoms; this patient has a recent history of a new sexual partner, a key risk factor for chlamydia infection.

Similarly to chlamydia, genital tract gonorrhoea infection may be symptomatic or asymptomatic. Characteristic clinical features of genitourinary gonorrhoea in women include pelvic pain and vaginal discharge that is purulent, yellow and malodorous. This patient is described to have clear, odourless vaginal discharge and has breakthrough bleeding, which is more suggestive of chlamydia.

The pathogen chlamydia trachomatis, serotypes L1-L3 (collectively termed the 'LGV biovar'), are responsible for lymphogranuloma venerum, a condition characterised by two distinct clinical stages. The first stage (primary infection) results in small, painless genital ulcers that heal spontaneously. The second stage (secondary infection) results in painful swelling of the inguinal lymph nodes, abscess formation and systemic signs. This patient does not have any symptoms or features on examination to suggest this diagnosis.

Women with bacterial vaginosis (BV) typically present with vaginal discharge that is thin, milky and malodourous, most often described as 'fishy'. Whilst sexual intercourse is the primary risk factor for BV, it is not considered an STI. This patient does not have any symptoms to suggest this is a likely diagnosis.

Women with trichomonas vaginitis classically present with vaginal discharge that is thin, variable in colour (e.g. green, yellow, white, grey), frothy and malodorous. Associated symptoms include dysuria and pruritus. Examination characteristically reveals a strawberry cervix (erythematous mucosa and petechiae). This patient does not have any symptoms or features on examination to suggest this diagnosis.

Further reading:

https://cks.nice.org.uk/topics/chlamydia-uncomplicated-genital/

Question:

A 10-year-old boy with cerebral palsy attends a general practice appointment with his mother due to difficulty eating. His mother explains that he struggles to chew and occasionally chokes on food. She also explains that her son was born prematurely, and diagnosed with cerebral palsy after an intracranial bleed.

On examination, there is evidence of skin breakdown around the child's mouth. He is sitting next to his mother and shows involuntary movements. His legs and arms make writhing, athetoid movements.

What is the most likely type of cerebral palsy, and which area of the brain is most likely affected?

A. Ataxic cerebral palsy, affecting the cerebellum

B. Dyskinetic cerebral palsy, affecting the basal ganglia

C. Spastic cerebral palsy, affecting the thalamus

D. Spastic cerebral palsy, affecting the mammillary bodies

E. Dyskinetic cerebral palsy, affecting the prefrontal cortex

Correct Answer:Dyskinetic cerebral palsy, affecting the basal ganglia

Explanation:

Dyskinetic cerebral palsy, affecting the basal ganglia is the correct answer. The patient's involuntary athetoid movements are in keeping with dyskinetic cerebral palsy, which affects the basal ganglia. His skin breakdown is likely due to sialorrhoea, a common complication of cerebral palsy. Notably, patients with movement disorders such as Parkinson's and Huntington's may also show writhing, athetoid movements. Athetoid movement disorders are classically localised to the basal ganglia.

Ataxic cerebral palsy, affecting the cerebellum is incorrect, as although ataxic cerebral palsy does affect the cerebellum, this patient has no features of ataxic cerebral palsy. Features of ataxic cerebral palsy include cerebellar signs: dysdiadochokinesia, ataxia, nystagmus, intention tremor, scanning dysarthria, and hypotonia.

Dyskinetic cerebral palsy, affecting the prefrontal cortex is incorrect, as although this patient's writhing, athetoid movements are in keeping with dyskinetic cerebral palsy, the basal ganglia are affected rather than the prefrontal cortex.

Spastic cerebral palsy, affecting the mammillary bodies is incorrect, as patients with spastic cerebral palsy classically show diplegia, hemiplegia, or quadriplegia and have upper motor neurone signs. Spastic cerebral palsy affects the motor cortex, rather than the mamillary bodies. This is the most common type of cerebral palsy, accounting for 80% of cases.

Spastic cerebral palsy, affecting the thalamus is incorrect, as patients with spastic cerebral palsy classically show diplegia, hemiplegia, or quadriplegia and have upper motor neurone signs. Spastic cerebral palsy affects the motor cortex, rather than the thalamus.

Further reading:

https://cerebralpalsy.org.au/our-research/about-cerebral-palsy/what-is-cerebral-palsy/types-of-cerebral-palsy/

Question:

A 30-year-old male is admitted to hospital, having fallen from a ladder. Primary and secondary surveys reveal a fracture to the right fibula and a displaced but reasonably well aligned right tibial fracture. Both injuries are closed, with no distal neurovascular deficit. He is initially tachycardic but this normalises and the patient remains stable after appropriate analgesia. He is placed into an above-knee backslab and his leg is elevated on pillows overnight to await theatre in the morning, with instructions for ‘compartment observations’ to be performed.

Which of the following examination findings is the most appropriate indicator of compartment syndrome?

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A. Evolving numbness within the first dorsal webspace

B. Compartment pressure reading of 25 mmHg

C. Pain out of proportion to the injury

D. Impalpable dorsalis pedis and posterior tibial pulses

E. Pain on passive lateral flexion of the hallux

Correct Answer:Pain out of proportion to the injury

Explanation:

Compartment syndrome is a surgical emergency whereby the pressure within a body cavity rises sufficiently high as to occlude the egress of venous blood and, ultimately, the ingress of arterial flow. A vicious cycle evolves whereby ischaemic tissues become oedematous and expand, thus increasing the pressure further. The muscles of the lower leg reside within anterior, lateral, superficial, posterior, and deep posterior compartments enclosed by fascia tightly bound to bone.

The causes of compartment syndrome of the limbs can be considered in terms of intrinsic pressure, and external compression. Intrinsic pressure, in this case, arises from post-traumatic swelling, bleeding, and necrosis of the bone and its soft tissue envelope. The closed nature of this fracture means that whilst compartment boundaries may be disrupted, the tissues are still bound circumferentially by the skin. Extrinsic compression is provided by the patient’s above-knee plaster backslab and its circumferential bandaging. Compartment syndrome is a clinical diagnosis for which the treatment is emergent surgical laying open of the compartments, or ‘fasciotomy.’

Pain experienced out of proportion to the injury sustained is an often-quoted cardinal feature of compartment syndrome, but this can be difficult to quantify in the face of massive injury and interpersonal variation in pain threshold. A common clinical surrogate is pain that is unresponsive or minimally responsive to doses of opiate analgesia.

The extensor hallucis longus muscle lies against the tibia within the anterior compartment, and flexor hallucis longus lies within the deep posterior compartment. Passive flexion and extension of the hallux will draw the constrained muscles through the tight compartments, causing pain if there is compartment syndrome and not lateral flexion.

In sedated or unconscious patients, the above clinical indicators are clearly impractical. In these instances, the pressure within vulnerable compartments can be monitored using a probe and transducer similar to that used in continuous arterial pressure monitoring. Absolute pressure readings of >30 mmHg may be used to guide the decision to perform fasciotomies to release pressure, as can a difference (‘delta’) reading <30 mmHg between the compartment and diastolic pressures. For example, compartment pressures of 25 mmHg in the context of 50 mmHg diastolic pressure would give a delta pressure of 25 mmHg; lower than 30mmHg, thus concerning for compartment syndrome.

Evolving paraesthesia, numbness or vascular compromise are late signs of end-tissue ischaemia with a progressively poorer prognosis, and should not be used as a primary means of diagnosis.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK448124/

Question:

You are the FY2 in Accident and Emergency. A 6-year-old female patient is brought to the department by her parents. You are told that the child’s abdomen has increased in size over the last 2 days. On further questioning, her parents report that her abdominal enlargement has been associated with extreme lethargy and fatigue. On examination, you note the following findings: blood pressure of 70/40 mmHg, a heart rate of 150 bpm, cool peripheries, and splenomegaly. After stabilising the patient, you discover that the patient suffers from sickle cell disease when reviewing her electronic record.

What is the MOST LIKELY diagnosis?

A. Infectious mononucleosis

B. Aplastic crisis

C. Acute chest syndrome

D. Sequestration crisis

E. Vaso-occlusive crisis

Correct Answer:Sequestration crisis

Explanation:

The most likely diagnosis is a sequestration crisis in which blood is trapped or 'sequestered' in the spleen. A sequestration crisis can be defined as rapid enlargement of the spleen coupled with a fall in haemoglobin concentration and circulatory collapse. This condition is a complication of sickle cell disease that typically occurs in young children. A sequestration crisis results in significant mortality. Mortality rates associated with this condition can be reduced in a variety of ways, including parental education and frequent examination of the abdomen to identify early signs of splenomegaly. Blood transfusion is the gold-standard management for this condition. Recurring sequestration crisis is an indication for splenectomy.

An aplastic crisis is less likely in this case as it is not associated with splenomegaly. An aplastic crisis can be defined as the transient halt of erythropoiesis leading to severe anaemia. It is typically triggered by a preceding parvovirus B19 infection.

A vaso-occlusive crisis is less likely in this case as it typically causes pain – not splenomegaly or a fall in haemoglobin. A vaso-occlusive crisis is the most common type of sickle cell crisis and occurs when the microcirculation is obstructed by sickled red blood cells. This results in tissue ischaemia and therefore extreme pain.

Acute chest syndrome is less likely in this case as it is not associated with splenomegaly or low haemoglobin. This complication is essentially a vaso-occlusive crisis that occurs in the lungs resulting in chest symptoms (e.g. hypoxia, cough, increased sputum production).

Infectious mononucleosis may indeed cause splenomegaly, however, the patient’s history of sickle cell disease makes sequestration crisis more likely.

Further reading:

https://patient.info/doctor/sickle-cell-disease-and-sickle-cell-anaemia-pro#nav-3

Question:

The on-call paediatric consultant is bleeped to see a 1-day-old baby after concerns were raised by the doctor who carried out the infant's newborn physical examination. There were no concerns raised at the birth itself, and the delivery was via a successful Caesarian section. However, on examining the child, the doctor noted a pansystolic murmur, heard loudest in the fourth intercostal space at the left sternal edge. A repeat examination by the consultant elicited the same findings and the child now appears unwell and is slightly cyanosed.

An urgent echocardiogram is performed; this is reported as demonstrating 'atrialisation of the right ventricle', with abnormalities of the tricuspid valve. The consultant informs the mother that her child is likely to need surgical intervention to resolve their symptoms.

Given the probable diagnosis, which of the following is most likely to be associated with the development of the condition?

A. Heavy smoking during pregnancy

B. Maternal age over 40

C. Lithium exposure during pregnancy

D. Family history of Tetralogy of Fallot

E. Failure to take folic acid supplementation during pregnancy

Correct Answer:Lithium exposure during pregnancy

Explanation:

The most likely diagnosis, in this case, is Ebstein's anomaly; a form of congenital heart defect that involves abnormal displacement of the posterior and septal leaflets of the tricuspid valve. This may result in the murmur of tricuspid regurgitation, as well as possibly a third or fourth heart sound. The classic echocardiography finding is of 'atrialisation of the right ventricle' due to this abnormality. The condition is most commonly linked to lithium exposure in-utero; typically in the context of maternal bipolar disorder. Lithium is a mood stabiliser commonly prescribed for this condition. Ebstein's anomaly often presents early in life; it may or may not be accompanied by a second defect allowing for right-to-left shunting, which will cause cyanosis. Symptoms may be simply those of heart failure in children, such as sweating when feeding, fatigue, and recurrent infections.

Ebstein's anomaly can often be associated with the presence of accessory electrical conduction pathways within the heart which can result in Wolff-Parkinson-White syndrome in affected patients. The management will depend upon the degree of abnormality of the valve, severity of the disease, presence or absence of cyanosis, and severe regurgitation through the valve. Severe disease may require surgical repair.

Heavy smoking during pregnancy is associated with an increased risk of intrauterine growth restriction and a baby that is small for gestational age, but not Ebstein's anomaly.

Folic acid supplementation is important in the prevention of neural tube defects such as the different forms of spina bifida and anencephaly, but failure to take these before conception and up to the first trimester has not been shown to be associated with cardiac defects.

Tetralogy of Fallot is a congenital heart condition with 4 components - overriding aorta, ventricular septal defect, pulmonary outflow tract obstruction, and right ventricular hypertrophy. The ventricular septal defect could cause a pansystolic murmur heard at the left sternal edge, but the echocardiogram findings are not in keeping with this condition.

Increased maternal age is a risk factor for a number of congenital conditions; most significantly the development of Down's syndrome. It is not associated with Ebstein's anomaly.

Further reading:

https://patient.info/doctor/ebsteins-anomaly-pro

Question:

A 25-year-old female attends her GP with a 2-month history of a painless swelling on the anterior portion of her neck. The patient also reports some associated symptoms including heat intolerance, hair thinning, diarrhoea and oligomenorrhoea. The patient has a past medical history of pernicious anaemia.

On examination, the following are noted:

heart rate of 110bpm

fine tremor

brisk reflexes

exophthalmos

a painless mass in the midline of the anterior neck

Investigations reveal the following:

Positive thyroid peroxidase antibodies

Positive TSH-receptor antibodies

What is the MOST LIKELY diagnosis?

A. Solitary thyroid nodule

B. Graves’ disease

C. Iodine deficiency

D. De Quervain’s thyroiditis

E. Hashimoto’s thyroiditis

Correct Answer:Graves’ disease

Explanation:

The most likely diagnosis is Graves’ disease (the most common cause of hyperthyroidism). Grave's disease is an autoimmune disease involving overstimulation of TSH receptors by autoantibodies. As a result, hyperthyroidism develops, in addition to thyroid hyperplasia and subsequent goitre.

Clinical features of hyperthyroidism are wide-ranging and can include tachycardia, heat intolerance, weight loss, diarrhoea, increased appetite, hair thinning and development of a goitre (presenting as a midline neck lump). Specific clinical features of Graves’ disease include eye changes (e.g. exophthalmos) and pretibial myxoedema.

Typical investigation results for Graves' disease include:

Low TSH

Raised T3 + T4

Positive thyroid peroxidase antibody

Positive TSH-receptor antibody

Management of Graves' can include the use of anti-thyroid drugs (e.g. carbimazole, propylthiouracil), radio-iodine and, less commonly, surgery.

Iodine deficiency is a cause of hypothyroidism.

De Quervain’s thyroiditis typically presents alongside a viral infection with features of hyperthyroidism plus a painful goitre, fever and raised inflammatory markers.

Hashimoto’s thyroiditis is a cause of hypothyroidism.

A solitary thyroid nodule is not likely in this scenario, given the findings of diffuse thyroid swelling.

Further reading:

https://patient.info/doctor/hyperthyroidism

Question:

A 28-year-old woman presents with concerns about her fertility. She and her husband have been having unprotected sexual intercourse on most days for the past 13 months but have so far failed to conceive. She has had no previous pregnancies and has never tested positive for a sexually transmitted infection. Her body mass index (BMI) is 22 kg/m2, she is a non-smoker, and she has a regular 35-day menstrual cycle. Recent HbA1c and thyroid function tests were within normal limits.

Which blood tests would be the most appropriate initial investigation to confirm ovulation?

A. Luteinising hormone (LH) level measured on day 21 of her cycle

B. Progesterone level measured on day 1 of her cycle

C. Progesterone level measured on day 21 of her cycle

D. Progesterone level measured on day 28 of her cycle

E. Oestrogen level measured on day 28 of her cycle

Correct Answer:Progesterone level measured on day 28 of her cycle

Explanation:

The correct answer is progesterone level measured on day 28 of her cycle. NICE guidelines recommend that the initial investigation to confirm ovulation should be a mid-luteal phase progesterone level. This should be taken seven days before the date she expects to start her period (i.e. her cycle length minus seven days). The question states this woman has a 35-day cycle, so progesterone should be measured on day 28.

Oestrogen level measured on day 28 of her cycle is incorrect as oestrogen is not used to confirm ovulation.

Luteinising hormone (LH) level measured on day 21 of her cycle is incorrect as LH is not used to confirm ovulation.

Progesterone level measured on day 21 of her cycle is incorrect as a mid-luteal sample of a 35-day cycle should be taken on day 28 (7 days before the expected period). If the patient had a 28-day cycle, a day 21 level would be appropriate.

Progesterone level measured on day 1 of her cycle is incorrect as a mid-luteal sample of a 35-day cycle should be taken on day 28 (7 days before the expected period).

Further reading:

https://cks.nice.org.uk/topics/infertility/management/

Question:

An 80-year-old woman presents to the emergency department with a 2-hour history of severe right forearm pain. Two days before, she fell and landed on her right arm and developed some bruising, but was able to return to her usual activities. There has been no new trauma. She has a past medical history of atrial fibrillation and takes apixaban.

There is reduced sensation and paraesthesia on the palmar aspect of the right radial 2.5 digits, and the examination is limited due to severe pain, including passive movement. Analgesia is given, but this is still insufficient. An x-ray demonstrates no bony abnormalities.

What is the most appropriate step in her management?

A. Continue apixaban, admit for observation and give analgesia

B. Withhold apixaban and refer for intracompartmental pressure measurement

C. Withhold apixaban, admit for observation and give analgesia

D. Immobilise arm and refer for further investigations

E. Withhold apixaban and refer for urgent fasciotomy

Correct Answer:Withhold apixaban and refer for urgent fasciotomy

Explanation:

Withhold apixaban and refer for urgent fasciotomy is correct. This patient has signs and symptoms of compartment syndrome, as suggested by the initial trauma, bruising, and severe pain associated with median nerve compromise (described by the reduced sensation and paraesthesia in the radial 2.5 digits). The inadequacy of analgesia and pain with movement, including passive movement, should raise suspicion of compartment syndrome. This patient is taking apixaban (an anticoagulant) for atrial fibrillation, placing them at an increased risk of haemorrhage. It is most likely that the initial trauma in this patient has led to haemorrhaging in this patient's forearm, compressing the muscle and neurovascular structures, leading to ischaemia and potentially necrosis, explaining the progression of her symptoms. Compartment syndrome can be diagnosed clinically if the signs and symptoms are strongly suggestive of it, and it requires an immediate fasciotomy to decompress the pressure building up in her forearm to prevent the death of muscle tissue and its complications (such as myoglobinuria and renal failure). It is also important to note that compartment syndrome does not typically show any pathology on an x-ray.

Withhold apixaban and refer for intracompartmental pressure measurement is incorrect. Although intracompartmental pressure measurements confirm the diagnosis of compartment syndrome, it takes multiple pressure measurements to confirm the diagnosis, which can take up time, risking the development of muscle tissue necrosis and neurovascular compromise. In severe cases such as this patient, compartment syndrome can be diagnosed clinically.

Continue apixaban, admit for observation and give analgesia and withhold apixaban, admit for observation and give analgesia are incorrect. Apixaban is contraindicated in acute bleeding and must be withheld, especially in this scenario, as continuing it may worsen the compartment syndrome. Although supportive treatment should be given at all times, observation and analgesia alone would be inappropriate as urgent decompression is necessary.

Immobilise arm and refer for further investigations is incorrect. A fracture is unlikely here as an x-ray is unremarkable. Immobilising the arm and referring for further investigations can take up time, risking the development of the complications of compartment syndrome.

Further reading:

https://geekymedics.com/compartment-syndrome/

Question:

A 45-year-old woman undergoes a screen for type 2 diabetes due to a significant family history of the condition. She is overweight but otherwise well at the moment, with no significant past medical history.

Her screening result is as follows:

HBA1c - 49 mmol/mol

Based on this result, which of the following is the most appropriate next step?

A. Commence gliclazide

B. Commence insulin

C. No further action

D. Commence metformin

E. Repeat HBA1c in 1-2 weeks

Correct Answer:Repeat HBA1c in 1-2 weeks

Explanation:

The most appropriate next step would be to repeat the HbAc test in 1-2 weeks time.

Diabetes is usually diagnosed by an HbA1c of 48 mmol/mol (6.5%) or more.

In an asymptomatic person, the diagnosis of diabetes should never be based on a single abnormal HbA1c or fasting plasma glucose level; at least one additional abnormal HbA1c or plasma glucose level is essential. If the second test results are normal, it is prudent to arrange regular review of the person.

In a symptomatic person, diabetes can be diagnosed with more confidence on the basis of a single abnormal HbA1c or fasting plasma glucose level (although a second test may be prudent). Be aware that severe hyperglycaemia in people with an acute infection, trauma, or circulatory (other stress) may be transitory and should not be regarded as diagnostic of diabetes.

It would not be appropriate to immediately start any of the treatments mentioned based upon this single reading in an otherwise asymptomatic patient. If a diagnosis of type 2 diabetes was confirmed, the next steps would involve creating an individualised care plan, offering a structured education programme (i.e. DESMOND), providing lifestyle advice (i.e. dietary advice, weight loss advice) and screening for complications of type 2 diabetes (i.e. retinal screening, diabetic foot check).

Drug treatments are typically commenced if lifestyle measures fail to achieve adequate control of blood glucose levels.

Further reading:

https://cks.nice.org.uk/diabetes-type-2#!diagnosisSub

Question:

A 35-year-old man presents to the GP with a 2-month history of episodic headaches. He experiences this type of headache up to 3 times a week. He describes the headache as a 'generalised tightness' around his whole head.

He does not report any nausea, vomiting, photophobia or neck stiffness. The headaches are typically worse after a stressful day at work.

He has a past medical history of asthma and nasal polyps. He currently takes beclomethasone and salbutamol inhalers. The patient's medical notes state he is allergic to non-selective NSAIDs. He explains they give him a rash and tight chest, which feels like an asthma attack.

On examination, there is marked tenderness of the scalp and trapezius muscles. Neurological examination and vital signs are otherwise normal.

What is the most appropriate initial prescription for this patient?

A. Aspirin

B. Ibuprofen

C. Morphine

D. Sumatriptan

E. Paracetamol

Correct Answer:Paracetamol

Explanation:

The most likely diagnosis in this patient is a tension-type headache (TTH). TTH is a common primary headache disorder causing a generalised headache, typically described as 'pressure' or 'tightness' around the head. NICE guidelines recommend that if clinical features are consistent with episodic TTH, first-line management should involve offering simple analgesia such as paracetamol to the patient.

Other alternatives to paracetamol in the simple analgesia classification include aspirin and non-steroidal anti-inflammatories (NSAIDs) such as ibuprofen. However, this patient has a past medical history of a severe allergy to non-selective NSAIDs, which includes both aspirin and ibuprofen. It is important to remember that patients with asthma and nasal polyps are often likely to have an allergic reaction to NSAIDs. Therefore, both options would not be the most suitable first-line management for this patient.

A nasal triptan, such as sumatriptan, may be used during an acute migraine attack or cluster headache; however, they are not indicated for use in TTH.

Patients should not be offered opioids, such as morphine, in any stage of TTH management. NICE guidelines recommend that if potent analgesia is required to manage symptoms, this should prompt reconsideration of the original diagnosis.

Further reading:

https://cks.nice.org.uk/topics/headache-tension-type/

Question:

A 10-year-old boy is seen in the emergency department with his mother after being bitten by a dog. He was bitten on the right arm 24 hours previously.

On examination, there is redness and purulent drainage from the bite site. The patient’s observations are stable.

Which pathogen is most likely to be responsible for the patient’s condition?

A. Rabies virus

B. Pseudomonas aeruginosa

C. Salmonella typhi

D. Staphylococcus aureus

E. Pasteurella multocida

Correct Answer:Pasteurella multocida

Explanation:

The child in the above question has been infected with a pathogen called Pasteurella multocida, a gram-negative bacteria which commonly colonises the mouths of dogs, cats, pigs and rats. This patient has signs of infection (erythema and purulent drainage) and therefore the wound should be thoroughly cleaned with normal saline. The boy should also be commenced on co-amoxiclav, or clindamycin if the patient reported a penicillin allergy.

S. typhi is associated with bloody bowel movement and typhoid fever (rose spots on the abdomen, constipation, abdominal pain and fevers) following the consumption of contaminated food or water.

P. aeruginosa can cause many infections in the human body which affect various organ systems. An animal bite resulting in a wound infection is unlikely to be secondary to P. aeruginosa.

Rabies virus is typically acquired following a bite from an infected animal. Bats, racoons and foxes are typical animals which carry this virus. Neurological manifestations like photophobia and hydrophobia are more likely to be seen in patients infected with the Rabies virus.

S. aureus is unlikely to cause signs of wound infection in a patient who has been recently bitten by an animal.

Further reading:

https://www.gov.uk/guidance/pasteurellosis#immediate-treatment

Question:

A 20-year-old university student presents to the emergency department feeling very unwell. She has had flu-like symptoms for the past 10-12 hours and complains of severe headache, vomiting, neck stiffness and photophobia. On examination, there are no focal neurological deficits, fundoscopy is normal but Kernig’s sign is positive. Her pulse is 90 bpm and her BP is 120/60 mmHg.

After taking a complete set of blood tests, what is the next most urgent investigation?

A. MRI scan

B. CT scan

C. Flu swab

D. Lumbar puncture

E. Blood culture

Correct Answer:Lumbar puncture

Explanation:

Sarah is presenting with symptoms suspicious of meningitis.

Lumbar puncture (LP) is the most useful diagnostic test, allowing the analysis of cerebrospinal fluid for evidence of infection. NICE also recommends a clinical assessment looking for signs of raised intracranial pressure (e.g. papilloedema, focal neurological deficits) to determine if LP is safe to perform (as CT scans can not completely exclude raised intracranial pressure). If papilloedema or focal neurological deficits are identified, CT imaging is crucial to exclude other intracranial pathology.

A CT scan is typically only considered in patients if there are focal neurological deficits or fluctuating levels of consciousness, as this helps to exclude other causes or co-existing encephalitis. In some patients, neuroimaging may be required before lumbar puncture. However, NICE guidelines state that clinical assessment, as opposed to a CT scan, should decide whether it is safe to perform a lumbar puncture, as CT is unreliable for identifying raised intracranial pressure. As this patient is alert, has a normal neurological examination and no evidence of papilloedema, it is unlikely a CT scan would be indicated first.

MRI is a more detailed, sensitive imaging modality. However, it is more difficult to arrange and unavailable in many hospitals out of hours. It is useful when considering diagnoses such as encephalitis or space-occupying lesions.

Blood cultures are important and should have been sent as part of the initial blood tests mentioned in the clinical vignette.

A flu swab could be performed alongside the other tests, however, this is less urgent than performing a CT head.

Further reading:

https://pathways.nice.org.uk/pathways/bacterial-meningitis-and-meningococcal-septicaemia-in-under-16s

Question:

A 6-year-old girl is brought to the GP by her parents with a rash. The parents report that their daughter suffered from a range of symptoms, which began around 2 weeks previously, prior to the onset of her rash. The other symptoms included malaise, anorexia, fever, headache and a runny nose. Her parents mention that the rash first appeared around 3 days ago and has gotten progressively worse. It apparently first appeared behind the patient’s ears, then spread to her face, before appearing on her back, chest, arms and legs.

On examination, the following are noted:

Temperature - 38.8oC

Pink, macular rash covering her face, trunk and extremities

Petechiae on her soft palate

Cervical, suboccipital and postauricular lymphadenopathy

What is the most appropriate next step for this patient?

A. Topical steroids and cold compresses

B. Penicillin

C. Aspirin and intravenous immunoglobulin (IVIg)

D. Hygiene measures coupled with topical fusidic acid

E. Conservative management (including the use of antipyretics and school absence for 5 days after the onset of the rash)

Correct Answer:Conservative management (including the use of antipyretics and school absence for 5 days after the onset of the rash)

Explanation:

The most likely diagnosis, in this case, is rubella (a.k.a. German measles). This condition is relatively rare in the UK due to the introduction of the measles, mumps and rubella vaccine (MMR).

Clinical features for this condition include:

a prodromal illness (comprising mild fever, headache, conjunctivitis, anorexia and rhinorrhoea)

rash (that first develops behind the ears, spreads to the face, followed by the trunk, is pink and macular in nature)

cervical, suboccipital and postauricular lymphadenopathy

arthralgia (in older patients)

Forchheimer’s sign (soft palate petechiae)

Serological and/or polymerase chain reaction (PCR) testing is the gold standard investigation. Management for this condition is conservative and includes school absence (for 5 days from rash onset), antipyretic therapy and avoidance of pregnant women.

Aspirin and IVIg are the mainstays of treatment for Kawasaki disease (an important differential diagnosis of rubella). This condition typically presents with abrupt onset fever, inflammation of the lips, erythema, and desquamation. Other features can include oedema of the extremities, bilateral conjunctivitis, non-vesicular rash and cervical lymphadenopathy.

Penicillin is the first-line therapy for scarlet fever. This condition commonly presents with sudden-onset fever and a prodromal illness, involving sore throat, headache, vomiting, abdominal pain and myalgia. A rash typically develops 12-48 hours after the onset of fever, first appearing on the neck and then spreading. The rash has a coarse, sandpaper texture and can sometimes be associated with desquamation.

Topical steroids and cold compresses would not be appropriate in this case. This line of management would be appropriate if pompholyx was suspected. Pompholyx (dyshidrotic eczema) is a type of eczema that causes tiny itchy blisters to develop across the fingers, palms of the hands and sometimes the soles of the feet.

Impetigo is usually treated with improved hygiene measures and topical fusidic acid. This condition typically presents with itchy gold crusted lesions (either macules, vesicles, bullae, or pustules).

Further reading:

https://patient.info/doctor/rubella

Question:

A 65-year-old man is admitted to intensive care with a diagnosis of hospital-acquired pneumonia. He is oliguric, and blood tests demonstrate a creatinine of 580 μmol/L, sodium 147 mmol/L, potassium 5.4 mmol/L and urea 7.2 mmol/L. A venous blood gas reveals a pH of 7.29.

He is treated with intravenous fluids and antibiotics, but his condition worsens with clinical signs of pulmonary oedema. IV furosemide is ineffective.

What is an indication for acute dialysis in this patient?

A. pH 7.29

B. Pulmonary oedema

C. Creatinine 580 μmol/L

D. K+ 5.4 mmol/L

E. Urea 7.2 mmol/L

Correct Answer:Pulmonary oedema

Explanation:

The question examines the knowledge of indications for acute dialysis. The commonest reasons for initiation of acute dialysis can be remembered as AEIOU:

Acidosis: metabolic acidosis with pH <7.1

Electrolytes: refractory hyperkalemia with a serum potassium >6.5 or rapidly rising concentration.

Intoxication: i.e. salicylates, lithium, isopropanol, methanol, ethylene glycol.

Overload: pulmonary oedema refractory to diuresis.

Uraemia: Elevated urea with signs or symptoms of uraemia, including pericarditis and seizures.

In this case, pulmonary oedema refractory to diuresis is the main indication for urgent dialysis.,

Raised creatinine is not an independent indication for acute dialysis.

Further reading:

https://patient.info/doctor/renal-replacement-therapy-and-transplantation

Question:

A 41-year-old woman presents to her GP as she has unintentionally lost 5kg of weight over the past month. She denies any abdominal pain, change in bowel habits, nausea or vomiting, excess sweating, palpitations, haemoptysis, cough, shortness of breath or fever. She has no significant past medical history, however, she has been smoking 20 cigarettes a day since she was 20 years old.

A thyroid status, cardiovascular, respiratory, and abdominal exam are unremarkable.

What is the most appropriate next step?

A. Reassurance and safety-netting advice

B. CT chest abdomen pelvis

C. Urgent chest X-ray within 2 weeks

D. Non-urgent chest X-ray

E. 2-week wait referral for suspected cancer

Correct Answer:Urgent chest X-ray within 2 weeks

Explanation:

Lung cancer should be suspected in anyone with a smoking history who is presenting with weight loss. According to NICE guidelines, all patients over the age of 40 years old who have smoked should receive an urgent chest X-ray within 2 weeks to assess for lung cancer if they present with any of the following symptoms:

Cough

Shortness of breath

Chest pain

Weight loss

Fatigue

Loss of appetite

Note that patients over the age of 40 who have never smoked require two of the above symptoms to be offered an urgent chest X-ray.

A 2-week wait referral for suspected cancer is offered to patients aged over 40 presenting with haemoptysis or for patients with chest X-ray findings suggestive of lung cancer. Therefore, the most appropriate next step is an urgent chest X-ray. If this is abnormal, the patient should be referred for a 2-week wait appointment for suspected lung cancer.

A CT chest abdomen pelvis is used to stage cancer. Although this patient may eventually need a CT chest abdomen pelvis if diagnosed with lung cancer, the most appropriate first step is to refer them for an urgent chest X-ray.

As this woman has a positive smoking history and has presented with weight loss, she should be investigated urgently for lung cancer. Therefore, a non-urgent chest X-ray and reassurance and safety-netting advice are incorrect.

Further reading:

https://www.nice.org.uk/guidance/ng12/chapter/Recommendations-organised-by-site-of-cancer#lung-and-pleural-cancers

Question:

A 25-year-old psychiatric inpatient is reviewed by the medical team due to new confusion and polydipsia and polyuria. The patient has produced 3 litres of dilute urine in 12 hours. She is normally well with no significant medical history.

Relevant biochemistry findings:

Serum sodium - 155 mmol/L (135 - 145)

Serum osmolality - 310 mmol/kg (275 - 295)

Urine osmolality ≤ 100 mOsm/kg (dilute urine)

What of the following medications is the most common cause of this presentation?

A. Clozapine

B. Lithium

C. Amitriptyline

D. Sertraline

E. Haloperidol

Correct Answer:Lithium

Explanation:

This patient demonstrates signs and symptoms of diabetes insipidus (DI). In DI, insufficient action of anti-diuretic hormone (ADH) causes dramatically increased water excretion which leads to a relative hypernatraemia and symptoms of thirst and excessive urination. In cranial DI, the posterior pituitary gland does not produce ADH. In nephrogenic DI, renal tubular cells no longer respond to ADH molecules. Biochemically, diabetes insipidus causes a relative hypernatraemia (caused by hypovolaemia), increased serum osmolality (molecules dissolve in a relatively low serum volume of water) and decreased urine osmolality (molecules dissolve in a dramatically increased urine volume).

Chronic lithium use (e.g in patients with bipolar disease) is the most common cause of acquired nephrogenic diabetes insipidus.

Sertraline is a selective serotonin reuptake inhibitor (SSRI) used in depressive disorders. Side effects include a syndrome of inappropriate secretion of ADH (SIADH) which would present with hyponatraemia.

Clozapine is an antipsychotic medication used as a 3rd-line treatment after trial of 2 other antipsychotics. Its most important side effect is agranulocytosis (depletion of neutrophils causing increased risk of infection) which must be monitored for using regular blood tests.

Amitriptyline is a tricyclic antidepressant (TCA). It can cause anticholinergic symptoms which include dry mouth, blurred vision, constipation and urine retention.

Haloperidol is a 1st generation antipsychotic. Some patients taking haloperidol experience extrapyramidal side effects such as acute dystonia, Parkinsonism, akathisia and tardive dyskinesia.

Further reading:

https://geekymedics.com/lithium-counselling-osce-guide/

Question:

A 25-year-old woman presents with a 4-month history of episodic nasal discharge, congestion, and cough. During this time, she has had associated facial pain that is worse when applying pressure to her face. She has had to breathe through her mouth due to her nasal congestion and blockage, and constantly feels the need to clear her throat. There is no bleeding or changes in hearing. She has a past medical history of asthma and uses salbutamol and beclometasone inhalers.

Anterior rhinoscopy is performed, which demonstrates thick nasal discharge and generalised erythema. Palpation over the maxillary bone of the face elicits pain.

What is the most likely diagnosis?

A. Chronic rhinosinusitis

B. Nasal polyps

C. Nasal turbinate hypertrophy

D. Allergic rhinitis

E. Acute rhinosinusitis

Correct Answer:Chronic rhinosinusitis

Explanation:

Chronic rhinosinusitis is correct. This patient has nasal discharge, obstruction, facial pain, and cough. These features suggest that rhinitis and sinusitis are both combined. The nasal symptoms support the diagnosis of rhinitis (inflammation of the nose), and the facial pain (in this question over the maxilla, which overlies the maxillary sinus), and cough (due to post-nasal drip) support the diagnosis of sinusitis (inflammation of the sinus). These two in combination form a diagnosis of rhinosinusitis, which is acute if it lasts up to 4 weeks, or chronic if it persists for more than 12 weeks. This patient's symptoms have persisted for 4 months, making the diagnosis chronic rhinosinusitis. She also has a history of asthma, which is a risk factor for the condition.

Acute rhinosinusitis is incorrect. This would present with a history lasting up to 4 weeks. Although they present very similarly, the symptoms are also more pronounced in acute rhinosinusitis. There may also be fever and signs of infection in patients with acute sinusitis, particularly if there is a bacterial cause.

Nasal polyps and nasal turbinate hypertrophy are incorrect. Although these can present with nasal obstruction and nasal discharge, obstruction would be the chief complaint. As well as this, the anterior rhinoscopy did not identify any polyps or nasal turbinate hypertrophy. In nasal polyps, many patients also complain of a poor sense of taste and smell.

Allergic rhinitis is incorrect. This can also cause a runny nose, however, itching is also a more prominent feature, along with sneezing and similar symptoms in the eyes (e.g. itching and wateriness). Although the timeframe in the question may not be long enough to tell, patients with allergic rhinitis will have seasonality to their symptoms, with their symptoms typically being worse during the summer or with exposure to a particular allergen (e.g. house dust mite or animal dander).

Further reading:

https://geekymedics.com/acute-sinusitis/

Question:

A 25-year-old man presented to the emergency department with sudden onset painless visual loss in the left eye. He has a history of frequent bone pains, chest infections, priapism and pulmonary hypertension. He had cholecystectomy due to recurrent gall stones two years ago. On general physical examination, he is noted to have hepatosplenomegaly. His family history is positive for multiple sclerosis.

His previous medical record shows: HbA - Absent, HbSS - 80% and HbF - 20%

What is the most likely cause of the visual changes in this case?

A. Central retinal vein occlusion

B. Subconjunctival haemorrhage

C. Optic neuritis

D. Central retinal artery occlusion

E. Cataract

Correct Answer:Central retinal artery occlusion

Explanation:

The most likely cause of visual changes in the given scenario is central retinal artery occlusion. The signs and symptoms (frequent bone pains, chest infections, priapism and pulmonary hypertension) along with examination findings point towards sickle cell disease. Vaso-occlusive complications are common in sickle cell disease.

Central retinal vein occlusion may also present with sudden onset painless loss of vision but is uncommon in sickle cell disease.

Optic neuritis presents sub-acutely with hours to days of visual blurring, and is associated with multiple sclerosis. However, it is often accompanied by pain worse on eye movements, and there is not adequate evidence mentioned in the stem to support multiple sclerosis and demyelinating disease in the patient.

Conjunctival haemorrhage can occur in sickle cell disease but it rarely causes any visual changes

Cataracts can present with visual changes, but this is most common in older people and doesn't cause acute symptoms as mentioned in the stem.

Further reading:

https://patient.info/doctor/sickle-cell-disease-and-sickle-cell-anaemia-pro

Question:

An 8-year-old boy is brought into the emergency department with a painful and swollen red eye. The right eyelid and surrounding skin are grossly swollen, and the right eye appears to bulge outwards. Apart from a recent upper respiratory tract infection, he usually is well.

On examination of the right eye, eye movements are painful in all directions and visual acuity is reduced to hand movements. Both pupils appear to dilate when a light is rapidly shone from the left to the right eye. He has a temperature of 38.3oC.

What is the most likely diagnosis?

A. Acute angle-closure glaucoma

B. Acute anterior uveitis

C. Periorbital cellulitis

D. Conjunctivitis

E. Orbital cellulitis

Correct Answer:Orbital cellulitis

Explanation:

This case demonstrates orbital cellulitis, which is defined as an infection posterior to the deep orbital septum. It is more common in children and can spread from a recent sinus/upper respiratory tract infection. It is an ophthalmological emergency and an important differential of periorbital cellulitis. They can be differentiated by the following:

Feature Periorbital cellulitis Orbital cellulitis

Proptosis Absent Present

Range of eye movements Normal Restricted and painful

Visual acuity Normal Decreased

Colour vision Normal Decreased

Relative afferent pupillary defect Absent Present

Acute angle-closure glaucoma typically presents with a severely painful red eye, decreased visual acuity and a fixed semi-dilated pupil. It is more common in a much older patient population (average age 60), and signs of infection are not seen.

Conjunctivitis typically presents with a red eye, discharge (serous or purulent depending on the cause) and a foreign body sensation. Visual acuity, eye movements and pupil reactions remain unaffected.

Acute anterior uveitis typically presents with a painful, red, photophobic eye and mild to moderate blurring of vision. An irregular pupil and hypopyon may also be present. Proptosis and fever are not commonly seen.

Further reading:

https://geekymedics.com/orbital-and-periorbital-cellulitis/

Question:

A 78-year-old woman presents to her GP with a rash. She reports a 2-3 day history of burning pain located underneath her bra-strap on the left side. This was associated with general malaise, myalgia, and headache.

On examination, there is 3-4cm patch of erythematous, swollen plaques with clusters of small vesicles located on the left side of her chest. The patient maintains the rash was not there yesterday.

Her past medical history is significant for hypertension, and progressive supranuclear palsy.

What is the most likely diagnosis?

A. Herpes simplex

B. Contact dermatitis

C. Bullous pemphigoid

D. Shingles

E. Atopic dermatitis

Correct Answer:Shingles

Explanation:

The patient's age, the short prodromal period of general malaise and burning pain, and the sudden appearance of vesicles in a localised distribution all point to shingles.

Atopic dermatitis would not give a prodrome of general malaise and is more commonly distributed on flexor surfaces and with a history of atopy.

Bullous pemphigoid is usually associated with a pre-existing chronic skin disease e.g. lichen planus, or a drug reaction.

Contact dermatitis would not give a prodrome of general malaise. Furthermore, if the rash was related to her clothes, a unilateral distribution of the rash would be unlikely.

Herpes simplex commonly affects the mouth, genitals, or eyes.

Further reading:

https://patient.info/doctor/shingles-and-shingles-vaccination

Question:

A 67-year-old man, admitted to the hospital three days ago for community-acquired pneumonia, develops acute onset agitation and aggression during the night shift.

He has a past medical history of Parkinson's disease, managed with carbidopa/levodopa (Co-Careldopa).

On examination, vital signs are normal. Neurological examination reveals agitation but no focal deficits. During the examination, he becomes verbally aggressive and starts shouting at you.

What is the most appropriate initial management step?

A. Administer haloperidol

B. Attempt de-escalation techniques and reorientation

C. Administer lorazepam

D. Administer levomepromazine

E. Withhold co-careldopa

Correct Answer:Attempt de-escalation techniques and reorientation

Explanation:

The most likely diagnosis in this patient is delirium - an acute, fluctuating change in mental status resulting in disturbed consciousness, attention, cognition and perception. NICE guidelines recommend that if a patient in secondary care with delirium develops challenging behaviour, such as aggression and shouting, then the first-line management is de-escalation techniques and reorientation. Non-pharmacological interventions should be used before medications and include addressing any underlying cause for the behaviour, moving the patient to a low-stimulation environment and using verbal and non-verbal reassurance.

In the management of delirium, unnecessary medications should be avoided whenever possible. Low-dose haloperidol (0.5mg) is usually the first-line medical option; however, it is contraindicated in patients with Parkinson's disease, owing to its effect on dopamine receptors.

If haloperidol is not suitable low-dose lorazepam (0.5mg) is considered an alternative first-line. However, both haloperidol and lorazepam would not be suitable for this patient without first attempting non-pharmacological management strategies.

Levomepromazine is a low-potency antipsychotic that is often used in a palliative care setting. NICE guidelines recommend a trial of levomepromazine to manage delirium in patients with intractable distress in an end-of-life care setting. As with all antipsychotic medications, it may exacerbate symptoms of Parkinson's disease and should therefore be used with caution. As this patient is not receiving palliative care and has a past medical history of Parkinson's disease, this would not be the most appropriate initial management.

Patients receiving treatment with co-careldopa must not have their medication stopped suddenly as this can result in a constellation of neuropsychiatric and autonomic symptoms. This is not a suitable option for managing delirium and would likely cause harm to the patient.

Further reading:

https://cks.nice.org.uk/topics/delirium/

Question:

A 28-year-old man applies for a job in a hospital. As part of his occupational health screening, he is screened for blood-borne viruses including hepatitis B. The results are shown below:

Marker Result

HBsAg Negative

anti-HBs/HBsAb Positive

anti-HBc (IgM) Negative

anti-HBc (IgG) Negative

HBeAg Negative

anti-HBe Negative

What is this man's hepatitis B status?

A. No vaccination or expsoure to hepatitis B

B. Immunity following previous vaccination

C. Acute infection

D. Chronic infection

E. Immunity following previous infection

Correct Answer:Immunity following previous vaccination

Explanation:

The correct answer is immunity following previous vaccination. This patient is only positive for HBsAb (which can occur due to either a previous cleared infection or vaccination). Given that he has no core antigens, this shows that he has not been infected with the virus previously (core antigen = caught the virus), therefore this immunity must have been conferred by vaccination.

Immunity following previous infection would result in positive anti-HBs, anti-HBe and anti-HBc (IgG).

Chronic infection would result in positive HBsAg and anti-HBc (IgG). An active infection would result in positive HBeAg, while a carrier would be positive for anti-HBe).

Acute infection would result in positive HBsAg, HBeAg and anti-HBc (IgM).

A patient with no vaccination or exposure to hepatitis B would test negative for all serological markers.

Hepatitis B Serology

Hepatitis B serology can be intimidating due to the number of antibodies and antigens which can be tested. Each of these tests gives different information, which can be taken as a whole to determine a patient's hepatitis B status.

It is important to remember that hepatitis B vaccines contain the hepatitis B surface antigen, but not the core antigen.

Marker Significance

Surface antigen (HBsAg)

Presence suggests active infection.

If present for >6 months - suggests chronic infection

Surface antibody (anti-HBs/HBsAb) Implies previous vaccination or cleared infection.

Core antigen (HBcAg) Rarely measured in clinical practice.

Core antibody (anti-HBc)

IgM suggests recent infection (last 6 months)

IgG suggests resolved or chronic infection

Envelope antigen (HBeAg) Implies higher viral replication and higher risk of transmissibility

Envelope antibody (anti-HBe) Suggests immunity from previous infection (not vaccination)

Table summarised from Geeky Medics "Interpreting Hepatitis B Serology" - see further reading link.

Further reading:

https://geekymedics.com/hepatitis-b-serology-interpretation/

Question:

A 3-week-old baby is brought to the emergency department by his mother. Over the past few days, he has been refusing bottle feeds and has been unusually lethargic. This is associated with vomiting, and loose stools, with some evidence of blood in the most recent stool.

The baby was born at 33 weeks and was given steroids due to prematurity, but fared very well, with no apparent breathing difficulties.

Examination reveals abdominal distension with taut skin overlying it, with no palpable masses.

Given the likely diagnosis, what is most likely to be seen on imaging?

A. Hypertrophy of the pyloric sphincter

B. Hepatosplenomegaly

C. Pneumatosis intestinalis

D. Rigler's triad

E. 'Double bubble' appearance

Correct Answer:Pneumatosis intestinalis

Explanation:

The most likely diagnosis, in this case, is necrotising enterocolitis (NEC); a severe inflammatory condition affecting the bowel in infants, most commonly those who were born prematurely. It most frequently presents with vomiting, diarrhoea, rectal bleeding, and abdominal distension, with tight shiny skin classically being seen on examination. The exact cause of the disease remains unexplained.

The condition is usually diagnosed via abdominal X-ray, which will often demonstrate pneumatosis intestinalis; air within the intestinal wall, arising due to the ongoing intestinal ischaemia. Gas within the portal venous system and visibly dilated intestinal loops are other commonly observed features on imaging. Management of the condition involves making the baby nil-by-mouth and providing parenteral nutrition; antibiotics are given to cover against infection. If this more conservative approach is unsuccessful, or necrotic areas of the bowel are identified, then surgical resection is often necessary.

Rigler's triad is the term used to describe the three characteristic findings in gallstone ileus - pneumobilia, small bowel obstruction, and the presence of a gallstone within the bowel.

The 'double bubble' sign is the term used to describe dilatation of the proximal duodenum and stomach, visible on both X-ray and ultrasound. It is seen in duodenal atresia rather than NEC.

Hypertrophy of the pyloric sphincter is the expected finding if this baby has a diagnosis of pyloric stenosis. It would not explain the diarrhoea in this case, nor the significant abdominal distension, and this baby is at a greater risk of NEC due to the fact they were born prematurely. The pyloric sphincter would usually be visualised using ultrasound rather than an X-ray.

Hepatosplenomegaly can arise in a number of paediatric conditions, including infections, haematological malignancies and lysosomal storage diseases. It is not a feature of NEC, however.

Further reading:

https://radiopaedia.org/articles/intramural-bowel-gas?lang=gb

Question:

A 35-year-old Caucasian presents with an 18-month history of subfertility despite regular unprotected intercourse. Her last menstrual period was five months ago. She states that her periods have always been irregular and heavy. She entered the menarche aged 16 and has never used contraception. She is gravida 0, parity 0. She has a BMI of 38 and is struggling to lose weight. The patient complains of adult acne on her face and back. On examination; the abdomen was soft with no palpable masses; you note that she has excessive terminal hairs distributed around the navel, thighs and buttocks. The patient says she has always been 'hairy'. On further questioning, she reveals that she had struggled with excessive facial hair growth in the past but had this treated with laser hair removal. Examination of the genitalia is unremarkable; there are no signs of virilisation. Her blood pressure was 126/89.

Her blood results are as follows:

Sex hormone-binding globulin (SHBG): low

Free androgen index (FAI): raised

Follicle-stimulating hormone (FSH): normal

Luteinising hormone (LH): raised

Prolactin: normal

Testosterone: raised

Oestrogen: slightly elevated

Day 21 progesterone: low

Thyroid function tests: normal

Glycosylated haemoglobin (HbA1c): raised

What is the most likely diagnosis?

A. Cushing's syndrome

B. Congenital adrenal hyperplasia

C. Polycystic ovarian syndrome

D. Androgen secreting tumour

E. Idiopathic hyperandrogenism

Correct Answer:Polycystic ovarian syndrome

Explanation:

This patient has polycystic ovarian syndrome (PCOS).

The Rotterdam criteria are used to diagnose PCOS. The patient must have two of the following three characteristics:

Clinical or biochemical hyperandrogenism

Oligomenorrhea or evidence of anovulation

Polycystic ovaries on ultrasound

Although our patient has not yet had an ultrasound performed, she already meets two of the three criteria. This patient has hirsutism and acne, both of which are clinical signs of hyperandrogenism. Biochemical hyperandrogenism is evidenced by the patients raised FAI and testosterone levels. The absence of a period for five months suggests anovulatory cycles. An ultrasound is not essential to make a diagnosis but is useful to rule out other pathology.

PCOS is not yet fully understood. Patients with PCOS typically have peripheral insulin resistance (note the patient has a raised HbA1c) with compensatory raised insulin levels. The ovarian theca is particularly sensitive to insulin levels and therefore produces excess androgens. Increased circulating androgens initially cause multiple ovarian follicles to develop (polycystic ovaries) but then cause a premature arrest of the antral follicles resulting in anovulation.

The primary goal of treatment is to resume ovulation. This is best achieved with weight reduction, initially by diet and exercise. Metformin, an insulin sensitising agent, can aid weight loss and reduce androgen levels. Clomiphene citrate can be combined with metformin to induce ovulation if a couple is trying to conceive. Women must have a menstrual bleed once every four months to reduce the risk of endometrial hyperplasia/cancer. A bleed may be induced with a high dose short course of progestogens.

Androgen secreting tumours typically causes a rapid onset of hirsutism. On examination, there will be evidence of virilisation (e.g. clitoromegaly and loss of female body contour). An abdominal or pelvic mass may be palpable.

Congenital adrenal hyperplasia (CAH) classically presents as ambiguous genitalia at birth; however, the late-onset form can first present with menstrual irregularities and infertility. CAH is much less common than PCOS and given that this patient has evidence of insulin resistance, PCOS is a more likely diagnosis.

PCOS is the most frequent endocrinopathy of the reproductive years, whereas Cushing's syndrome is quite uncommon. The symptomology can be quite similar; however, patients with Cushing's syndrome may additionally have marked abdominal purple striae, muscle wasting, moon face and hypertension.

Idiopathic hyperandrogenism is not the most likely diagnosis, and all other reasonable causes must have been excluded first.

Further reading:

https://academic.oup.com/jcem/article/98/12/4565/2833703

Question:

A 63-year-old man is referred for a CT chest scan by his respiratory consultant due to ongoing shortness of breath, fevers and cough. He has a past medical history of rheumatoid arthritis, for which he takes methotrexate. The CT scan shows patchy consolidation and fibrosis of the upper zones.

Which of the following is the most likely cause of this?

A. Methotrexate

B. Rheumatoid arthritis

C. Idiopathic pulmonary fibrosis

D. Asbestosis

E. Tuberculosis

Correct Answer:Tuberculosis

Explanation:

The correct answer is tuberculosis. This patient has upper zone pulmonary fibrosis on his CT scan. This is commonly associated with pulmonary tuberculosis (particularly post-primary pulmonary tuberculosis).

Asbestosis would be associated with previous occupational exposure to asbestos, which is not mentioned in this history. Additionally, asbestosis tends to cause fibrosis of the lower zones.

Idiopathic pulmonary fibrosis would present with persistent cough and breathlessness, but it tends to cause fibrosis of the lower zones.

Methotrexate can cause lung fibrosis, however, it tends to affect the lower zones rather than the upper zones.

Rheumatoid arthritis and many other autoimmune disorders can cause lung fibrosis. However, with the exception of ankylosing spondylitis, they tend to cause lower zone fibrosis.

Further reading:

https://radiopaedia.org/articles/interstitial-lung-disease?lang=gb

Question:

An 81-year-old man has presented to A&E via ambulance with excruciating pain in his right hip. The pain started acutely after a fall whilst playing tennis in which he heard a crack. He is in a lot of pain but is otherwise stable. He is normally fit and well but says he is annoyed with himself as he didn’t think this sort of thing happened if you stayed active. He has no significant past medical history or family history of note. He lives in a house with his wife and has no problems managing his activities of daily living.

On examination, his right leg is shortened and externally rotated. An x-ray confirms a right-sided displaced intracapsular fractured neck of femur.

What is the most appropriate management option?

A. Fixation with intramedullary nails

B. Fixation with dynamic hip screws

C. Hemiarthroplasty

D. Total hip replacement

E. Fixation with parallel pins

Correct Answer:Total hip replacement

Explanation:

The most appropriate management is a total hip replacement as the patient has experienced a displaced intracapsular fractured neck of femur (Garden’s classification 3 or 4) and is clearly fit enough for the operation. This is evident in the history of presenting complaint (playing tennis), his past medical history (normally fit and well, keeps active) and his social background (lives in a house, manages his activities of daily living). Were this not the case then a hemiarthroplasty would be the most appropriate management given his age and Garden’s classification of 3 or 4.

Fixing the fracture with nails, screws or pins are less appropriate as they are usually reserved for non-displaced intracapsular fractures (Garden’s classification 1 or 2) or younger patients. Irrespective of the choice of surgical management, all patients should receive post-operative physiotherapy and rehabilitation.

Further reading:

https://www.nice.org.uk/guidance/cg124

Question:

A 10-month-old Norwegian girl has been brought into the GP surgery by her worried parents. They have noticed her eyes have turned yellow. She has not been abroad recently and has no past medical history of note. She was born at term via caesarean section.

On examination you note splenomegaly. You request some blood tests which reveal: Hb 98, MCV 82 and reticulocytosis on blood film.

What is the most likely underlying diagnosis?

A. Gallstones

B. Hereditary spherocytosis

C. G6PD deficiency

D. Biliary atresia

E. Hepatitis E

Correct Answer:Hereditary spherocytosis

Explanation:

Hereditary spherocytosis (HS) is a collection of inherited disorders which result in spherical-shaped erythrocytes. These spherocytes are typically identified on a blood film.

HS typically presents with jaundice, haemolytic anaemia and splenomegaly. It can present at any age and there is typically a family history of anaemia. Diagnosis is usually achieved based on clinical features (i.e. jaundice, anaemia, gallstones), family history and laboratory investigations (raised reticulocytes, raised MCHC, raised unconjugated bilirubin) and the presence of spherocytes on blood film).

Gallstones can be a presenting feature of hereditary spherocytosis however gallstones alone are not the underlying cause of the anaemia and jaundice.

G6PD deficiency can present with jaundice, haemolytic anaemia and gallstones, however, it is an X-linked recessive disorder, making it extremely rare in females. G6PD is more common in those of African or Mediterranean descent. A blood film may reveal Heinz bodies.

Hepatitis E can present with jaundice, however this patient has no history of travel to high-risk areas and hepatitis E would not explain the anaemia.

Biliary atresia is a cause of prolonged neonatal jaundice and typically presents shortly after birth. It would not present this late in the child's life.

Further reading:

https://patient.info/doctor/hereditary-spherocytosis-pro

Question:

A 43-year-old woman presents to the walk-in eye clinic complaining of a sudden loss of vision in her right eye. She reports that 'colours look funny' when she closes her left eye, and that moving her right eye causes her pain. She denies photophobia, itch or discharge from either eye. This is the first such episode that she has experienced, and has had no previous issues with her vision.

The patient's past medical history is unremarkable and she takes no regular medication. On examination, visual acuity (assessed via Snellen chart) in the left eye is 6/6, compared to the right which is 6/24. The swinging lamp test reveals that when the torch is swung towards the right eye after being shone into the left eye, it dilates rather than constricting. Fundoscopy reveals a normal red reflex and no abnormalities of the retina are visualised.

Given the likely diagnosis, which of the following underlying conditions is most likely to be present?

A. Diabetic retinopathy

B. Amyotrophic lateral sclerosis

C. Neuromyelitis optica

D. Marfan syndrome

E. Multiple sclerosis

Correct Answer:Multiple sclerosis

Explanation:

The most likely diagnosis, in this case, is optic neuritis. Loss of colour vision, pain during eye movement and a relative afferent pupillary defect (RAPD) on examination are all common features of the condition, that arises due to inflammation of the optic nerve. A relative afferent pupillary defect refers to abnormal pupillary constriction during the swinging lamp test, due to reduced electrical impulses being transmitted. It usually indicates the presence of asymmetrical retinal or optic nerve pathology, with optic neuritis, retinal detachment, anterior ischaemic optic neuropathy being common culprits.

Multiple sclerosis (MS) is the most common underlying cause identified in the setting of optic neuritis, with the patient fitting the usual demographic for this disease. The diagnosis is confirmed via MRI of the brain and spinal cord as well as of the optic nerves to assess for the presence of demyelination.

Treatment of optic neuritis involves the provision of high-dose intravenous methylprednisolone, with the aim of reducing inflammation and restoring visual acuity. Provided that this is initiated early, the prognosis is excellent, with the majority of patients making a full recovery, without residual visual changes. In rare cases, patients may have a degree of impaired acuity or colour differentiation.

Diabetic retinopathy can cause tractional retinal detachment which could cause sudden visual loss and possibly a RAPD, but would not explain the pain on eye movement. There is no mention of diabetes in the patient's past medical history.

Neuromyelitis optica is a recognised cause of optic neuritis; the condition most commonly arises due to antibodies targeting aquaporin-4 receptors. However, it affects less than 1 per 100,000 worldwide and, given its rarity, is not the most likely underlying disease in this case.

Marfan syndrome is a connective tissue disease caused by a mutation in the fibrillin 1 gene. It can cause ocular involvement in the form of ectopia lentis but does not cause optic neuritis.

Amyotrophic lateral sclerosis is the most common form of motor neuron disease. It does not cause optic neuritis; the eyes are often spared in those with the condition.

Further reading:

https://eyewiki.aao.org/Demyelinating\_Optic\_Neuritis#Management

Question:

Graham Short, a 65-year-old gentleman, presents with a 5-day history of a worsening dry cough. This is present throughout the day but is especially bad at night. He also reports shortness of breath when walking up hills and stairs.

He has a past medical history of heart failure for which he takes Ramipril and Bisoprolol.

On examination, he is apyrexial with a NEWS of 0.

Examination of the chest reveals stony dullness on percussion of the bases. On auscultation, you hear bibasal crackles with reduced breath sounds and decreased tactile fremitus.

What is the most likely diagnosis?

A. Pleural effusion

B. Pneumonia

C. Pneumothorax

D. ACE-inhibitor use

E. Lobar collapse

Correct Answer:Pleural effusion

Explanation:

Mr Short has a pleural effusion secondary to his pre-existing heart failure. This classically presents with dyspnoea, non-productive cough and chest pain with examination findings including dullness to percuss, reduced breath sounds and reduced chest expansion.

Heart failure is the most common transudative cause of pleural effusion. Inefficient left ventricular function causes increased venous pressure in the pulmonary veins. This increases capillary hydrostatic pressure causing fluid to ‘leak’ into the pleural space.

Further management will depend on the severity of the effusion. Diuretics (such as furosemide) can be given orally or intravenously. When the effusion is large, thoracocentesis may be used for symptomatic relief. As Mr Short has a history of heart failure it is likely he will be started on diuretics long-term to prevent a recurrence.

A pneumothorax would present with acute or progressive shortness of breath and unilateral chest pain. Examination will show hyper-resonance and reduced breath sounds.

Pneumonia would present with a productive cough, shortness of breath and chest pain. Patients are typically systemically unwell with fever and tachycardia.

Whilst ACE-inhibitors can cause a dry cough they would not cause crackles and reduced breath sounds.

Lobar collapse can have an acute or chronic onset and would present with increased vocal resonance on auscultation of the chest. Tracheal deviation may also be present.

Further reading:

https://www.nice.org.uk/guidance/ng106

Question:

A 16-month-old boy is brought to the emergency department by his parents after witnessing a 'fit' at home. His parents describe a single episode where the boy became unresponsive, went stiff and then began jerking his limbs. This episode lasted approximately 3 minutes. Afterwards, the boy appeared sleepy but was responsive to his parents.

His parents report an ongoing febrile illness with coryzal symptoms lasting two days. They have treated him with regular oral paracetamol at home. After the fit, they administered another dose of paracetamol as he felt 'very hot'.

On examination, the child is alert and playing with toys. His temperature is 38.8°C, respiratory rate 24/min, blood pressure 92/55 mmHg and SpO2 99% on room air. Neurological examination is normal, with no neck stiffness noted.

Which of the following is the most appropriate initial investigation in this patient?

A. Electroencephalogram

B. CT brain

C. MRI brain

D. Lumbar puncture

E. No investigations required

Correct Answer:No investigations required

Explanation:

The most likely diagnosis in this patient is a febrile seizure - a seizure occurring in infants in the context of febrile illness, without central nervous system involvement, and fever (any temperature higher than 38°C). This child has most likely experienced a simple febrile seizure - a generalised, tonic-clonic seizure lasting <15 minutes with only one episode in the previous 24 hours. Importantly, this child has symptoms suggestive of a viral upper respiratory tract infection, indicating he has a clear source for his fever. The only significant finding on examination is pyrexia. Therefore, no further investigations would be warranted in this patient, as a clinical diagnosis can be made.

An MRI brain or CT brain are only considered in patients with complex seizures, an atypical history or abnormal findings on neurological examination post-seizure. This child has most likely experienced a simple febrile seizure. Furthermore, the child is now alert and has no evidence of focal neurological deficits on examination; therefore, neuroimaging would not be indicated.

An electroencephalogram (EEG) should be considered in all children with recurrent complex febrile seizures or those who exhibit abnormal neurological signs. This patient has most likely experienced a simple febrile seizure and has no apparent neurological abnormalities on examination; therefore, an EEG would not be indicated.

A lumbar puncture (LP) is indicated in all patients with symptoms suggestive of meningitis or encephalitis (e.g. nuchal rigidity, vomiting, photophobia, altered consciousness). Therefore, this child does not meet any criteria to suggest an LP is required. However, it is important to mention, in children <12 months, an LP is always indicated following an apparent febrile seizure, as this age group does not present with the classic signs or symptoms.

Further reading:

https://cks.nice.org.uk/topics/febrile-seizure/

Question:

A 71-year-old female with lung cancer presents to the emergency department complaining of worsening, severe back pain and urinary incontinence. She explains that the pain woke her up from her sleep last night and that she has not yet tried any pain relief medication. On further questioning, she comments that she has not been able to pass any urine for the last 12 hours and has experienced an episode of faecal incontinence.

Examination reveals localised spinal tenderness at the L3 level, as well as reduced anal tone. Motor examination shows bilateral lower limb weakness, and sensory examination demonstrates saddle anaesthesia.

Given the likely diagnosis, which is the most appropriate initial management?

A. Prednisolone

B. Sit the patient upright

C. Morphine

D. Bisphosphonates

E. Dexamethasone

Correct Answer:Dexamethasone

Explanation:

This patient is presenting with cauda equina syndrome caused by metastatic tumour compression. It is an oncological emergency, and the initial treatment is 16mg of dexamethasone. This corticosteroid works to limit the inflammation at the site of the cord compression and so improve the clinical outcome for the patient. However, dexamethasone is not the definitive treatment, and this patient should be urgently escalated for consideration of radiotherapy and decompressive surgery.

While prednisolone is also a corticosteroid, it is not the preferred drug for metastatic spinal cord compression (MSCC). The only other steroid used for treating spinal cord compression is methylprednisolone, which is mainly used for an acute, traumatic spinal cord injury rather than MSCC.

Patients with suspected MSCC must not be sat upright, instead, they should be nursed lying flat with a neutral spine. If the patient needs to be moved this should be done with a log rolling procedure.

Bisphosphonates are generally not used for patients with MSCC, although they may have some analgesic function in certain patient groups. NICE guidance suggests they may only be used for patients with MSCC and myeloma, breast cancer or prostate cancer.

Morphine may be used for pain relief in patients with MSCC, however, it will not treat the underlying pathology. Also, analgesia should be given according to the WHO analgesic ladder, and so it would be more appropriate to start with a less potent analgesic drug, such as codeine.

Further reading:

https://www.nice.org.uk/guidance/CG75/chapter/1-Guidance#treatment-of-spinal-metastases-and-mscc

Question:

A 35-year-old male has presented to the GP with his wife. She is concerned that he has been acting strange recently. He states he has been having really good ideas for new businesses and that his wife doesn’t understand. Upon asking he reveals he hasn’t been sleeping recently and that he has felt like he has a lot of energy. His wife reveals she got a call from the bank regarding re-mortgaging their house to invest in a business. His past medical history includes a mild depressive episode last year.

On examination, he is dressed appropriately but appears agitated with pressured speech. He states he has not had any hallucinations but that his wife and family have been disagreeing with his business ideas.

Which of the following is the most likely diagnosis?

A. Sub-clinical depression

B. Schizophrenia

C. Paranoid personality disorder

D. Bipolar disorder

E. Cyclothymia

Correct Answer:Bipolar disorder

Explanation:

The most likely diagnosis is bipolar disorder given the patient's current manic symptoms and history of depression.

Bipolar disorder is a chronic episodic illness associated with behavioural disturbances. It is characterised by episodes of both mania and depression. In the manic phase, patients typically exhibit symptoms such as grandiose ideas, pressure of speech, excessive energy, flight of ideas, overactivity and reckless behaviour with money. During these manic phases, patients lack insight, making the condition particularly dangerous. In the depressive phase, patients experience low mood, reduced energy, anhedonia and negative thoughts. They may also have reduced appetite, early morning wakening and loss of libido.

Diagnosis of bipolar disorder requires at least 2 episodes in which a person's mood and activity levels are significantly disturbed. At least one of these episodes has to involve mania or hypomania.

Cyclothymia is the occurrence of sub-threshold depression and mania, hence presents in a similar way but often without as much disturbance of function.

Schizophrenia typically presents with delusions, hallucinations, thought disorders and lack of insight. This clinical scenario does not mention the presence of hallucinations or thought disorders, making the diagnosis less likely than bipolar disorder.

Paranoid personality disorder would not develop in an acute fashion, as is the case in this scenario, as this is a life-long condition. Patients typically display distrust and suspicion about most things.

Sub-clinical depression is an unlikely diagnosis in this scenario, given the severity of the patient's manic symptoms and the absence of any symptoms of depression in this particular episode.

Further reading:

https://patient.info/doctor/bipolar-disorder-pro

Question:

A 50-year-old farmer presents to the GP with swollen testes. A few days ago he noticed them enlarging but now believes them to be too big. He has noticed no fevers or dysuria.

On examination, the right testis is a normal size but the left is swollen. The spermatic cord can be felt above the swelling but the swelling cannot be isolated from the testes. The lump transilluminates. Vital signs are normal.

What is the most likely diagnosis?

A. Indirect inguinal hernia

B. Hydrocele

C. Testicular cancer

D. Varicocele

E. Epididymal cyst

Correct Answer:Hydrocele

Explanation:

The most likely cause of this gentleman’s testicular swelling is a hydrocele.

Hydroceles occur due to the accumulation of fluid in the tunica vaginalis which surrounds the testes. A hydrocele typically presents as a non-tender, smooth cystic swelling of the testicle. The testis is usually palpable (however this may be difficult in a large hydrocele). On palpation, the swelling is unable to be isolated from the testis itself. The spermatic cord is usually palpable above the swelling. If a light source is placed against the swelling, it should transilluminate.

The investigation of choice is ultrasound. Treatment typically involves conservative measures, drainage or surgery to remove the tunica vaginalis for recurrent hydrocele.

In the case of an indirect inguinal hernia, you would not be able to palpate above the lump, due to the bowel originating from the abdomen. An indirect inguinal hernia would not usually transilluminate either.

Varicoceles are varicose veins within the scrotum. Patients often describe them feeling like "a bag of worms". There can also be associated aching in the scrotum.

Testicular cancer tends to present as a hard irregular testicular lump.

To diagnose scrotal masses, the questions you need to ask are:

1) Can you get above the lump?

2) Is it separate from the testes?

3) Can you transilluminate it (e.g. solid vs cystic)?

Further reading:

https://patient.info/doctor/hydrocele#nav-1

Question:

A 22-year-old woman makes an emergency telephone appointment with her general practitioner after having two episodes of haematemesis. The patient describes feeling nauseated and unwell, going to the bathroom and retching up a small volume of blood mixed with food. This happened again 10 minutes later. There has been no further vomiting since. The patient consumed a large volume of alcohol the night previously.

The patient has mild odynophagia but no dysphagia to solids or liquids. She describes no abdominal pain or distention, recent changes in bowel habits, or rectal bleeding. She does not think she is jaundiced. She feels well in herself apart from a mild headache that she attributes to a hangover. CAGE screening does not indicate ongoing problematic alcohol use.

Past medical history is unremarkable. The patient takes the combined oral contraceptive pill (COCP) once daily and nil other medications.

What is the most appropriate next step in management?

A. Calculate Glasgow-Blatchford score

B. Admit patient for urgent gastroscopy

C. Prescribe intravenous omeprazole infusion

D. Watch and wait approach with safety netting advice

E. Prescribe oral omeprazole 20 mg once daily

Correct Answer:Watch and wait approach with safety netting advice

Explanation:

This question describes a young patient with upper GI bleeding (UGIB). The causes of UGIB vary, but the most important question to ask in the first instance is "Does this patient seem systemically unwell?". The answer will allow you to decide if the patient can be managed in the community, electively as an outpatient, or acutely in hospital.

A history of alcohol use, retching, and small volume haematemesis in a young person is a typical presentation of Mallory-Weiss syndrome. This is a small mucosal tear that occurs at the gastro-oesophageal junction due to forceful retching or vomiting. The vast majority of tears undergo rapid haemostasis and require no further intervention. Bloody vomiting understandably alarms the patient. A watch and wait approach to intervention with safety netting advice (i.e if you experience further bloody vomiting and/or feel dizzy, fatigued or otherwise unwell, get back in touch) is appropriate. This is unlikely to be variceal bleeding (no history of alcoholic liver disease), Boerhaave syndrome (full-thickness oesophageal tears will cause rapid haemodynamic instability and critical illness), or peptic ulcer disease.

The Glasgow-Blatchford score is a useful risk stratification tool for patients with UGIB. It uses blood results (Hb, urea), routine observations and a patient's past medical history to identify those who need to be managed in higher-level care settings. Much of this information is unavailable and clinically speaking the patient is well.

Oral/intravenous proton pump inhibitors (e.g omeprazole) would help reduce gastric acid production in a patient with known peptic ulcer disease or gastro-oesophageal reflux disease (GORD). Intravenous PPIs require hospital admission which is not appropriate for this patient.

Urgent gastroscopy would be indicated for a patient with ongoing UGIB, e.g variceal bleeding or a ruptured peptic ulcer. This patient's UGIB is self-limiting and they appear systemically well.

Further reading:

https://geekymedics.com/a-lady-with-haematemesis/

Question:

Katherine, a 30-year-old woman, has presented to you with prolonged pregnancy. She passed her due date 14 days ago - aside from this her pregnancy has been unremarkable. She is becoming increasingly uncomfortable and is keen to discuss induction of labour.

A CTG is performed, showing a reassuring trace. Obstetric abdominal examination suggests a cephalic presentation.

Which is the most appropriate intervention to offer her first?

A. Intravenous oxytocin

B. Vaginal prostaglandins

C. Membrane sweep

D. Corticosteroids

E. Misoprostol

Correct Answer:Membrane sweep

Explanation:

Roughly 20% of pregnancies will require induction of labour. Women with uncomplicated pregnancies should be offered induction between 41-42 weeks to avoid the risks associated with prolonged pregnancy

The latest guidance recommends offering a vaginal examination for membrane sweeping prior to a formal induction of labour. Membrane sweeping involves placing a finger just inside the cervix and making a circular, sweeping movement to separate the membranes from the cervix. This also causes the release of prostaglandins to help stimulate labour.

Intravenous oxytocin is used in the active management of the third stage of labour and may be used to induce labour, however, vaginal prostaglandins have been found to be more effective.

Misoprostol is a prostaglandin analogue that should only be offered to women who have intrauterine foetal death.

NICE guidelines state that corticosteroids should not be used for induction of labour.

Further reading:

https://www.nice.org.uk/guidance/cg70/chapter/1-Guidance#induction-of-labour-in-specific-circumstances

Question:

A 27-year-old female presents to her GP with a three months history of fatigue and exertional dyspnoea. On examination, the conjunctiva appears pale, and the tongue appears swollen and inflamed. Both corners of the mouth appear red and cracked.

Blood tests are carried out with shows a B12 and folate deficiency. Intrinsic factor is below the normal limits. The GP prescribes oral cyanocobalamin and oral folic acid supplements.

What condition is this patient at risk of?

A. Friedrichs ataxia

B. Transverse myelitis

C. Subacute combined degeneration of the cord

D. Multiple sclerosis

E. Constipation

Correct Answer:Subacute combined degeneration of the cord

Explanation:

This case demonstrates anaemia, which is sometimes asymptomatic but can present with fatigue, dyspnoea, conjunctival pallor, glossitis and angular cheilitis. With a reduced intrinsic factor, this patient likely has pernicious anaemia. Therefore, oral cyanocobalamin (vitamin B12) is ineffective as it will not be absorbed. If vitamin B12 deficiency coexists with folate deficiency, vitamin B12 should be replaced first to prevent subacute combined degeneration of the spinal cord (SACD).

SACD is caused by vitamin B12 deficiency and typically presents with loss of vibration sense and proprioception in the limbs, with progression to total sensory loss, ataxia and distal muscle weakness.

Transverse myelitis is an inflammatory condition of the spinal cord, resulting in progressive sensory, motor and autonomic dysfunction. It is not associated with folic acid or vitamin B12 deficiency.

Multiple sclerosis is an acquired inflammatory condition resulting in demyelination, gliosis, and secondary neuronal damage throughout the central nervous system. It has a variable presentation, depending on the area of demyelination. Folic acid or vitamin B12 deficiency is not known to cause multiple sclerosis.

Friedrichs ataxia is a genetic, progressive, neurodegenerative movement disorder. It typically presents between 10-15 years old with limb or gait ataxia, bulbar palsy, oculomotor symptoms and other endocrine and cardiology conditions.

Constipation is not a side effect of oral folic acid or cyanocobalamin.

Further reading:

https://radiopaedia.org/articles/subacute-combined-degeneration-of-the-cord-1?lang=gb

Question:

A 30-year-old usually fit and well sales manager presents to primary care with a one-week history of anterior chest pain, worse on sudden movements and coughing. The pain does not radiate beyond the anterior chest, does not wake her from sleep and there are no features concerning for cardiopulmonary aetiology. Physiological observations are normal and chaperoned examination reveals marked point left parasternal tenderness at the level of the second rib. Cardiorespiratory and breast examinations are otherwise normal.

Which one of the following statements concerning Tietze’s syndrome is false?

A. Symptoms are worse during menses

B. The condition is idiopathic

C. Symptoms are usually unilateral

D. Symptoms are non-cyclical

E. Pain may be felt in the medial aspect of the breast

Correct Answer:Symptoms are worse during menses

Explanation:

Tietze syndrome is one of idiopathic costochondritis, most commonly unilateral and affecting the hyaline costal cartilage of one or more of the second, third or fourth ribs. It is rare, but a differential diagnosis to be considered in patients presenting with anterior mechanical chest wall pain or non-cyclical medial mastalgia. When examining female patients the breast should be displaced with one hand and the underlying thoracic wall palpated with the other; the costochondritis of Tietze syndrome is characterised by well-localised tender palpable swelling of the involved costal cartilage. Once sinister causes have been excluded by history, examination and investigations as necessary, treatment is supportive and involves reassurance and simple analgesia. Cases are self-limiting over a period of weeks to months, but there may be a role for local corticosteroid injections for refractory cases.

Further differentials for non-cyclical mastalgia include infection, trauma, post-traumatic fat necrosis and tumour. Differentials for mechanical chest wall tenderness include trauma, osteoporotic or malignant pathological fracture and neuralgic conditions such as herpes zoster (shingles). Causes of generalised, bilateral costochondritis exist, as seen in some seronegative spondylartharthropathies including ankylosing spondylitis.

Cyclical mastalgia is usually bilateral and, as the term suggests, is worse prior to menstruation and improves afterwards. There is no clear cause, but it is often associated with fibrocystic breast disease. Proposed risk factors include high dietary caffeine intake, low essential fatty acid intake and use of oestrogen-based hormonal replacement therapy, and management is generally supportive but medical treatment is available for refractory cases.

Source: Henry Vandyke Carter / Public domain

Further reading:

https://patient.info/doctor/costochondritis-and-tietzes-syndrome

Question:

A 65-year-old man presents to his GP with a 2-month history of constipation. He is usually fit and well, however, seven months earlier, he presented to the emergency department with pain in his left lower abdomen and bloody diarrhoea. He was managed non-operatively.

He is referred for a 2-week wait colonoscopy, which shows a narrowing in the sigmoid colon but no abnormal masses.

What is the most appropriate definitive treatment option?

A. Surgical resection and chemotherapy

B. Adhesiolysis

C. Stenting

D. Gastrograffin

E. Surgical resection

Correct Answer:Surgical resection

Explanation:

This patient has developed a stricture after an episode of diverticulitis seven months ago. According to NICE guidelines, elective surgical resection should be considered for patients who have recovered from complicated diverticulitis but have persisting symptoms due to a stricture or fistula.

Surgical resection and chemotherapy may be used to treat bowel cancer. As the colonoscopy showed a stricture with no abnormal masses, the most likely diagnosis is a stricture resulting from diverticulitis. This answer is, therefore, incorrect.

Adhesiolysis and gastrograffin are used to treat small bowel obstruction caused by adhesions. They are not used to treat strictures resulting from diverticulitis.

Stenting is usually used in colorectal cancer as a palliative treatment or as a bridging measure to surgery. It is not typically used for strictures caused by diverticulitis, and there is no indication in the question stem that the patient is unfit for surgery.

Further reading:

https://www.nice.org.uk/guidance/ng147/chapter/Recommendations#acute-diverticulitis

Question:

The on-call paediatric consultant is bleeped to see a baby brought to A&E by his mother, she is extremely distressed about symptoms he has developed. The baby was born at 33 weeks, and was given steroids due to prematurity, but fared very well, with no apparent breathing difficulties. After 2 days in the hospital, both baby and mother were able to be discharged home.

Over the past few days, the baby has been refusing bottle-feeds as usual and has been unusually lethargic. He has been vomiting for the past 12 hours, his mother describes this as 'brown', and denies any bilious matter being vomited. The baby has had loose stools, with some evidence of blood in the most recent, and looks extremely unwell. Examination reveals abdominal distension with taut skin overlying it, no masses are palpable.

The consultant orders an abdominal X-ray and starts broad-spectrum antibiotics; he tells the mother that her baby is more prone to a certain abdominal pathology due to the fact that he was born prematurely.

Given the likely diagnosis, which of the following is a recognised risk factor alongside prematurity?

A. Maternal diabetes

B. Macrosomia

C. Formula feeding

D. Male sex

E. Down's syndrome

Correct Answer:Formula feeding

Explanation:

Necrotising enterocolitis (NEC) is a severe inflammatory condition affecting the bowel in infants, most commonly those who were born prematurely. It most frequently presents with vomiting, diarrhoea, rectal bleeding, and abdominal distension, with tight shiny skin classically being seen on examination. The exact cause of the disease remains unexplained, however, there have been significant links made to formula feeding, and this is a documented risk factor.

The condition is usually diagnosed via abdominal X-ray, which will often demonstrate pneumatosis intestinalis (air within the intestinal wall). Gas within the portal venous system and visibly dilated intestinal loops are other commonly observed features. Management involves making the baby nil-by-mouth and providing parenteral nutrition; antibiotics are given to cover against infection. If this more conservative approach is unsuccessful, or necrotic areas of the bowel are identified, then surgical resection is often necessary.

Male sex is a risk factor for a number of paediatric conditions; pyloric stenosis is one such example, with a 5:1 male to female ratio. However, it is not a significant risk factor for NEC.

Maternal diabetes can lead to a number of issues in infancy, including an increased risk of cardiac defects, macrosomia (also not associated with NEC in its own right) and a greater chance of hypoglycaemia shortly after birth. However, it is not known to be associated with an increased risk of NEC.

Down's syndrome carries a greater risk of a baby developing duodenal atresia and also Hirschsprung's disease but is not associated with necrotising enterocolitis.

Further reading:

https://patient.info/doctor/necrotising-enterocolitis

Question:

You are a junior doctor working in the acute medical unit. You are asked to urgently review a 19-year-old female with a background of type 1 diabetes, which she has had since the age of 10 years old and manages with long-acting insulin.

The patient contacted her diabetes nurse practitioner earlier today as she was feeling unwell and was recording high blood sugars with her home checking kit. She currently looks unwell and is vomiting. Point of care testing shows the following:

Blood glucose: “Hi”

Ketones: 5.9 mmol / L

She is cannulated and a subsequent venous blood gas shows the following:

pH: 7.2

Bicarbonate: 4.7 mmol / L

Glucose: 43 mmol / L

She tells you she took 10 units of subcutaneous rapid-acting insulin before setting off for hospital around 35 minutes ago.

What is the most appropriate first step in treatment?

A. Administer 500 ml of 5% dextrose over 30 minutes

B. Administer 1 litre of 0.9% sodium chloride with potassium chloride added over 4 hours

C. Commence a variable rate insulin infusion

D. Commence a fixed rate insulin infusion

E. Administer 1 litre of 0.9% sodium chloride over 1 hour

Correct Answer:Administer 1 litre of 0.9% sodium chloride over 1 hour

Explanation:

Patients in diabetic ketoacidosis (DKA) need fluid urgently and this should be the first step here - 1 litre of 0.9% sodium chloride administered over 1 hour is an appropriate volume and rate to commence. Once this is underway the fixed-rate insulin infusion is needed. Caution is needed in pregnant women and older adults with significant co-morbidities such as heart or renal failure - senior/expert input is needed in these cases. Paediatric populations are at increased risk of cerebral oedema and again require specialist input.

5% dextrose has no role in DKA management. Variable-rate insulin infusions may be needed when the patient has 'resolved' and has normal pH, bicarbonate and ketones but has no place in acute management.

Sodium chloride with potassium will be needed but only later in the management process after the important first hour.

It is important to review and familiarise yourself with your local DKA protocol.

Further reading:

https://www.diabetes.org.uk/professionals/position-statements-reports/specialist-care-for-children-and-adults-and-complications/the-management-of-diabetic-ketoacidosis-in-adults

Question:

A 61-year-old gentleman is brought into his GP surgery by his wife for review. She remarks that he has been having increasing trouble with his language over the last 4-5 years. This initially started as minor difficulties with finding words such as ‘toaster’ or ‘television’ but now severely impacts his speech. He is still able to remember appointments and events but his wife complains that he has become inappropriate and withdrawn in relation to these. On direct questioning, he denies any significant problems.

What is the most likely underlying diagnosis?

A. Dementia with Lewy bodies

B. Vascular dementia

C. Alzheimer’s disease

D. Frontotemporal dementia

E. Delirium

Correct Answer:Frontotemporal dementia

Explanation:

The history described here is of progressive language difficulties and subsequent personality change. This is in keeping with a diagnosis of primary progressive aphasia, a variant of frontotemporal dementia (FTD). FTD is an uncommon but important cause of dementia and is seen relatively more commonly in younger patients.

Alzheimer’s disease tends to present slightly later in life and with memory impairment as a prominent feature.

Vascular dementia may mimic other causes but will typically go alongside a history of relevant risk factors and may show stepwise progression.

Dementia with Lewy bodies is associated with Parkinsonism, hallucinations and fluctuating cognition.

Delirium is an acute confusional state with a wide differential of its own.

Further reading:

https://patient.info/doctor/frontotemporal-dementia

Question:

A 75-year-old man presents to the GP with a 4-month history of vague abdominal pain, fatigue, and early satiety. During this time he has had unexplained weight loss. On examination, he is cachectic, there is conjunctival pallor, and massive splenomegaly is demonstrated on abdominal examination.

Investigations are performed:

Investigation Result Reference range

Haemoglobin 103 g/L (130 – 180 g/L)

Platelets 440 x109/L (140 – 400 x109/L)

White cell count 23.1 x109/L (3.6 – 11.0 x 109/L)

Neutrophils 15.3 x109/L (1.8 – 7.5 x 109/L)

Lymphocytes 2.3 x109/L (1.0 – 4.0 x 109/L)

Monocytes 1.0 x109/L (0.2 – 0.8 x 109/L)

Eosinophils 0.7 x109/L (0.1 – 0.4 x 109/L)

What is the most likely diagnosis?

A. Chronic myeloid leukaemia

B. Chronic lymphocytic leukaemia

C. Acute lymphoblastic leukaemia

D. Acute myeloid leukaemia

E. Hodgkin's lymphoma

Correct Answer:Chronic myeloid leukaemia

Explanation:

Chronic myeloid leukaemia is correct. This patient has signs and symptoms consistent with a haematological malignancy due to the presence of anaemia and unexplained weight loss, and the presence of splenomegaly supports this. The next step in the diagnosis is to determine which lineage of cells is affected (the myeloid or lymphoid cells). The investigations show that platelets, neutrophils, monocytes, and eosinophils are raised, which are all from the myeloid lineage of cells. The lymphocytes are normal. This suggests that this patient has a type of myeloid leukaemia. Blood film findings would ordinarily help differentiate between chronic myeloid leukaemia (which has band cells present) and acute myeloid leukaemia (which has Auer rods present), however, they are not given in this scenario. Chronic myeloid leukaemia can present with massive splenomegaly, which exerts a force on the surrounding organs leading to early satiety. As well as this, the time period over which his symptoms have occurred is less acute.

Acute lymphoblastic leukaemia is most commonly seen in children under 5 years of age. It presents with anaemia, neutropaenia, and thrombocytopenia, and may have splenomegaly. This patient does not have neutropenia or thrombocytopenia, nor is this diagnosis common in his age group.

Acute myeloid leukaemia is incorrect. Although this would also have an increased number of cells from the myeloid lineage and splenomegaly, patients with acute myeloid leukaemia have a more acute onset of symptoms along with neutropaenia and thrombocytopaenia, which are not seen.

In cases of chronic lymphocytic leukaemia, patients are often asymptomatic, and increased lymphocyte numbers are incidentally picked up. They may have associated anaemia, unexplained weight loss, and night sweats. This patient's lymphocytes are normal, indicating no problem with cells of the lymphoid lineage.

Patients with Hodgkin's lymphoma present with painless cervical and/or supraclavicular lymphadenopathy, which may be worsened when consuming alcohol. There is no mention of these features in the stem. Splenomegaly is not commonly seen unless in advanced disease.

Further reading:

https://geekymedics.com/chronic-myeloid-leukaemia/

Question:

James, a four-year-old boy with a 3-day history of diarrhoea is brought to see the GP by his mum. She has become concerned because the diarrhoea which had been profuse and watery has now also become bloody. The GP refers James to the hospital for an emergency paediatric assessment.

On examination, he is pyrexial at 38.1 degrees, tachycardic at a rate of 150 bpm and his capillary refill time is 3 seconds. Initial blood tests reveal the following:

Hb 102 g/L

Plt 98 x109/L

Urea 10.2mmol/L

Creatinine 110umol/L

Blood film: schistocytes present

What is the most likely causative pathogen?

A. C. Difficile

B. Campylobacter

C. MRSA

D. E. Coli

E. Shigella

Correct Answer:E. Coli

Explanation:

The most likely diagnosis is haemolytic uraemic syndrome (HUS). HUS is most commonly caused by E. Coli 0157 and typically presents with profuse watery diarrhoea which becomes bloody 1-3 days after onset. E.coli produces a verotoxin which causes endothelial damage in the microvasculature resulting in the classic triad of microangiopathic haemolytic anaemia, thrombocytopenia and acute kidney injury (uraemia). Blood tests would reflect the above and a peripheral blood smear would show fragmented red blood cells (i.e. schistocytes).

Shigella and campylobacter enteritis often present with bloody diarrhoea and can indeed cause HUS but E. Coli is the most common pathogen implicated.

C. Difficile rarely affects children, it usually affects the elderly and recent antibiotic use is the biggest risk factor for developing C. Difficile infection.

MRSA does not usually cause diarrhoea. It typically causes skin infections and is often acquired in hospitals by the immunocompromised.

Further reading:

https://patient.info/doctor/haemolytic-uraemic-syndrome-pro

Question:

A 28-year-old lady is referred to the one-stop breast clinic by her GP after the discovery of a small but firm breast lump, which she noticed in the shower two weeks ago. She has no systemic symptoms, but is very anxious about this as her maternal aunt had breast cancer, and her paternal grandmother died from ovarian cancer. She is a non-smoker and has no children. She has no past medical history and is on no regular medications. She is not on any hormonal contraception. USS shows a 4x3mm lump in keeping with a fibroadenoma, U2 grading.

What is the next most appropriate step?

A. Genetic testing

B. Wide local excision

C. Biopsy

D. Mammogram

E. Reassurance, self-examination education, no further follow-up

Correct Answer:Reassurance, self-examination education, no further follow-up

Explanation:

Fibroadenomas are common benign lumps often found in young women and pose no threat in terms of breast cancer. Large lumps may warrant surveillance, but lumps of 4x3mm are not of concern. U2 grading means there is a lesion which is benign (see below for grading explanation), and so reassurance with education is most appropriate. She is too young for a mammogram to give any useful data, as her breast tissue will be too dense, and although there is a lump on ultrasound, a biopsy is not required. Genetic testing is not indicated as she does not meet the criteria, and wide local excision would be inappropriate for this tiny benign lesion.

Ultrasound grading assesses the lesion to give an estimate of its likelihood of being benign or malignant:

U1 – no abnormality/normal tissue

U2 – benign lesion

U3 – lesion with indeterminate features

U4 – lesion with some features of malignancy

U5 – lesion with features of malignancy/ overtly malignant

Further reading:

https://patient.info/doctor/benign-breast-disease

Question:

A 70-year-old woman presents with a 3-month history of dull achy back pain. On further questioning, she has felt more tired and out of breath than usual and admits she has not opened her bowels in 3 days. She takes ramipril for hypertension and regular ibuprofen for back pain.

Observations reveal a temperature of 36.5°C and blood pressure of 150/110 mmHg.

Blood tests show:

Test (units) Result Reference

Haemoglobin (g/L) 80 115-165

Creatinine (μmol/ L) 105 (baseline 70) 45–84

Sodium (mmol/L) 135 133-146

Potassium (mmol/L) 5.2 3.5-5.3

Calcium (mmol/L) 2.9 2.2-2.6

What is the most appropriate initial management step?

A. Stop ibuprofen

B. Increase ramipril dose to 20mg

C. Add a calcium channel blocker to her current medications

D. Transfuse 1 unit red blood cells over 2 hours and re-check her full blood count

E. Advise fluid restriction

Correct Answer:Stop ibuprofen

Explanation:

This patient presents with “CRAB” symptoms of hyperCalcaemia, Renal impairment, Anaemia and Bony pain, pointing towards a diagnosis of multiple myeloma. More information on this condition can be found on the Geeky Medics multiple myeloma page. However, of acute concern, her creatinine level is diagnostic of stage 1 acute kidney injury (AKI), showing a 50% rise from baseline.

Stopping ibuprofen is the most important initial course of management here, along with discontinuing any other drugs that are nephrotoxic. The immediate complication to avoid is further deterioration of the patient’s renal function.

AKI is a major complication of myeloma and may lead to hindered cancer treatment, increased length of hospitalisation and worse overall prognosis. Myeloma classically creates a perfect storm for AKI, with a combination of nephrotoxic serum-free light chains building up in the kidneys, high calcium from the osteoclastic activity and often chronic use of non-steroidal anti-inflammatory drugs (NSAIDs) for pain relief.

Increasing the ramipril dose to 20mg risks worsening the AKI. Angiotensin-converting enzyme (ACE) inhibitors such as ramipril cause dilation of the efferent arterioles in the glomeruli, reducing hydrostatic pressures necessary for filtration and thus reducing renal function. Although the patient is hypertensive, ACE inhibitors should be stopped alongside NSAIDs. Subsequent discussions may be needed regarding medical control of her hypertension in the future. However, blood pressure is not the major immediate threat here.

Similarly, adding a calcium channel blocker focuses on hypertension management and whilst it may be a more appropriate option than ramipril here, it is still not the most important issue to address first.

Transfusing one unit of red blood cells is not appropriate. This patient is anaemic, which is one of the commonest presenting features in myeloma patients and may well necessitate blood transfusions down the line. However, transfusion is not usually considered an immediate priority unless there is active bleeding, the patient is unstable or the haemoglobin has fallen below 70 g/L.

Advising fluid restriction in a patient with AKI and hypercalcaemia risks a further decline in renal function. This is, therefore, an incorrect option. Instead, encouraging plentiful hydration and carefully monitoring renal function would be appropriate management steps.

Further reading:

https://geekymedics.com/acute-kidney-injury-aki/

Question:

Jamie Jackson is a 47-year-old man who presents to the GP with drooping of his upper eyelids. He complains that this worsens as the day goes on. He also reports a general feeling of weakness and sometimes experiences difficulty swallowing. On examination, the patient’s voice becomes less audible as you get him to count to 50 and on repetitive blinking, he continues to slow down.

Which of the following tests will provide a definitive diagnosis for the likely condition in this scenario?

A. Anti-Jo antibodies

B. Serum anti-acetylcholine receptor antibody testing

C. MRI head

D. Thyroid function tests

E. Electrophysiology studies

Correct Answer:Serum anti-acetylcholine receptor antibody testing

Explanation:

The history and clinical findings of easily fatiguable muscle groups suggest a diagnosis of myasthenia gravis. Myasthenia gravis is caused by autoantibodies to post-synaptic acetylcholine receptors, resulting in impaired neuromuscular junction transmission.

As a result, serum anti-acetylcholine receptor antibody testing is the investigation most likely to provide a definitive diagnosis.

Electrophysiology studies are used as a diagnostic test for Lambert-Eaton syndrome. Lambert-Eaton syndrome typically presents with weakness of the limbs and is caused by autoantibodies to the pre-synaptic membrane of the neuromuscular junction.

Anti-Jo antibodies are typically useful diagnosing dermatomyositis, a connective tissue disease characterised by inflammation of muscles

Thyroid function tests are an important test to carry out to rule out hypothyroidism but they are not the diagnostic test for myasthenia gravis in this scenario.

An MRI head will not show any abnormalities in the context of myasthenia gravis.

Further reading:

https://patient.info/doctor/myasthenia-gravis-pro

Question:

A 42-year-old patient, Mrs Jeanette Tweed, attends her General Practitioner complaining of a 1-week history of passing orange coloured urine. Mrs Tweed states that she initially thought that she was dehydrated, but recently she has noticed that her tears and sweat are orange coloured too. Mrs Tweed denies dysuria or abdominal pain.

On examination, Mrs Tweed looks anxious but well, the abdominal examination is unremarkable. Mrs Tweeds background includes a previous gastric ulcer, hypercholesterolaemia and a recent diagnosis of pulmonary tuberculosis (TB) which is being managed at the local TB specialist centre.

Her observations are as follows:

SpO2: 96% on air

HR: 75 bpm

RR: 16

BP: 118/70 mmHg

Temp: 36.8 oC

Which medication is most likely to be responsible for the patient's symptoms?

A. Ethambutol

B. Isoniazid

C. Pyrazinamide

D. Atorvastatin

E. Rifampicin

Correct Answer:Rifampicin

Explanation:

The correct answer is rifampicin, an antibiotic prescribed to treat tuberculosis (TB). This question tests your knowledge of the common side effects of tuberculosis medications.

TB is an infectious disease caused by mycobacterium tuberculosis. The treatment for active TB without central nervous system involvement includes:

2 months of Rifampicin, Isoniazid (with Pyridoxine), Pyrazinamide and Ethambutol

Followed by a further 4 months of Isoniazid (with Pyridoxine), and Rifampicin.

Patients are closely monitored by TB specialists and treatment regimes vary depending on response. Below is a list of the common side effects of TB medications:

Rifampicin - renal failure, liver toxicity, red-orange body secretions

Ethambutol - colour blindness, optic neuritis, pruritis, thrombocytopenia

Pyrazinamide - nausea, vomiting, arthralgia, hepatotoxicity

Isoniazid - peripheral neuropathy, hepatitis, psychosis

Atorvastatin is a medicine used for the treatment of hypercholesterolaemia, it would not cause body secretions to turn orange.

Further reading:

https://bnf.nice.org.uk/drug/rifampicin.html#cautions

Question:

A 39-year-old lady presents to the rheumatology clinic with pain and swelling affecting her knuckles. This affects both hands roughly symmetrically and has happened most mornings for the past 2 months, taking her around 45 minutes to ease the stiffness she experiences on waking. She has had no other symptoms apart from feeling generally tired over the same time.

Which of the following extra-articular manifestations is most commonly associated with her underlying condition?

A. Oesophageal dysmotility

B. Tophus formation

C. Heliotrope rash

D. Calcinosis

E. Interstitial lung disease

Correct Answer:Interstitial lung disease

Explanation:

In this young woman with asymmetrical inflammatory polyarthritis, the most likely diagnosis is rheumatoid arthritis. Interstitial lung disease is a recognised complication of both rheumatoid arthritis and also methotrexate use, a commonly used drug in the management of rheumatoid arthritis.

Tophi are associated with gout.

Calcinosis and oesophageal dysmotility are features of systemic sclerosis.

A heliotrope rash is classically associated with dermatomyositis.

Further reading:

https://patient.info/doctor/rheumatoid-arthritis-and-the-lung

Question:

A scientist develops a new breath test for the diagnosis of H. pylori. She wishes to determine the sensitivity of the test. She recruits 200 patients with suspected H. pylori infection and first uses the new breath test, before using the urea breath test (the gold standard non-invasive diagnostic test for H. pylori) to determine whether the patients have H. pylori. The results are shown below.

Urea breath test positive Urea breath test negative

New breath test positive 60 20

New breath test negative 40 80

What is the sensitivity of the new breath test?

A. 75%

B. 60%

C. 85%

D. 95%

E. 90%

Correct Answer:60%

Explanation:

The correct answer is 60%.

The sensitivity of a test is the proportion of individuals with the condition who will test positive, for example, a 60% sensitivity means that 60% of individuals with the condition will test positive.

Therefore, to calculate the sensitivity, you need to divide the number of individuals with the condition who test positive (60) by the total number of individuals with the condition (60 + 40 = 100). Finally, multiply by 100 to convert this decimal into a percentage.

This is summarised by the formula and table below:

Sensitivity = [a/(a+c)] x 100

Have the condition (according to the gold standard investigation) Do not have the condition (according to the gold standard investigation)

Test positive a b

Test negative c d

Further reading:

https://geekymedics.com/sensitivity-specificity-ppv-and-npv/#:~:text=Sensitivity%20is%20the%20percentage%20of,target%20disease%20will%20test%20negative

Question:

A 36-year-old pregnant lady presents to the Maternity Assessment Unit with lower abdominal pain and heavy bleeding. She is currently 9 weeks pregnant. The patient has a past medical history of antiphospholipid syndrome and has experienced 3 previous miscarriages.

On a speculum examination, the cervical os is open. No products of conception are present in the canal. Abdominal ultrasound reveals fetus in the uterine cavity, but the fetal heartbeat is absent.

What is the most likely diagnosis?

A. Threatened miscarriage

B. Placenta praevia

C. Complete miscarriage

D. Inevitable miscarriage

E. Incomplete miscarriage

Correct Answer:Inevitable miscarriage

Explanation:

The most likely diagnosis is an inevitable miscarriage given the history of abdominal cramping, vaginal bleeding in addition to the findings of an open cervical os and an absent fetal heartbeat.

An incomplete miscarriage is diagnosed when there is vaginal bleeding, lower abdominal pain and passage of some products of conception. On examination the cervical os is open and there are products of conception present in the canal.

A complete miscarriage is diagnosed if the products of conception have been passed. On examination the cervical os is closed and ultrasound reveals an empty uterine cavity.

A threatened miscarriage is diagnosed when there is some vaginal bleeding but the cervical os is closed and ultrasound reveals a viable intrauterine pregnancy.

Placenta praevia involves the whole or partial insertion of the placenta into the lower segment of the uterus. This condition typically presents with painless vaginal bleeding after 28 weeks gestation.

Further reading:

https://patient.info/doctor/miscarriage-pro

Question:

A 68-year-old male presents to his primary care doctor after seeing blood in his urine for 3 days. The patient denies dysuria or urinary urgency and does not have fevers or chills.

His past medical history is significant for hypertension. He was adopted so he is not aware of his family medical history. He has been prescribed antihypertensive medication but is not compliant with this and has no known allergies. He reports a 35-pack-year history of smoking.

Physical examination reveals a palpable mass in the right flank. Laboratory results reveal normal renal function.

What is the most appropriate initial investigation?

A. Abdominal magnetic resonance imaging (MRI)

B. Serum calcium levels

C. Serum renin levels

D. Lumbar spine radiograph

E. Abdominal computerised tomography (CT) scan

Correct Answer:Abdominal computerised tomography (CT) scan

Explanation:

This male patient presented with the classic triad of flank pain, haematuria and a palpable abdominal mass suggestive of renal cell carcinoma. Given his significant smoking history and hypertension (both risk factors for renal cell carcinoma), an abdominal CT scan (with contrast) should be organised urgently.

Lumbar spine radiograph is unlikely to lead to a diagnosis in this patient. Lumbar spine radiographs are useful in the investigation of bony pathologies such as vertebral osteoporosis and vertebral fractures.

Serum renin levels are likely to be elevated in this patient, but would not be appropriate as an initial investigation.

Abdominal MRI would be a suitable investigation if the patient had poor renal function or a contrast allergy.

Although this patient may have high calcium levels due to a paraneoplastic syndrome as a result of his RCC, it is not an appropriate first-line investigation in this clinical scenario. An abdominal CT scan is more likely to provide a diagnosis.

Further reading:

https://patient.info/doctor/renal-cancer

Question:

A 17-year-old male is admitted to the urology ward from A&E having presented with a right testicular lump. He is otherwise fit and well with no medical problems. His examination reveals a mass in the right testicle but no other abnormalities.

Which is the most appropriate tumour marker to measure relevant to the possible underlying diagnosis?

A. CA 19-9

B. Carcinoembryonic antigen (CEA)

C. CA 15-3

D. CA 27.29

E. Beta-human chorionic gonadotrophin (beta-hCG)

Correct Answer:Beta-human chorionic gonadotrophin (beta-hCG)

Explanation:

Beta-human chorionic gonadotrophin (beta-hCG) is produced physiologically by the placenta and is usually not present in males. Elevated beta-hCG levels in men may indicate malignancy and can be produced by both seminoma and non-seminomatous germ cell tumours (NSGCT). NSGCTs contain a group of cancers called choriocarcinomas and these may produce particularly high levels of beta-hCG. Alpha-fetoprotein and lactate dehydrogenase may also be raised in testicular malignancies.

Carcinoembryonic antigen is typically associated with colorectal cancer. CA 19-9 is associated with pancreatic cancer. CA 15-3 and CA 27.29 are both associated with breast cancer.

Further reading:

https://patient.info/doctor/testicular-cancer-pro

Question:

A 30-year-old man presents to the GP with a 3-day history of burning eye pain. He has noticed that the eye is red, it hurts to look at bright lights and he feels his vision is reduced in the affected eye.

He is referred to the nearby eye hospital emergency department where he is seen by the on-call ophthalmologist. On examination, the conjunctiva and eyelid of the left eye appear red and inflamed. On slit-lamp examination, the cornea is inflamed and small white punctate lesions are visible, with a single dendritic ulcer. The ophthalmologist applies fluorescein and the dendritic ulcer is seen. Corneal sensation is absent on the affected side.

The man has experienced a similar episode previously, but it resolved within a few days without medical attention. He has not experienced any recent eye trauma. He has a past medical history of ulcerative colitis, which is maintained with a regimen of systemic corticosteroids and azathioprine. He has recently had an increased frequency of flare-ups of his colitis symptoms with multiple hospital admissions.

What is the most likely diagnosis for his eye problem?

A. Herpes simplex keratitis

B. Bacterial keratitis

C. Conjunctivitis

D. Corneal abrasion

E. Uveitis

Correct Answer:Herpes simplex keratitis

Explanation:

The most likely diagnosis is herpes simplex keratitis. Classically HSV produces a ‘linear branching’ dendritic ulcer on the cornea visible on the application of fluorescein dye. Irritation of the cornea results in light sensitivity, blurred vision and redness. The condition is more common in immunocompromised patients with poor general health, particularly patients on immunosuppressive drugs such as steroids. It is typically only unilateral.

This is unlikely to be conjunctivitis. Although the conjunctiva appears inflamed, this is accompanied by further signs and symptoms that would not be apparent in conjunctivitis, such as ulceration of the cornea and reduced corneal sensitivity.

Bacterial keratitis is a less likely diagnosis than HSV keratitis. Bacterial keratitis will usually result in more prominent discharge, which may be purulent, and the corneal lesions that occur will have a different typical appearance of round, white-yellow infiltrates. It is also more likely to be linked to contact lens use.

This is unlikely to be a corneal abrasion. This generally occurs following injury to the surface of the eye, such as scratching the eye with a fingernail or getting grit in the eye, which results in a small scratch on the cornea. It tends to result in pain, watering and redness but the symptoms should usually resolve within 48 hours.

Uveitis can occur in ulcerative colitis patients and is an important differential for a painful red eye. However, on examination, you would expect involvement of the anterior chamber of the eye (presence of cells and flare) and a more typical appearance than that described above would be keratic precipitates (white irregular lesions) on the posterior cornea.

Further reading:

https://geekymedics.com/keratitis/

Question:

A 23-year-old lady presents to the emergency department with severe shortness of breath. She has been increasingly short of breath over the last day and now struggles to complete sentences. She has a past medical history of asthma.

Clinical examination reveals the following:

Respiratory rate of 35/min

SpO2 of 93% on room air

Heart rate is 140 bpm regular

Blood pressure 85/52 mmHg

Which feature in her history is most concerning?

A. Inability to complete sentences

B. Respiratory rate

C. Oxygen saturation

D. Systolic blood pressure

E. Heart rate

Correct Answer:Systolic blood pressure

Explanation:

This lady is having a life-threatening acute exacerbation of her asthma. The only life-threatening feature she has is hypotension (systolic blood pressure <90 mmHg), and therefore that is the most concerning.

Her other features are all suggestive of a severe exacerbation:

respiratory rate ≥ 25/min

oxygen saturations ≥ 92%

heart rate ≥ 110 bpm

inability to complete sentences in one breath

The severity of an asthma attack is defined by the most severe feature.

Further reading:

https://www.brit-thoracic.org.uk/quality-improvement/guidelines/asthma/

Question:

A 54-year-old female presents to her GP with tiredness and shortness of breath over the past 6 months. She denies any weight loss, fevers or night sweats. She has no significant past medical history and takes no regular medication. Clinical examination reveals no significant abnormalities and vital signs are normal.

Blood tests reveal the following:

Hb = 82g/L (115-160)

MCV = 114fL (76-96)

WCC = 7.3 x109/L (4.0-11.0)

Neutrophils = 4.1x109/L (1.5-8.0)

Platelets = 131 x109/L (150-400)

Ferritin = 198ng/L (12-150)

Iron = 87 micrograms/dL (50-170)

Total Iron Binding Capacity = 50micromol/L (45-66)

Vitamin B12 = 50 ng/L (160-900)

Folate = 5.9 microg/L (3-18)

Which of the following antibody tests would be most useful in confirming the likely diagnosis?

A. Tissue transglutaminase antibodies

B. Intrinsic factor antibodies

C. Mitochondrial antibodies

D. Double stranded DNA antibodies

E. Glutamic acid decarboxylase antibodies

Correct Answer:Intrinsic factor antibodies

Explanation:

The blood tests reveal this patient has a macrocytic anaemia, which would explain her fatigue and shortness of breath. Causes of macrocytic anaemia include B12 deficiency, folate deficiency and alcohol excess. The most likely cause in this patient is vitamin B12 deficiency, as the blood tests demonstrate a normal folate level and there is no history of alcohol excess.

One of the common causes of vitamin B12 deficiency is pernicious anaemia. Pernicious anaemia involves the autoimmune destruction of intrinsic factor, which is required for the absorption of vitamin B12. Parietal cell antibodies and intrinsic factor antibodies are both associated with pernicious anaemia.

Glutamic acid decarboxylase antibodies are associated with type 1 diabetes and late-onset diabetes

Tissue transglutaminase antibodies are associated with coeliac disease.

Mitochondrial antibodies are associated with primary biliary cholangitis.

Double-stranded DNA antibodies are associated with systemic lupus erythematosus.

Further reading:

https://patient.info/doctor/pernicious-anaemia-and-b12-deficiency#nav-4

Question:

A 55-year-old man presents to his GP with symptoms of involuntary shaking at rest and a few episodes of fainting after getting out of bed which started a few months ago. On further questioning, he mentions a few occasions where he’s been incontinent of urine. He has a past medical history of depression for which he was started on sertraline 50mg daily 6 months ago. He lives with his wife but offers that ‘things haven’t quite been the same recently due to problems he’s experiencing in the bedroom’.

Notable findings on examination include a resting tremor in his upper limbs, increased rigidity in all limbs and a slow gait when walking to his chair. In addition, his lying blood pressure (BP) is 138/90 mmHg and standing BP is 110/65 mmHg.

What is the most likely cause of this man’s parkinsonism?

A. Progressive supranuclear palsy

B. Drug-induced parkinsonism

C. Parkinson’s disease

D. Multiple system atrophy

E. Dementia with Lewy bodies

Correct Answer:Multiple system atrophy

Explanation:

The most likely diagnosis is multiple system atrophy (MSA). The history and examination provide findings of parkinsonian symptoms (resting tremor, rigidity and bradykinesia) and autonomic dysfunction (orthostatic hypotension, urinary incontinence and impotence). Marked autonomic dysfunction is a key feature of MSA and helps identify it from the other causes of parkinsonism.

Sertraline could be a cause of drug-induced parkinsonism and the time frame with which it was prescribed fits. It is not however as common a side effect as other drugs better known for inducing parkinsonism (e.g. antipsychotics) and the rest of the vignette is much more indicative of MSA.

Parkinson’s disease can also show signs of autonomic dysfunction but the degree to which these symptoms are so markedly increased in this case is what makes MSA more likely.

Progressive supranuclear palsy whilst a cause of parkinsonism will often present with eye signs (decreased vertical gaze) and impulsivity.

Dementia with Lewy bodies again is a cause of parkinsonism but is more likely to present with visual hallucinations and cognitive fluctuations.

Further reading:

https://patient.info/doctor/multiple-system-atrophy

Question:

A 28-year-old woman presents to the outpatient breast clinic with a 3-month history of a breast lump. On further questioning, this breast lump ‘moves around’ and is mildly uncomfortable, especially around her periods. She reports no nipple discharge and has no relevant past medical history. She denies any weight loss or fatigue.

On examination, there are no overlying skin abnormalities and the nipple is normal. The lump, measuring approximately 2.5cm x 1cm is freely mobile under the skin and is smooth. On more extensive palpation many smaller lumps can be felt and the breast has a general ‘lumpy feel’, making it difficult to differentiate between normal breast tissue and the lumps themselves. The same is true of the other breast.

Given this presentation, what is the most likely diagnosis?

A. Fibroadenoma

B. Ductal carcinoma in situ

C. Paget’s disease of the breast

D. Fibrocystic change of the breast

E. Ductal abscess

Correct Answer:Fibrocystic change of the breast

Explanation:

Patients with breast lumps can be referred for triple assessment at a breast clinic, which includes a clinical review (history/examination), imaging and biopsy. This patient likely has fibrocystic change of the breast, given the story of a ‘lumpy breast’ that becomes more uncomfortable around the time of her periods. Often these lumps can be of different sizes. Fibrocystic change of the breast is the most common benign breast disorder, usually affecting women aged 20-50 years old. The disease appears to be related to underlying hormonal changes, with the symptoms being greatest one week prior to menstruation. Typical examination findings include areas of nodularity or thickening, with poor differentiation from the surrounding normal breast tissue.

Ductal carcinoma in situ is a form of breast cancer that is normally identified as part of routine breast screening. It involves malignant proliferation of milk duct epithelial cells. It can present clinically as a palpable mass and nipple discharge. The clinical findings, lack of a family history of breast cancer and the absence of systemic symptoms make this diagnosis less likely.

Paget’s disease of the breast is a rare type of breast cancer that has the appearance of eczema, with skin changes involving the nipple of the breast. Nipple discharge and a burning sensation may also be present.

Fibroadenomas are benign tumours that are commonly found in young women, with a peak incidence of 20-24 years. They are the most common type of breast lesion. Fibroadenomas typically present as solitary, firm, non-tender, highly mobile palpable lumps and do not tend to change in during the course of the menstrual cycle. In this scenario, although this diagnosis is possible, the presence of multiple painful lumps that are difficult to distinguish from normal breast tissue are more likely to relate to fibrocystic change of the breast.

Ductal abscesses typically present with overlying erythema are very tender. There may also be fever, nipple discharge and general malaise associated with the abscess.

Further reading:

https://patient.info/doctor/benign-breast-disease

Question:

A 68-year-old woman presents with weakness, nausea and confusion. She is unable to give a coherent history. Her husband describes progressive lethargy and confusion of 48-hours duration. He also mentions she has complained of "painful and frequent urination" for approximately the last 4-days. Her past medical history is significant for hypertension and type 2 diabetes mellitus. Her current medications include lisinopril, amlodipine and indapamide.

On examination, her mucous membranes appear dry. Her vital signs are recorded as temperature 38.5°C, respiratory rate 24/min, pulse 106/min, blood pressure 105/68 mmHg and SpO2 99% on room air. A bedside catheter urinalysis is negative for ketones and blood and positive for nitrites, leukocytes and glucose. A brief neurological examination is normal, with no focal neurological deficits.

What is the most likely diagnosis?

A. Hyperosmolar hyperglycaemic state

B. Disseminated intravascular coagulation

C. Diabetes insipidus

D. Diabetic ketoacidosis

E. Stroke

Correct Answer:Hyperosmolar hyperglycaemic state

Explanation:

The most likely diagnosis in this patient is a hyperosmolar hyperglycaemic state (HHS) - a rare but potentially life-threatening condition that most commonly affects older people with type 2 diabetes (T2DM) in the context of infection. Highly suggestive clinical features of HHS include an acute cognitive impairment, weakness ± lethargy, clinical signs of infection and dehydration. The urinalysis in this patient has suggested the most likely source of infection is within the urinary tract (UTI); the presence of glucose and absence of ketones is also an important finding. This constellation of clinical findings is, therefore, most consistent with HHS.

Diabetic ketoacidosis (DKA) is a metabolic state characterised by the triad of hyperglycaemia, metabolic acidosis and ketonaemia/ketonuria; like HHS, it is a potentially life-threatening metabolic emergency. However, DKA is commonly seen in younger patients with type 1 diabetes mellitus (T1DM). Furthermore, DKA is often associated with diffuse abdominal pain and marked ketonuria.

It is essential to consider the possibility of cerebrovascular accidents (CVA), such as ischaemic stroke, in patients presenting with acute cognitive dysfunction and vascular risk factors such as T2DM and hypertension. In most cases of CVA, symptoms appear rapidly (within seconds to minutes) and are often associated with specific patterns of limb or facial weakness ± visual disturbance. The absence of focal neurological deficits and findings of pyrexia and dehydration make CVA a less likely diagnosis.

A rare but potential complication of HHS is disseminated intravascular coagulation (DIC). Patients with DIC typically present with generalised bleeding from unrelated sites, resulting in manifestations such as epistaxis, haematuria and petechiae. There is no evidence of this in this patient; therefore, this is an unlikely diagnosis.

Diabetes insipidus (DI) is a metabolic disorder characterised by an inability to concentrate urine; it typically results in the production of large quantities of dilute urine. Patients with diabetes insipidus would not have evidence of glycosuria on urine dipstick and usually report a long history of progressive polyuria and nocturia.

Further reading:

https://diabetes-resources-production.s3-eu-west-1.amazonaws.com/diabetes-storage/migration/pdf/JBDS-IP-HHS-Adults.pdf

Question:

An 82-year-old woman presents to her general practitioner with a 3-month history of visual disturbances, reporting diplopia when looking to the right.

Her past medical history is significant only for hypertension and lung cancer, for which she has been in remission for 2 years. The patient continues to smoke and reports 12 kg of unintentional weight loss over the last 2-months.

On examination, pupils are equal and reactive to light. An assessment of her eye movements reveals an isolated abduction deficit of the right eye.

Given this information, what is the most likely aetiology of the woman's symptoms?

A. Lateral medullary syndrome

B. Subarachnoid haemorrhage

C. Brain metastases

D. Posterior communicating artery aneurysm

E. Benign intracranial hypertension

Correct Answer:Brain metastases

Explanation:

The correct answer is brain metastases. This patient's isolated abduction deficit in her right eye is consistent with an abducens nerve palsy (CNVI), which may be the first sign of intracranial metastases in a patient with a history of cancer. This patient has a history of lung cancer and a recent 12 kg of unintentional weight loss over the last 2 months, a red flag for a recurrence of cancer. CN6 palsies, manifesting clinically as horizontal diplopia with an isolated abduction deficit, may be caused by brain metastases.

Benign intracranial hypertension may cause cranial nerve palsies, although this patient's history of unintentional weight loss and a history of lung cancer makes this a more likely diagnosis. Benign intracranial hypertension classically occurs in obese women of childbearing age and presents with headaches that are worst in the morning.

Posterior communicating artery aneurysms are classically associated with a third nerve palsy rather than a sixth nerve palsy. A posterior communicating artery aneurysm would be unlikely to present with an isolated sixth nerve palsy.

Subarachnoid haemorrhage may cause a sixth nerve palsy, though this patient has no other clinical features in keeping with a subarachnoid haemorrhage. Patients presenting with subarachnoid haemorrhage classically present with a severe thunderclap headache, focal neurology, and may have signs of meningeal irritation such as photophobia or neck stiffness.

Lateral medullary syndrome (Wallenberg syndrome) is caused by ischaemia of the lateral brainstem and would not present with an isolated sixth nerve palsy. Lateral medullary syndrome classically presents with dysphagia, nystagmus, nausea and vomiting, and Horner's syndrome.

Further reading:

https://geekymedics.com/the-abducens-nerve-vi/

Question:

A 68-year-old man presents to his GP with shortness of breath on exertion. He first noticed it three months ago and finds that he is now unable to walk to the shop opposite his house because of it. He also complains of feeling tired all the time and has noticed that his shoes feel tighter than usual. He denies any cough, chest pain or weight loss. He has been smoking five cigarettes a day for the last two years.

On examination, there are bibasal fine inspiratory crackles and bilateral pitting oedema up to the mid-shin.

What is the most likely diagnosis?

A. Lung cancer

B. Pulmonary embolism

C. Idiopathic pulmonary fibrosis

D. Heart failure

E. Pneumonia

Correct Answer:Heart failure

Explanation:

This patient is presenting with exertional dyspnoea and fatigue. Combined with the examination findings of fine inspiratory crackles at both lung bases and pitting oedema, this makes a diagnosis of heart failure most likely.

Although lung cancer may cause fatigue and exertional dyspnoea, it is less common than heart failure and would typically be associated with a cough and weight loss.

Although idiopathic pulmonary fibrosis would cause bibasal crackles, it would not explain the ankle swelling. Furthermore, a common feature of idiopathic pulmonary fibrosis is a dry cough, which this patient denies having.

Pneumonia typically causes coarse crackles, a productive cough and fever.

A pulmonary embolism typically presents with pleuritic chest pain along with shortness of breath. The lack of chest pain, long history and presence of pitting oedema make pulmonary embolism unlikely.

Further reading:

https://geekymedics.com/chronic-heart-failure-chf/

Question:

You are at the MDT for the breast surgery department and are discussing a 65-year-old patient with breast cancer. She was diagnosed with a 35mm focus of intermediate grade ductal carcinoma in situ (DCIS) in her right breast. She opted for a skin-sparing mastectomy, despite the cancer being amenable to wide local excision. Histology shows that there are clear margins and no evidence of spread to lymph nodes, and she is referred for chest wall radiotherapy to complete treatment. A further discussion of histology notes that her cancer is HER2 -ve, ER +ve and PR –ve.

Along with 5-year follow up with yearly mammograms, what else would be included in her long term management plan?

A. Adjuvant chemotherapy

B. Consideration for prophylactic contralateral mastectomy

C. Active monitoring of CA-125

D. 5-10 years of letrozole

E. 5-10 years of tamoxifen

Correct Answer:5-10 years of letrozole

Explanation:

Patients with DCIS who are oestrogen receptor (ER) status positive, you oestrogen blockade should be given for 5-10 years depending on patient preference. In a pre-menopausal woman, that would be tamoxifen, however in a post-menopausal woman that would be letrozole (an aromatase inhibitor).

There is no role for CA-125 monitoring in breast cancer, and chemotherapy is not required in this cancer with no lymphatic spread.

Prophylactic mastectomy can be considered if the patient is specifically asking about it, but there is no indication to offer this, as there are significant surgical risks, and little to be gained in terms of risk reduction.

Further reading:

https://www.nice.org.uk/guidance/ng101

Question:

A 50-year-old female attends the GP complaining of lethargy and stiffness in her shoulder and hips.

She has a past medical history of temporal arteritis, and the GP requests an ESR blood test, suspecting a diagnosis of polymyalgia rheumatica, given her past medical history. The blood test reveals an elevated ESR, and the GP has arranged an appointment to discuss management. She is currently not on any regular medications.

Her observations are stable. She has difficulty mobilising onto the examination couch and a limited range of mobility on examination of the shoulder girdle and hip joints. The joints do not appear red or swollen.

What is the most appropriate management option for this patient?

A. Simple analgesia and review in 1 week to assess further management

B. Prednisolone 25mg PO OD, reducing to 10mg PO OD over the next 4 weeks

C. Methylprednisolone 50mg PO OW for the next 3 weeks

D. Prednisolone 12.5mg PO OD, increasing to 25mg PO OD over the next 4 weeks

E. Methylprednisolone 100mg IM OW for the next 3 weeks

Correct Answer:Prednisolone 25mg PO OD, reducing to 10mg PO OD over the next 4 weeks

Explanation:

The most likely underlying cause of her shoulder pain is polymyalgia rheumatica (PMR). This is a condition in which there is inflammation around the neck and shoulder girdle which manifests typically as morning stiffness. It may be isolated, or it may be associated with temporal arteritis in which there is tenderness in the temporal region of the scalp that is typically exacerbated by a patient combing their hair. On examination, there is usually a limited range of movement in the shoulder girdle. ESR and CRP are typically raised. PMR will usually respond very well to a short course of corticosteroids (such as prednisolone), which will usually be started at a dose of 12.5-25mg once daily then gradually reduced to a smaller dose over 1-2 months. The most appropriate management is, therefore, prednisolone 25mg PO OD, reducing to 10mg PO OD over the next 4 weeks.

Methylprednisolone IM can be given second-line to prednisolone (e.g. if a patient is poorly compliant with oral medications). The IM dose is usually 120mg every 3 weeks for 3 months before the dose is gradually decreased.

Further reading:

https://patient.info/doctor/polymyalgia-rheumatica-pro

Question:

A 34-year-old man attends his general practice with a relapse of slimy diarrhoea five times a day, lethargy, and abdominal pain. This is the fourth relapse this year. He smokes socially, drinks only at weddings, and takes no dietary supplements. The patient states he used to go to the gym but doesn't anymore. He has recently started a job as a night baker.

The patient asks for advice on how to reduce the chances of relapses.

Given the most likely diagnosis, what is the most important advice to give to this man?

A. Smoking cessation

B. Increase exercise

C. Begin supplement use

D. Education on the risks of flour inhalation from his occupation

E. Completely avoid alcohol

Correct Answer:Smoking cessation

Explanation:

The history of a young man with increased, slimy bowel habits and abdominal pain suggests a diagnosis of Crohn's disease. Smoking cessation is correct as smoking is a significant risk factor for relapses in Crohn's disease, as well as increasing the risk of many other diseases. He should be given support to stop.

Beginning supplement use is incorrect as while patients with Crohn's can suffer from deficiencies due to impaired absorption (including vitamin D), this is not linked to relapses. There is no evidence given in the case to suggest that the patient has a deficiency, and investigations would be needed to diagnose this. However, as patients with Crohn's are more prone to deficiencies, it is an important consideration to bear in mind.

Completely avoiding alcohol is incorrect, as while alcohol has been shown to have negative effects on IBD symptoms, this patient drinks very rarely, so this is not the most important advice to give. His smoking is likely to be more regular than his drinking, as social events are more common than weddings. Furthermore, smoking has a greater link to relapse in Crohn's disease than alcohol.

Education on the risks of flour inhalation from his occupation is irrelevant as flour inhalation has been associated with respiratory symptoms (colloquially referred to as 'baker's lung') but not Crohn's disease. As his job is as a night baker, he would be exposed to flour inhalation, but this is not the cause of his relapse.

Although increasing exercise can help reduce the chance of relapse, smoking has the potential to cause a relapse. This is why we first advise smoking cessation. Smoking may be triggering relapses, therefore, advising to remove a potential trigger is more important advice than increasing something protective. Smoking has a more strongly established link with relapse in the scientific literature.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK436021/#:~:text=may%20exacerbate%20disease-,Avoid%20smoking,-Get%20mental%20health

Question:

A 10-year-old boy complains of a painful left eye. He notes the pain is worse on movement of the eye, and his vision is blurred.

On examination, he has swelling around his left eye, which is erythematous. He has reduced visual acuity of the left eye and a temperature of 38.1°C.

Based on the likely diagnosis, what is the imaging modality of choice?

A. MRI orbit, sinuses and brain

B. CT cerebral venogram

C. Cranial ultrasound

D. CT orbit, sinuses and brain

E. X-ray skull

Correct Answer:CT orbit, sinuses and brain

Explanation:

The most likely diagnosis is orbital cellulitis. Typical symptoms of orbital cellulitis include erythema and swelling around the eye, blurred vision, painful eye movements, change in colour vision and fever. CT orbit, sinuses and brain is the gold-standard imaging modality for suspected orbital cellulitis. Imaging is required to identify complications of orbital cellulitis (such as abscess formation or intracranial involvement) and to guide ongoing management. Imaging is indicated if clinical examination of the eye is not possible, if there are any red flag eye signs, or if there is a failure to improve (e.g. ongoing pyrexia) after 36-48 hours of intravenous antibiotics.

Red flag eye signs include:

Painful eye movements

Reduced visual acuity and/or visual fields

Proptosis (bulging or protruding eyeball)

Relevant afferent pupillary defect (RAPD)

Altered colour vision

An X-ray skull would not provide sufficient visualisation to diagnose orbital cellulitis.

MRI orbit, sinuses and brain is incorrect as it does not provide additional detail in this context over a CT. CT has much faster image acquisition and has adequate resolution to diagnose soft tissue infection and osteomyelitis.

CT cerebral venogram may be required to aid the diagnosis of cavernous sinus thrombosis.

Cranial ultrasounds are usually only performed in neonates and young infants. It can no longer be performed when the cranial bones have fused.

Further reading:

https://geekymedics.com/orbital-and-periorbital-cellulitis/

Question:

A 22-year-old male presents to the emergency department with severe scrotal pain. He explains that it came on suddenly earlier today and that he has also noticed that his right testicle has become very swollen.

His past medical history is significant for Klinefelter syndrome.

The patient denies any recent trauma to his scrotum, although he comments that he practices rugby on a weekly basis. He is regularly sexually active with a female partner and smokes around 15 cigarettes a day.

Examination reveals a tender, enlarged right testicle and an absent cremasteric reflex. Urgent surgical exploration is arranged, during which the surgeon notes the presence of a bell clapper deformity.

Which feature of the patient’s history is the strongest risk factor for the likely diagnosis?

A. Klinefelter syndrome

B. Smoking

C. Sexual activity

D. Combat sport

E. Bell clapper deformity

Correct Answer:Bell clapper deformity

Explanation:

This patient is presenting with testicular torsion, which occurs when one of the testicles rotates and causes twisting of its spermatic cord. The strongest risk factor for this presentation is a bell clapper deformity, where the spermatic cord has an inappropriately high attachment site to the tunica vaginalis, leaving it susceptible to rotation.

Klinefelter syndrome is a congenital disease caused by an extra X chromosome in males. It can lead to hypogonadism and is a weak risk factor for the development of testicular cancer. However, it is not a known risk factor for testicular torsion.

Combat sport such as rugby is associated with testicular torsion, where a severe trauma to the scrotum can precipitate twisting of the spermatic cord. However, combat sports only account for a small minority of testicular torsion cases in comparison to patients with a bell clapper deformity.

Sexual activity is not recognised as a risk factor for testicular torsion.

Smoking is not a known risk factor for developing testicular torsion, although it is a risk factor for other urological pathologies such as cancer, subfertility and erectile dysfunction.

Further reading:

https://geekymedics.com/testicular-torsion/

Question:

A 52-year-old woman presents to the GP, complaining of persistent fatigue. She is now struggling in her job as a maths teacher and feels exhausted by the end of the day. The patient explains that they have also experienced frequent urinary tract infections, and often gets pains in a number of her joints after a long day at work. She has stopped menstruating 3 months previously, and wonders if her symptoms are simply due to menopause; she denies any issues with her mood or sleep, and has no other past medical history of note. She reports drinking roughly 4 units of alcohol per week.

There are no abnormalities on examination; the patient has no evidence of pallor, rather she appears relatively tanned. Abdominal examination is unremarkable.

The GP informs the patient that menopause could account for a number of her symptoms, but orders a number of investigations to rule out other possibilities. FBC and U&E are both normal, however, LFT's demonstrate a mildly elevated ALP and ALT. A HBA1c measurement returns a result of 54, which the GP tells the patient is above the threshold for a diagnosis of diabetes mellitus. This comes as a great surprise to the patient, as she maintains a healthy diet and exercise routine.

The GP is not certain of the cause of the patient's wide array of symptoms and therefore arranges a hospital referral for a second opinion and further investigations.

Which of the following is the most likely to assist in the investigation of this patient's symptoms?

A. FSH levels

B. Faecal calprotectin

C. Oral glucose tolerance test

D. Iron studies

E. Liver ultrasound

Correct Answer:Iron studies

Explanation:

Hereditary haemochromatosis is a disorder of iron metabolism in which patients have issues with the excretion of the metal, leading to accumulation and deposition within organs. This can go unnoticed for many years; in women, it commonly presents post-menopause, as prior to this, iron is naturally removed from the body via menstruation.

Excessively high iron levels can damage a number of internal organs; the liver is frequently infected, with low-level hepatitis developing, with possible progression to cirrhosis. Pancreatic inflammation can result in secondary diabetes mellitus; this explains the abnormal HBA1c result in this patient. Other features can include:

Arthralgia

Pituitary gland dysfunction

Restrictive cardiomyopathy

Skin hyperpigmentation

Iron studies are a good first-line investigation for hereditary haemochromatosis; these will usually demonstrate a raised ferritin, which makes the diagnosis extremely likely, although the role of ferritin as an acute phase reactant must be taken into account. Genetic testing and liver biopsy are other possibilities, should diagnostic doubt remain.

Whilst liver involvement is common in hereditary haemochromatosis, an ultrasound is unlikely to be especially beneficial in this scenario; it will only reveal hepatitis (or possibly cirrhosis in later-stage disease), and will not help to determine the underlying cause; a biopsy would be necessary for this.

An oral glucose tolerance test is sometimes used to help to make a diagnosis of diabetes; especially in patients who are pregnant. In a patient with an abnormal HBA1c, it would simply confirm the existing result, and would not be beneficial in this scenario.

Excessively high FSH levels can be used to confirm whether a patient is likely to be post-menopausal; however, this is usually a clinical diagnosis, and menopause would not account for all of the symptoms experienced by the patient.

Faecal calprotectin may be raised in diseases such as Crohn's - there is no evidence of gastrointestinal involvement in this patient.

Further reading:

https://patient.info/doctor/hereditary-haemochromatosis

Question:

A 50-year-old man presents to the GP with joint pain in his knees and hands that has developed and gradually worsened over the last 2 months. He is finding it difficult to mobilise given the pain in his knee, and the pain in his fingers makes it difficult to hold items in his right hand. He reports that the joints feel stiff, particularly in the morning. He does not have any other symptoms and has no history of recent illnesses or infections. He does not report pain in any other joints.

On examination, there is considerable swelling of his knee and the inter-phalangeal joints of his right index finger and thumb. You also note the presence of large silver-white plaques on the elbows and knees, and there is pitting of the fingernails.

He was diagnosed with psoriasis 5 years ago when he attended the GP due to his nail and skin changes. He has no other past medical history and is only prescribed emollients for the psoriatic plaques. You determine that it most likely he has developed psoriatic arthritis.

What would be the most appropriate management option at this stage?

A. Long-term corticosteroids

B. Commence methotrexate with a bridging intra-articular steroid

C. Immediately start biological therapy

D. Provide pain relief in the form of NSAIDs and refer to secondary care

E. Encourage movement of joints and review in 1-month for progression

Correct Answer:Provide pain relief in the form of NSAIDs and refer to secondary care

Explanation:

The most appropriate management option in this patient would be to provide pain relief in the form of NSAIDs and refer to secondary care. NICE has recently issued guidelines on the management of psoriatic arthritis to guide patient care. In any patient who is suspected of having psoriatic arthritis, it is appropriate to refer the patient to rheumatology for further assessment and advice on planning care. In order to immediately address the joint pain that many patients present with it is also appropriate to offer pain relief, for which NSAIDs are typically recommended. This patient has no contraindications to NSAID therapy and hence this would be the most suitable pain relief to offer.

It would be inappropriate to immediately start biological therapy. Biological agents that can be effective in psoriatic arthritis include TNF-inhibitors (such as adalimumab, etanercept and infliximab). However, these would not be commenced as initial management, and would only be considered following referral to secondary care and an insufficient response to or unsuitability for NSAIDs, intra-articular steroid injections and disease-modifying anti-rheumatic drugs (DMARDs) such as methotrexate. Once a biological agent is supplied, it is important to assess the patient to determine if an adequate response has occurred, as it may be that an alternative biological agent may be more suitable.

Although it is useful to encourage movement of joints and exercises can help to reduce pain and strengthen muscles to support the joints, it would inappropriate to just encourage movement of joints and review in 1-month for progression. As the patient is in pain, pain relief needs to be offered, and a secondary care opinion is required to see if they are suitable for further treatment.

Long-term corticosteroids would only be used with caution by secondary care, if at all, due to their associations with increased osteoporotic risk and immune suppression. Local intra-articular steroid injections may be used as an adjunct therapy in appropriate patients.

It would also be inappropriate to commence methotrexate with a bridging intra-articular steroid. Methotrexate is a DMARD which may be helpful for the patient but would be prescribed following secondary care referral rather than in the GP setting.

Further reading:

https://patient.info/doctor/psoriatic-arthritis-pro#ref-3

Question:

A 65-year-old woman presents to her GP with a new skin lesion on her right upper arm, which she first noticed four months ago. She had a renal transplant two years ago and is taking immunosuppressants. She has no significant family history and does not drink alcohol. However, she has a 10-pack-year smoking history.

On examination, there is a flat pigmented lesion, 6 mm in diameter. It is symmetrical, however, it has irregular borders and contains two different colours.

Based on the likely diagnosis, what is this patient's most significant risk factor?

A. Renal transplant

B. Smoking

C. Immunosuppression

D. Being female

E. Location of the lesion

Correct Answer:Immunosuppression

Explanation:

This patient most likely has melanoma. The only risk factor for melanoma listed is her immunosuppression; a renal transplant itself does not increase the risk of melanoma. The commonest location of the lesion in melanoma in women is on the legs and in men on the trunk. Being female reduces the risk of melanoma, and polycystic ovary syndrome does not increase the risk of melanoma. Note that although smoking increases the risk of squamous cell carcinoma, it does not increase the risk of melanoma.

The risk factors for melanoma are listed below:

Fair skin, freckling, light hair, light-coloured eyes

Previous skin cancer or atypical naevi

Large number of moles

Family history of melanoma

Pale skin (Fitzpatrick type I and II)

Being male

Previous sunburn, outdoor occupation, sunbed use

Immunosuppression

Certain genetic conditions, e.g. xeroderma pigmentosum

Further reading:

https://geekymedics.com/malignant-melanoma-of-the-skin/

Question:

A 72-year-old male presents to his primary care doctor with a 5-month history of pain and stiffness in the shoulders and hips. The stiffness usually lasts for 1.5 hours each morning. He also reports 2 kilograms of weight loss and occasional mild fevers. He has no past medical history or surgical history.

Laboratory results are significant for an elevated erythrocyte sedimentation rate (ESR). Rheumatoid factor and antinuclear antibody levels are within normal limits.

What is the most appropriate initial treatment for this patient?

A. Hydroxychloroquine

B. Amitriptyline

C. Methotrexate

D. High dose corticosteroids

E. Low dose corticosteroids

Correct Answer:Low dose corticosteroids

Explanation:

The above patient has a history of proximal joint pain and stiffness with constitutional symptoms of weight loss and fever. This presentation is consistent with polymyalgia rheumatica (PMR). Treatment of PMR usually involves low dose corticosteroids, with rapid relief of symptoms noted in most patients within the first week of treatment.

High dose corticosteroids should be used cautiously in any patient given the side effect profile of this medication. Giant cell arteritis (GCA), which has an affiliation with PMR, is a clinical indication to commence a patient on high dose oral steroids. This patient does not have signs or symptoms of GCA (which include jaw claudication, scalp tenderness and monocular vision loss).

Methotrexate is a potent medication used in the treatment of many autoimmune diseases such as rheumatoid arthritis (RA). Although it can be used in some patients with PMR who are struggling with glucocorticoid-induced side effects, it is not considered the first-line treatment for PMR.

Hydroxychloroquine is a disease-modifying medication that is often used to treat patients with RA, however, it is not indicated in the management of PMR.

Amitriptyline is a tricyclic antidepressant that is often used in low doses to treat patients with fibromyalgia.

Further reading:

https://patient.info/doctor/polymyalgia-rheumatica-pro

Question:

A 68-year-old man is brought to the emergency department via ambulance following a witnessed seizure at home.

The patient is accompanied by his wife, who describes the seizure as a 2-minute episode where he "went stiff and then jerked aggressively on the floor".

The patient is unable to give a coherent history. His wife explains that he had "cold-like symptoms" for the past week but began to develop a headache, fever and confusion 48 hours ago.

His past medical history is significant for hypertension and type 2 diabetes mellitus. His current medications include lisinopril, amlodipine and metformin.

On examination, the patient appears unwell. His temperature is 39.1°C, pulse 105/min, BP 123/72mmHg, respiratory rate 16/min and SpO2 100% (on 15L NRB). Neurological examination reveals confusion as the patient is not oriented to person, place or time. Additional findings include nuchal rigidity and slurred speech.

What is the most likely diagnosis in this patient?

A. Subarachnoid haemorrhage

B. Migraine

C. Encephalitis

D. Meningitis

E. Ischaemic stroke

Correct Answer:Encephalitis

Explanation:

The most likely diagnosis in this patient is encephalitis - inflammation of the brain parenchyma associated with subsequent neurological dysfunction. Viruses are the leading cause of encephalitis; however, an aetiological agent is only identified in around 50% of cases. The presence of fever, altered mental status, focal neurological deficits and seizures are strongly suggestive of encephalitis. Furthermore, this patient has a recent history of "cold-like symptoms", suggesting a potential source of viral infection.

Whilst encephalitis may closely resemble meningitis, the presence of focal neurological deficits, altered mental status and tonic-clonic seizure is more commonly seen in encephalitis. In meningitis, the predominant symptoms are often headache, neck stiffness and fever. However, it is important to remember that the conditions can co-exist as meningoencephalitis or encephalomeningitis, depending on the predominant process.

Patients with migraine classically present with a pulsatile, unilateral headache lasting 4-72 hours. Migraine is also often associated with visual disturbances, photophobia, phonophobia and nausea ± vomiting. Whilst it is possible for migraines to cause neurological symptoms, the presence of systemic symptoms (e.g. fever), reduced level of consciousness and history of seizure should raise concerns for encephalitis.

Patients with subarachnoid haemorrhage (SAH) may present with a 'thunderclap headache' (sudden, severely painful headache), meningism, impaired consciousness, focal neurological deficits and seizure. Whilst SAH can't be ruled out until further investigation, this patient has a recent history of viral infection and fever, suggesting an infectious aetiology is more likely.

Patients with ischaemic stroke may present with sudden onset focal neurological deficits, altered mental status and headache. Whilst there are no specific clinical differentiating features, this patient has a recent history of viral infection and fever, suggesting an infectious aetiology is more likely.

Further reading:

https://patient.info/doctor/encephalitis-pro

Question:

You are an SHO working in Dermatology. A 30-year-old female patient is referred to clinic with shiny lesions located on her shins. She reports that these lesions have been present for the past year and have become progressively larger, changing in appearance from reddish-brown to yellow in colour. The patient mentions that her shin lesions do not usually cause her any pain, however, the lesion on her right shin has recently developed an ulcer that is painful. She reports that the ulcer appeared soon after injuring her right shin a few days prior to its onset. The patient reports no other problems with her health. On examination, you note bilateral pretibial lesions measuring around 4x4 inches with a yellow, waxy appearance, as well as an ulcer on the lower right shin with a red, indurated appearance.

What is the MOST LIKELY diagnosis?

A. Xanthoma

B. Pretibial myxoedema

C. Necrobiosis lipoidica

D. Sarcoidosis

E. Granuloma annulare

Correct Answer:Necrobiosis lipoidica

Explanation:

The most likely diagnosis is necrobiosis lipoidica. This condition can be defined as a disorder of cutaneous collagen degeneration, fat deposition and blood vessel wall thickening. The aetiology of necrobiosis lipoidica is still not clear. The disease typically occurs in young female adults. Clinical features for this condition include the progressive enlargement of skin lesions over a period of months to years. Skin lesions are often pretibial in location and have a reddish-brown appearance initially which later transforms into a yellow, waxy appearance. Ulcers often develop at the site of trauma (i.e. Koebner phenomenon) which can be tender.

Xanthomas usually present in individuals with a personal or family history of cardiovascular disease or hyperlipidaemia. They are deposits of lipid-rich substance that are yellow, flat and velvety in appearance and often present in the inner aspect of the eyes.

Granuloma annulare presents as individual, skin-coloured papules that coalesce to form plaques. The plaques are depressed centrally in relation to the edges. They appear on the dorsal surfaces of the feet and hands, as well as on the extensor aspects of the arms and legs.

Sarcoidosis is associated with several cutaneous manifestations including erythema nodosum (red, painful, pretibial lesions) and lupus pernio (violet lesions on the face).

Pretibial myxoedema is associated with Graves' disease.

Further reading:

https://www.dermnetnz.org/topics/necrobiosis-lipoidica/

Question:

A 29-year-old male presents to general practice. He reports a 4-month history of intermittent tingling in both hands and has also noticed that his hands feel 'thick'. He wasn't sure of his hands increasing in size until he noticed that his wedding ring no longer fit. In addition, his work shoes also no longer seem to fit correctly.

On examination, he has coarse facial features with a wide nose and widely spaced teeth. He has macroglossia and oily skin.

Which blood test is most likely to be helpful in establishing an underlying diagnosis?

A. Thyroid function tests

B. Insulin-like growth factor 1 (IGF-1) levels

C. Serum glucose

D. Serum calcium

E. Prolactin levels

Correct Answer:Insulin-like growth factor 1 (IGF-1) levels

Explanation:

The history and examination findings are consistent with acromegaly. Although his serum glucose and calcium are likely to be raised, these are non-specific findings. Insulin-like growth factor 1 (IGF-1) levels are the recommended screening biochemical test for acromegaly. If IGF-1 levels are found to be elevated, then further confirmatory testing should include an oral glucose tolerance test (which, in acromegaly, should show a lack of suppression of growth hormone during hyperglycaemia).

Thyroid function testing may be useful in assessing this patient but is not diagnostic in acromegaly. Prolactin levels may also be helpful in assessing someone with a confirmed pituitary lesion but are not helpful in diagnosing acromegaly.

Further reading:

https://patient.info/doctor/acromegaly-pro

Question:

A 57-year-old man presents to the A&E department with central chest pain radiating to his left arm. Based on his clinical presentation he is diagnosed with an acute myocardial infarction. His ECG is attached below.

Based on the ECG findings, which coronary artery is most likely to be occluded?

James Heilman, MD, CC BY-SA 4.0, via Wikimedia Commons

A. Right coronary artery

B. Left circumflex artery

C. Left anterior descending artery

D. Right marginal artery

E. Left coronary artery

Correct Answer:Right coronary artery

Explanation:

The ECG demonstrates ST elevation in the inferior leads (II, III and aVF) indicative of an inferior myocardial infarction (inferior STEMI). Other ECG changes present include the progressive development of Q waves in leads II, III and aVF, as well as reciprocal ST depression in aVL (again in keeping with a diagnosis of inferior STEMI).

The right coronary artery supplies blood to the inferior surface of the heart including the right atrium, sinoatrial/atrioventricular nodes, the posterior part of the interventricular septum and the left ventricle.

The left coronary artery supplies blood to the left side of the heart including the left atrium, left ventricle, interventricular septum and atrioventricular bundles.

The left circumflex artery supplies blood to the left and posterior surfaces of the heart including the left atrium and ventricle.

The left anterior descending artery supplies blood to the anterolateral surface of the heart including the right ventricle, left ventricle and anterior two-thirds of the interventricular septum

Further reading:

https://litfl.com/inferior-stemi-ecg-library/

Question:

An 18-month-old girl is brought to the GP by her mother, with a two-week history of a cough. The cough is intermittent and is typically worse at night and after feeding. Her mother is particularly worried about several episodes where the girl 'turned blue' and vomited after prolonged coughing. She is otherwise well apart from a coryzal illness 16 days ago. She has not received any immunisations.

What is the most likely causative organism?

A. Parainfluenza virus

B. Haemophilus influenzae type B

C. Staphylococcal pneumonia

D. Bordetella pertussis

E. Respiratory syncytial virus

Correct Answer:Bordetella pertussis

Explanation:

This case demonstrates whooping cough, or pertussis, caused by the Gram-negative bacterium Bordetella pertussis. It presents with a 2-3 day coryzal illness followed by a dry, hacking cough which is usually worse at night and after eating. Persistent coughing can lead to vomiting, cyanosis and apnoeas. A forceful inspiratory whoop may be present but is not always. A vaccine is available.

Parainfluenza virus is the common causative organism of croup, which presents with a barking cough and stridor. Viral upper respiratory tract symptoms commonly precede the cough. It is most common in children aged 6 months - 3 years old.

Respiratory syncytial virus is the common causative organism of bronchiolitis. It typically presents with a dry cough, dyspnoea and respiratory distress. It is most common in children aged 3-6 months old.

Haemophilus influenzae type B is the most common cause of epiglottitis. It is characterised by a sore throat, dysphagia, drooling of saliva and a fever. Children are commonly seen in the tripod position, leaning forward with their tongue out. This is a respiratory emergency and requires urgent senior support to manage the airway. It is now rare, thanks to the vaccination programme.

Staphylococcal pneumonia is a common cause of pneumonia in children. It typically presents with a cough and fever. Apnoeic and cyanotic episodes are uncommon.

Further reading:

https://patient.info/doctor/whooping-cough-pro

Question:

An 80-year-old female patient presents to her GP with a lump in her neck. She describes that the lump has been present for the past two months and has been getting progressively larger. The patient also reports difficulty swallowing that has developed over the last month – first with solid food and now with liquids. Whilst the patient is talking, laboured breathing is noticed. Examination reveals a hard, locally fixed thyroid nodule, cervical lymphadenopathy as well as right-sided ptosis, miosis and anhidrosis.

What is the most likely diagnosis?

A. Medullary thyroid malignancy

B. Anaplastic thyroid malignancy

C. Follicular thyroid malignancy

D. Papillary thyroid malignancy

E. Lymphoma

Correct Answer:Anaplastic thyroid malignancy

Explanation:

The most likely diagnosis is anaplastic thyroid malignancy. The most significant risk factors for anaplastic thyroid malignancy are old age and female gender.

Typical clinical features for this condition include signs of local invasion (dysphagia, stridor, Horner’s syndrome), a hard, locally fixed nodule that grows rapidly and aggressive blood, lymph node and pulmonary metastases. Histologically, anaplastic thyroid malignancy is associated with undifferentiated follicular cells. Management for this condition usually comprises of palliative measures including thyroidectomy, radiotherapy and tracheal decompression.

Papillary thyroid malignancy is less likely in this case. Along with follicular carcinoma, papillary thyroid cancer is the most common form of thyroid cancer. Risk factors for this condition include previous irradiation, age <40 years and female gender. Papillary carcinoma is usually slow-growing and associated with local lymphadenopathy. This condition originates from follicular cells and is associated with a Tg tumour marker. Psammoma bodies and nuclear inclusions are typical findings on histological investigation.

Follicular thyroid carcinoma is less likely as a diagnosis. Major risk factors for this condition include female gender and age 30-50 years. The most typical presentation for this condition is a solitary thyroid nodule. This condition originates from follicular cells and is associated with a Tg tumour marker. Histological investigation shows cells in solid masses with rudimentary acini which are very vascular.

Medullary thyroid carcinoma risk factors include a positive family history, age 30-40 years and MEN2 syndrome. This condition usually presents with an enlargement of one or both thyroid lobes. The disease originates from para-follicular C-cells and is associated with CEA and calcitonin markers.

Lymphoma involving the thyroid is rare and less likely in this case. It may present as a long-term side effect of Hashimoto's thyroiditis.

Further reading:

https://patient.info/doctor/thyroid-cancer-pro

Question:

An 82-year-old man is transferred to the cardiology ward of a district general hospital for rehabilitation, following a myocardial infarction for which he has undergone primary coronary intervention 2 days ago. During the evening medication round, he is found unresponsive by nursing staff, with a GCS of 3, and no palpable pulse. The resuscitation team is called, and chest compressions are started.

On arrival of the cardiac arrest team, an ECG is performed:

Image created by Karthik Sheka, M.D., CC BY-SA 2.5 via Wikimedia Commons

What is the most appropriate next step in the management of this patient?

A. IV adrenaline

B. IV adenosine

C. IV atropine

D. Direct current shock

E. IV amiodarone

Correct Answer:Direct current shock

Explanation:

This patient’s ECG demonstrates ventricular tachycardia, a wide complex tachycardia that is regular in rhythm. Ventricular tachycardia is one of the most common arrhythmias in the early period following myocardial infarction and a significant cause of post-infarction mortality. It is a ‘shockable’ cardiac arrest rhythm (as opposed to asystole or pulseless electrical activity) and is treated by delivery of a direct current shock of at least 150J, followed by the immediate resumption of chest compressions for 2 minutes without stopping for a rhythm or pulse check.

IV adrenaline can be given in the treatment of ventricular tachycardia, but should be given following the third shock (i.e. during the 3rd round of CPR), and must not delay the delivery of a DC shock.

IV atropine is used in the management of bradycardia, it has no role in the management of ventricular tachycardia.

IV amiodarone can be given in the treatment of ventricular tachycardia, but should be given following the third shock (i.e. during the 3rd round of CPR), and must not delay the delivery of a DC shock. Amiodarone can also be considered in stable patients with VT who have a palpable pulse and no adverse features (shock; chest pain; syncope; heart failure).

IV adenosine transiently blocks AV nodal conduction. It is used in the diagnosis and management of supraventricular arrhythmias such as supraventricular tachycardia (SVT).

It is important to note that the Resuscitation Council UK states ‘although drugs are still included among Advanced Life Support interventions, they are of secondary importance to high-quality uninterrupted chest compressions and early defibrillation.’

Further reading:

https://www.resus.org.uk/library/2015-resuscitation-guidelines/guidelines-adult-advanced-life-support

Question:

A 27-year-old woman presents with pain in several fingers, which has been intermittently present over the last few months. She describes the ends of some fingers becoming pale with no clear trigger, which is then followed by pain and change of colour to a dusky blue. Each time this problem resolves on its own, with the fingers turning from blue to a bright red colour, before finally returning to their normal colour. She is otherwise well with no past medical history. Clinical examination is unremarkable and vital signs are normal.

Which of the following is the most likely diagnosis?

A. Dermatomyositis

B. Sjögren's syndrome

C. Systemic sclerosis

D. Systemic lupus erythematosus (SLE)

E. Primary Raynaud's disease

Correct Answer:Primary Raynaud's disease

Explanation:

The most likely diagnosis is Primary Raynaud's disease, given the very classical description of the condition, which involves the following stages:

The initial pallor of the distal portion of one or more digits

Numbness or pain in the affected digits, accompanied by cyanosis

Hyperaemia phase where the digit becomes red and feels warm

The disease occurs due to paroxysmal vasospastic and subsequent vasodilatory actions of the peripheral arterioles in the hands and feet. Cold and emotional situations are known to trigger the condition. Primary Raynaud's disease most commonly occurs in females under the age of 30, with a family history of the disease. In primary Raynaud's disease, there are often no clinical signs between episodes and blood tests are usually also normal.

Systemic sclerosis is a multisystem autoimmune disease involving increased fibroblast activity that results in abnormal deposition of connective tissue. This ultimately results in damage to blood vessels and fibrosis in the gastrointestinal tract, heart, lungs, skin and other organs. Secondary Raynaud's phenomenon is a feature of systemic sclerosis and therefore could account for all of the patient's symptoms. However, this diagnosis is less likely than primary Raynaud's due to the absence of any other symptoms of systemic sclerosis (i.e. skin thickening).

Systemic lupus erythematosus (SLE) is an inflammatory multisystem autoimmune disease that can also cause secondary Raynaud's phenomenon. However, again, the absence of any other systemic symptoms and the patient's age/gender make a diagnosis of primary Raynaud's more likely.

Dermatomyositis is a connective tissue disease involving inflammation of muscle tissue and skin manifestations. Patients typically present with fever, arthralgia and weight loss. Clinical examination reveals proximal muscle weakness, heliotrope rash and Gottron's papules. Dermatomyositis can also present with secondary Raynaud's phenomenon, however, the absence of other features of the disease in this scenario makes the diagnosis less likely.

Sjögren's syndrome is an autoimmune disease that results in infiltration of the exocrine glands, ultimately causing dry eyes, dry mouth and enlargement of the parotid glands. Secondary Sjögren's syndrome can occur in rheumatoid arthritis, SLE and scleroderma. Sjögren's syndrome can also present with secondary Raynaud's phenomenon, however, the absence of other features of the disease in this scenario makes the diagnosis less likely.

Further reading:

https://patient.info/doctor/raynauds-phenomenon-pro

Question:

A 32-year-old pregnant lady at 22 weeks gestation presents to the emergency department due to severe left-sided flank pain for the last 3 hours. She states the pain comes and goes and she has some vomiting with each episode. The pain radiates from her left flank into her groin region. The patient denies fever, dysuria, haematuria or urinary urgency.

She has no past medical history and no family medical history. Her pregnancy has been progressing normally.

Physical examination demonstrates tenderness in the left flank and a uterus that is consistent with her gestational age. Her vital signs are shown below:

Temperature: 37.1 degrees Celsius

Blood pressure: 114/75 mmHg

Heart rate: 80 beats/minute

Respiratory rate: 15 breaths/minute

SpO2: 99% on room air

What is the most likely diagnosis in this patient?

A. Placenta praevia

B. Appendicitis

C. Cholecystitis

D. Placental abruption

E. Renal calculus

Correct Answer:Renal calculus

Explanation:

This pregnant lady has presented with colicky pain that radiates from her flank to her groin region alongside vomiting. The most likely diagnosis is a renal calculus. Haematuria may also be present. Pregnant women are particularly at risk for nephrolithiasis, therefore it is an important diagnosis to consider in these patients.

Appendicitis typically presents with central abdominal pain that localises over time to the right lower quadrant, anorexia and leucocytosis. It is unlikely to the cause of the above patient’s symptoms.

Cholecystitis classically presents in pregnant patients after the first trimester with right upper quadrant pain and often has other clinical findings such as anorexia and leucocytosis associated with it.

Placenta praevia usually presents with painless third trimester bleeding. A speculum or digital examination should be avoided in these patients as this is likely to worsen the bleeding.

Placental abruption is a life-threatening condition that is the most common cause of third trimester bleeding. Patients are likely to present with painful vaginal bleeding with midline uterine pain.

Further reading:

https://patient.info/doctor/urinary-tract-stones-urolithiasis

Question:

Aamiina is an 18-month-old girl born in the Somali, referred to a developmental clinic by the GP as she is not meeting her milestones. Aamiina is not yet walking and is only able to say two words.

The GP has also noted that Aamiina is small for her age, despite what mum reports as good oral intake. Mum reports regular wet and dirty nappies and mentions that the dirty nappies are very foul-smelling. There is nothing to suggest neglect in her appearance - she is clean and dressed appropriately, and interacting well with mum throughout the consultation.

There is nothing serious in her past medical history - a few chest infections requiring antibiotics, but no hospitalisations. She is not on any regular medications. Mum cannot think of anyone in the family who had developmental delay.

There were no concerns during pregnancy and she was born via an uncomplicated vaginal delivery. She passed meconium within 48 hours but did have prolonged jaundice which eventually resolved.

On examination, you notice that Aamiina is very skinny, and she is well below the 2nd centile on her growth charts for height, weight and head circumference. She is alert and active throughout the consultation and appears well hydrated.

Given the likely diagnosis, which of the following investigations would be most useful in confirming this?

A. Schedule of growing skills

B. CT head

C. Karyotyping

D. Sweat test

E. Capillary blood glucose

Correct Answer:Sweat test

Explanation:

Aamiina most likely has a diagnosis of cystic fibrosis (CF), causing severe malnutrition and subsequent global developmental delay.

There are a few hints here that point you towards a diagnosis of CF:

She has had several chest infections that needed antibiotics.

She was born outside of the UK, which leads us to the possibility of not having had newborn screening.

She had prolonged jaundice after birth.

She has foul-smelling stools, most likely steatorrhoea, which is typical of fat malabsorption.

Faltering growth

Other potential features could have included meconium ileus, diarrhoea and nasal polyps.

Of the options available, a sweat test would be the most useful investigation for confirming the diagnosis as it is 98% sensitive.

Karyotyping is a useful test to do in cases of developmental delay. However, it often takes quite a while to get results, and it is good to look for reversible causes of delay in the first instance. If her sweat test was negative, karyotyping would be sent off to look for an alternative cause.

Schedule of growing skills (SOGS) is useful in determining the developmental age of the child so that you can measure areas of delay. It would not be useful in identifying the underlying cause of the developmental delay.

Capillary blood glucose is not indicated, as there is nothing in the clinical history that suggests she has hypoglycaemia or hyperglycaemia.

A CT head is a possible investigation for developmental delay, however, it should not be done unless really necessary and it would certainly not be performed as a first-line investigation in a scenario such as this.

Further reading:

https://patient.info/doctor/cystic-fibrosis-pro#nav-3

Question:

A 70-year-old man presents to his GP with 4 months of progressive shortness of breath and syncopal episodes. He is currently being treated for hypertension, and had a metallic aortic valve replacement 13 years ago for severe aortic stenosis

Examination of his precordium reveals an ejection systolic murmur heard loudest in the second intercostal space at the right sternal edge. There is also an S2 metallic 'click', and an early diastolic murmur heard at the left sternal edge.

His blood pressure is 155/55 mmHg.

Which of the following is the most likely diagnosis?

A. Aortic regurgitation

B. Tricuspid regurgitation

C. Pulmonary stenosis

D. Pulmonary regurgitation

E. Aortic stenosis

Correct Answer:Aortic regurgitation

Explanation:

As a prosthetic aortic valve degenerates it may become incompetent (ie. regurgitate). Aortic regurgitation typically gives an early-diastolic decrescendo murmur which is loudest at the left sternal edge. Additionally, aortic regurgitation causes a 'collapsing pulse' with a wide pulse pressure (the difference between systolic and diastolic pressures). The pulse pressure in the question is 100 mmHg which is very wide.

An ejection systolic murmur is a normal finding in a patient with an aortic valve replacement since blood becomes turbulent as it passes across an artificial valve. It does not necessarily indicate aortic stenosis.

Pulmonary stenosis would yield an ejection systolic murmur loudest at the left sternal edge. Tricuspid regurgitation causes a pan-systolic murmur at the left sternal edge. Pulmonary regurgitation also gives an end-diastolic murmur, however, the wide pulse pressure and history of aortic valve replacement make aortic regurgitation more likely

Further reading:

https://patient.info/doctor/aortic-regurgitation-pro

Question:

A 26-year-old woman presents to her GP with a pigmented skin lesion on her left thigh. She first noticed the lesion three months ago, which has since become progressively larger in size. On examination, the lesion is flat and asymmetrical with irregular borders and contains brown, black and grey areas of colouration. It measures 11mm in diameter.

What investigation is most appropriate to confirm the diagnosis?

A. Excision biopsy

B. Punch biopsy

C. CT chest-abdomen-pelvis

D. Genetic analysis

E. Sentinel lymph node biopsy

Correct Answer:Excision biopsy

Explanation:

The most appropriate investigation to confirm the diagnosis is an excision biopsy. The clinical scenario describes the typical appearance of malignant melanoma (remember the ABCDE rule for assessing pigmented skin lesions: A – asymmetry; B – border (irregular); C – colour (the more heterogenous, the higher the suspicion of melanoma); D – diameter/size (>6mm is concerning); E – evolving characteristics including changes in shape, size and colour. Other concerning features to assess for include an oozing or crusting lesion and any associated changes in sensation (including itching). Suspicious pigmented lesions (i.e. those displaying three or more of the above characteristics) require an urgent 2-week wait referral to dermatology. If the lesion appears suspicious after dermoscopy, immediate excision and biopsy are indicated. It will then undergo histopathological assessment for staging, part of which involves calculating the Breslow thickness (the most important prognostic indicator and defined as the depth in mm from the granular cell layer to the deepest part of invasion); this can only be achieved by an excision biopsy which allows the lesion to be examined in its entirety.

Sentinel lymph node biopsy (or fine needle aspiration cytology) is not typically used for investigation of cutaneous lesions and would be considered only if there is clinical evidence of sentinel lymphadenopathy and when excisional biopsy has already confirmed the Breslow thickness is >1mm

A punch biopsy is unlikely to capture the entirety of the lesion (i.e. the complete tissue architecture), which is essential for the determination of the Breslow thickness and subsequent prognostication

A CT chest-abdomen-pelvis forms part of the initial staging assessment once a lesion has been assessed histologically and is usually offered to patients with confirmed stage IIC melanoma who have not had sentinel lymph node biopsy, and to patients with either stage II or suspected stage IV melanoma

Genetic analysis is often conducted for more advanced melanoma and assesses for BRAF mutations as these patients may then be eligible for BRAF inhibitor therapy, including vemurafenib +/- immunotherapy

Further reading:

https://www.nice.org.uk/guidance/ng14

Question:

A 52-year-old female presents to her GP with a 3-month history of a cough, shortness of breath and weight loss. She also complains of shooting pains and weakness in her left arm, drooping of her left eyelid and an abnormally small left pupil. She has a past medical history of hypertension and chronic obstructive pulmonary disease. She smokes 30 cigarettes a day and has done so for the past 30 years.

An urgent chest x-ray is requested, which reveals a coin-like lesion.

Based on the clinical features, where is the likely location of the lesion?

A. Left lung base

B. Left hilum

C. Left main bronchus

D. Left apex

E. Trachea

Correct Answer:Left apex

Explanation:

Based on the clinical features and chest x-ray findings, a lung malignancy is highly likely in this patient. This patient is also showing features of a Pancoast tumour - a tumour in the lung apex. These tumours can invade the brachial plexus, sympathetic trunk and subclavian vein. Pancoast tumours are known to cause:

Horner’s syndrome: ptosis (drooping of the upper eyelid), miosis (constricted pupil) and anhidrosis (absence of sweating of the face)

Pain in the shoulder that radiates into the arm and hand

Atrophy of the muscles of the upper limb

Oedema of the upper limb

Further reading:

https://geekymedics.com/lung-cancer/

Question:

A 48-year-old male presents with painless jaundice and weight loss. He is suspected to have pancreatic cancer.

Which blood test is most likely to be elevated?

A. CEA

B. BCR-ABL fusion gene

C. CA 19-9

D. AFP

E. PSA

Correct Answer:CA 19-9

Explanation:

The correct answer is CA 19-9. This is the most commonly elevated tumour marker in pancreatic cancer.

CEA is most specific for colorectal cancer.

AFP is most specific for hepatocellular carcinoma and germ cell tumours.

The BCR-ABL fusion gene is also known as the Philadelphia chromosome and is of use in haematological malignancies (CLL, ALL and AML).

PSA is most specific for prostate cancers.

Further reading:

https://patient.info/doctor/Tumour-Markers

Question:

A 67-year-old man presents to the emergency department with a 40-minute history of central chest pain. He describes the pain as a ‘heavy pressure’ on his chest, radiating to his left jaw. It started whilst sitting and watching TV at home. On further questioning, he has experienced two previous episodes like this over the last week whilst at rest; they each did not last longer than 15 minutes and he did not seek help.

On examination, he’s pale and sweaty. His observations are stable. An ECG demonstrates T wave inversion in the lateral leads. Serial troponins are taken, which show no significant increase.

What is the most likely diagnosis?

A. ST-elevation myocardial infarction

B. Unstable angina

C. Non-ST elevation myocardial infarction

D. Stable angina

E. Musculoskeletal chest pain

Correct Answer:Unstable angina

Explanation:

In this patient, the likely diagnosis is unstable angina. This is characterised by new-onset angina or the abrupt deterioration of stable angina, often at rest. With two previous episodes of cardiac chest pain over the last week, this makes unstable angina even more likely. Acute coronary syndrome includes unstable angina, non-ST elevation myocardial infarction (NSTEMI) and ST-elevation myocardial infarction (STEMI). These three conditions can be differentiated by:

Unstable angina: an ECG may demonstrate non-specific signs of ischaemia or may be normal. Troponin levels are not significantly raised.

NSTEMI: an ECG may demonstrate non-specific signs of ischaemia or may be normal. Troponin levels are raised.

STEMI: an ECG will demonstrate ST elevation or new-onset left bundle branch block. Troponin levels are raised.

Stable angina classically presents with chest pain/discomfort on exertion, relieved by rest or glycerol trinitrate (GTN) spray.

Musculoskeletal chest pain would not commonly present at rest and is associated with a history of trauma or injury. In addition, an ECG would not demonstrate ischaemic changes.

Further reading:

https://patient.info/doctor/acute-coronary-syndrome-pro

Question:

A 40-year-old Polish gentleman attends his GP with lethargy. He reports that he has felt increasingly tired over the past 3 months. The patient also mentions associated unintentional weight loss of around 1 stone, right upper quadrant pain, abdominal distension, and yellowing of his skin. The GP reviews his electronic patient record and discover that the patient was diagnosed with hepatitis B 6 months previously. On examination, the GP notes the following: right hypochondrial tenderness, hepatomegaly, ascites, jaundice and palmar erythema. Hepatitis serology later highlights the presence of two types of hepatitis.

Which two types of hepatitis has the patient likely contracted?

A. Hepatitis B and E

B. Hepatitis D and A

C. Hepatitis B and A

D. Hepatitis B and C

E. Hepatitis B and D

Correct Answer:Hepatitis B and D

Explanation:

The patient has likely contracted Hepatitis D (HDV) on the background of a Hepatitis B (HBV) infection. HDV is unique in that it requires the presence of HBV to replicate. HDV may occur in 2 ways associated with HBV: i) at the same time as HBV (co-infection), or ii) after infection by HBV (super-infection). Around 20 million individuals infected with HBV globally are also infected with HDV. Hepatitis D is associated with the development of chronic hepatitis (which the patient has likely developed) and rarely presents acutely. HDV is more common in certain areas of the globe, including Eastern Europe, the Middle East, Africa, and South America.

Hepatitis A may indeed occur in conjunction with Hepatitis B but is less likely in this case. Hepatitis A does not require the presence of HBV to replicate. Hepatitis A usually occurs in outbreaks, is commonly transmitted in food or water, and is common amongst travellers.

Hepatitis C may indeed occur in conjunction with Hepatitis B but is less likely in this case. Hepatitis C does not require the presence of HBV to replicate. Hepatitis C is more common in the following groups: IV drug users, after blood transfusion, after unprotected sexual intercourse and many more.

Hepatitis E may indeed occur in conjunction with Hepatitis B but is less likely in this case. Hepatitis E does not require the presence of HBV to replicate. Hepatitis E is more common in countries with contaminated water supplies (Indian subcontinent, Central and Southeast Asia).

Further reading:

https://patient.info/doctor/viral-hepatitis-particularly-d-and-e#nav-8

Question:

A 65-year-old man presents to his GP with a 3-month history of progressive, dull and constant upper-right quadrant pain. He denies any weight loss or lethargy. His past medical history includes asthma and osteoarthritis. He began drinking alcohol two years ago after the death of his wife, and now drinks 60 units per week. He denies recent foreign travel.

Ultrasound reveals three solid liver lesions 0.5-3 cm in diameter with irregular borders. The hepatic tissue has a normal texture and no surface nodularity.

What is the most likely diagnosis?

A. Colon cancer

B. Adult-dominant polycystic kidney disease

C. Hepatocellular carcinoma

D. Entamoeba histolytica

E. Hepatic adenoma

Correct Answer:Colon cancer

Explanation:

The most likely explanation for this man’s findings is a non-hepatic metastatic malignancy. The multiple solid lesions found in this man’s liver are consistent with malignancy and more than 90% of malignancies found in the liver are secondary metastases. As the liver filters a large amount of blood, it is a frequent site of metastases for most cancers, but ~50% of these arise from a gastrointestinal source, with colon cancer being the most common.

This man is unlikely to have hepatocellular carcinoma (HCC). Greater than 90% of HCCs develop in cirrhotic livers, and the ultrasound, which is a sensitive detector of cirrhosis, has found normal tissue and no surface nodularity. Although his heavy alcohol use could have caused cirrhosis over the past two years, it would be unusual for HCC to develop so quickly (typically it takes decades to develop). HCCs often present as single lesions, and the presence of multiple lesions is also more consistent with metastatic disease.

Hepatic adenomas are typically solitary with smooth well-defined borders.

Polycystic kidney disease can result in multiple liver lesions, but they are usually fluid-filled, and this disease is less common than colon cancer.

Entamoeba histolytica can present with liver cysts, but these would similarly be identified as fluid-filled on ultrasound, and this disease is unlikely in the absence of foreign travel, as it usually presents within 1 year of infection.

Further reading:

https://patient.info/doctor/secondary-liver-cancer

Question:

A 40-year-old man presents to A&E due to progressive breathlessness over the preceding 4 days. The breathlessness occurs on mild exertion and when lying flat. He has also experienced chest pain and 3 episodes of palpitations.

He has a past medical history of ulcerative colitis and previously underwent a panproctocolectomy for a severe flare-up. He has no history of cardiac or respiratory disease.

On examination of the chest, there is an audible S3 gallop and friction rub audible. He is tachycardic with a heart rate of 125bpm, but otherwise, his observations are stable and he is apyrexial.

Initial investigations are ordered, including an ECG, chest X-ray, blood tests and an echocardiogram.

What are the most likely investigation findings in this patient?

A. Sinus tachycardia and ST elevation on ECG, elevated troponin, bacterial growth on the aortic valve

B. Sinus tachycardia and ST depression on ECG, mildly elevated creatinine kinase and troponin, motion abnormalities on echocardiogram

C. Widened mediastinum on chest X-ray, normal troponin and raised creatinine kinase, sinus tachycardia on ECG

D. Ventricular arrhythmia on ECG, normal creatinine kinase and raised troponin, valve motion abnormalities on echocardiogram

E. Ventricular arrhythmia on ECG, raised CK and normal troponin, normal echocardiogram

Correct Answer:Sinus tachycardia and ST depression on ECG, mildly elevated creatinine kinase and troponin, motion abnormalities on echocardiogram

Explanation:

The patient's history and clinical findings are strongly suggestive of a diagnosis of myocarditis.

Typical clinical findings in myocarditis include:

Exertional/positional dyspnoea

Chest pain

History of other autoimmune disorders (e.g. ulcerative colitis)

S3 gallop rhythm

Pericardial friction rub

Typical investigation findings in myocarditis include:

ECG: sinus tachycardia, non-specific ST-segment/T-wave abnormalities

Creatinine kinase: mildly elevated

Troponin: often mildly elevated

Echocardiogram: left ventricle motion abnormalities (in some cases left ventricular dilatation can also occur and is typically associated with worsened cardiac function and patient instability)

Chest X-ray: pulmonary infiltrates

Bacterial growth on the aortic valve would be suggestive of endocarditis rather than myocarditis.

A widened mediastinum is most commonly associated with aortic aneurysm/dissection.

Further reading:

https://patient.info/doctor/myocarditis-pro

Question:

A 23-year-old woman presents to A&E with severe sharp abdominal pain in her right lower quadrant which began four hours ago. She reports that the pain is exacerbated by movement and associated with dizziness at times. Her bowels have been regular recently and she denies any urinary symptoms.

She has no significant past medical history and has been with the same sexual partner for the last 3 years. Her last menstrual period was six weeks ago.

Vital signs reveal: blood pressure 90/50mmHg, pulse 105bpm, temperature 36.5, RR 18, SPO2 98% on air.

On abdominal examination, there is tenderness in the right lower quadrant. Bowel sounds are present on auscultation.

What is the most likely diagnosis?

A. Appendicitis

B. Ovarian torsion

C. Kidney stone

D. Ectopic pregnancy

E. Irritable bowel syndrome

Correct Answer:Ectopic pregnancy

Explanation:

The most likely diagnosis is ectopic pregnancy given the patient’s symptoms of lower abdominal/pelvic pain, a missed period and dizziness in the absence of any gastrointestinal or urinary symptoms. The clinical findings also support this diagnosis and suggest the need for urgent intervention given her haemodynamic instability.

A diagnosis of ectopic pregnancy should always be considered in females of childbearing age presenting with abdominal pain. A urinary pregnancy test should be performed to exclude the diagnosis as soon as possible.

Appendicitis typically presents with central abdominal pain that migrates to the right lower quadrant over a period of hours to days. There is also often a change in bowel habit and the patient may complain of nausea and vomiting.

Ovarian torsion is a less common cause of acute lower abdominal pain in women and would not account for the missed period.

Kidney stones typically present with colicky flank pain with urinary symptoms such as haematuria, dysuria, frequency and urgency. Patients are usually unable to sit still and move around frequently (opposed to a patient with peritonitis, who usually prefers to lie still).

Irritable bowel syndrome is unlikely in this scenario given the absence of any change in bowel habit and the localised severe abdominal pain.

Further reading:

https://geekymedics.com/ectopic-pregnancy/

Question:

A 35-year-old male patient on a respiratory ward is found collapsed by his bed. He was admitted this morning for treatment of community-acquired pneumonia. The nurse tells you that she has recently administered his IV amoxicillin.

This patient’s observations are as follows: respiratory rate 35, oxygen saturations 79% on air, heart rate 130 bpm, blood pressure 85/50 mmHg, temperature 37.0⁰C. On examination, the patient has a widespread urticarial rash and there is a loud, high-pitched wheeze on inspiration. You check the patient’s drug chart and note a penicillin allergy.

Which of the following options is the most appropriate initial management option?

A. 1g adrenaline IV + 10mg chlorphenamine IV + 150mg hydrocortisone IV

B. 1g adrenaline IM + 10mg chlorphenamine IV + 150mg hydrocortisone IV

C. 500 micrograms adrenaline IV + 10mg chlorphenamine IV + 200mg hydrocortisone IV

D. 500 micrograms adrenaline IM + 5mg chlorphenamine IV + 150mg hydrocortisone IV

E. 500 micrograms adrenaline IM

Correct Answer:500 micrograms adrenaline IM

Explanation:

This patient has clinical features of anaphylaxis (e.g. urticaria, wheeze, hypotension, tachycardia, hypoxia) and has recently received a medication they are known to be allergic too.

Emergency management of anaphylaxis requires the administration of the following medication:

500 micrograms adrenaline IM

Intramuscular adrenaline is preferred over intravenous adrenaline due to ease of administration and a reduced risk of harmful side effects.

In previous guidelines, adrenaline IM, steroids and also antihistamines are given in the treatment of initial resuscitation of anaphylaxis. However, in the latest Resus Council guidelines, IM adrenaline is the sole treatment, with the addition of IV fluid bolus as needed. Nebulised adrenaline can also be given for patients with stridor.

In anaphylaxis, antihistamines are not routinely given, but sometimes given after initial resuscitation in patients with persisting urticaria and/or angio-oedema. Corticosteroids are also given after initial resuscitation for refractory reactions or ongoing asthma or shock, and not as routine during the initial treatment for anaphylaxis.

Further reading:

https://www.resus.org.uk/library/additional-guidance/guidance-anaphylaxis/emergency-treatment

Question:

A 21-year-old male presents to his GP with a 2-week history of a rash (shown below). He said that this rash was preceded by a small red area of redness on his back. He reports mild pruritis over the lesions but no tenderness and he has no other symptoms. He is otherwise fit and well and takes no regular medications.

What is the most likely diagnosis?

Source: Public Domain

A. Guttate psoriasis

B. Acanthosis nigricans

C. Pityriasis versicolor

D. Pityriasis rosea

E. Erythema multiforme

Correct Answer:Pityriasis rosea

Explanation:

Pityriasis rosea is a viral skin rash most commonly seen in children and young adults. It causes oval-shaped, scaly papules that are often described as a salmon coloured. They commonly occur on the limbs and trunks and are often pruritic. Typically, a small scaly plaque appears a few days to weeks before the onset of the main rash and is termed a ‘herald patch’. It is a mild, self-limiting condition that doesn’t cause systemic upset and only symptomatic treatment to relieve the itch is usually required to manage these cases. The appearance of the lesions and the preceding ‘herald patch’ makes this the most likely diagnosis.

Pityriasis versicolor is a fungal skin infection that causes hyperpigmented or hypopigmented skin macules and patches.

Guttate psoriasis typically occurs after a streptococcal throat infection and causes scaly papules most commonly on the trunk.

Acanthosis nigricans is a dark, velvety rash in the skin creases and can occur secondary to some carcinomas, endocrine conditions and obesity.

Erythema multiforme is a hypersensitivity skin reaction that characteristically causes ‘target lesions’ which consist of a central dusky or dark red area with a peripheral pink ring. It is most commonly associated with herpes simplex virus.

Further reading:

https://www.dermnetnz.org/topics/pityriasis-rosea

Question:

A 27-year-old woman presents with sudden onset chest pain and shortness of breath. She is 30 weeks pregnant, with an uneventful midwife-led pregnancy. Her heart rate is 116 beats per minute, her blood pressure 95/62 mmHg, respiratory rate 28 breaths per minute with pulse oximetry of 95% in room air, she is apyrexial. On examination she looks unwell, her heart sounds are normal, the chest is clear and her abdomen is distended in keeping with known pregnancy. Her calves are soft with a small amount of bilateral ankle oedema.

Her chest x-ray is normal, she is treated with low molecular weight heparin for presumed pulmonary embolism. A subsequent computed tomography pulmonary angiogram confirms large bilateral pulmonary emboli.

She complains of increased shortness of breath to the nursing staff and prior to review by the medical team goes into cardiac arrest. Chest compressions, with uterine displacement, are started and the cardiac arrest team is called. An attached cardiac monitor shows asystole.

What is the most appropriate first intervention?

A. Thrombolysis

B. Adrenaline

C. Endotracheal intubation

D. Cardioversion

E. Emergency caesarean section

Correct Answer:Adrenaline

Explanation:

The priority in maternal cardiac arrest is to establish advanced life support including chest compressions with manual left uterine displacement (to prevent the uterus compressing the inferior vena cava and reducing venous return to the heart). This is a non-shockable cardiac arrest (asystole or pulseless electrical activity) and so adrenaline should be given as soon as possible. If it was a shockable cardiac arrest (ventricular tachycardia or ventricular fibrillation) cardioversion should be performed as soon as possible.

This woman has a known pulmonary embolism and is now in cardiac arrest. She should receive thrombolysis once advanced life support is established.

In maternal cardiac arrest, most people would advocate for early endotracheal intubation, but this should not interfere with chest compressions, administration of adrenaline or cardioversion.

In maternal cardiac arrest, if there is no return of spontaneous circulation by 4 minutes, the foetus should be removed from the mother. This improves physiology and significantly improves the chance of maternal survival. The procedure for this is sometimes called a perimortem caesarean section or resuscitative hysterotomy. But it is not an emergency caesarean section, and other interventions should ideally be established first. The term resuscitative hysterotomy better describes this procedure as a life-saving intervention technically distinct from a caesarean section; including that it is performed at the site of the arrest and does not require an obstetrician to perform.

Further reading:

https://www.bjaed.org/article/S2058-5349(20)30048-2/pdf

Question:

A 10-year-old boy is brought to the general practitioner by his mother. He presents with a skin rash on the buttocks, abdominal pain and joint pains for the last four days. He suffered from an upper respiratory infection seven days ago. The patient does not have any past medical history. He does not take any medications and has no known drug allergies.

Physical examination reveals a mildly tender abdomen and palpable purpura on the sacral region. Blood tests have been performed and results are pending.

What is the most appropriate management plan for this patient?

A. Treat with aspirin

B. Treat with penicillin

C. Supportive care

D. Treat with doxycycline

E. Treat with ceftriaxone

Correct Answer:Supportive care

Explanation:

The patient above has a presentation consistent with Henoch-Schönlein purpura (HSP), which is also known as IgA vasculitis. It is a common vasculitis of unknown origin that leads to renal, abdominal, articular and cutaneous manifestations. HSP is typically managed with supportive care with symptomatic treatment of pain (usually with paracetamol or non-steroidal anti-inflammatories) if required. Patients typically require serial urinalysis for several months post-diagnosis to ensure resolution of haematuria and to monitor for development of nephritis. Patients with severe and unremitting renal disease can be admitted and considered for renal transplant if their condition is refractory to treatment.

Doxycycline is typically used in the management of sexually transmitted infections and atypical causes of pneumonia. It is not indicated in the management of HSP. Additionally, it is contraindicated in children under 12 years of age due to its potential to inhibit bone growth.

Ceftriaxone is a third-generation cephalosporin that is not indicated in the management of HSP.

Penicillin is typically used in the management of syphilis and upper respiratory tract infections.

Aspirin is indicated in patients suffering from Kawasaki disease – an acute vasculitis that leads to prolonged fevers, conjunctival injection, mucous membrane changes and lymphadenopathy.

Further reading:

https://patient.info/doctor/henoch-schonlein-purpura-pro

Question:

A 59-year-old patient, Mrs Sadia Khan, attends the Emergency Department via ambulance complaining of breathlessness. Mrs Khan seems very anxious on arrival, and she reports a fluttering sensation in her chest and a ‘sticky’ productive cough. Her past medical history includes diverticular disease, anxiety and ovarian fibroids.

On examination Mrs Khan looks alert and well perfused, chest auscultation reveals reduced air entry and crackles at the left base. An ECG is recorded and is shown below.

Her vital signs are as follows:

O2 95% on air

HR 140 bpm

RR 24

BP 129/65 mmHg

Temp 37.7 oC

What is the most appropriate management choice for this patient’s tachycardia?

Source: Jer5150 [CC BY-SA 3.0]

A. Bisoprolol

B. Diazepam

C. Digoxin

D. Amiodarone

E. Amlodipine

Correct Answer:Bisoprolol

Explanation:

The most appropriate management choice for this patient's tachycardia is bisoprolol. The patient has presented with new-onset atrial fibrillation (AF) most likely secondary to pneumonia. When managing patients with new-onset AF, the main aspects of treatment are:

Investigating any precipitating factors that may have triggered AF (e.g. pneumonia)

Controlling the rapid heart rate

Considering the need for anticoagulation

4. Controlling the associated symptoms

For the management of tachycardia, bisoprolol (or diltiazem or verapamil) are first-line medication for reducing heart rate. Bisoprolol is favoured over digoxin due to its rapid onset of action. If the patient presented with haemodynamically unstable AF or severely reduced left ventricular function, then amiodarone would be indicated for management.

Amlodipine is a calcium channel blocker and its use is predominantly in hypertension and angina prophylaxis. It is not used in the management of AF-related tachycardia.

Diazepam can be used as an anxiolytic however it is not used in the management of AF.

Further reading:

https://www.nice.org.uk/guidance/cg180

Question:

A 54-year-old male presents to the emergency department following an episode of right-sided weakness and slurred speech earlier today. He says he also found difficulty in expressing what he wanted to say. This lasted for around 60 minutes and has since resolved. On further questioning, he describes palpitations and a 'funny heartbeat' for the last week. On examination, his pulse is irregularly irregular. There are no neurological features present.

A transient ischaemic attack is suspected and treatment is started. The patient wishes to resume driving his car as soon as possible.

Which of the following guidance is most appropriate?

A. Inform the DVLA and resume driving after 4 weeks

B. Start driving immediately as there are no persistent neurological features

C. Inform the DVLA and resume driving after 1 year

D. Resume driving after 2 weeks

E. Do not inform the DVLA and resume driving after 4 weeks

Correct Answer:Do not inform the DVLA and resume driving after 4 weeks

Explanation:

Following a transient ischaemic attack, patients must stop driving for at least four weeks for a car or motorcycle licence. Patients do not need to inform the DVLA if there are no persistent neurological features.

For a bus, coach or lorry licence, the DVLA must be informed, and patients cannot drive these vehicles for a least one year.

Further reading:

https://www.gov.uk/transient-ischaemic-attacks-and-driving

Question:

A 24-year-old woman with a known history of asthma presents to the emergency department with shortness of breath and a dry cough. Her heart rate is 105 beats per minute, her respiratory rate is 23 per minute, her saturations are 98% on air, and her temperature is 37.0 ºC. On examination, she appears to be in respiratory distress and cannot complete a full sentence to give a history. She has a mild bilateral expiratory wheeze on auscultation. On arrival, her peak flow is 280 L/min and she states that her personal best is 500 L/min.

What is the most likely diagnosis?

A. Moderate exacerbation of asthma

B. Pulmonary embolism (PE)

C. Anxiety

D. Life-threatening exacerbation of asthma

E. Severe exacerbation of asthma

Correct Answer:Severe exacerbation of asthma

Explanation:

This patient is most likely suffering from a severe exacerbation of asthma. She has a history of asthma and is presenting with typical symptoms of an asthma attack - shortness of breath, a dry cough, difficulty speaking and an expiratory wheeze. While her heart rate, respiratory rate and peak flow do not meet the criteria for a severe exacerbation, the fact that she is unable to speak in full sentences means that this would still be classed as a severe exacerbation. Oxygen saturations do not form part of the criteria for severe asthma attacks, it is still possible for patients to have a severe or life-threatening exacerbation of asthma with normal oxygen saturations. It is important to remember when classifying asthma exacerbations that only one criterion is needed from the severe or life-threatening categories for the exacerbation to be classified as such.

Anxiety is unlikely to be the cause of this patient's symptoms. The physical symptoms of anxiety can include shortness of breath and chest tightness, however, they would not be expected to have an expiratory wheeze. Anxiety should only be diagnosed as causing shortness of breath once other physical causes have been ruled out.

This patient is not suffering from a life-threatening exacerbation of asthma as they do not meet any of the criteria. Criteria of a life-threatening exacerbation include saturations < 92% on air, a peak flow below 33% of a patient's predicted/best, normal CO2 on an ABG, silent chest or exhaustion. It is important to remember that only one of these criteria needs to be present for an exacerbation to be classed as life-threatening.

At first glance it may appear that this patient is suffering from a moderate exacerbation of asthma as their heart rate is below 110 per minute, their respiratory rate is below 25 per minute and their peak flow is 56% of their personal best. However, they are unable to speak in full sentences so this would be classed as a severe exacerbation.

A PE is an important differential to rule out in a patient presenting with shortness of breath. However, a patient with a PE would generally present with shortness of breath, pain on inspiration and have no additional sounds heard on auscultation.

Further reading:

https://cks.nice.org.uk/topics/asthma/management/acute-exacerbation-of-asthma/

Question:

A 70-year-old man presents to the Emergency Department after a fall. He is confused and agitated. A collateral history from his wife finds that he has not been himself over the last few months. He has become disorganised, irritable and unable to go about his day, needing more help with activities such as shopping and cleaning. She has become worried recently when he talks about objects in the room that she can’t see. He sometimes stares into space for hours on end and won’t respond to her. His doctor recently prescribed some medication for depression, however, he has only gotten worse since then.

What is the most likely diagnosis?

A. Frontotemporal dementia

B. Alzheimer's

C. Subdural haemorrhage

D. Depression

E. Lewy-body dementia

Correct Answer:Lewy-body dementia

Explanation:

The most likely diagnosis is Lewy-body dementia. The collateral history describes a subacute onset of cognitive and behavioural changes, with decreased ability to carry out activities of daily living, pointing towards a diagnosis of dementia. The episodes of visual hallucinations and fluctuating attention indicate Lewy-body dementia as the most likely diagnosis. The possible depressive symptoms and the recent fall could also support the diagnosis of Lewy-body dementia but are less specific.

Alzheimer’s is the most common cause of dementia but would be more likely to present with short-term memory loss and behavioural changes.

Depression is not the most likely diagnosis. Depression is common in people with Lewy-body dementia but is unlikely to be the primary diagnosis. The vignette does not describe low mood, low energy and anhedonia, which are main features of clinical depression.

Frontotemporal dementia is an important consideration, however, it would usually present with aphasia and/or behavioural problems, such as disinhibition and inappropriate behaviour. Frontotemporal dementia is usually seen in people less than 65-years-old.

Subdural haemorrhage is an important differential diagnosis, especially considering his fall. While a full falls assessment and neurological examination would need to be undertaken to rule this out, it is not the most likely diagnosis in this case. The fluctuating attention and visual hallucinations are not typical of a subdural haemorrhage.

Further reading:

https://www.nice.org.uk/guidance/ng97

Question:

Jack, 21, presents to the Emergency Department with shortness of breath. He has a past medical history of asthma for which he takes a steroid inhaler.

On assessment:

He is unable to speak in full sentences and has a widespread respiratory wheeze

Respiratory rate: 31 breaths/min

Heart rate: 115bpm

Blood pressure: 124/75 mmHg

He is conscious and performs a peak expiratory flow which shows a rate of 270L/min (40% predicted)

An arterial blood gas is performed:

pH: 7.47

PaO2: 9.9kPa

Pa CO2: 3.8kPa

HCO3-: 24 mmol/L

BE: -1 mmol/L

SpO2: 93% (air)

Which category of an acute exacerbation of asthma most closely describes the severity of this patient’s current state of illness?

A. Severe

B. Near-fatal

C. Mild

D. Moderate

E. Life-threatening

Correct Answer:Severe

Explanation:

Being unable to complete sentences means the severity of this patient's acute asthma exacerbation is at least severe.

Life-threatening asthma is characterised by:

Altered conscious level

Exhaustion

Hypotension (see guideline below)

PEFR <33% predicted

SpO2 <92% and normal PaCO2

If the PaCO2 was above normal this would be then be categorised as near-fatal asthma.

Further reading:

https://www.brit-thoracic.org.uk/quality-improvement/guidelines/asthma/

Question:

A 3-week-old boy presents to the paediatric clinic after referral by his GP for faltering growth. His mother reports no issues during the pregnancy and a normal vaginal delivery. Since birth, he has not been feeding particularly well, often appearing to have laboured breathing during feeds. On examination, he is peripherally warm and well perfused. He appears underweight and there is some mild clubbing of his fingers. His SpO2 is found to be 83% on air.

What is the most likely diagnosis?

A. Coarctation of the aorta (CoA)

B. Tetralogy of Fallot (ToF)

C. Atrio-ventricular septal defect (AVSD)

D. Ventricular septal defect (VSD)

E. Transposition of the great arteries (TGA)

Correct Answer:Tetralogy of Fallot (ToF)

Explanation:

Tetralogy of Fallot (ToF) is the most common form of cyanotic congenital heart disease. ToF has four main anatomical features:

a large ventricular septal defect

overriding aorta

right ventricular outflow obstruction

right ventricular hypertrophy

Most cases of ToF in the UK are now either diagnosed antenatally, present with low oxygen saturations or are diagnosed following assessment for a heart murmur. Occasionally ToF may be unrecognised and presents with cyanotic episodes or clubbing. Congenital heart disease can be either acyanotic or cyanotic.

Acyanotic heart conditions are more common and include:

VSD

ASD

Patent ductus arteriosus (PDA)

Aortic stenosis

Pulmonary stenosis

CoA

Cyanotic heart conditions include:

ToF

TGA

Tricuspid atresia

VSDs can be asymptomatic if small, however, if larger, they often present with poor feeding and increased respiratory effort. Clinical examination may reveal an enhanced apical pulsation, parasternal heave and a systolic murmur at the left sternal border (either pansystolic or early systolic). Clubbing is not a feature of isolated VSDs.

TGA involves the transposition of the pulmonary artery and aorta. It is often associated with a VSD which allows oxygenated blood to get into circulation. Without a VSD it presents with cyanosis in the first week of life and requires the maintenance of a PDA to buy time until the infant can be operated on to resolve the defect.

Coarctation of the aorta involves narrowing of the aorta (either in the ascending or descending aorta). CoA presents with reduced femoral pulses and a left infraclavicular systolic murmur.

AVSD is characterised by a deficiency of the atrioventricular septum of the heart. AVSD can present with dyspnoea, cyanosis, oedema, wheeze and an irregular pulse. AVSD is commonly associated with Down's syndrome.

Further reading:

https://patient.info/doctor/fallots-tetralogy

Question:

A 34-year-old woman is referred to hospital by the GP, who is concerned about her recent presentation. She initially attended her local practice, complaining of a headache that had been present for 2 weeks; this was described as being constant and poorly localised. The patient denied fever, neck stiffness, visual changes and other neurological symptoms, and reported that over-the-counter analgesia had not been of benefit. She stated that she is currently suffering from hayfever, and that sneezing makes her headache far worse, as does lying for a prolonged period of time. On examination, the patient was morbidly obese, having gained a significant amount of weight during the recent COVID-19 lockdowns. Neurological examination revealed no focal pathology, but on fundoscopy, bilateral blurring of the optic disc margins was noted.

Further investigations carried out in hospital included an MRI, which was reported as normal, and a lumbar puncture. CSF analysis showed no abnormalities, but the opening pressure was measured at 34cm H20; significantly above the normal range. The consultant communicates the likely diagnosis to the patient and starts her on medical therapy which is effective in resolving her symptoms.

Given the likely diagnosis, which of the following is the most appropriate treatment option for the condition?

A. Apraclonide

B. Amantadine

C. Vincristine

D. Timolol

E. Acetazolamide

Correct Answer:Acetazolamide

Explanation:

The most likely diagnosis, in this case, is idiopathic intracranial hypertension (previously referred to as pseudotumour cerebri); a condition of unknown pathophysiology that principally affects obese middle-aged women. The usual presentation is with signs and symptoms of raised intracranial pressure, including headache, often worse on bending, lying or sneezing, and possibly tinnitus, visual disturbance and nausea. Due to the rise in intracranial pressure, bilateral papilloedema is often seen on examination.

Lumbar puncture is an important investigation in the setting of suspected IIH; the fluid itself will be normal, but the opening pressure is likely to be markedly raised. Carrying out this procedure will often be of therapeutic relief to patients, as this in itself will reduce the CSF volume and thus the intracranial pressure. Definitive management is usually with acetazolamide, a carbonic anhydrase inhibitor that has diuretic effects, and helps to return the intracranial pressure to normal. This medication is also used to treat acute angle-closure glaucoma, by a similar mechanism.

Vincristine is a chemotherapy agent that functions by targeting the mitotic spindle, thus preventing cell division. It would certainly not be indicated in the absence of malignant disease.

Timolol is a beta-blocker usually given topically that may be used to treat open-angle glaucoma, with apraclonidine being an alpha-receptor agonist also used for this condition. Neither would be appropriate in this scenario.

Amantadine is an NMDA receptor antagonist; it may be used to help to manage dyskinesia that can arise due to Parkinson's disease or the drugs used in its treatment.

Further reading:

https://patient.info/doctor/idiopathic-intracranial-hypertension-pro

Question:

A 23-year-old student presents to the GP with a worsening sore throat that has been present for the last 4 days. This has progressed to a level that is now beginning to affect his ability to eat without discomfort, which has triggered him to seek medical advice. The patient reports that they feel relatively well systemically, although they have had a minor headache for the last week. He has no other medical conditions, although he describes that he has had more than 10 episodes of tonsillitis in the last year; he is thoroughly fed up with having to take time off from work with the condition.

The GP ascertains that the patient meets all four of the Centor criteria and prescribes the patient phenoxymethylpenicillin. He also makes a referral to the ENT clinic at the hospital, as the patient meets the criteria to be considered for a tonsillectomy. He explains to the patient that not every patient is recommended to have surgery, as there are a number of potential complications, including a risk of bleeding and of nerve damage.

Which of the following nerves is most likely to be damaged during a tonsillectomy?

A. Vagus nerve

B. Lesser occipital nerve

C. Glossopharyngeal nerve

D. Chorda tympani

E. Zygomatic branch of the facial nerve

Correct Answer:Glossopharyngeal nerve

Explanation:

The glossopharyngeal nerve (CN IX) runs in close proximity to the palatine tonsils, therefore, there is a risk of transection or stretching of the nerve during a tonsillectomy. If this occurs, patient's may lose taste and general sensation to the posterior 1/3 of the tongue and possibly parotid gland dysfunction, both of which are functions of CN IX. Haemorrhage is the other main complication of a tonsillectomy; this can happen both at the time of surgery, or as a delayed haemorrhage; these patients will often require a return to theatre.

The vagus nerve is a very important structure with motor, sensory and parasympathetic functions. It has a long anatomical course and is more commonly damaged in procedures aiming to treat patients with reflux. Individual branches of the nerve can be damaged during other surgeries; the recurrent laryngeal nerve is at risk during thyroidectomy for example.

The lesser occipital nerve and the zygomatic branch of the facial nerve are both superficial nerves that run on the outer aspect of the head and neck; they are extremely unlikely to be damaged during tonsillectomy.

The chorda tympani is another branch of the facial nerve; this runs through the middle ear and is far less likely than the glossopharyngeal nerve to be damaged due to surgery on the tonsils.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK538296/

Question:

A 62-year-old man presents to A&E with bilious vomiting and abdominal pain for the past 3 hours. The pain is diffuse and severe. He has recently noticed blood in his stool and that his clothes have been a bit looser. He has no past medical history. On examination, there is voluntary guarding over the whole of the abdomen. A number of investigations are ordered. An abdominal radiograph suggests a large bowel obstruction but there is no evidence of pneumoperitoneum on a chest X-ray. The patient is prescribed IV fluids.

What is the most appropriate next step in the management of this patient?

A. Abdomino-perineal excision of the rectum

B. De-functioning loop colostomy

C. Refer to an oncologist

D. Prescribe senna

E. Insertion of a nasogastric tube

Correct Answer:Insertion of a nasogastric tube

Explanation:

Insertion of a large-bore nasogastric tube is the most appropriate management here; part of the ‘drip and suck’ management of bowel obstruction. ‘Suck’; insertion of a nasogastric tube allows removal of the contents of the stomach and small intestine which can relieve a patient’s pain and vomiting. Removal of the contents can also help reduce swelling and inflammation by reducing pressure on the bowel. ‘Drip’; the patient should be prescribed IV fluids and be nil by mouth.

A de-functioning loop colostomy is one of the most appropriate initial surgical options, but as other management has not been fully attempted, surgery at this point is inappropriate. This procedure would involve diversion of the bowel contents into a stoma to relieve the obstruction. Staging of cancer would also be performed as part of the procedure, to inform decisions regarding treatment options.

An abdomino-perineal excision of the rectum is used to remove very low rectal tumours, or those which involve the sphincter complex. As other non-surgical options have not yet been tried, and the cancer has not been staged, this is an inappropriate choice.

Referral to an oncologist is inappropriate at this stage as a diagnosis of malignancy is not confirmed and the patient must be managed acutely before starting any chemotherapy or radiotherapy.

Prescribing senna is also inappropriate as stimulant laxatives should not be used in suspected bowel obstruction; they can increase the pressure in the bowel, increasing the risk of perforation.

Further reading:

https://patient.info/doctor/colorectal-cancer

Question:

A 35-year-old woman is under investigation for abnormal vaginal bleeding. She feels faint and complains of tingling in her fingers. She has also noticed a slight blurring of her vision and a headache. She has not been eating as regularly as she usually does.

On examination, she is responsive to your questions. She is apyrexial and her observations are stable. She complains of some double vision when you ask her to read a short piece of writing, and you notice a slight tremor in her hands bilaterally. She is conscious, orientated and able to swallow.

Her capillary blood glucose is measured and found to be 3mmol/L.

What is the most appropriate management of this patient’s capillary blood glucose levels?

A. Repeat capillary blood glucose in 30 minutes, and treat if <3mmol/L

B. Give glucose 10% IV infusion over 15 minutes and re-check capillary blood glucose in 30 minutes

C. Give 50mg of IM glucagon and re-check capillary blood glucose in 30 minutes

D. Give a cup of fruit juice and re-check capillary blood glucose in 1 hour

E. Give 2 glucose tablets and re-check capillary blood glucose in 15 minutes

Correct Answer:Give 2 glucose tablets and re-check capillary blood glucose in 15 minutes

Explanation:

The correct answer is to give glucose tablets and re-check blood glucose in 15 minutes. As this patient has symptomatic hypoglycaemia, with a capillary blood glucose of 3mmol/L (hypoglycaemia is typically defined as <4mmol/L), it is appropriate to try and raise blood sugar as soon as possible. Given that she can swallow it is most appropriate to begin with oral glucose to try and raise her blood sugar – this may be in the form of glucose tablets, pure fruit juice or sugar dissolved in water. It is then appropriate to re-check her capillary blood glucose in 10-15 minutes to assess the effect that this has had.

It is incorrect to give fruit juice and re-check blood glucose in 1 hour. The capillary blood glucose needs to be re-checked in 10-15 minutes to assess the effect of the short-acting carbohydrate.

It is incorrect to give 50mg IM Glucagon and re-check capillary blood glucose in 30 minutes. Although it would be appropriate to consider IM glucagon after 3 cycles of short-acting carbohydrate failing to raise capillary blood glucose >4mmol/L, a lower dose of 1mg would typically be used.

It is incorrect to give glucose 10% IV infusion over 15 minutes. This would only be considered if the oral short-acting carbohydrate failed to raise capillary blood glucose.

Further reading:

https://patient.info/doctor/hypoglycaemia

Question:

A 59-year-old male is brought into the emergency department by ambulance with a 2-day history of worsening shortness of breath at rest. On further questioning, he has had a cough for the past 6 months and occasionally coughed up small amounts of blood. He has a past medical history of anxiety, hypertension and previous renal calculi and takes propranolol and lisinopril. He smokes 15 cigarettes per day and drinks approximately 10 pints of alcohol per week. He has previously worked as a cleaner at a school.

On examination, he is breathless at rest. His observations are as follows:

Temperature 37.1°C

HR 85 bpm regular

BP 136/81 mmHg

RR 24/min

O2 sat 93% breathing air

Respiratory examination reveals an occasional wheeze but no focal crackles. Heart sounds are normal. He is noted to have mild facial and neck oedema as well as venous distension visible on his upper neck, but there is no peripheral oedema. JVP is raised. His symptoms are exacerbated when he leans forward to remove his slippers.

What is the most likely diagnosis?

A. Pulmonary embolism

B. Cardiac tamponade

C. Pulmonary oedema

D. Community acquired pneumonia

E. Superior vena cava (SVC) obstruction

Correct Answer:Superior vena cava (SVC) obstruction

Explanation:

Superior vena cava (SVC) obstruction is the most likely diagnosis. Dyspnoea combined with facial oedema and neck venous engorgement suggests SVC obstruction, and symptoms are classically worse on bending over, lying flat or lifting the arms above the head. The most common malignant cause of SVC obstruction is lung carcinoma, as suggested here by the history of persistent cough and haemoptysis in a patient with a smoking history. After initial assessment and resuscitation, urgent imaging is required, followed by consideration of interventions such as radiotherapy or chemotherapy.

Pulmonary embolism is an important differential diagnosis for acute dyspnoea, and underlying conditions such as malignancy are risk factors. In isolation, however, a pulmonary embolus would not cause facial oedema or venous engorgement.

Pulmonary oedema is suggested by the presence of bibasal crackles, orthopnoea, and frothy sputum. In this case, the history of facial and neck oedema and the distended neck veins make SVC obstruction more likely.

Cardiac tamponade is an emergency classically causing Beck's triad - hypotension, muffled heart sounds and distended neck veins, of which only venous distension is present here.

Community-acquired pneumonia usually causes cough productive of purulent sputum, fevers, breathlessness and focal crackles on auscultation of the chest.

Further reading:

https://patient.info/doctor/superior-vena-cava-obstruction

Question:

You are an SHO working in Paediatrics. A 4-year-old male patient is referred by his GP accompanied by his parents with an unusual body odour. His parents describe the odour as ‘mousey and musty’. They also report that their son suffers from recurrent vomiting every couple of days, behavioural disturbance (becoming increasing more irritable and withdrawn) and feel that he is falling behind his peers at nursery in terms of his ability to communicate. On further questioning, the family originated in Turkey and moved to the UK last year. On examination, you confirm the unusual body odour, note eczematous skin eruptions on the flexures of his elbows and also notice that he has fair hair and very pale blue eyes – an unusual finding considering that his parents are both brown-haired with brown eyes.

What is the MOST LIKELY diagnosis?

A. Galactosaemia

B. Phenylketonuria

C. Methylmalonic acidemia

D. Tyrosinaemia

E. Cerebral palsy

Correct Answer:Phenylketonuria

Explanation:

The condition described in this scenario is most likely phenylketonuria (PKU). Major risk factors for this condition include geographical origin (Turkey, Northern and Eastern Europe) and ethnicity (particularly the Yemenite Jewish population). Clinical features include fair hair and pale blue eyes, a ‘musty’ odour, progressive developmental delay and general learning disability, recurrent vomiting, eczematous skin eruptions, seizures and severe behavioural disturbance. However, most diagnoses of PKU occur through an abnormal result of the heel-prick blood assay at birth.

Tyrosinaemia is less likely in this case. This condition presents with failure to thrive, vomiting and diarrhoea followed by bloody stool, hepatomegaly, lethargy, jaundice, and a ‘cabbage-like’ odour amongst other features.

Galactosaemia is less likely in this case. This presents with feeding difficulties, vomiting and failure to gain weight in the first few weeks of life, jaundice, hepatomegaly, cataracts, and short stature.

Cerebral palsy is less likely in this case. This condition would present with motor dysfunction and associated conditions such as learning difficulties and epilepsy.

Methylmalonic academia is less likely in this case as it usually presents in the neonatal period.

Further reading:

https://patient.info/doctor/phenylketonuria-pro

Question:

A 68-year-old male presents to his GP with a 3-month history of persistent dyspepsia. He also describes 1 stone of weight loss over the last 2 months. On examination, an enlarged, hard, left-sided supraclavicular lymph node is noted. There are no other relevant findings during the clinical assessment.

What is the most likely diagnosis?

A. Liver cancer

B. Thyroid cancer

C. Oesophageal cancer

D. Lymphoma

E. Gastric cancer

Correct Answer:Gastric cancer

Explanation:

The most likely diagnosis is gastric cancer, given the history of dyspepsia, unintentional weight loss and the presence of Virchow's node (an enlarged left supraclavicular lymph node). This lymph node drains lymph from the abdomen and thorax via the thoracic duct. The discovery of an enlarged, hard, left supraclavicular lymph node is known as 'Troisier's sign' and is strongly suggestive of gastric cancer.

Other presenting symptoms of gastric cancer include vomiting and dysphagia.

Further reading:

https://patient.info/doctor/gastric-cancer

Question:

A 24-year-old woman is admitted to a psychiatric hospital. She was arrested by police after climbing onto the roof of the town hall, exclaiming that the aliens were picking her up in their spaceship as she had won a competition to travel to Mars. After a consultant review, she is diagnosed with schizophrenia. Her mother, uncle and grandfather were all previously treated for the same diagnosis, but she has never had any problems with her own mental health. Her flatmate said the patient never used illicit drugs and rarely drank alcohol as she was focussing on her degree in astrophysics.

What feature of this history indicates a poor prognosis?

A. University level study

B. Rapid onset of symptoms

C. Lack of previous mental health problems

D. Female sex

E. Positive family history

Correct Answer:Positive family history

Explanation:

The correct answer is positive family history. Having relatives affected by schizophrenia has been associated with poorer outcomes. This is the only answer option that is associated with a poor prognosis.

The rapid onset of symptoms is incorrect. Slow onset of symptoms is associated with a poorer prognosis in schizophrenia; therefore, a rapid onset would likely indicate a better outcome.

University level study is incorrect. The question mentions that the patient is studying for a degree in astrophysics, and it may therefore be presumed she has a relatively high IQ. A high IQ is associated with better outcomes in schizophrenia, whereas patients with a low IQ have a poorer prognosis.

Female sex is incorrect. Being male is associated with a poorer prognosis in schizophrenia.

The lack of previous mental health problems is incorrect. Individuals with a history of mental health problems have a poorer prognosis in schizophrenia than those with no past psychiatric history.

Further reading:

https://cks.nice.org.uk/topics/psychosis-schizophrenia/background-information/course-prognosis/

Question:

A 43-year-old man presents to the GP complaining of persistent joint pain, particularly in the back and knees, and a generalised itch. The pain is worse in the morning, but he finds that swimming helps. On further questioning, he reports suffering from diarrhoea and abdominal pain for a number of years and also describes a few occasions of self-resolving painful lesions on his shins.

Blood tests are requested:

Test Result Reference range

Alkaline phosphatase (ALP) 158 U/L (30–130)

Alanine aminotransferase (ALT) 30 U/L (<41)

Bilirubin 32 μmol/L (<21)

GGT 72 U/L (<60)

Albumin 42 g/L (35–50)

Faecal calprotectin Positive Negative

Colonoscopy reveals continous erythematous and friable mucous, extending proximally from the rectum, without perianal involvement.

What is the most likely diagnosis?

A. Autoimmune hepatitis

B. Primary sclerosing cholangitis

C. Primary biliary cholangitis

D. Liver metastasis secondary to bowel malignancy

E. Gallstones due to terminal ileum Crohn's disease

Correct Answer:Primary sclerosing cholangitis

Explanation:

The history of arthralgia, in combination with vague abdominal symptoms and erythema nodosum (the likely explanation for the patient's shin lesions), should lead to a consideration of inflammatory bowel disease (IBD) as a possible diagnosis. Enteropathic arthritis and erythema nodosum are relatively common extra-articular manifestations of both Crohn's and ulcerative colitis, and whilst irritable bowel syndrome could account for the patient's symptoms, this is a diagnosis of exclusion, and the history given suggests that the patient has not sought medical advice for his medical symptoms previously. The colonoscopy findings are classical of ulcerative colitis, making this the likely cause of the patient's varied presentation.

The LFT results reveal a cholestatic picture, with a raised ALP and GGT. Considering the patient's history of likely ulcerative colitis, and reports of increasing itch, the most likely explanation for these results is primary sclerosing cholangitis; this condition is almost exclusively seen in those with the condition. The disease involves chronic inflammation of intra- and extrahepatic bile ducts, which results in issues with the passage of bile, and explains the abnormalities on LFTs.

The disease can often remain asymptomatic for a number of years, with itch being a common first symptom; fatigue and jaundice can follow, with the condition potentially progressing to liver cirrhosis if left untreated.

Primary biliary cholangitis can also cause a cholestatic LFT picture; however, this is more common in middle-aged women and is classically associated with positive anti-mitochondrial antibodies. Given the patient's diagnosis of ulcerative colitis, this is not the most likely diagnosis in this scenario.

Autoimmune hepatitis and liver metastasis are more likely to present with a mixed or hepatitic picture (raised ALT/AST) on LFTs rather than a purely cholestatic one. Bowel cancer would have likely been detected on colonoscopy.

Crohn's disease does carry an increased risk of gallstones, which are a classic cause of a cholestatic picture on LFTs; the terminal ileum is the most commonly involved site, and this is also the area of the intestine in which bile salts are reabsorbed. However, the colonoscopy features are indicative of ulcerative colitis, rather than Crohn's disease.

Further reading:

https://patient.info/doctor/primary-sclerosing-cholangitis-pro

Question:

Mr E, a 56-year-old gentleman, recently returned to the UK from Pakistan. He was recently found to have active pulmonary tuberculosis after six weeks of dry cough and night sweats. He presents to his GP 3 months into his treatment because he is concerned that his urine and tears are an orangey-red colour.

Which of his medications is most likely to have caused these side effects?

A. Pyrazinamide

B. Isoniazid

C. Rifampicin

D. Ethambutol

E. Pyridoxine

Correct Answer:Rifampicin

Explanation:

This gentleman has active respiratory tuberculosis (TB) which should be treated with six months of a four-drug regimen.

Rifampicin is an anti-TB drug which aside from being a potent enzyme inducer, can cause flu-like symptoms, hepatitis and orange secretions.

Isoniazid is an enzyme inhibitor which can cause hepatitis, agranulocytosis and peripheral neuropathy. Pyridoxine (vitamin B6) is given to patients on isoniazid to help prevent this peripheral neuropathy.

Pyrazinamide can cause hyperuricaemia which in turn can cause gout. It can also cause hepatitis.

Ethambutol classically can cause optic neuritis. Therefore it’s important to check visual acuity before and during treatment.

Further reading:

https://www.nice.org.uk/guidance/ng33

Question:

A 54-year-old engineer presents to his general practitioner for a routine occupational health assessment. The patient reports no symptoms and takes medication only for hypertension. He tells his general practitioner that he had significant asbestos exposure early in his career. The patient denies chest pain, weight loss, dyspnoea, or haemoptysis. He has never smoked tobacco and drinks 8-units of alcohol each week.

On examination, there is no increased work of breathing at rest. Breath sounds are vesicular bilaterally, and heart sounds are normal with no added sounds.

A chest x-ray is requested, showing no obvious consolidation. The x-ray report describes incidental pleural calcification following the contour of the 8th rib bilaterally. A CT thorax confirms pleural thickening with regular borders. There is no blunting of the costophrenic angles or lymphadenopathy.

What is the most likely cause of the patient's chest x-ray findings?

A. Pleural effusion

B. Mesothelioma

C. Premalignant pleural plaque

D. Pleural plaques

E. Aspergillosis

Correct Answer:Pleural plaques

Explanation:

The correct answer is pleural plaques. Benign pleural plaques are markers of historic asbestos exposure, with a latency period of around 20 years. This patient has a history of asbestos exposure, and the chest x-ray findings of pleural calcification are typical of benign pleural plaques. These plaques are classically an incidental finding in asymptomatic individuals with a history of asbestos exposure. Pleural plaques are benign and do not progress to mesothelioma.

Patients with mesothelioma classically have a history of asbestos exposure and present with chest pain, dyspnoea, haemoptysis, and unintentional weight loss. This patient is asymptomatic and reports no chest pain, weight loss, or other systemic symptoms, making mesothelioma less likely than pleural plaques.

As pleural plaques are benign and do not undergo neoplastic transformation, premalignant pleural plaque is an incorrect answer.

Pleural effusions typically cause blunting of the costophrenic angle on chest x-rays and may show a fluid level. However, as these findings are not present on the patient's chest x-ray and the patient has a history of asbestos exposure, benign pleural plaques are a more likely cause of the pleural changes.

Aspergillosis classically presents with fever, cough, and dyspnoea in a patient with a history of cavitating lung diseases, such as tuberculosis, sarcoidosis, cancer, or vasculitis. However, the patient's history of asbestos exposure and calcifications on chest x-ray are more consistent with benign pleural plaques.

Further reading:

https://radiopaedia.org/articles/pleural-plaque?lang=gb

Question:

A 69-year-old female presents to her GP with a longstanding productive cough and exertional dyspnoea. Her sputum is currently white, but she says that it has become green in the past. There are no red flag features present. She is a current smoker with a 50 pack-year smoking history. On examination, the chest appears hyperexpanded. A bilateral expiratory wheeze is audible, with no coarse crackles. On examination, blood pressure 135/87mmHg, heart rate 78bpm, oxygen saturation 96%, temperature 37.1oC, respiratory rate 17/min.

The GP suspects chronic obstructive pulmonary disease.

What is the diagnostic investigation for this condition?

A. Arterial blood gas

B. CT thorax

C. Chest x-ray

D. Serial peak flow measurements

E. Spirometry

Correct Answer:Spirometry

Explanation:

Chronic obstructive pulmonary disease (COPD) is characterised by persistent respiratory symptoms and airflow obstruction, usually progressive and not fully reversible. Spirometry is the diagnostic investigation in COPD and will demonstrate a reduced forced expiratory volume in 1 second (FEV1), a normal or reduced forced vital capacity (FVC), and a reduced FEV1/FVC ratio.

A chest x-ray is not diagnostic for COPD but may demonstrate hyperinflation. An additional underlying pathology may also be revealed (e.g. malignancy).

An arterial blood gas is commonly requested in acutely unwell COPD patients in secondary care. It may demonstrate hypercapnia, hypoxia, and respiratory acidosis; however, it is not diagnostic of COPD.

A CT thorax provides better visualisation of the lung tissue than a chest x-ray. It is useful in excluding other underlying pulmonary diseases; however, stable, low-risk patients are unlikely to undergo CT.

Serial peak flow measurements are commonly used in diagnosing asthma and have no role in diagnosing COPD. However, they may be helpful to exclude asthma if there is diagnostic uncertainty.

Further reading:

https://cks.nice.org.uk/topics/chronic-obstructive-pulmonary-disease/

Question:

A 32-year-old is brought to A&E after having been involved in a motorbike accident where he injured his back. The spinal team examines him once he is stable and find he has sustained a significant injury to his T11-T12 vertebrae on CT. They are able to find a response to pinprick and light touch bilaterally up to T11 but only faint response to pinprick at T12 (not to light touch) and no sensory response below. The patient is noted to have good power in his upper limbs (5/5 on the MRC scale) but only a flicker of movements in his hip flexors, with no movement noted elsewhere in his lower limbs. The patient has intact upper limb reflexes but absent knee and ankle reflexes. The patient is noted to have absent bulbocavernosus reflex, no anal sensation or tone.

What is his ASIA score?

A. L1 ASIA C

B. C6 ASIA A

C. T11 ASIA D

D. T11 ASIA A

E. L1 ASIA B

Correct Answer:T11 ASIA A

Explanation:

ASIA stands for American Spinal Injuries Association. It is a standardised method of assessing the neurological and functional status of patients with spinal cord injuries (SCI); and also to quantify the consequences of SCI. This is vital information to know if you undertake an assessment of a spinal injury patient as it’s a standard method of identifying their level of injury (C1-S5) and the severity of injury (A to E). It involves a detailed examination of the patient’s neurological system - sensory tracts, motor power, and reflexes, to establish the last intact spinal cord level before damage occurs. Then the severity of the injury can be assessed depending on if sensory or motor or both functions are lost. This helps identify prognosis (recovery) and helps guide rehabilitation needs.

In this patient, the last level of intact sensory response is T11. The last level of intact motor function is T1 (upper limb is 5/5). His hip flexors flicker (grade 1). So his level is likely T11. He has absent anal tone/sensation and absent BC reflex. So he is a complete spinal cord injury - T11 ASIA A

A - Complete

No motor or sensory function in the lowest sacral segment (S4-S5)

B - Incomplete

Sensory function below neurologic level and in S4-S5, no motor function below neurologic level

C - Incomplete

Motor function is preserved below the neurological level and more than half of the key muscle groups below the neurological level have a muscle grade less than 3.

D - Incomplete

Motor function is preserved below the neurological level and at least half of the key muscle groups below the neurological level have a muscle grade >3

E - Normal

Sensory and motor function is normal

Sensory Examination

The sensory levels are scored on a 0 to 2 scale for each dermatome. If the body is divided into two identical halves there are 28 key sensory points to be tested. Each dermatome is tested for light touch and pinprick sensation and labelled as NT (not testable) if it cannot be tested.

Otherwise, the following scores are given to each sensory point

0 – The sensation is absent

1 – The sensation is present but impaired

2 – The sensation is normal

Scores are individually tested for both light touch and pinprick sensation.

Motor Examination

10 key muscles, 5 in the upper limb and 5 in the lower limb are tested. Five specific upper extremity muscles, one from each respective segment of the cervical cord, are scored on a 5-point muscle grading scale. Five specific lower extremity muscles are similarly scored.

Muscle strength is graded as:

0 - Total paralysis

1 - Palpable or visible contraction

2 - Active movement, full range of motion, gravity eliminated

3 - Active movement, full range of motion, against gravity

4 - Active movement, full range of motion, against gravity and provides some resistance

5 - Active movement, full range of motion, against gravity and provides normal resistance [Muscle able to exert, in the examiner’s judgement, sufficient resistance to be considered normal if identifiable inhibiting factors were not present]

NT - not testable. Patient unable to reliably exert effort or muscle unavailable for testing due to factors such as immobilisation, pain on effort or contracture

Voluntary anal contraction is also noted

Determine Single Neurological Level

After motor and sensory levels have been determined, the information is assimilated for determining a single neurological level. This is important because the sensory and motor level may differ.

The neurological level is the lowest segment where motor and sensory function is normal on both sides and is the most cephalad of the sensory and motor levels determined in sensory and motor examination.

Complete or incomplete spinal cord injury

A spinal cord injury is complete if there is:

No voluntary anal contraction

S4-5 sensory scores = 0

No anal sensation

Otherwise, the injury is incomplete.

Further reading:

http://www.asialearningcenter.org

Question:

A 14-year-old boy presents to the emergency department with sudden onset, unilateral scrotal pain. This started 30 minutes ago whilst playing football. He feels nauseated and has vomited twice. He has no significant past medical history and takes no medications.

On examination, the left testicle appears swollen and is lying horizontally. It is exquisitely painful to touch, and the pain is not relieved by elevation of the scrotum.

What is the most appropriate investigation?

A. Urgent surgical exploration

B. Routine scrotal ultrasound

C. Urine microscopy, culture and sensitivity

D. Chlamydia and gonorrhoea NAAT testing

E. Diagnostic aspiration

Correct Answer:Urgent surgical exploration

Explanation:

This case demonstrates testicular torsion, in a young boy whilst playing sport. Testicular torsion is characterised by sudden onset, unilateral scrotal pain associated with nausea and vomiting. The testicle may appear inflamed with a horizontal lie and the pain is not relieved on elevating the testes. The cremasteric reflex may also be absent, whereby stroking the inner thigh fails to cause an upward movement of the testes. Urgent surgical exploration is required to relieve the torsion and assess the viability of the testicle. If viable, bilateral orchiopexy will be performed.

Scrotal ultrasound should only be performed if it will not delay surgical exploration. A routine request will undoubtedly delay intervention and result in worsening ischaemia.

Diagnostic aspiration has no role in testicular torsion.

Whilst a bedside urine dip may exclude a urinary tract infection, urine microscopy, culture and sensitivity results are not available immediately and will delay surgical intervention.

Chlamydia and gonorrhoea can cause epididymo-orchitis and testicular pain, however, the pain is typically of gradual onset and relieved on elevation of the scrotum.

Further reading:

https://geekymedics.com/testicular-torsion/

Question:

Matthew Hogan, a 48-year-old sewage worker, presents to his GP with a 7-day history of headaches, myalgia and fever. He has no background medical history and he hasn’t been out of the country in 2 years. He denies ever taking any recreational drugs. On examination he has a temperature of 38.3° and is notably jaundiced. His GP orders blood tests which reveal the following results:

ALT: 54 U/L

AST: 47 U/L

GGT: 81 U/L

Bilirubin: 38 μmol/L

Urea: 10.3 mmol/L

Creatinine: 120 μmol/L

Given his symptoms and blood results, what is the most likely diagnosis?

A. Malaria

B. Hepatitis C

C. Influenza

D. Leptospirosis

E. Dengue fever

Correct Answer:Leptospirosis

Explanation:

The correct answer here is leptospirosis. This disease is caused by the spirochaete leptospira interrogans, which is spread through infected animal urine (often rats). It commonly appears in multiple-choice questions featuring sewage workers or farmers, but in reality, anyone with exposure to rats can be infected. It will often start out with influenza-like symptoms but can progress to more severe complications such as liver failure, renal failure, bleeding or meningitis. The more severe cases are sometimes referred to as Weil’s disease. Treatment is with high dose penicillin or doxycycline.

Dengue fever and malaria would both be considered in the differential diagnosis, however, the lack of foreign travel makes them less likely.

Hepatitis C would present in a similar fashion, and testing for HCV RNA would be considered, but the lack of risk factors makes this less likely. Risk factors include sharing needles, needlestick injuries and blood transfusions before 1991.

The original symptoms are similar to influenza, but the severe renal and liver involvement in an otherwise healthy patient makes it an unlikely diagnosis.

Further reading:

https://patient.info/doctor/leptospirosis-weils-disease

Question:

A 5-year-old boy is brought to the GP by his mum with a one-day history of multiple painful spots on his left arm. He has a history of atopy with poorly controlled eczema, asthma and seasonal rhinitis. On examination, he is lethargic and disinterested. His left antecubital fossa is erythematous with clusters of small (0.2 x 0.2mm) blisters which are weeping clear fluid.

His observations are as follows:

Temperature 39°C

HR 150 bpm

RR 30

BP 110/60 mmHg

What is the best initial management step?

A. Topical fusidic acid

B. Oral flucloxacillin

C. Admit to hospital for IV acyclovir

D. Oral erythromycin

E. Admit to hospital for IV co-amoxiclav

Correct Answer:Admit to hospital for IV acyclovir

Explanation:

This is a classical presentation of eczema herpeticum. This is caused by herpes simplex virus infecting areas of broken skin. It is a medical emergency and can spread rapidly and cause systemic illness. The patient is febrile, tachycardic and not responding to normal social cues, suggesting he is quite unwell. He warrants further assessment in secondary care regardless of the underlying diagnosis. The most appropriate treatment for eczema herpeticum is IV aciclovir.

Bacterial superinfection is common in eczema but would usually form pustules not clusters of blisters. Bacterial infection can be treated with oral antibiotics if widespread and/or has systemic features. Topical antibiotics can be used if there is only localised infection, without systemic features.

Further reading:

https://cks.nice.org.uk/eczema-atopic#!topicsummary

Question:

A man brings his 5-year-old daughter to see her GP. She has an acute illness manifesting as mouth ulcers, fever, and vesicles on her palms and feet. The GP diagnoses this as hand, foot and mouth disease.

What is the most likely causative organism?

A. Cytomegalovirus

B. Human herpesvirus 6

C. Human immunodeficiency virus

D. Streptococcus pyogenes

E. Coxsackievirus A16

Correct Answer:Coxsackievirus A16

Explanation:

Coxsackievirus A16, along with enterovirus, can cause hand, foot and mouth disease. This is a self-limiting and common condition in paediatrics which is managed conservatively and does not require isolation from school. It commonly presents as described in the stem.

Cytomegalovirus is a common virus that tends to only cause disease in the immunocompromised. However, it can also cause congenital infections, which may have long-lasting effects such as slowed growth, the striking 'blueberry muffin' appearance, sensorineural deafness, encephalitis, and more.

Human herpesvirus 6, or HHV-6, causes roseola infantum, a common cause of rash most likely seen in under 2-year-olds. It is self-limiting, and its management is conservative.

Human immunodeficiency virus causes AIDS, which manifests in a variety of ways depending on concurrent infections, CD4 cell count, and subsequent disease progression. It could initially present as a fever, sore throat, and rash, but it does not cause hand, foot and mouth disease.

Streptococcus pyogenes is a common cause of upper respiratory airway infection, with this genus of bacteria being associated with post-streptococcal glomerulonephritis. It does not typically present with a rash.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK431082/

Question:

An 80-year-old woman presents due to problems with her vision in both eyes. She describes painless visual decline over the past couple of years to the point that she now struggles with activities of daily living. The patient equates her vision decline to a worsening ‘blurring’ of her vision with associated glare. On further questioning, the patient admits to being a heavy smoker and drinks more than 14 units of alcohol per week. She is a poorly controlled type two diabetic and suffered from a single episode of anterior uveitis 5 years previously. On examination with a slit-lamp, a black shape obscures the red reflex bilaterally, there is misting of her lenses bilaterally with the naked eye, and reduced visual acuity.

What is the most significant risk factor for the likely diagnosis?

A. Uveitis

B. Diabetes

C. Smoking

D. Increasing age

E. Excessive alcohol intake

Correct Answer:Increasing age

Explanation:

The condition described in this scenario is most likely cataracts. Cataracts can be defined as an opacification of the lens of the eye. Typical features for this condition include a very gradual, painless, progressive decline in vision, loss of contrast sensitivity and glare (particularly on a sunny day or at night when driving). On direct ophthalmoscopy at arms length away, this may present as a dull and/or distorted reflex. The most significant risk factor for this condition is increasing age with 100% of patient's older than 80-year-old suffering from cataracts to some degree.

Uveitis is a significant risk factor for cataract development, but there is no history of recurrent episodes of uveitis.

Diabetes is a risk factor for cataract development, but not as significant as increasing age.

Smoking is indeed a risk factor for the development of cataracts but is not the most significant in this case.

Excessive alcohol intake is indeed a risk factor for the development of cataracts but is not the most significant in this case.

Further reading:

https://patient.info/doctor/cataracts-and-cataract-surgery

Question:

A 75-year-old woman is referred to the breast clinic as she noticed a firm painless lump in her left breast 3 weeks ago. She has also noticed that she has been feeling more tired over the last month.

She has a past medical history of type 2 diabetes mellitus, but no previous history of breast disease. Her sister has just finished a course of chemotherapy for breast cancer but she has not undergone any genetic testing for breast cancer previously.

On examination, there is a firm lump in the upper inner quadrant of the left breast, with some evidence of nipple inversion and dimpling of the skin over the same region. There are three palpable nodes in the left axilla.

Following history and examination, the consultant explains that she will now undergo further tests.

What is the most appropriate investigation to conduct next?

A. Fine-needle aspiration

B. Mammography

C. Blood tests

D. Core biopsy

E. Ultrasound scan

Correct Answer:Mammography

Explanation:

The most appropriate investigation to conduct next would be mammography. When a patient presents with a new lump (particularly if it is firm and presents with accompanying signs such as nipple inversion, nipple discharge or skin dimpling) malignancy needs to be ruled out and, therefore, patients will be referred to the breast clinic. Here they will undergo a ‘triple assessment' which consists of a thorough history and examination, imaging (usually an initial USS in women under 35, or an initial mammogram in women over 35) and biopsy (for histological analysis of solid lesions) or aspiration (for cytological analysis of fluid-containing lesions).

In younger women <35 presenting with similar symptoms an ultrasound scan would be favoured over mammography as in younger women the breast tissue is denser and mammography is less effective.

Blood tests may be performed to investigate her systemic symptoms but are not routinely performed as part of the triple assessment in the breast clinic to confirm a diagnosis.

Core biopsy and fine-needle aspiration are both techniques that are used to obtain a sample for further investigation; if the lesion is solid, a core biopsy will be taken for histological analysis, and if the lesion is more likely to be fluid (or cystic) a fine needle aspiration will be performed for cytological analysis. However, imaging will usually be performed before samples are taken, to characterise the type and location of the lesion(s).

Further reading:

https://patient.info/doctor/breast-cancer-pro

Question:

A 20-month-old boy is brought to the GP by his mother for a review of his development. He was born at 38 weeks gestation with shoulder dystocia complicating his birth.

On assessment, he is not yet walking or crawling but has a good pincer grip, and bangs toy bricks together. He knows and responds to his own name and is friendly and babbling. During the assessment, bruises on the abdomen, and the right and left calves are noted. His mother states these are due to his clumsiness and is concerned it may be similar to the bruising she had previously, which required oral corticosteroids.

What is the most appropriate next step in management?

A. Perform coagulation screen and coagulopathy test

B. Prescribe oral prednisolone

C. Urgent referral to paediatric haematologist

D. Immediately contact relevant safeguarding lead

E. Urgent full blood count within 48 hours

Correct Answer:Immediately contact relevant safeguarding lead

Explanation:

Immediately contact relevant safeguarding lead is correct. This infant is non-mobile and has multiple bruises, which should raise suspicion of non-accidental injury (NAI). Bruising in non-mobile infants warrants immediate assessment by a paediatric safeguarding lead as it is unlikely that the bruising has occurred due to clumsiness. Although coagulopathies may be a possible cause, NAI must be ruled out first.

Urgent full blood count within 48 hours and performing coagulation screen and coagulopathy tests may be considered down the line to investigate for any underlying causes of bruising, however, the history is more suggestive of NAI and requires immediate assessment.

Prescribing oral prednisolone is considered in immune thrombocytopenia (ITP) in adults, however, it is not first-line in children. The history is more suggestive of NAI and requires immediate assessment.

An urgent referral to a paediatric haematologist should be considered if there is suspicion of an underlying haematological condition that can cause bruising, however, the history is more suggestive of NAI and requires immediate assessment.

Further reading:

https://geekymedics.com/non-accidental-injury-nai/

Question:

A 52-year-old man presents to the GP, complaining of worsening hearing loss in his right ear, which started six months ago. He denies otalgia, otorrhoea, tinnitus, vertigo, and weakness and has no past medical history of note; nobody in his family has a history of hearing loss. He works as a banker, and is not frequently exposed to loud noises.

Examination of the ear including reveals no abnormalities, and Rinne's test is positive; however, there is lateralisation on Weber's towards the left ear. Audiometry reveals reduced hearing in the right ear, which is worse at higher frequencies. Audiometry of the left ear is unremarkable.

Given the likely diagnosis, what is the most likely complication?

A. Hoarse voice

B. Facial weakness

C. Metastasis to involve orbital structures

D. Loss of taste on the posterior aspect of the tongue

E. Cerebral metastases

Correct Answer:Facial weakness

Explanation:

The most likely diagnosis, in this case, is an acoustic neuroma (also referred to as a vestibular schwannoma); a benign tumour of Schwann cells; this most commonly develops in the cerebellopontine angle and can compress the internal auditory meatus and vestibulocochlear nerve, resulting in sensorineural hearing loss (demonstrated in this patient by the findings of Weber's test, as well as the audiometry result). There should be a high index of suspicion of the condition in any patient with unilateral sensorineural hearing loss confirmed on audiometry; the more common causes of sensorineural hearing loss such as presbyacusis are usually bilateral, and therefore unilateral disease may be indicative of focal pathology.

An MRI head should generally be arranged for any patient presenting with unilateral sensorineural hearing loss; this will usually allow for the identification of the mass. Surgical resection is usually carried out in masses causing significant hearing loss, or tumours of significant size; further growth of an acoustic neuroma can potentially cause involvement of CN V and CN VII, due to their adjacent location to the cerebellopontine angle. Involvement of the facial nerve can cause facial weakness and droop, whilst compression of the trigeminal nerve may lead to altered facial sensation and issues with mastication.

Acoustic neuromas are almost exclusively benign tumours, meaning that they will not metastasise to distant structures; therefore, both metastasis to involve orbital structures and cerebral metastases are unlikely in this patient.

Loss of taste on the posterior aspect of the tongue would indicate an issue with the glossopharyngeal nerve, as this is one of its functions. This is unlikely to be affected by an acoustic neuroma due to its anatomical path. The same is true of the vagus nerve, which is the most likely to be affected in the setting of a new onset of a hoarse voice.

Further reading:

https://patient.info/doctor/acoustic-neuromas

Question:

A 23-year-old woman presents with a 2-day history of a painful and red left breast that is warm to touch. She is seven weeks postpartum from her first pregnancy and has a fever of 38.0°C with general malaise. She is feeding a combination of formula milk and breast milk, reports no trauma to the breast and usually sleeps in a supine position. She is an ex-smoker.

What risk factor most likely contributes to the diagnosis?

A. Maternal smoking cessation

B. Primiparity

C. Partial formula milk feeding

D. Slow weaning from breast milk

E. Supine sleeping position

Correct Answer:Partial formula milk feeding

Explanation:

This patient’s history is indicative of lactational mastitis, for which partial formula milk feeding is a predisposing factor. A feeding regime with breast and formula milk would result in less frequent breast milk expression, and poor infant attachment to the breast (for example, from tongue-tie in the infant) can lead to nipple damage, leading to ineffective milk removal. In women who are breastfeeding, lactational mastitis is caused by milk stasis: the prolonged accumulation of milk in the breast stimulates an inflammatory response if it is not expressed. This can then present with pain, tenderness, heat and erythema in the breast, as well as systemic symptoms, such as general malaise, fever, rigours, nausea and lethargy.

Slow weaning from breast milk is incorrect. Rapid weaning from breast milk or a reduction in the number or duration of breastfeeds would encourage milk stasis in the breast as it is not being expressed often enough and would likely lead to the patient's symptoms. Slower weaning allows for a more gradual decrease in the milk supply to avoid milk stasis.

A supine sleeping position would not be a predisposing factor to lactational mastitis, as pressure would not be applied to the breast in this position. A prone sleeping position, ill-fitting bras and tight clothing keep pressure on the breast, preventing effective milk drainage.

Maternal smoking cessation would be a protective factor against developing mastitis in women of all ages, as the nicotine and toxins in cigarette smoke accumulating in the breast can damage the structure of the ducts.

Primiparity only refers to the fact that this is the patient’s first baby, which is not viewed as a risk factor for developing mastitis.

Further reading:

https://patient.info/doctor/puerperal-mastitis

Question:

A 24-year-old female patient presents to the emergency department with lower abdominal pain. She describes the pain as severe and explains that it came on progressively over the last day. The patient adds that the pain sometimes radiates to her shoulder tip and that she has vomited once since her symptoms began. On further questioning, she comments that her last menstrual period was 7 weeks ago.

A serum hCG level gives a value of 5,100 IU/litre, and a transvaginal ultrasound detects an adnexal mass separate to the ovary measuring 36mm.

Which of the following is the most appropriate management for this patient?

A. Observation only

B. Oxytocin

C. Laparoscopic salpingectomy

D. Misoprostol

E. Methotrexate

Correct Answer:Laparoscopic salpingectomy

Explanation:

This patient is presenting with an ectopic pregnancy, which refers to the implantation of a fertilised ovum outside of the uterus. Depending on the clinical circumstances, patients may be managed expectantly, medically or surgically. NICE criteria for surgical management include serum hCG levels above 5,000 IU/litre and a mass measuring ≥ 35mm. Surgical management for an ectopic pregnancy usually involves a laparoscopic salpingectomy, unless the other Fallopian tube is damaged in which case a laparoscopic salpingotomy would be offered.

Methotrexate is the first-line medical management for ectopic pregnancy and works by disrupting cell division. If the criteria for surgical management are not met, and the patient is able to return for a follow-up appointment, then it would be appropriate to offer medical management to the patient.

Misoprostol is a drug used for a medically induced termination of pregnancy, often in combination with mifepristone. It is not used in the management of ectopic pregnancies.

Many patients with ectopic pregnancies choose to undergo expectant management, which involves close observation only until the ectopic pregnancy resolves. However, the clinical features of this case mean that expectant management would not be safe, and surgical intervention is required.

Oxytocin is usually administered to patients requiring induction or augmentation of labour. It is not used in the management of an ectopic pregnancy.

Further reading:

https://geekymedics.com/ectopic-pregnancy/

Question:

A 65-year-old woman attends her GP surgery with a neck swelling. She reports that her neck swelling has developed over the previous month and is not associated with any pain. The patient suffers from type 1 diabetes mellitus. Examination reveals a diffuse thyroid swelling with no focal nodularity. Thyroid function tests reveal the patient is euthyroid. Anti-TPO and Anti-TG antibodies are also detected.

What is the MOST LIKELY diagnosis?

A. Riedel’s thyroiditis

B. Grave’s disease

C. Plummer’s toxic multinodular goitre

D. Thyroid cyst

E. Hashimoto’s thyroiditis

Correct Answer:Hashimoto’s thyroiditis

Explanation:

The most likely diagnosis is Hashimoto’s thyroiditis (a.k.a autoimmune thyroiditis). This condition is most common in post-menopausal women and those who suffer from other autoimmune diseases (e.g. T1DM). Autoimmune thyroiditis typically presents with a diffuse, firm and painless goitre. Thyroid function tests may show several different results, including euthyroid, transient hyperthyroidism, or hypothyroidism. Anti-thyroid antibodies will also be detectable, most notably Anti-TPO and Anti-TG antibodies.

Grave’s disease presents with a diffuse goitre, sometimes with an associated bruit, exophthalmos and pretibial myxedema. TSH receptor stimulating antibodies are typical in Grave’s disease.

Plummer’s toxic multinodular goitre develops on a background of multinodular goitre. It typically presents with a nodular goitre and symptoms of hyperthyroidism.

Riedel’s thyroiditis presents with a firm, fixed, irregular thyroid mass that is painless. It is associated with retroperitoneal fibrosis.

Thyroid cysts present as solitary thyroid nodules that are less firm. They are usually painless but cyst rupture may lead to pain.

Further reading:

https://patient.info/doctor/hashimotos-thyroiditis

Question:

A 50-year-old man presents with jaundice over the last 2 weeks. He denies any abdominal pain but has noticed some recent weight loss. He denies any fevers but does mention his stools have appeared pale and his urine has appeared darker. He has never smoked and drinks sparingly on social occasions about once a month. He travels often due to his work but denies having any tattoos or recreational drug use. His wife is his only sexual partner. There is no other past medical history.

On examination, he is jaundiced and appears slightly underweight. There are no other abnormalities noted and his vital signs are normal.

What is the most likely diagnosis?

A. Pancreatic cancer

B. Haemochromatosis

C. Alcoholic liver disease

D. Ascending cholangitis

E. HIV

Correct Answer:Pancreatic cancer

Explanation:

This patient most likely has a diagnosis of pancreatic cancer, given the history of painless jaundice and weight loss. Pancreatic cancer has an insidious onset and typically presents late. Early symptoms can include vague mild intermittent abdominal pain and weight loss. As the pancreatic tumour obstructs the common bile duct, the patient becomes progressively jaundiced.

Ascending cholangitis is unlikely in this scenario given the absence of fever and abdominal pain. Typically the condition presents with fevers, jaundice and jaundice. Patients with obstructive jaundice are at risk of developing ascending cholangitis due to stasis of bile.

There are no specific risk factors for HIV provided in the clinical scenario and HIV does not typically present with jaundice. HIV is often asymptomatic, however, patients can present with constitutional symptoms such as fever, night sweats, diarrhoea and weight loss. Other presenting features can include generalised lymphadenopathy and opportunistic infections (i.e. oral candida).

Alcoholic liver disease seems highly unlikely given the absence of a significant alcohol history. You would also expect to find more clinical signs of alcoholic liver disease on examination (i.e. ascites, caput medusa, spider naevia etc).

Haemochromatosis is unlikely in this scenario given there is no mention of a family history of the disease. Typical presenting symptoms appear between the ages of 40-60 in males, including fatigue, arthropathy, non-specific abdominal problems, erectile dysfunction cardiac problems and liver cirrhosis.

Further reading:

https://patient.info/doctor/pancreatic-exocrine-tumours

Question:

A 39-year-old woman presents to the emergency department with a severe headache that came on yesterday morning, and pain in her neck and shoulders which is made worse by movement. She has no significant medical history and is not on any medications.

On examination, she struggles to open her eyes due to the bright lights in the room, however, it is observed that her right eye is deviated nasally and is unable to abduct.

Her observations are

Oxygen saturation: 98% on room air

Respiratory rate: 20 breaths per minute

Heart rate: 98 beats per minute

Blood pressure: 130/82 mmHg

Temperature: 39.0 °C

What is the most likely mechanism causing her symptoms?

A. Ischaemia

B. Extrinsic compression of the sixth nerve by a space-occupying lesion

C. Trauma to the sixth nerve

D. Haemorrhage

E. Raised intracranial pressure

Correct Answer:Raised intracranial pressure

Explanation:

This patient is presenting with a fever, headache, neck stiffness and photophobia, which point towards a diagnosis of meningitis or encephalitis. Meningitis and encephalitis can cause raised intracranial pressure, which can, in turn, cause cranial nerve palsies. This explains the patient’s nasally deviated eye, which represents a sixth nerve palsy.

Although extrinsic compression of the sixth nerve by a space-occupying lesion could cause a sixth nerve palsy and a headache, it would not typically be associated with fever, neck stiffness and photophobia. Furthermore, sixth nerve palsies are false-localising, meaning they can be caused by raised intracranial pressure and not necessarily a lesion at the site of the nerve.

Trauma to the sixth nerve could cause sixth nerve palsy and headache, however, the symptoms of fever, neck stiffness and photophobia are more suggestive of meningitis or encephalitis.

The commonest cause of an isolated sixth nerve palsy in adults is ischaemic mononeuropathy due to diabetes, hypertension or atherosclerosis. However, the presence of fever, neck stiffness and photophobia make raised intracranial pressure more likely than ischaemia.

Although an intracranial haemorrhage could cause raised intracranial pressure, leading to a sixth nerve palsy, the history does not mention any recent head trauma or anticoagulant use, making this less likely.

Further reading:

https://geekymedics.com/the-abducens-nerve-vi/

Question:

A 31-year-old woman presents to her GP with a one-month history of right-sided facial pain. She reports that the pain comes on suddenly, often triggered by touching her face, and feels like an electric shock. She has between 10-20 of these episodes each day.

She has no significant past medical history and takes the combined oral contraceptive pill. On examination, she is tender to palpation over the maxillary and mandibular distributions of the trigeminal nerve on the right side.

Given the most likely diagnosis, what investigation is most appropriate to consider?

A. Lumbar puncture

B. MRI head

C. ESR

D. CT head

E. Nerve conduction studies

Correct Answer:MRI head

Explanation:

This patient’s symptoms are most likely caused by trigeminal neuralgia (TN), a neuropathic condition involving cranial nerve five. Most patients with TN do not require any further investigations as the diagnosis is clinical, but doctors should be aware of red flag symptoms and signs that may suggest a serious underlying cause (e.g. deafness/aural involvement, optic neuritis, family history of multiple sclerosis, age of onset under 40 years).

As this patient is under 40, the GP should consider ordering an MRI head to screen for intracerebral tumours, extracranial masses, lacunar infarcts, or demyelination plaques that might indicate multiple sclerosis.

A CT head might be sufficient to spot a tumour or mass but is not suitable for subtle infarcts or demyelination plaques.

Nerve conduction studies might confirm abnormal patterns of conduction in the trigeminal nerve but would not be very useful in determining the underlying cause.

ESR can be used in the diagnosis of giant cell arteritis but this condition usually presents with temporal headache, myalgia, and malaise and so is less likely to be the cause of this patient’s symptoms.

A lumbar puncture is useful in establishing a diagnosis of multiple sclerosis, which may present with trigeminal neuralgia, but does not screen for other important causes (e.g. masses or infarcts).

Further reading:

https://cks.nice.org.uk/topics/trigeminal-neuralgia

Question:

A trial is carried out to study the efficacy of a new disease-modifying antirheumatic drug (DMARD) on patients with rheumatoid arthritis. The assessment of disease severity involves the doctor examining the patient’s joints and judging the degree of joint swelling qualitatively. The doctors involved in the study all believe the DMARD should be effective and therefore expect the study to produce positive results.

What form of bias is most likely to be present here?

A. Central tendency bias

B. Observer bias

C. Misclassification bias

D. Procedure bias

E. Confounding bias

Correct Answer:Observer bias

Explanation:

The ability of a researcher’s expectations or preconceptions to affect the way they perceive and record a variable is observer bias. There are many forms of observer bias, including confirmation bias, where the researcher has a tendency to interpret data in a way that affirms their pre-existing beliefs, and the halo effect, where positive beliefs around one aspect of a person lead to other unfounded positive beliefs around other aspects of that person.

Procedure bias is the bias that arises from the conditions in which a study is undertaken, for example not giving participants enough time to complete a questionnaire or interviewing participants in a non-private room.

Misclassification bias is the bias that arises from incorrectly classifying a study participant.

Central tendency bias is the bias that arises from people’s tendency to rate items towards the middle of a scale.

Confounding bias is the bias that arises when an additional factor is independently associated with both the exposure and the outcome. This leads to an apparent correlation between the exposure and outcome.

Further reading:

https://geekymedics.com/statistics-for-medical-students/

Question:

A 64-year-old man with progressive chronic kidney disease asks his nephrologist which future treatment is the most suitable for him. He currently has symptoms of fluid overload managed by high dose diuretics, nausea on a morning, and occasional itchiness of the skin. He has had two admissions for treatment of hyperkalaemia in the last 8 weeks. His urine output is reduced although he restricts his fluid intake to help manage his volume status. eGFR is currently 9ml/min.

He describes his quality of life as being very good and has an exercise tolerance of approximately a mile. His past medical history is notable for inflammatory bowel disease. He also underwent resection of a bowel adenocarcinoma, with formation of a stoma, one year ago, which was complicated by a parastomal hernia.

Which of the following is the most appropriate management option?

A. Haemodialysis

B. Pre-emptive renal transplantation

C. Automated peritoneal dialysis

D. Conservative care, without dialysis

E. Continuous ambulatory peritoneal dialysis

Correct Answer:Haemodialysis

Explanation:

This patient already has symptoms in keeping with advanced CKD and is therefore expected to require treatment imminently. He would probably be best suited to haemodialysis in order to control his fluid overload and uraemic symptoms.

The recent colonic cancer precludes him from renal transplantation according to British Transplant Society guidelines, for a minimum of 2 years. Additionally, he would be unlikely to undergo transplantation in time before he required dialysis, given the extensive workup required prior to transplant.

Peritoneal dialysis (PD) is generally discouraged in patients with a stoma, due to the risk of leaks and peritoneal dialysis catheter infections. Inflammatory bowel disease is also a risk factor for peritonitis and therefore peritoneal dialysis is usually avoided. KDOQI guidelines suggest that the risk associated with PD in such patients be carefully balanced to reach an individualised decision.

Conservative care is becoming increasingly recogniSed amongst frail or co-morbid patients as a means of managing symptoms associated with CKD. Whilst this patient clearly has developing symptoms, he still has a good quality of life so he is more likely to benefit from haemodialysis.

Further reading:

https://bts.org.uk/wp-content/uploads/2016/09/10\_RA\_KidneyRecipient-1.pdf

Question:

A 41-year-old gentleman presents to his GP with a history of increasing lethargy, joint pains and loss of libido. On examination, he has mild hepatomegaly and notably bronzed skin. He takes no regular medications but reports that his father died of heart failure and had ‘liver disease’.

Which of the following investigations is most useful in the initial investigation of the likely underlying diagnosis?

A. Blood borne virus screen

B. Liver biopsy

C. Testosterone, FSH and LH assays

D. MRI liver

E. Serum ferritin and transferrin saturation

Correct Answer:Serum ferritin and transferrin saturation

Explanation:

The likely diagnosis here is haemochromatosis. Serum transferrin saturation is the first lab test to become abnormal and should be raised alongside ferritin. Once a diagnosis is established, MRI liver and biopsy allow quantification of the iron load in the liver/presence of cirrhosis and therefore guide prognosis and management. Testosterone, FSH and LH assays are useful in establishing gonadal dysfunction due to iron deposition. A blood-borne virus screen may be useful if the diagnosis is uncertain and there is suspicion of hepatitis. In this scenario, however, haemochromatosis is more likely and should be investigated first.

Further reading:

https://patient.info/doctor/hereditary-haemochromatosis

Question:

A 32-year-old female presents to the general practitioner with complaints of severe pain on defecation for the last one week. The pain has gradually worsened and she states she is occasionally able to see small amounts of red blood on the toilet paper after wiping. She states that she has been suffering from constipation for the last five months and although she has attempted to increase her dietary intake of fibre, this has had limited impact on her constipation symptoms. She moves her bowels every three days and her stools are small and pellet-like. She has no other medical problems, does not take any medications and has no relevant family medical history. She has no recent travel history.

On physical examination, her vital signs are normal. A rectal examination is attempted, however it is limited by extreme pain and anal sphincter spasm.

Which of the following is the best initial step in management?

A. Metronidazole

B. Warm baths, stool softeners and topical glyceryl trinitrate (GTN)

C. Sulfasalazine

D. Referral for surgery

E. Loperamide

Correct Answer:Warm baths, stool softeners and topical glyceryl trinitrate (GTN)

Explanation:

Painful rectal bleeding in a young female patient who has a history of long-standing constipation, a spasmodic anal sphincter and pain on digital rectal examination is highly suggestive of an anal fissure. First-line treatment involves stool softeners, warm baths and a topical vasodilator such as glyceryl trinitrate. A topical analgesic can also be prescribed for these patients in the form a lidocaine jelly for pain relief.

Referral for surgery would be necessary if the patient had failed medical management. Rarely, a lateral internal sphincterotomy can be performed in patients who have anal fissures refractory to medical management.

Sulfasalazine is used in the management of inflammatory bowel disease. It does not have a role in the treatment of anal fissures.

Metronidazole is a commonly used medication for the treatment of, for example, Clostridium difficile colitis. It does not have a role in the medical management of anal fissures. Concurrent consumption of metronidazole with alcohol can lead to a disulfiram-like reaction (flushing, tachycardia and nausea), hence it is important to inform patients to avoid alcohol when taking this medication.

Loperamide is an over-the-counter opiate agonist that is likely to worsen constipation and therefore should be avoided in those who are suffering from anal fissures.

Further reading:

https://patient.info/doctor/anal-fissure-pro#nav-4

Question:

A 32-year-old patient presents with a 6-week history of lower back pain and associated right leg pain. He describes the acute onset of pain following lifting a heavy weight in the gym. He reports intermittent, severe, shooting pain in the right leg which shoots down the full length of his leg into the sole of the foot. He does not report any sensory disturbance, urinary symptoms or bowel disturbance.

Clinical examination of the right leg reveals a mild weakness in ankle plantar flexion, loss of ankle jerk and sensory disturbance on the lateral aspect of the foot.

Compression of which of the following nerves is most likely responsible for the patient's symptoms?

A. Right L5 nerve

B. Right L3 nerve

C. Right L4 nerve

D. Cauda equina

E. Right S1 nerve

Correct Answer:Right S1 nerve

Explanation:

The S1 nerve root is responsible for supplying the gastrocnemius muscle. Compression of the nerve can, therefore, lead to weakness in ankle plantar flexion and hip extension, sensory loss within the S1 dermatome (lateral aspect of the foot) and loss of the ankle jerk reflex.

L5 root compression may lead to sensory loss along the lateral aspect of the leg, dorsal foot and great toe. Weakness may be detected in hip abduction, knee flexion and dorsiflexion of the ankle.

Compression of L4 is characterised by loss of knee jerk reflex, weakness in knee extension and sensory loss over the medial aspect of the leg.

L3 compression may cause sensory disturbance in the anterior thigh and medial knee. Weakness may be found in thigh adduction and flexion.

Cauda equina compression affects lumbar and sacral roots below the L3 level. Classic sensory disturbance involves the perineal region, with loss of anal tone and bladder disturbance. Loss of ankle reflexes may be observed as well as unilateral or bilateral sciatic pain.

Further reading:

https://en.wikipedia.org/wiki/Sacral\_spinal\_nerve\_1

Question:

A 19-year-old is brought to A&E by their partner after he suffered severe burns to his chest whilst leaning over a hot hob during a 'Bake-Off' competition that they were having against one another. The patient has removed his T-shirt as it was loose and non-adherent to the site, and the burn is clearly visible in the upper chest region. There is an area of significant erythema which measures approximately 8cm across, with notable blistering. He is complaining of extreme pain.

The lesion feels relatively moist to the touch and blanches when pressure is applied. The doctor prescribes the patient analgesia, cleans the site, and applies a sterile dressing. He informs the patient that the lesion will hopefully avoid scarring and documents in the notes that he is safe for discharge. Before the patient goes home he gives him some general first-aid advice for actions to take if another burn is suffered in the future.

Which of the following is an appropriate first-aid approach to a patient who has suffered a burn?

A. Immediate application of ice to the site of injury

B. Continuous irrigation using cold water for at least 5 minutes

C. Wrap the burn with soft material

D. Removal of any clothing that is stuck to the burn

E. Continuous irrigation using cold water for at least 20 minutes

Correct Answer:Continuous irrigation using cold water for at least 20 minutes

Explanation:

Burns are a very common injury presenting to A&E, and having knowledge of a general first-aid approach to these injuries is important. All patients should be encouraged to irrigate the burn using cold water for at least 20-30 minutes; this could involve having a cold shower or placing the site of injury under a tap. Other recommended steps include:

Keeping the patient warm

Ensuring adequate hydration

Considering wrapping the burn in clingfilm to replace the skin barrier

The burn can then be assessed further once this first-aid has taken place; there may be a need for consultation with a specialist burns centre if the lesion is extensive, or simple dressings may be adequate.

Application of ice to the site of injury is not recommended; this can cause vasoconstriction, which can cause further damage and impair the healing process.

Patients should be encouraged to irrigate the burn for at least 20 minutes; whilst most people are aware of the need to do this, often the extent of time for which this should continue is not known. Cooling the burn should take place for much longer than just 5 minutes.

Removal of any clothing that is stuck to the burn is not recommended; this has the potential to cause further trauma to the wound. Clothing, jewellery etc... should only be removed if it is loose and non-adherent to the site of injury.

Wrapping the burn with soft material is not recommended, the burn site should be cleared if possible. There is the potential for the material to get stuck within the burn, which could further complicate the management.

Further reading:

https://cks.nice.org.uk/topics/burns-scalds/management/first-aid-initial-management/

Question:

You are a junior doctor working in the emergency department. You are asked to review a 42-year-old male patient who has self-presented to the department complaining of headache, sweating, palpitations and flushing.

He describes recurrent similar episodes which are now occurring several times per day. He has presented to the emergency department today because he describes this as the worst he has felt and feels significantly anxious.

On examination, he is very flushed and appears anxious. He is tachycardic and hypertensive. Blood tests are taken and show a raised white cell count. The rest of his blood tests, including urea and electrolytes, thyroid function, random cortisol and CRP are all within normal limits.

What is the most likely underlying diagnosis?

A. Hyperthyroidism

B. Addison's disease

C. Phaeochromocytoma

D. Acromegaly

E. Conn's syndrome

Correct Answer:Phaeochromocytoma

Explanation:

Phaeochromocytoma is rare and often presents with non-specific, episodic symptoms. It is a catecholamine-producing tumour arising from sympathetic paraganglionic cells and in 90% of cases is found in the adrenal gland. The classical triad is of episodic headache, sweating and tachycardia. It may also be associated with hypertension. and a raised white cell count on full blood count.

Addison’s disease may present with symptoms of lethargy, fatigue, weakness, abdominal pain and muscle cramps. Blood pressure is typically low rather than elevated and hyperkalaemia and hyponatraemia may be seen.

Hyperthyroidism may cause similar symptoms but is ruled out with normal thyroid function tests.

Acromegaly may present with a range of symptoms including, arthralgia, coarsening of facial features, enlarging hands and feet, jaw malocclusion and macroglossia. Hypertension can also occur but none of the other features present in this case fit with acromegaly.

Conn’s syndrome should be considered in patients presenting with hypertension that is refractory to medical management or with onset under the age of 40. Hypokalaemia occurs due to aldosterone excess. In the absence of metabolic disturbance in this patient, and with other symptoms not explained by hyperaldosteronism, this is less likely.

Further reading:

https://patient.info/doctor/phaeochromocytoma-pro

Question:

An 85-year-old woman is admitted to hospital 3 days after a fall at home, in which she tried to get up from her chair without her frame and hit her head on a cabinet. She does not think that she lost consciousness, but her daughter reports that today she has been less responsive and more disorientated than usual.

She has a past medical history of atrial fibrillation and recurrent falls. She is on anti-coagulation therapy for her atrial fibrillation with warfarin. She has no history of renal or liver disease.

On examination, her observations are currently stable. An abbreviated mental test (AMT) is conducted and her score is 5/10 – she is disorientated to time and place. Her GCS is 14/15. Neurological examination reveals that her pupils are equal and reactive to light, but there is left-sided weakness on examination of the limbs.

A non-contrast CT head is conducted, which demonstrates a crescentic hyperdensity between the dura mater and the arachnoid mater.

What is the most likely diagnosis in this patient?

A. Intracerebral haemorrhage

B. Subdural haemorrhage

C. Extradural haemorrhage

D. Ischaemic stroke

E. Subarachnoid haemorrhage

Correct Answer:Subdural haemorrhage

Explanation:

This appears to be a subdural haemorrhage in which there is a collection of blood between the inner dura mater and the arachnoid mater of the brain, and should be suspected in elderly patients with a deterioration in consciousness and a history of recurrent falls. In these patients, head trauma can result in bridging veins traversing the subdural space tearing – due to age-related cerebral atrophy these veins are often already under tension in the elderly and hence prone to tearing even with minor head trauma. Typically patients will present with a gradual deterioration in consciousness or alertness, and possibly headache, nausea/vomiting or seizures if the bleed is large and causing a rise in intracranial pressure. It is important to ask about anticoagulation therapy as if patients are taking an anticoagulant (for example, this patient is on warfarin for atrial fibrillation), the anticoagulant agent will need to be stopped, coagulation profile monitored and correction using vitamin K may be required. A non-contrast CT scan is the first-line investigation for suspected subdural haemorrhage, and will typically show a crescentic hyperdensity caused by the accumulation of blood between the dura mater and arachnoid mater.

Extradural haemorrhage usually presents with a history of trauma to the temporal region and will appear as a lens-shaped hyperdensity rather than crescent-shaped, as the bleed is limited by the periosteum of the cranial suture lines.

Subarachnoid haemorrhage typically causes a ‘thunderclap’ headache which comes on very suddenly. CT scan will demonstrate a collection of blood between the arachnoid mater and the cerebrum.

Intracerebral haemorrhage and ischaemic stroke will more frequently present with focal neurological symptoms, rather than symptoms of raised intracranial pressure. CT scans will demonstrate intra-cerebral haemorrhage and ischaemia respectively, rather than extra-cerebral changes in density.

Further reading:

https://patient.info/doctor/subdural-haematoma-pro

Question:

A 19-year-old female presents to the emergency department with acute wheeze and shortness of breath. She has had worsening symptoms for the past 4 hours and has had no improvement from her salbutamol inhaler. Her past medical history includes asthma, hay fever and eczema. She is a non-smoker and does not drink alcohol. She has had one previous admission to critical care for acute asthma.

On examination, she is unable to complete full sentences, she has a widespread expiratory wheeze on auscultation, and her peak flow is 190 L/min (usually 400). Her vital signs are as follows: HR 120bpm, RR 26, temp 36.8oC, SpO2 93% (room air), BP 120/75 mmHg.

An ABG is requested:

Result Reference range

pH 7.37 (7.35 - 7.45)

PaO2 10.2 kPa (11 - 13)

PaCO2 5.8 kPa (4.7 - 6.0)

What feature characterises this as a life-threatening asthma exacerbation?

A. History of previous critical care admission

B. Inability to complete full sentences

C. PaO2 10.2 kPa

D. PaCO2 5.8 kPa

E. PEFR 190 l/min

Correct Answer:PaCO2 5.8 kPa

Explanation:

The correct answer is PaCO2 5.8. An acute exacerbation of asthma with a normal PaCO2 is classified as life-threatening. This is because CO2 should be low due to hyperventilation, so if the patient is no longer “blowing off” CO2 then they are beginning to tire.

It is important to be familiar with the criteria for acute asthma exacerbations. Any life-threatening features should prompt immediate discussion with critical care as the patient may require intubation and ventilation. Patients can deteriorate extremely rapidly once they tire and prior discussion with critical care is helpful in these scenarios.

The previous history of critical care admission is an important feature of the history and may alert you to the fact that this patient may require critical care support on this admission.

Inability to complete full sentences is classified as a feature of acute severe asthma, as is her PEFR (47.5% of her usual).

Further reading:

https://www.brit-thoracic.org.uk/document-library/guidelines/asthma/btssign-asthma-guideline-quick-reference-guide-2016/

Question:

A 28-year-old pregnant woman (G3P0 at 25 weeks gestation) presents to the emergency department with acute onset right upper abdominal pain, jaundice and hepatomegaly. Gross examination of the abdomen reveals clear shifting dullness indicating ascites. She is currently under the care of the obstetrics team due to her past medical history of antiphospholipid syndrome.

An ascitic tap is performed and the serum ascites albumin gradient (SAAG) is ascertained. A raised gradient of 1.5 g/dL is noted (>1.1 g/dL).

Given this presentation, what is the most likely diagnosis to cause a raised SAAG in this scenario?

A. Sarcoidosis

B. Focal segmental glomerulosclerosis

C. Endometriosis

D. Hepatic vein obstruction

E. Cirrhosis

Correct Answer:Hepatic vein obstruction

Explanation:

The correct answer is hepatic vein obstruction (Budd-Chiari syndrome). Although this is an extremely rare presentation, the history of a prothrombotic disorder (anti-phospholipid syndrome) in a background of pregnancy with a raised SAAG would point to this disease above the other options provided.

Liver cirrhosis is another cause of raised SAAG. However, given the acute nature of this presentation and history of prothrombotic disease, this would be less likely to be the case. It must be said that a thorough social history regarding alcohol intake would be appropriate in such a presentation given the rarity of Budd-Chiari syndrome.

Focal segmental glomerulosclerosis could cause a raised SAAG as it is a form of nephrotic syndrome. However, the absence of generalised oedema along with the right upper quadrant pain and jaundice would make this less likely.

Both sarcoidosis and endometriosis are incorrect as these conditions would give a low gradient SAAG.

Further reading:

https://geekymedics.com/ascitic-fluid-analysis/

Question:

An 83-year-old female is admitted to the medical admissions ward following a diarrhoeal illness and dehydration. She has a past medical history of poorly controlled type 2 diabetes, essential hypertension, previous myocardial infarcts and recurrent urinary tract infections. She has continued to take her regular medications during her acute illness, which include ramipril 10mg OD, metformin 500mg TDS, aspirin 75mg OD, bisoprolol 5mg OD and over-the-counter ibuprofen for general aches.

On examination, she has capillary refill time of greater than 4 seconds, reduced skin turgor and dry mucous membranes. Her blood pressure is 90/60 mmHg and her heart rate is 60 bpm. Blood tests show a serum potassium concentration 6.0mmol/litre and a doubling of her creatinine level compared to her baseline.

What is the most important advice/management for this patient prior to discharge?

A. Offer dietary advice about potassium, salt and phosphate intake

B. To stop nephrotoxic drugs during illness

C. Stop ACE-inhibitor on discharge

D. Switch to an alternative non-steroidal anti-inflammatory analgesic

E. Organise an outpatient renal ultrasound

Correct Answer:To stop nephrotoxic drugs during illness

Explanation:

Acute kidney injury (AKI) is seen in 13–18% of all people admitted to hospital, with older adults being particularly affected. This patient’s AKI is multifactorial. It follows an acute illness with dehydration, which is enough on its own to cause renal impairment. Furthermore, she is on several nephrotoxic medications including Ramipril, which is not directly nephrotoxic but affects the glomerular filtration rate and Ibuprofen, which is directly nephrotoxic. The use of Ibuprofen is not recommended for use in patients with chronic kidney disease, which this patient likely has given her poor diabetes control. ACE-inhibitors can also cause electrolyte disturbances such as hyperkalaemia.

The important management in this patient’s AKI is to adequately rehydrate her, stop her nephrotoxic medication in the acute period and review the medications again prior to discharge. It is important to advise her of the ‘sick day rule’ when she should stop taking her nephrotoxic medications when she is ill. Some medication, like ACE-inhibitors, are important in cardiovascular disease and are proven to confer mortality benefit (they are particularly useful in patients with proteinuria secondary to diabetes). It would be preferable, therefore, that she could resume her ACE-inhibitor once her AKI and hyperkalaemia have resolved. Her renal function would also need to be monitored in the community with more frequent blood test initially and subsequently at any new dose change.

She should not be taking NSAIDs if possible and switched to an alternative analgesic medication that does not affect the kidneys.

There is no indication for an outpatient ultrasound unless there was evidence of accelerated progression of CKD or symptoms of urinary tract obstruction (see NICE guidelines for more details).

Dietary advice is important but unlikely to confer as much benefit as advising the patient to avoid nephrotoxic medication during acute illness. She has poorly controlled diabetes and her diet is likely to be suboptimal already.

Further reading:

https://www.nice.org.uk/guidance/cg182/chapter/1-Recommendations

Question:

A 35-year-old man presents to the emergency department with sudden-onset severe back pain. He denies any trauma and the pain came on suddenly after standing up from sitting. Over the last 5 months, he has had episodes of sweating, palpitations, insomnia, feeling uncomfortably hot, and has had unexpected weight loss.

He has a history of COPD and has recently been discharged from hospital with a 5-day course of prednisolone due to an exacerbation. He finds it difficult to take his medication regularly and admits to poor compliance. There is no relevant family history and he no longer smokes but drinks 16 units of alcohol per week. He works in an office and he does not exercise regularly.

On examination, there is thoracic vertebral tenderness and finger clubbing. An x-ray is performed which demonstrates a thoracic vertebral fracture.

What is the most likely underlying cause of his presentation?

A. Sedentary lifestyle

B. Corticosteroid use

C. Hyperthyroidism

D. Alcohol consumption

E. Osteogenesis imperfecta

Correct Answer:Hyperthyroidism

Explanation:

Hyperthyroidism is correct. This patient has presented with a compression vertebral fracture in the absence of any trauma or physical activity that would ordinarily contribute to this type of fracture at a relatively young age, suggesting that there may be a problem with bone strength. The history of insomnia, weight loss, heat intolerance, and sweating are all suggestive for a diagnosis of hyperthyroidism. The presence of fingernail clubbing also suggests thyroid acropachy, which is seen in hyperthyroidism. Patients with untreated hyperthyroidism are at an increased risk of osteoporosis due to increased osteoclast activity, making this the most likely cause of the osteoporotic fracture.

Although corticosteroids can cause osteoporosis, this patient has only been taking prednisolone for 5 days, which is a very short timeframe. The risk of osteoporosis is higher in patients that have taken corticosteroids for more than a few weeks to months, and patients are offered bone protection if they are to be prescribed corticosteroids for time periods as long as this.

Although alcohol consumption can lead to osteoporosis, given this patient's age and the fact that they drink slightly over the recommended amount per week, it is unlikely that this would be the cause of his presentation.

Sedentary lifestyle is incorrect. This is a risk factor for osteoporosis in older patients. This patient is 35 and it is extremely unlikely that this alone would contribute to its development. Osteoporotic fractures in younger patients should raise suspicion of an underlying pathological process and require further investigation.

Although osteogenesis imperfecta can cause osteoporosis, this is an autosomal dominant condition that presents in childhood with fractures following minor trauma. This patient has no family history, nor any history of injury or fractures in his childhood.

Further reading:

https://patient.info/doctor/hyperthyroidism

Question:

A 31-year-old football player comes to the walk-in clinic with severe left knee pain. Earlier today, during her football match, the patient landed on her left knee in an awkward manner. She heard a popping sound which was followed by significant swelling around the left knee joint. She has no past medical history.

Physical examination reveals increased laxity on the anterior drawer test of the left tibia relative to the femur.

Which of the following investigations would be most appropriate in confirming the diagnosis?

A. Left knee x-ray

B. Left knee magnetic resonance imaging (MRI)

C. Left knee posterior drawer test

D. Left knee joint aspiration

E. Left femur bone biopsy

Correct Answer:Left knee magnetic resonance imaging (MRI)

Explanation:

The football player in the above scenario is likely to have suffered an anterior cruciate ligament (ACL) injury. ACL injuries often occur in sports that require pivoting or rapid changes in direction. Such patients will often complain of a popping sensation followed by rapid onset haemarthrosis. Physical examination demonstrates increased anterior translation of the tibia relative to the femur when performing the anterior drawer test. The Lachman’s test is another physical manoeuvre that can be utilised when clinically assessing ACL injuries. The diagnostic investigation of choice is a knee MRI.

A knee x-ray would be useful if a fracture or knee osteoarthritis was being considered. Although the patient does have a recent history of trauma, the mechanism of the injury and the popping sensation followed by the swelling is more indicative of a ligamentous injury for which plain radiography would have limited diagnostic utility.

The posterior drawer test is a clinical test used to diagnose posterior cruciate ligament injuries. This patient mechanism of injury and increased laxity on the anterior drawer test indicates an ACL injury.

Bone biopsies can be performed when the diagnosis of osteomyelitis or a bone tumour needs to be confirmed. The patient in the above scenario is presenting with an acute injury which is likely to be soft tissue in origin.

A knee joint aspiration is an important diagnostic technique in conditions where synovial fluid microscopy is needed, for example, septic arthritis and pseudogout (calcium pyrophosphate dehydrate disease). Septic arthritis is likely to present with signs of an underlying infective process (e.g. tachycardia, fever and hypotension) in a patient with risk factors such as poorly controlled diabetes, immunosuppression, prosthetic joints, history of intravenous drug use (IVDU) and old age. Septic joints need immediate joint aspiration as joint destruction is a possible outcome without prompt intervention. Pseudogout is a type of acute inflammatory arthritis that is often triggered by dehydration, acute illness or recent surgery and is unlikely to be the diagnosis in the above scenario.

Further reading:

https://patient.info/doctor/knee-ligament-injuries-pro#nav-4

Question:

A 45-year-old woman presents to the emergency department complaining of severe upper abdominal pain which began 2 hours ago. and has increased in severity. It initially appeared to come in waves but is now constant. She has vomited twice and feels hot and sweaty.

On examination, the patient is overweight and looks pale and unwell. Her sclerae appear slightly icteric, and general observations reveal a HR of 128bpm, RR 24/min and temperature of 38.8°C. Abdominal examination exhibits severe tenderness in the right upper quadrant with guarding, although there are no masses, nor any evidence of rigidity or rebound tenderness. Murphy's sign is negative.

Given the probably diagnosis, what is the most likely complication?

A. Laparotomy wound infection

B. Pulmonary embolism

C. Pancreatitis

D. Life-threatening bleeding

E. Intestinal perforation

Correct Answer:Pancreatitis

Explanation:

The most likely diagnosis, in this case, is ascending cholangitis; a potentially life-threatening infection of the biliary system, arising due to bile stasis allowing for the colonisation of the tract with bacteria. The most common trigger for this stasis is choledocholithiasis (gallstones), although any pathology causing obstruction can potentially be implicated (such as biliary strictures, tumours etc...). The classic presentation is with Charcot's triad of clinical features, which consists of fever, jaundice, and right upper quadrant pain - the patient is displaying all of these, and this is, therefore, the most likely cause of the patient's symptoms.

The diagnosis will usually be confirmed via ultrasound of the biliary system; this will reveal dilation of the common bile duct (the stones themselves are unlikely to be visualised, as only calcified gallstones are visible on ultrasound). Antibiotic provision is the most important aspect of management, with biliary drainage also often necessary for definitive management; this involves endoscopic retrograde cholangiopancreatography (ERCP) to remove the obstruction, with a stent possibly also inserted. The most common complication of ERCP is pancreatitis, due to the close anatomical relationship of the pancreatic duct to the site of obstruction - this affects between 3-5% of patients.

Intestinal perforation and life-threatening bleeding can both arise as a result of ERCP; however, these are exceptionally rare and are much less likely to affect this patient than pancreatitis.

ERCP does not require a surgical incision, and whilst patients with ascending cholangitis will often undergo subsequent cholecystectomy, this is usually carried out via a laparoscopic approach. Therefore, a laparotomy wound infection is unlikely to affect this patient.

Pulmonary embolism is a feared complication in patients immobilised post-surgery; however, prolonged immobilisation is not required for ERCP, which is carried out in a similar manner to any upper GI endoscopy. It is also not usually required for cholecystectomy, which is carried out most commonly as a day procedure. Therefore, pulmonary embolism is likely to complicate this patient's recovery.

Further reading:

https://patient.info/doctor/cholangitis

Question:

A 70-year-old man is referred to a diabetes clinic. He was incidentally found to have elevated blood glucose levels and an elevated HbA1c of 65 during a recent A&E attendance. He has a background of chronic kidney disease (CKD), with a most recent eGFR of 25. He also has ischaemic heart disease and heart failure and a BMI of 22.

What is the most appropriate first-line medical treatment?

A. Gliclazide

B. Pioglitazone

C. Insulin

D. Exenatide

E. Metformin

Correct Answer:Gliclazide

Explanation:

This man’s diabetes management is complicated by his other comorbidities. Gliclazide would be the most appropriate treatment. Metformin is contraindicated by his CKD (eGFR <30) and pioglitazone is contraindicated because of his heart failure. Exenatide is used in obesity-related type 2 diabetes. Insulin is always an option, but it would be more appropriate to try oral therapy first.

Further reading:

https://www.nice.org.uk/guidance/ng28

Question:

A 5-year-old girl is brought to the GP surgery with a facial rash. On examination, you note several golden-crusted lesions around the mouth and nose, with some surrounding erythema. She has no past medical or family history. Her mother reports that other children at school have had a similar rash. Vital signs are normal.

Which of the following is the most likely cause of the condition?

A. MRSA

B. Streptococcus pyogenes

C. Staphylococcus aureus

D. Varicella zoster virus

E. Herpes simplex virus

Correct Answer:Staphylococcus aureus

Explanation:

The most likely diagnosis is impetigo, given the classical description of golden-crusted lesions with surrounding erythema, in addition to the history of contacts with similar symptoms.

Impetigo is a superficial infection of the skin, most commonly caused by staphylococcus aureus.

Streptococcus pyogenes is another potential cause of impetigo, although it is significantly less common than staphylococcus aureus. This organism commonly causes pharyngitis (often referred to as "strep throat").

Meticillin-resistant S. aureus (MRSA) is another potential cause of impetigo which is becoming increasingly common (although it is still less common than non-resistant S. aureus).

Herpes simplex virus can cause oral (HSV-1) and genital disease (HSV-2). Typical presenting symptoms include pain and blistering within the mouth or around the lips (often referred to as cold sores). The individual lesions are vesicular (not golden-crusted).

Varicella-zoster virus causes chickenpox in children. It typically presents with fever, headache, malaise and crops of vesicles. The lesions are usually intensely pruritic and pass through a sequence of stages including papule, vesicle, pustule and crust.

Further reading:

https://patient.info/doctor/impetigo-pro

Question:

A 45-year-old woman presents to the emergency department with sudden onset pleuritic chest pain and shortness of breath. Her observations show a heart rate of 118 per minute, respiratory rate of 22 per minute, oxygen saturations of 94% on air, a blood pressure of 124/84 mmHg and a normal temperature. A chest X-Ray is normal and an ECG shows sinus tachycardia. Her past medical history includes oestrogen-receptor positive breast cancer, type 2 diabetes mellitus (T2DM), rheumatoid arthritis and depression.

Which factor is most likely to have contributed to her presentation?

A. Citalopram

B. Anastrozole

C. Metformin

D. Tamoxifen

E. Prednisolone

Correct Answer:Tamoxifen

Explanation:

The correct answer is tamoxifen. This patient is most likely presenting with a pulmonary embolism. Tamoxifen is a selective oestrogen receptor modulator (SERM) that is often prescribed to pre-menopausal women with oestrogen receptor-positive breast cancer. It is associated with an increased risk of venous thromboembolism (VTE) and so is most likely to have contributed to this patient's presentation out of the medications listed here.

Anastrozole is an aromatase inhibitor often prescribed to post-menopausal women with oestrogen receptor-positive breast cancer. An increased risk of VTE is not a common side effect of this medication. Also, as this patient is only 45-years-old she is much more likely to be taking tamoxifen for her cancer.

Citalopram is an example of a selective serotonin reuptake inhibitor (SSRI) that is commonly prescribed for depression. SSRIs are not associated with an increased risk of VTE.

Metformin is a medication used to treat T2DM. It is not associated with an increased risk of venous thromboembolism.

This patient may be taking prednisolone for an acute flare of their rheumatoid arthritis. While thromboembolism is a potential side effect, it is listed as 'uncommon' in the BNF and not as likely to have contributed as tamoxifen.

Further reading:

https://bnf.nice.org.uk/drug/tamoxifen.html

Question:

Jo, a 26-year-old woman, attends her GP practice complaining of abdominal pain during sex. On further discussion, you ascertain that Jo has had multiple sexual partners over the past few months. She is on the combined oral contraceptive pill and does not regularly use condoms. She has not noticed any change to her periods.

A pregnancy test is negative. Speculum examination reveals mucopurulent discharge and she is in considerable discomfort during the examination.

What is the most likely diagnosis?

A. Pelvic inflammatory disease

B. Endometriosis

C. Urinary tract infection

D. Ovarian torsion

E. Ectopic pregnancy

Correct Answer:Pelvic inflammatory disease

Explanation:

Pelvic inflammatory disease describes infection and inflammation of the female pelvic organs. It is usually due to infection by chlamydia or gonorrhoea species. It requires prompt treatment as it carries risks of infertility, ectopic pregnancy and chronic pelvic pain.

While ovarian torsion would also cause pain during the examination, the typical onset would be more acute and not associated with abnormal vaginal discharge.

As she has had a negative pregnancy test, an ectopic pregnancy is unlikely.

Endometriosis can cause deep dyspareunia, but it is usually associated with menstrual irregularity and normal vaginal discharge.

Urinary tract infections can cause dysuria and urinary frequency but not abnormal vaginal discharge.

Further reading:

https://cks.nice.org.uk/pelvic-inflammatory-disease#!scenario

Question:

A 14-year-old male presents with abdominal pain and fatigue. On examination vitals are within normal limits, skin turgor is mildly decreased, and his mouth appears dry. Serum electrolyte and glucose levels are then measured, and the results shown in the table below.

Test Result (mmol/L) Normal Range (mmol/L)

Sodium 130 136-144

Potassium 4.0 3.7-5.1

Chloride 102 97-105

Magnesium 2.0 1.7-4.8

Phosphate 3.1 2.5-4.8

Bicarbonate 13 22-30

Glucose 24 <7.8

What process is the major driver of this patient’s hyponatremia?

A. Renal sodium loss

B. Dehydration

C. Syndrome of inappropriate antidiuretic hormone

D. Hyperglycaemia

E. Metabolic acidosis

Correct Answer:Hyperglycaemia

Explanation:

This patient is presenting with diabetic ketoacidosis (DKA). Without insulin, glucose accumulates in the intravascular space, unable to enter cells. As glucose is osmotically active, water is drawn across the cell membrane diluting the concentration of other serum electrolytes. Thus DKA is a hyperosmolar state, and the dilutional hyponatremia is driven by hyperglycaemia.

As serum sodium changes with a predictable relationship to glucose, the following formula can be used to calculate the corrected sodium level:

Corrected sodium = measured sodium + 0.3 x (glucose – 5.5) mmol/L

In addition to a dilutional hyponatremia, hyperglycaemia in DKA creates an osmotic diuresis, causing increased renal excretion of sodium. However, renal sodium loss per se is not the major cause of hyponatremia in DKA.

Although total body water is often reduced in DKA, dehydration does not account for the hyponatremia. Dehydration, in isolation, should cause hypernatremia as serum sodium becomes more concentrated. Similarly, while a metabolic acidosis is typical in DKA, this does not cause hyponatremia.

Syndrome of inappropriate antidiuretic hormone may occur in severely ill people, but it is not in keeping with the clinical picture of moderate dehydration.

Further reading:

https://emedicine.medscape.com/article/118361-overview

Question:

A 51-year-old woman presents to her GP with a new skin lesion which appeared 3 weeks ago. It has grown in size since and has bled on two occasions.

On examination, there is a raised dark bluish-red lesion measuring 1 cm in diameter on the anterior aspect of the right leg. Dermatoscopy shows the pigment in the lesion is melanin rather than altered blood. Several colours are seen with an asymmetrical distribution and an atypical pigment network.

What is the most likely diagnosis?

A. Pigmented basal cell carcinoma

B. Haemangioma

C. Squamous cell carcinoma

D. Nodular melanoma

E. Melanocytic naevus

Correct Answer:Nodular melanoma

Explanation:

This woman is presenting with a rapidly-growing pigmented lesion on her leg, which raises the suspicion of a melanoma. The raised appearance makes this most likely to be a nodular melanoma. These are rapidly growing nodules that often bleed. Although they may be dark bluish-red, 60% of nodular melanomas are amelanotic.

Pigmented basal cell carcinomas have a similar appearance to nodular melanomas, however, they are typically slow-growing, emerging over months to years, whereas nodular melanomas are typically faster-growing, emerging over weeks to months.

Haemangiomas are bright red lesions that may be flat or raised and may bleed if scratched. However, as dermatoscopy shows the colour of the lesion comes from melanin rather than altered blood, this makes a nodular melanoma the more likely diagnosis.

Squamous cell carcinomas typically present as unpigmented scaly lesions that may bleed, itch or crust.

Melanocytic naevi, or moles, may be flat or raised and may vary in colour. However, they typically contain only one colour, and dermatoscopy shows a normal melanin network.

Further reading:

https://dermnetnz.org/topics/nodular-melanoma

Question:

A 30-year-old female is commenced on methotrexate for psoriasis. She is otherwise fit and well with no medical comorbidities.

Which of the following should be monitored throughout treatment?

A. Pulmonary function tests

B. Regular plain film chest x-ray

C. Cortisol level

D. Coagulation screen

E. Liver function tests

Correct Answer:Liver function tests

Explanation:

Liver function tests and full blood count should be monitored regularly throughout treatment with methotrexate. Primary care guidelines for recommend monitoring every 2 weeks until stable. More specific markers of liver function in methotrexate treatment include the P3NP marker.

A coagulation screen and a cortisol level are not routinely monitored during methotrexate treatment.

Although methotrexate can cause pulmonary fibrosis repeated chest x-rays are not indicated unless patients develop symptoms. A baseline chest x-ray prior to commencing treatment may be indicated to screen for existing or past pulmonary pathology. Similarly, pulmonary function tests do not feature in recommended monitoring requirements.

Further reading:

https://cks.nice.org.uk/dmards#!scenario:10

Question:

A 25-year-old woman is 38/40 weeks pregnant. She presents to the labour ward following rupture of membranes with increasing contractions. She has received additional scans during this pregnancy due to polyhydramnios.

On vaginal examination, she is 7cm dilated and an umbilical cord is palpated. She is attached to cardiotocography (CTG) monitoring which shows acute bradycardia on fatal heart rate monitoring.

Which of the following is a risk factor for this obstetric emergency?

A. Spontaneous rupture of membrane

B. Cephalic presentation

C. Oligohydramnios

D. Breech presentation

E. Singleton pregnancy

Correct Answer:Breech presentation

Explanation:

Breech presentation can increase the risk of cord prolapse. The exact cause of cord prolapse varies in each pregnancy, however, generally, any factors associated with fetal malposition increase the risk as well as obstetric procedures; these can include:

Breech, transverse, unstable lie

Twin pregnancy (especially delivery of the second twin)

Polyhydramnios

Artificial rupture of membranes

External cephalic version

Cord prolapse is an obstetric emergency as the umbilical cord will develop vasospasm, and fetal hypoxia will occur if left untreated. Therefore, immediate delivery is required by caesarean section. If the fetal heart rate pattern is abnormal, this should be a category one caesarean section (delivery within 30 minutes).

Further reading:

https://geekymedics.com/cord-prolapse/

Question:

A 50-year-old woman presents to the emergency department with sudden onset epigastric pain, which is now generalised across the abdomen. She feels nauseous and has had two episodes of blood-stained vomited. The pain is worsened by movement. She has a history of recurrent episodes of epigastric pain, that typically occurs immediately after eating

On examination, she is lying still in bed. Vital signs reveal a blood pressure of 95/70mmHg and a heart rate of 120bpm. On palpation of the abdomen, there is generalised tenderness, the abdomen feels rigid, and bowel sounds are absent.

Blood tests and an abdominal X-ray are requested.

What is the most likely radiographical finding?

A. Prominent appearance of the internal and external bowel wall

B. Prominent appearance of the superior diaphragmatic edge

C. Small bowel diameter of 5cm

D. Mottled appearance of the abdominal cavity

E. Loss of haustral markings

Correct Answer:Prominent appearance of the internal and external bowel wall

Explanation:

The correct answer is the prominent appearance of the internal and external bowel wall. The clinical scenario suggests the presence of a gastric ulcer that has perforated, i.e. a history of recurrent epigastric pain immediately after eating and new signs of peritonism. Clinical features of peritonism, in this case, include diffuse abdominal rigidity (also known as ‘abdominal guarding’), abdominal tenderness and the absence of bowel sounds. Although there are multiple causes of peritonism, her history of gastric ulceration and haemodynamic compromise (tachycardia and low blood pressure) are suggestive of perforation. When intestinal perforation occurs, free air within the abdomen (also known as pneumoperitoneum) provides additional contrast on abdominal X-ray, which results in both the inner and outer bowel walls becoming visible (normally, only the inner wall should be visible). This sign is known as ‘Rigler’s sign’ and is demonstrated below.

Scott 1751. Licence: CC BY-SA 3.0.

A prominent appearance of the superior diaphragmatic edge would not be apparent on an abdominal X-ray. An erect chest X-ray performed in a patient with pneumoperitoneum may demonstrate free air under the diaphragm, however, this would be associated with a prominent appearance of the inferior diaphragmatic edge rather than the superior edge.

A small bowel diameter of 5cm would not be expected in the abdominal X-ray of this patient. The upper limit for the diameter of the small bowel is usually 3cm, and therefore a diameter of 5cm would be suggestive of small bowel enlargement. Although this may occur in small bowel obstruction, this clinical scenario is not suggestive of a diagnosis of small bowel obstruction; a diagnosis of perforation is more likely, which would not typically result in small bowel dilatation. It is useful to remember the upper limits of bowel segment diameters as the 3/6/9 rule – 3cm for the small bowel, 6cm for the colon and 9cm for the caecum.

A mottled appearance of the abdominal cavity is not typical of bowel perforation on abdominal X-ray. Mottling is associated with the presence of faeces in the colon and occurs due to trapped gas interspersing between solid faeces. It will usually appear in the distribution of the large bowel rather than the entirety of the abdominal cavity.

In large bowel obstruction, dilatation of the large bowel can result in a loss of haustral markings. Haustra are sacculations (or pouches) that protrude into the lumen of the large bowel that are normally visible on abdominal X-ray and are a useful way of distinguishing between small and large bowel. However, this is not a typical finding in pneumoperitoneum, and there are no features in the clinical history suggestive of large bowel obstruction.

Further reading:

https://geekymedics.com/abdominal-x-ray-interpretation/

Question:

A 29-year-old pregnant woman presents to her GP with a 2-week history of generalised muscle aches and fatigue. She says that she has noticed a rash on her leg. She mentions this rash has been spreading over the past 2 weeks. She has no other significant past medical history, however, she recalls going on a hiking trip around 4 weeks ago with her partner.

On examination, she has a circular rash on her lower leg. The rash appears in a bull's eye-like appearance.

What is the most appropriate initial management option?

A. Topical emollients

B. Ceftriaxone

C. Amoxicillin

D. Flucloxacillin

E. Doxycycline

Correct Answer:Amoxicillin

Explanation:

This woman's symptoms and examination findings are suggestive of Lyme disease. Lyme disease is caused by ticks (tick bites), often found in grassy areas. Clinical features include fatigue, tiredness and a target-like rash (erythema migrans). Symptoms typically present 1 to 4 weeks after being bitten by an infected tick, as in this woman's case. NICE guidelines recommend that Lyme disease be diagnosed clinically if the classical rash is present. However, if not, the first-line investigation is ELISA for IgM and IgG to Borrelia burgdorferi.

Although the first-line management for symptomatic tick bites is doxycycline, this would be incorrect as tetracyclines are contraindicated during pregnancy, making amoxicillin the most appropriate management option.

Flucloxacillin is not typically used in the management of Lyme disease. Instead, it is commonly used in skin infections, such as cellulitis. Cellulitis is an infection of the subcutaneous tissue, typically presenting with erythema, pain and swelling, however, it is an unlikely diagnosis here due to several reasons. Firstly, the well-demarcated bull's eye appearance is a classic sign of Lyme disease, unlike cellulitis, in which the erythema is poorly demarcated. Secondly, cellulitis will cause a painful rash and swelling, which is less likely in Lyme disease.

Ceftriaxone is used in the management of Lyme disease. However, it is reserved for severe disease, where signs of disseminated disease are seen, i.e. neurological symptoms.

Topical emollients would not be effective in treating the infection but may be useful in managing any itching or dryness associated with the rash.

Further reading:

https://bnf.nice.org.uk/treatment-summaries/lyme-disease/

Question:

A 42-year-old patient is rushed into hospital by paramedics after being rescued from the wreckage of a road traffic accident. He remains conscious and is able to hold a conversation with the admitting doctors, albeit he appears slightly confused. He has suffered a number of wounds to his upper chest and limbs; the paramedics estimate that he lost approximately 500mls of blood at the site. The patient is complaining of severe shortness of breath, and some dull central chest pain.

Assessment of the patient reveals significant tachycardia and tachypnoea, with a prolonged capillary refill time, and cold, clammy extremities. The patient's JVP is notably elevated at 6cm above the sternal angle. His blood pressure is noted to be 80/52; back-to-back fluid boluses help to raise this slightly. Auscultation of the lungs reveals no added sounds, but the heart sounds are unable to be commented on, as they appear to be unusually quiet.

The admitting doctor attaches ECG leads and is considering the need for further imaging - he is extremely concerned about the patient's presentation.

Given the likely diagnosis, which of the following is most likely to represent the definitive management?

A. Pericardiocentesis

B. Conservative management with repeated fluid boluses

C. Cardiac transplant

D. Urgent aortic repair

E. 80mg furosemide IV

Correct Answer:Pericardiocentesis

Explanation:

This patient has presented with likely cardiac tamponade secondary to the sustained chest trauma. This can result in non-specific symptoms of shock, as the accumulation of fluid within the pericardial space can obstruct diastolic ventricular filling and reduce cardiac output. This patient also has a number of examination features that point towards this as the likely diagnosis - the combination of muffled heart sounds, elevated JVP and hypotension is referred to as 'Beck's triad' and is classically associated with this condition.

This patient will likely require echocardiography to confirm the diagnosis should he remain stable, with treatment being via pericardiocentesis; a needle is passed under the rib-cage into the pericardial space to allow for the drainage of the fluid and the relief of the pressure on the heart. It is essential that this occurs as swiftly as possible, as there is a significant risk of cardiac arrest (most frequently in the form of pulseless electrical activity) and subsequent morbidity and mortality.

IV furosemide is an important treatment in the setting of acute heart failure; whilst cardiac tamponade can progress to cause this as a complication, the fact that the lungs are clear mean that this is less likely to be the cause of his presentation, and it would be more appropriate to address the underlying tamponade through pericardiocentesis.

Cardiac transplant can be used as a treatment option for those with diseases such as cardiomyopathy or congenital heart disease; it is not used in acute scenarios such as that in this vignette.

Urgent aortic repair would be indicated if the patient had suffered a traumatic aortic rupture; this can arise as a result of road traffic collisions but is less likely to be the cause of this patient's symptoms. The mortality rate of this injury is exceptionally high, and even greater haemodynamic instability would be expected, with the patient unlikely to be conscious. It would not explain the examination features such as a raised JVP present in this scenario.

If left untreated, tamponade is likely to progress to cardiac arrest; repeated fluid boluses with conservative management will not address the cause of the obstructive shock and this alone would not be an appropriate management plan in this scenario.

Further reading:

https://patient.info/doctor/cardiac-tamponade

Question:

A 23-year-old female visits the practice nurse with a new vaginal discharge. She has experienced superficial dyspareunia and intense itching of the vulva and vagina. She has been in a relationship with the same male partner for the past three years, who has no symptoms.

On examination, the vulva appears red and excoriated. There is a non-offensive white, lumpy discharge visible in the vagina. The pH of the discharge is 3.7.

What is the most likely diagnosis?

A. Trichomoniasis

B. Vulvovaginal candidiasis

C. Chlamydia

D. Bacterial vaginosis

E. Gonorrhoea

Correct Answer:Vulvovaginal candidiasis

Explanation:

Vulvovaginal candidiasis typically presents with a non-offensive white and lumpy 'cottage cheese' discharge that may be associated with vulval itching and superficial soreness. The pH is classically <4.5.

Bacterial vaginosis typically presents with an offensive, fishy-smelling vaginal discharge, without any associated soreness or irritation. The pH is classically >4.5.

Chlamydia is asymptomatic in around 50% of people but typically presents with a clear discharge when symptomatic. Pruritis is uncommon. With the patient having the same partner for the past three years, this is less likely.

Gonorrhoea is asymptomatic in around 50% of people but typically presents with a thin, green discharge when symptomatic. Pruritis is uncommon. With the patient having the same partner for the past three years, this is less likely.

Trichomoniasis typically presents with a fishy-smelling, yellow/green frothy discharge that may be associated with itching, soreness, and dysuria. The pH is classically >4.5.

Further reading:

https://cks.nice.org.uk/topics/vaginal-discharge/

Question:

A 50-year-old male presents to GP with a persistent ulcer in his mouth. He says the ulcer has been present for about a month and just won’t seem to heal. He is otherwise fit and well and does not take any regular medications. He has a 30-pack-year smoking history and drinks around 20 units of alcohol a week.

Which of the following is the most appropriate next step in managing this patient?

A. Urgent hospital admission under ENT

B. Reassure patient and provide analgesic gel for the lesion

C. Non-urgent 6 week referral to ENT

D. Prescribe antimicrobial mouthwash and send home

E. Urgent 2 week referral to ENT

Correct Answer:Urgent 2 week referral to ENT

Explanation:

The most appropriate management option in this scenario is arranging an urgent 2-week referral to ENT for investigation of a possible oral malignancy. NICE guidance advises 2-week referral for any unexplained ulceration in the oral cavity lasting more than 3 weeks.

This patient has several risk factors for oral cancer, including a persistent mouth ulcer and a significant smoking and alcohol history.

Buccal mucosa cancers are often painless in the early stages and then as they become ulcerated and secondarily infected, they become painful. Bleeding and difficulty chewing may also be associated. Clinical examination may reveal local lymphadenopathy suggestive of metastasis.

You may also provide gel and mouthwash to address the patients symptoms, but doing these things in isolation without referral would be inappropriate.

Further reading:

https://cks.nice.org.uk/head-and-neck-cancers-recognition-and-referral#!scenario

Question:

A 7-month-old boy is brought to the emergency department by his parents because of fever, fatigue, breathing difficulties and cough. His parents explain he has also had nasal congestion.

He has no significant past medical history. His parents describe an uncomplicated pregnancy, labour and delivery. His parents think he may be allergic to milk, causing a red rash across his face.

On general inspection, the child appears ill, with a wet sounding cough and nasal flaring. Vital signs include temperature 38.0°C, HR 172/min, RR 47/min and SpO2 91% on room air. Examination of the chest reveals moderate chest wall retraction, diffuse bilateral crackles and a bilateral expiratory wheeze.

He is admitted to the paediatric unit.

Which of the following options would be most appropriate to make a diagnosis in this patient?

A. No investigations required

B. Enzyme-linked immunosorbent assay

C. Chest X-ray

D. Pulmonary function tests

E. Full blood count

Correct Answer:No investigations required

Explanation:

The most likely diagnosis in this patient is bronchiolitis - an infection of the lower respiratory tract, most commonly caused by the respiratory syncytial virus (RSV). Bronchiolitis is a leading cause of hospital admission in infants under one year of age. The typical clinical manifestations of bronchiolitis include a coryzal prodrome lasting 1-3 days, followed by a persistent cough, tachypnoea, chest recession and wheeze ± crackles on the chest auscultation. NICE guidelines suggest that bronchiolitis is a clinical diagnosis; therefore, no additional investigations are required to make a diagnosis in this patient, as clinical criteria have been met.

NICE guidelines do not routinely recommend using a chest x-ray (CXR) in children with suspected bronchiolitis, as potential changes on x-ray may mimic pneumonia, altering the subsequent management plan. A CXR may reveal lung hyperinflation, interstitial infiltrates, and atelectasis; however, it is not required to make a diagnosis.

NICE guidelines do not recommend routinely performing blood tests in the initial assessment of children with suspected bronchiolitis, especially as it is not required to make a diagnosis. A full blood count (FBC) may reveal a normal or mildly elevated white blood cell count.

Rapid antigen testing using an enzyme-linked immunosorbent assay (ELISA) for RSV is not routinely recommended in diagnosing bronchiolitis. Whilst a positive antigen test is predictive of the causative viral agent; a negative result does not rule out the presence of the virus. Therefore, ELISA is required to reach a definitive diagnosis.

Pulmonary function tests (PFTs) are not considered diagnostic in bronchiolitis due to the variability in possible results. Whilst patients with bronchiolitis may demonstrate impaired respiratory function, this is not regarded as sensitive or specific and cannot be used to make a diagnosis.

Further reading:

https://www.nice.org.uk/guidance/ng9/chapter/recommendations#when-to-refer

Question:

A 59-year-old man presents to his GP with a new lesion on his left leg. He drinks once a month, has a 5-pack-year smoking history, and smokes marijuana recreationally. He used to work as a builder in Kenya and reports being sunburned multiple times there.

On examination, there is a 2 cm circular pigmented lesion on the posterior aspect of the left leg with irregular borders. There is also reduced sensation in the skin at the site of the lesion.

Based on the likely diagnosis, what is this patient's most significant risk factor?

A. Marijuana use

B. Location of the lesion

C. Smoking

D. Repeated sunburn

E. Alcohol

Correct Answer:Repeated sunburn

Explanation:

This patient most likely has melanoma. The only risk factor for melanoma listed is repeated sunburn.

Marijuana use is not associated with an increased risk of melanoma. The commonest location of the lesion in melanoma in women is on the legs and in men on the trunk. Note that although smoking increases the risk of squamous cell carcinoma, it does not increase the risk of melanoma. Although alcohol increases the risk of many cancers, including melanoma, consuming alcohol once a month is unlikely to have as significant an impact as repeated sunburn.

The risk factors for melanoma are listed below:

Fair skin, freckling, light hair, light-coloured eyes

Previous skin cancer or atypical naevi

Large number of moles

Family history of melanoma

Pale skin (Fitzpatrick type I and II)

Being male

Previous sunburn, outdoor occupation, sunbed use

Immunosuppression

Certain genetic conditions, e.g. xeroderma pigmentosum

Further reading:

https://geekymedics.com/malignant-melanoma-of-the-skin/

Question:

A 58-year-old patient presents to an outpatient heart failure clinic for follow-up. The patient has a longstanding diagnosis of chronic heart failure with reduced ejection fraction. Despite using ramipril, bisoprolol, and spironolactone, he still feels breathless when walking and is now struggling to complete day-to-day activities such as getting dressed. In addition to his heart failure, the patient has a history of permanent atrial fibrillation.

An electrocardiogram (ECG) recorded before the clinic shows an irregularly irregular rhythm but no other abnormalities. A recent echocardiogram demonstrates the patient's left ventricular ejection fraction to be 29%.

What is the most appropriate management step?

A. Offer the patient cardiac resynchronisation therapy

B. Offer ivabradine in addition to his current therapy

C. Offer ivabradine instead of ramipril

D. Offer sacubitril valsartan in addition to his current therapy

E. Offer sacubitril valsartan instead of ramipril

Correct Answer:Offer sacubitril valsartan instead of ramipril

Explanation:

The most appropriate management step is to offer sacubitril valsartan instead of ramipril. This is because the patient is refractory to first and second-line chronic heart failure therapy, has a left ventricular ejection fraction (LVEF) less than 35%, and the only abnormality on his ECG is atrial fibrillation. Sacubitril valsartan stimulates the breakdown of natriuretic peptides which has systemic effects including vasodilation. It is recommended for patients with chronic heart failure with reduced ejection fraction as third-line therapy, particularly among patients who are unable to receive ivabradine.

While sacubitril valsartan is the most appropriate drug to offer, it should never be given in combination with angiotensin-converting-enzyme (ACE) inhibitors such as ramipril, due to the risk of angioedema. Therefore, patients should stop their ACE inhibitor and start sacubitril valsartan 36 hours later.

Cardiac resynchronisation therapy is not appropriate to offer because the patient has a normal QRS complex. Cardiac resynchronisation therapy is indicated in patients with a reduced LVEF and a prolonged QRS on ECG.

Ivabradine in addition to his current therapy is inappropriate to offer as ivabradine is only effective with sinus rhythm. Patients with a reduced LVEF, a heart rate >75bpm, and a sinus rhythm are eligible to receive ivabradine. Where ivabradine is indicated, it should be used alongside current therapy, including ramipril.

Further reading:

https://bnf.nice.org.uk/treatment-summary/chronic-heart-failure.html

Question:

A 44-year-old woman presents to A&E complaining of seven hours of severe right upper quadrant pain. She has a history of intermittent right-sided abdominal pain for the last year, but the pain worsened a few days ago and became acutely painful around seven hours ago. Her past medical history is significant for cholelithiasis.

Her temperature is 39.1°C, pulse is 110/min, respirations are 18/min, and blood pressure is 98/64 mmHg.

On examination, you note mild scleral icterus. Abdominal examination reveals extreme tenderness to palpation in the right upper quadrant. No rebound tenderness or guarding is present. I

Initial blood tests reveal:

Haemoglobin – 14 × 109/ L

Platelets – 268 × 109/ L

Leukocytes – 16.1 × 109/ L

Aspartate aminotransferase – 94 U/L

Alanine aminotransferase – 99 U/L

Alkaline phosphatase – 225 U/L

Total bilirubin – 51.3 μmol/ L

Direct bilirubin – 34.2 μmol/ L

Which of the following investigations would be the most appropriate to perform next, in an attempt to reach a diagnosis?

A. Blood cultures

B. CT Abdomen

C. Abdominal ultrasound

D. Cholescintigraphy (HIDA scan)

E. Endoscopic retrograde cholangiopancreatography (ERCP)

Correct Answer:Abdominal ultrasound

Explanation:

This patient is suffering from ascending cholangitis (infection of the bile ducts). She has a previous history of gallstones (cholelithiasis) and demonstrates Charcot's triad: fever, jaundice and right upper quadrant pain.

Her blood test results further support this diagnosis; her leucocytosis is evidence of inflammation, while her elevated transaminases, alkaline phosphatase, and total and direct bilirubin are all consistent with cholestasis.

The first imaging test to confirm the diagnosis would be an abdominal ultrasound. In cholangitis, ultrasound typically shows signs of biliary obstruction, such as ductal dilatation and stones. You would not usually see evidence of inflammation of the gallbladder, such as pericholecystic fluid, which occurs in cholecystitis (infection of the gallbladder itself).

NOTE: ultrasound detects a minority of obstructing stones in patients with cholangitis, but it remains the first-line imaging test because you can use it to differentiate cholangitis from cholecystitis (which presents with similar symptoms) without the radiation exposure of a CT scan.

A CT abdomen may be an appropriate second-line investigation, after an abdominal ultrasound. The majority of gallstones are cholesterol stones, which are radiolucent and difficult to visualise on abdominal CT unless they are calcified or cause filling defects.

Cholescintigraphy (HIDA scan) is a nuclear medicine test that evaluates bile duct obstruction and gallbladder function. A HIDA scan is more sensitive than ultrasound at detecting obstructing stones located more distally in the common duct and may be considered if ultrasound is not diagnostic. However, it is important to note that it is expensive, time-consuming, and difficult to obtain out of hours and as such it is not the first test used to confirm the diagnosis.

Blood cultures should be obtained in patients with suspected cholangitis to help guide antibiotic therapy. However, they would not provide specific confirmation of the diagnosis of cholangitis; as such it is not the first test used to confirm the diagnosis.

ERCP is used to remove obstructing stones. However, the diagnosis should be confirmed with an abdominal ultrasound before proceeding with any invasive procedure.

Further reading:

https://patient.info/doctor/cholangitis

Question:

An 11-year-old boy presents to the emergency department with his mother. He was bitten by a dog 24 hours ago on the right arm. There is redness and purulent drainage from the bite site.

He does not have any past medical history and does not take medications. He has no known drug allergies. The patient’s observations are stable.

What is the most appropriate treatment for this patient?

A. Doxycycline

B. Co-amoxiclav

C. Trimethoprim

D. Clindamycin

E. Ceftriaxone

Correct Answer:Co-amoxiclav

Explanation:

The child in the above question has most likely been infected with a pathogen called Pasteurella multocida, a gram-negative bacteria which commonly colonises the mouths of dogs, cats, pigs and rats. This patient has signs of infection (erythema and purulent drainage) and therefore the wound should be thoroughly irrigated with normal saline with the removal of any foreign bodies. Samples from the drainage can also be sent for culture to guide antibiotic choice. The boy should also be started on co-amoxiclav as first-line treatment.

Trimethoprim is a commonly used antibiotic for urinary tract infections but is not indicated in the management of animal bites.

Third-generation cephalosporins like ceftriaxone are often used in the management of sexually transmitted infections, meningitis and acute bacterial prostatitis, but are not indicated for P. multocida infections.

Clindamycin is not considered first-line for patients with animal bites. If the patient had a penicillin allergy, then clindamycin would be a more appropriate choice.

Doxycycline is a commonly used antibiotic belonging to the tetracycline class. Tetracyclines are contraindicated in children less than 12 years of age, in women who are breastfeeding and in pregnancy.

Further reading:

https://www.gov.uk/guidance/pasteurellosis#immediate-treatment

Question:

An 18-year-old patient presents to the GP, concerned about stretch marks that have developed on his back. He reports having grown significantly over the last year and is now significantly taller than the rest of his family. He puts this down to a 'growth spurt', but is concerned that the presence of striae may indicate that he is growing too fast; having been shown a picture of the skin lesions, he believes them to be unsightly. The patient denies any headache, visual changes or neurological features, and has not noticed any other changes in his appearance.

The patient describes no past medical history other than recurrent lens dislocation which has been managed surgically. There is no family history of growth disorders, nor any other relevant medical conditions.

On examination, the patient has a BMI of 18, with a slender frame; the patient exhibits no coarsening of facial features. The only other finding on examination of the other organ systems is the presence of a murmur; this is heard in late systole and is accompanied by an opening snap.

What is the most likely cause of the patient's symptoms?

A. Marfan syndrome

B. Soto syndrome

C. Gigantism

D. Fragile X syndrome

E. Normal pubertal growth spurt

Correct Answer:Marfan syndrome

Explanation:

Marfan syndrome is an autosomal dominant condition caused by a mutation in the fibrillin 1 gene; the characteristic presentation is a tall, thin individual, with a low BMI and arachnodactyly. Striae are relatively commonly seen in those with the condition. This is not a completely typical presentation, as there is no family history of the condition; however, approximately 25% of patients with Marfan syndrome develop the disease due to a de novo mutation, which is the likely explanation in this case.

A number of features of the history alongside the patient's physical appearance point toward Marfan as the probable diagnosis; lens dislocation, referred to medically as ectopia lentis is a common complication, as is mitral valve prolapse, which is the murmur most likely to be represented by the auscultation findings. Hypermobility, dural ectasia, kyphoscoliosis and chest wall deformities are all also possible in those with the condition.

The Ghent nosology is a set of criteria that can assist in the diagnosis of Marfan syndrome - this takes into account the aortic root diameter, the presence of ectopia lentis, whether fibrillin 1 gene mutation has been detected, as well as a general systemic feature score to determine whether a diagnosis of the condition can be confirmed.

Soto syndrome is a congenital condition that can result in excessive growth; however, this is usually accompanied by characteristic dysmorphic facial features and intellectual disability, neither of which are described in this scenario.

Gigantism refers to a condition involving the production of excessive amounts of growth hormone before the fusion of growth plates. The usual cause is a functional pituitary tumour; there are no features of this in this patient's history, and the ectopia lentis and mitral valve prolapse point towards Marfan as the likely diagnosis.

Fragile X syndrome is a condition arising due to a trinucleotide repeat expansion of CGG; patients usually have severe intellectual disability, a long, thin face and large testicles.

Whilst an extended period of growth at the age of 18 in a man could feasibly simply be due to a pubertal growth spurt, the other features in the history would not be explained by this.

Further reading:

https://patient.info/doctor/marfans-syndrome-pro

Question:

A 70-year-old man with known type 2 diabetes presents to his GP for review. He has had diabetes for 15 years and takes twice daily Humulin M3 (30 units) insulin and has diabetic retinopathy. For the last month, he has experienced vomiting and bloating particularly after large meals. In addition, he has been having trouble with erratic blood sugars and has had two episodes of mild hypoglycaemia, of which he had decreased awareness.

Aside from optimising glycaemic control, what is the most appropriate initial management strategy for his recent symptoms?

A. Long-term domperidone

B. Trial of nasojejunal tube

C. Encourage low-fat, smaller, more frequent meals

D. Oesophageal dilation

E. Trial of loperamide

Correct Answer:Encourage low-fat, smaller, more frequent meals

Explanation:

The scenario here is of a type 2 diabetic with evidence of end-organ damage and persistent poor sugar control. Gastroparesis is a recognised complication of diabetes due to autonomic neuropathy and it is associated with poor glycaemic control. Optimising this should be the first step. For symptomatic management, diet should first be modified to avoid high fat and high fibre. Also recommended are smaller more frequent meals, chewing food well and trialling clear fluids with meals. If this fails or vomiting is persistent and troublesome metoclopramide, domperidone or erythromycin may be trialled for short-term relief.

Further intervention may involve nasojejunal tubes or surgical intervention. Oesophageal dilatation and loperamide would be ineffective in managing gastroparesis.

Further reading:

https://www.diabetes.co.uk/diabetes-complications/diabetes-and-gastroparesis.html

Question:

A 70-year-old woman attends her GP with yellowing of her skin. She describes that her skin has gradually become more yellow over the past 6 months. This has been associated with unintentional weight loss of around 1 stone, malaise, dull upper abdominal pain, as well as the passage of dark urine and pale stools. The patient also informs that she was diagnosed with ulcerative colitis 30 years previously and, more recently, has been diagnosed with primary sclerosing cholangitis. On examination, notable findings include hepatomegaly, and a tender right upper quadrant with a palpable gallbladder.

What is the most likely diagnosis?

A. Cholangiocarcinoma

B. Acute hepatitis

C. Carcinoma of the head of the pancreas

D. Acute cholecystitis

E. Primary biliary cirrhosis

Correct Answer:Cholangiocarcinoma

Explanation:

The most likely diagnosis is cholangiocarcinoma. This condition can be defined as a carcinoma (usually an adenocarcinoma) arising from any section of the biliary tree. Major risk factors for cholangiocarcinoma include age over 60 years, patients with ulcerative colitis who later develop primary sclerosing cholangitis and industrial chemical exposure. Features typical of this condition include jaundice associated with hepatomegaly, right upper quadrant pain, systemic features (weight loss, malaise, anorexia) and a palpable gallbladder.

Acute hepatitis is less likely in this case. Acute hepatitis typically presents with prodromal features (including myalgia, fatigue, coryza) followed by nausea and vomiting and right upper quadrant pain.

Acute cholecystitis is less likely the cause of this scenario due to the gradual onset of symptoms. Acute cholecystitis, or infection within the gallbladder, may be precipitated by a cholangiocarcinoma but is seen more commonly as a complication of gallstones. Features such as Murphy’s sign (pain on inspiration whilst palpating the RUQ) would make this diagnosis more likely.

Primary biliary cirrhosis is less likely as other autoimmune diseases (e.g. coeliac disease, thyroid disease or systemic sclerosis) are not present. This condition is often a diagnosis of exclusion in the presence of chronic cholestasis.

Carcinoma of the head of the pancreas typically presents with painless jaundice, rather than with RUQ pain.

Further reading:

https://patient.info/doctor/cholangiocarcinoma

Question:

A 6-year-old boy presents with a 5-day history of a productive cough and fever. His parents explain that he has become subdued and sleepy. He has a history of hereditary spherocytosis, for which he had surgery two years previously. Development has been unremarkable. He has not received any vaccines due to parental concerns after one of his siblings developed a rash following the MMR.

Observations are recorded as, HR 134/min, RR 35/min, BP 84/62mmHg, CRT 4 seconds.

Auscultation of the chest reveals bilateral crepitations, prominent in the right lower zone. Sputum and blood cultures are requested, and treatment is started.

What is the most likely organism to be isolated on culture?

A. Haemophilus influenzae

B. Staphylococcus aureus

C. Legionella pneumophila

D. Pneumocystis jirovecii

E. E. coli

Correct Answer:Haemophilus influenzae

Explanation:

The correct answer, in this case, is Haemophilus influenzae, given its status as an encapsulated bacteria that frequently causes respiratory infection. The boy in the clinical vignette has a history of hereditary spherocytosis, for which the treatment often involves splenectomy, to prevent the excessive breakdown of the abnormally-shaped erythrocytes. This is effective in managing the condition, but comes with complications, due to the essential immune roles of the spleen.

The white pulp of the spleen is an important lymphoid tissue and plays an important role in the defence against encapsulated bacteria in particular. As a result, those having had splenectomy must have several precautions taken. Patients are usually given daily antibiotics as infection prophylaxis; this is often continued life-long. Vaccination is also important, patients should be advised to ensure that they are up to date with all their vaccines, and are also recommended additional vaccines, given their susceptibility to encapsulated bacteria. There are 3 such bacteria that are particularly of concern:

Neisseria species - it is important that splenectomy patients receive their Men B and Men C vaccines to protect against these species of Neisseria meningitidis

Haemophilus influenzae - splenectomy patients should be encouraged to have their 6-in-1 vaccine, which protects against Haemophilus influenzae type B

Streptococcus pneumoniae - splenectomy patients are recommended to have the pneumococcal vaccine before the procedure to protect against this bacteria

This child has presented with clinical signs of sepsis, likely of respiratory origin, given the symptoms and auscultation features. Given his history, and lack of vaccination, suspicion of infection with one of the encapsulated bacteria should be high. Of the answers listed, Haemophilus influenzae is the only organism to possess a capsule and is, therefore, the correct answer.

Staphylococcus aureus is more commonly acquired within a hospital setting and is not an encapsulated bacteria, so is less likely in this case.

E. coli more frequently causes urinary tract infection and is not a common organism implicated in pneumonia.

Legionella pneumophila is often acquired through exposure to contaminated water sources or air conditioning; classically after travelling on a cruise ship, or staying in a low-quality hotel. There is nothing in the history to suggest this as the likely diagnosis.

Pneumocystis jirovecii is a fungal infection that can give respiratory infection in immunocompromised patients; particularly those who are HIV positive. Whilst splenectomy patients are have reduced immune protection to an extent, it is unlikely to be significant enough for this to be a consideration as the most likely organism in this case.

Further reading:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1188098/

Question:

A 16-year-old female patient attends her GP with blurred vision. She reports that her vision has been progressively deteriorating over the past 6 months. The patient mentions that her near vision is unaffected, but she struggles to focus on distant objects. She is currently in the midst of studying for exams and her mother suffered from similar symptoms at around the same age. She has no significant past medical history. On examination, a mild refractive error is noted in both eyes.

What is the MOST APPROPRIATE management option for the condition described?

A. Spherocylindrical lens

B. Convex lens

C. No management

D. Concave lens

E. Cylindrical lens

Correct Answer:Concave lens

Explanation:

The most likely diagnosis is myopia (also known as short-sightedness). This condition can be defined as a difficulty in visualising distant objects due to blurring. Myopia is caused by light being focused in front of (rather than on) the retina either due to an excessively curved cornea or increased eye length. Major risk factors for this condition include young age, family history of myopia, excessive close-up work and other conditions (e.g. Marfan’s syndrome, prematurity, Stickler’s syndrome, homocystinuria).

Clinical features of myopia include blurring of distant vision whilst maintaining the ability to focus on close-by objects. A concave lens is used to correct this refractive error.

Convex lenses are used to correct hypermetropia.

No management would not be appropriate in this case as the patient has a confirmed refractive error on examination.

Cylindrical lenses are used to correct astigmatism with no associated myopia or hypermetropia.

Spherocylindrical lenses are used to correct astigmatism associated with myopia or hypermetropia.

Further reading:

https://patient.info/doctor/refraction-and-refractive-errors

Question:

A 44-year-old man presents to his general practitioner complaining of facial swelling, ankle swelling and weight gain. He reports that these symptoms have come on over several weeks, with the facial/ankle swelling worst in the mornings. He suffered from an upper respiratory tract infection several weeks ago but has since been well. He has no significant past medical history or family history. He is unemployed and takes no regular medications. He smokes 5 cigarettes per day and drinks 10 pints of beer per week.

Clinical examination is unremarkable aside from ankle swelling bilaterally. Blood pressure is 142/82 mmHg.

Urine dipstick shows:

Protein (++++)

Blood (+)

Blood tests show:

Test Result Reference Range

Na+ 135 mmol/L (133–146)

K+ 4.2 mmol/L (3.5–5.3)

Urea 4.8 mmol/L (2.5 - 7.8)

Creatinine 67 umol/L (59–104)

Ca2+ (adj) 2.4 mmol/L (2.2-2.6)

Glucose (fasting) 5.2 mmol/L (4.0 to 6.0)

Prothrombin time 14 sec (10 – 14)

ALT 29 units/L (<41)

Albumin 24 g/L (35–50)

What is the most likely cause for this presentation?

A. Focal segmental glomerulosclerosis

B. Minimal change disease

C. Polyarteritis nodosa (PAN)

D. IgA nephropathy

E. Diabetic nephropathy

Correct Answer:Focal segmental glomerulosclerosis

Explanation:

This patient's clinical presentation is typical of nephrotic syndrome (leg oedema, facial oedema, heavy proteinuria and low albumin levels). The most likely cause is focal segmental glomerulosclerosis, which is the most common cause of acute onset nephrotic syndrome in an adult secondary to infections.

Whilst diabetic nephropathy is the commonest worldwide cause of nephrotic syndrome, this man has no history of diabetes. Additionally, nephrotic syndrome in the context of diabetes usually has an insidious onset, and might be expected to present with renal impairment.

IgA nephropathy can occur at the same time as an upper respiratory tract infection but would usually present with renal impairment, hypertension and dipstick haematoproteinuria, representing a nephritic-type picture (only rarely would it present with nephrotic syndrome).

PAN is a rare type of medium vessel vasculitis which can present with palpable purpura and multi-system involvement, but not nephrotic syndrome.

Minimal change disease is a plausible differential diagnosis of nephrotic syndrome but is more often associated with childhood nephrotic syndrome post upper respiratory tract infections.

Further reading:

https://patient.info/doctor/glomerulonephritis-pro

Question:

A 13-year-old boy is brought to see his GP by his father with an itchy, painful ear. On otoscopic examination, you note that the ear canal is red and swollen. He is otherwise well in himself and has no other symptoms. Looking through his records, you see that this is the fifth presentation with these symptoms. On further questioning, the boy says that he is concerned as he swims competitively for his school and is currently training for a competition.

Which of the following is likely to have triggered this presentation in this patient?

A. Contact dermatitis

B. Diabetes mellitus

C. Recent swimming

D. Allergic rhinitis

E. Recent viral upper respiratory tract infection (URTI)

Correct Answer:Recent swimming

Explanation:

The correct answer is recent swimming.

This patient is presenting with typical symptoms of otitis externa. Swimming is a common trigger for otitis externa. Given that this patient swims regularly this is the most likely trigger of this episode.

Allergic rhinitis is not normally associated with otitis externa, it is more associated with eustachian tube dysfunction and otitis media.

Contact dermatitis can be a trigger of otitis externa, however, there is nothing in this history to suggest this as a cause.

Diabetes mellitus is a condition that can increase the risk of otitis externa and may predispose patients to malignant otitis externa but there is nothing to suggest that it is a cause of symptoms in this patient.

URTIs don't typically cause otitis externa, they are more frequently due to bacterial or fungal infections. Otitis media on the other hand is commonly caused by URTIs.

Further reading:

https://cks.nice.org.uk/topics/otitis-externa/

Question:

A 42-year-old woman attends her GP 12 weeks after the birth of her second child to discuss ongoing contraception. She is successfully breastfeeding without concerns. She has no significant past medical or family history, and on assessment by the practice nurse is found to have a BMI of 38kg/m2 and blood pressure of 170/100. Social history reveals no alcohol or drug use, but she continues to smoke 10 cigarettes a day.

Which feature in this patient’s history would be an absolute contraindication (UKMEC 4) to the use of the combined oral contraceptive pill?

A. Age

B. Blood pressure

C. BMI

D. Breastfeeding status

E. Smoking history

Correct Answer:Blood pressure

Explanation:

The Faculty of Reproductive and Sexual Healthcare have produced clear guidance regarding contraindications to contraception. As such, 4 categories of recommendation (UK medical eligibility criteria, or UKMEC) exist:

Category 1 - A condition for which there is no restriction for the use of the method

Category 2 - A condition where the advantages of using the method generally outweigh the theoretical or proven risks

Category 3 - A condition where the theoretical or proven risks usually outweigh the advantages of using the method. The provision of a method requires expert clinical judgement and/or referral to a specialist contraceptive provider, since use of the method is not usually recommended unless other more appropriate methods are not available or not acceptable

Category 4 - A condition which represents an unacceptable health risk if the method is used

From the given list, only blood pressure of 170/100 is UKMEC category 4 for the combined oral contraceptive (COC), with the recommendation that blood pressure ≥ 160 systolic or 100 diastolic represents an unacceptable risk in regards to prescribing the COCP.

Age 42 is not a contraindication to the provision of the COCP, with age ≥ 40 representing UKMEC 2.

Breastfeeding is not UKMEC 4, as she is more than 6 weeks postpartum. Breastfeeding 0-6 weeks postpartum is UKMEC 4, breastfeeding 6 weeks – 6 months is UKMEC 2, and breastfeeding at ≥ 6 months postpartum is UKMEC 1.

Smoking 10 cigarettes a day at age 42 is UKMEC 3. Smoking ≥ 15 a day would represent UKMEC 4. Smoking at less than 35 years old, regardless of amount, is UKMEC 2 for the combined pill.

BMI of 38kg/m2 is UKMEC 3 for the COC. A BMI of 30-34 would represent UKMEC 2.

A link is provided to the FRSH’s comprehensive document, detailing their recommendations for a wide range of conditions and contraceptive methods.

Further reading:

https://www.fsrh.org/standards-and-guidance/documents/ukmec-2016/fsrh-ukmec-full-book-2019.pdf

Question:

An adult male is brought to the emergency department having fallen whilst mountain climbing. His fall was arrested by his climbing rope, but he hit his head against the rock face in the process. He lost consciousness on the scene then appeared to improve during transit, however, the air ambulance crew are now concerned he has deteriorated. On primary survey his cervical spine is immobilised, he is maintaining his own airway and is haemodynamically stable. He opens his eyes to voice, gives disjointed and irrelevant answers to questions and localises to painful stimuli. Pupils remain equal and reactive to light. There is a boggy scalp haematoma, and on inspection, his climbing helmet is cracked on the same side. He undergoes a CT trauma scan on account of his mechanism of injury and reduced GCS of 11/15 (E3 V3 M5) which reveals the following abnormality.

Which vascular structure is most likely responsible for the demonstrated intracranial bleeding?

Hellerhoff / CC BY-SA

A. Dural bridging vein

B. Right middle meningeal artery

C. Right superficial temporal artery

D. Right anterior cerebral artery

E. Right middle cerebral artery

Correct Answer:Right middle meningeal artery

Explanation:

This CT image demonstrates an extradural haematoma (EDH), which account for approximately 2-4% of traumatic brain injuries and classically result from traumatic rupture of the middle meningeal artery (MMA) as it courses between the dura mater and the inner bony cortex of the cranial vault in the region of the pterion. The pterion is the site at which the frontal, parietal and temporal bones converge with the greater wing of the sphenoid, and is particularly vulnerable to fracture. Brisk MMA bleeding strips the dura away from the skull until haematoma expansion is restricted by dense dural adhesions to cranial sutures. Once the haematoma is no longer able to expand anteroposteriorly, it expands medially to give its biconvex CT appearance. Other causes of EDH include dural sinus lacerations and bleeding from the diploë, which is the vascular layer of trabecular bone between the inner and outer cortices of the skull.

A lucid interval is often described whereby patients neurologically improve following the initial concussion of the primary injury, but then deteriorate at the point of intracranial pressure decompensation. Symptoms are caused by extrinsic compression of the brain and there may be remarkably little intrinsic brain damage. As such, the prognosis may be relatively good if the haematoma is evacuated before cerebral herniation occurs. Surgery generally involves a craniotomy, where a flap of bone is removed and the gelatinous, viscous clot can then be prised away from the dura and MMA haemostasis secured. The bone flap may be replaced if it is thought that the bleeding is controlled and the brain unlikely to swell significantly over the following days, or it may be stored for elective replacement when the patient is stable.

The anterior and middle cerebral arteries contribute to the circle of Willis and ruptures of these vessels results in intracerebral haemorrhagic strokes.

The superficial temporal artery is the terminal branch of the external carotid artery, running anterior to the tragus to supply the temporalis muscle and scalp. Whilst it may also be injured in this case, it lies external to the cranial vault.

Dural bridging veins originate deep to the arachnoid mater, traverse the subdural space and drain blood into the dural venous sinuses. Rupture of these bridging vessels results in subdural haemorrhage.

Mike Price

Further reading:

https://braintrauma.org/coma/guidelines

Question:

A 26-year-old woman, is admitted to the emergency department with tremor and tachycardia. She is known to be alcohol dependent. She does not have a significant past medical history and does not take any regular medications.

Which of the following would be the most appropriate treatment for the patient’s symptoms?

A. Lorazepam

B. Disulfiram

C. Phenytoin

D. Thiamine

E. Chlordiazepoxide

Correct Answer:Chlordiazepoxide

Explanation:

Benzodiazepines are used first-line to attenuate acute alcohol withdrawal symptoms. A long-acting benzodiazepine such as chlordiazepoxide or diazepam is recommended. The Clinical Institute Withdrawal Assessment – Alcohol revised (CIWA-Ar) scale is an assessment tool that can be used to assess the severity of alcohol withdrawal, guide treatment and monitor recovery of a patient.

Oral lorazepam is a short term benzodiazepine used in the treatment of delirium tremens (characterised by hallucinations, agitation and paranoia). It is not currently licensed for managing acute alcohol withdrawal.

Phenytoin is an anticonvulsant that should not be used to treat alcohol withdrawal seizures.

Thiamine should be offered to those at risk of developing Wernicke’s encephalopathy (those who are malnourished or have decompensated liver disease). Oral thiamine is poorly absorbed in dependent drinkers and so parenteral preparations (Pabrinex) are initially used, followed by long-term oral thiamine. Thiamine will not, however, treat her presenting symptoms.

Disulfiram reacts with alcohol to cause unpleasant acetaldehyde intoxication and histamine release. It is used as an adjunct in the treatment of alcohol dependence (under expert supervision).

Further reading:

https://www.nice.org.uk/guidance/cg100/chapter/Recommendations#acute-alcohol-withdrawal

Question:

A 26-year-old man presents to A&E with a red left eye. He explains that over the last 24 hours, the eye became red, painful and sensitive to light. He does not report any discharge from the eye but has experienced tearing.

He has a past medical history of Crohn's disease, which is currently managed with budesonide 9mg.

Slit-lamp examination reveals a small, irregular pupil, conjunctival injection around the cornea and inflammatory cells in the anterior chamber.

What is the most likely diagnosis?

A. Keratitis

B. Bacterial conjunctivitis

C. Acute angle-closure glaucoma

D. Acute anterior uveitis

E. Scleritis

Correct Answer:Acute anterior uveitis

Explanation:

The most likely diagnosis in this patient is acute anterior uveitis (AAU), also known as iritis, which is the inflammation of the iris and ciliary body. Iritis classically presents with pain, red eye, blurred vision, tearing and photophobia. The red-eye of AAU is described as a 'ciliary flush' - conjunctival injection around the corneal limbus. Slit-lamp examination often reveals a constricted or non-reactive pupil that may also be irregular in shape due to the formation of posterior synechiae (adhesions) between the iris and the lens. Iritis may be idiopathic or associated with an underlying systemic disorder. Notably, this patient has Crohn's disease, commonly associated with HLA-B27. Extra-intestinal manifestations of Crohn's disease can include anterior uveitis.

Patients with acute angle-closure glaucoma (AACG) typically present with headache, nausea ± vomiting and periocular pain. On examination, patients with AACG have a red eye, reduced visual acuity, corneal oedema and a fixed, dilated pupil.

In scleritis, there is transmural inflammation of the sclera resulting in focal eye pain with tenderness to palpation of the eye. Patients describe the pain as boring and made worse by eye movement. Scleritis can be associated with an underlying systemic disorder; however, it is more commonly associated with rheumatoid arthritis than inflammatory bowel disease.

Bacterial conjunctivitis classically presents with mucopurulent discharge, pain described as 'grittiness' or 'burning', and either mild or absent pruritus. Clinical examination typically reveals diffuse conjunctival erythema, discharge but the cornea is clear with normal or near-normal visual acuity.

Keratitis typically occurs in the context of corneal trauma or contact lens wear and presents with progressive ocular pain, decreased visual acuity and purulent discharge. Slit-lamp examination typically reveals corneal epithelial defect and infiltrate (white area of corneal oedema and inflammation).

Further reading:

https://cks.nice.org.uk/topics/uveitis/

Question:

A scientist develops a new blood test for the diagnosis of bowel cancer. He wishes to determine the negative predictive value of the test. 150 patients with suspected bowel cancer are tested first with the new blood test, then receive a colonoscopy to provide a definitive diagnosis. The results are shown below.

Colonoscopy positive Colonoscopy negative

New blood test positive 20 10

New blood test negative 80 40

What is the negative predictive value of the new breath test?

A. 90%

B. 50%

C. 80%

D. 66%

E. 33%

Correct Answer:33%

Explanation:

The correct answer is 33%.

The negative predictive value of a test is the proportion of individuals testing negative who truly do not have the condition, for example, a 33% negative predictive value means that 33% of individuals testing negative do not have the condition.

Therefore, to calculate the negative predictive value, you need to divide the number of individuals testing negative who do not have the condition (40) by the total number of individuals testing negative (80 + 40 = 120). Finally, multiply by 100 to convert this decimal into a percentage.

This is summarised by the formula below:

Sensitivity = [d/(c+d)] x 100

Have the condition (according to the gold standard investigation) Do not have the condition (according to the gold standard investigation)

Test positive a b

Test negative c d

Further reading:

https://geekymedics.com/sensitivity-specificity-ppv-and-npv/#:~:text=Sensitivity%20is%20the%20percentage%20of,target%20disease%20will%20test%20negative

Question:

A 45-year-old woman presents to the emergency department with severe generalised abdominal pain. She mentions that she has been vomiting after every meal and has not opened her bowels or passed flatus over the last 24 hours. She is currently awaiting an elective laparoscopic cholecystectomy.

On examination, she is tachycardic and febrile. Her abdomen appears distended, and there is abdominal tenderness in the right upper quadrant (RUQ). Percussion over the abdomen reveals a tympanic sound, and 'tinkling' bowel sounds can be heard on auscultation.

What is the most likely diagnosis?

A. Chronic cholecystitis

B. Gallstone pancreatitis

C. Gallbladder empyema

D. Mirizzi syndrome

E. Gallstone ileus

Correct Answer:Gallstone ileus

Explanation:

Gallstone ileus is caused by a large gallstone which has impacted in the terminal ileum, causing a small bowel obstruction. It typically occurs in older patients and is characterised by severe abdominal pain, nausea and vomiting, and abdominal distension, On examination, the patient is likely to be tender in the right upper quadrant (RUQ), with a palpable abdominal mass. Abdominal x-ray may show dilated loops of bowel with air-fluid levels, and a plain abdominal CT scan will show a gallstone impacted in the terminal ileum.

Mirizzi syndrome is a rare complication of gallstones which is caused by an impacted stone in the cystic duct. Typical clinical features include RUQ pain, fever, jaundice, and abdominal tenderness. Patients may also have a palpable gallbladder, which is a sign of severe inflammation. Ultrasound and CT scans may reveal an impacted stone in the cystic duct.

Chronic cholecystitis can cause abdominal pain, nausea and vomiting, fever, and changes in appetite. On examination, there is usually tenderness in the RUQ and the patient may have jaundice. Patients may elicit a positive Murphy's sign (indicates an inflamed gallbladder). To elicit Murphy's sign, apply pressure in the RUQ whilst asking the patient to inspire. If Murphy's sign is positive, there will be a sudden halt in inspiration due to the pain, and the pain will not be reciprocated on palpation of the LUQ. There may be signs of an infection such as a high white cell count. Ultrasound or CT scan can confirm the diagnosis.

Gallbladder empyema is characterised by the accumulation of purulent, infected pus in the gallbladder. Symptoms include RUQ pain, fever, nausea and vomiting, anorexia, and pale-coloured stools. On examination, there is usually tenderness in the RUQ and the patient may show some guarding, rigidity, and rebound tenderness. Abdominal ultrasound is the preferred imaging modality for gallbladder empyema and is usually diagnostic.

Gallstone pancreatitis is a serious condition that can lead to infection and bleeding if not treated promptly. The most common symptoms are abdominal pain radiating to the back, nausea, and vomiting. On examination, there may be some abdominal tenderness, distension and guarding. Blood tests will show elevated amylase and lipase, indicating inflammation of the pancreas. Ultrasound or CT scan can confirm the diagnosis.

Further reading:

https://patient.info/doctor/gallstones-and-cholecystitis

Question:

A white British 53-year-old presents with a troublesome cough. He states that this cough has been present over the past two weeks. It is not productive, and he has felt well otherwise. Past medical history includes newly diagnosed hypertension, which is now being treated. He used to smoke but gave up 30 years ago after having been exposed to 5 pack years. Clinical examination and vital signs are unremarkable.

What is the most likely cause of this patient's cough?

A. Lung cancer

B. Ramipril

C. Community-acquired pneumonia

D. Amlodipine

E. Asthma

Correct Answer:Ramipril

Explanation:

The most likely cause of this patient's cough is ramipril. The question not only tests candidates ability to understand the stepwise management of hypertension, but also the relevant side effects of medications. A dry cough is a well-known side effect of ramipril and if it is present, an alternative antihypertensive should be considered.

Amlodipine shouldn’t have been given to this patient as first-line therapy for hypertension given his age. Furthermore calcium channel blockers are not associated with a dry cough but instead with ankle swelling.

Community-acquired pneumonia is very unlikely, especially given that he is systemically well and the cough is non-productive.

Lung cancer is another possibility as it can present with a non-productive cough. Although you would expect to see other symptoms such as weight loss, an extensive smoking history, and potentially haemoptysis.

Asthma could present in a very similar manner although would be highly unlikely to present in a patient of this age. Typically asthma would present with nocturnal cough, shortness of breath, wheezing and chest tightness. Common triggers include various allergens, cold weather, and exercise.

Further reading:

https://patient.info/doctor/hypertension

Question:

A 62-year-old man is investigated for iron deficiency anaemia. He undergoes a colonoscopy, which finds no tumours or polyps but reveals that he has diverticulosis in the sigmoid colon. He denies any abdominal pain, constipation, diarrhoea, or weight loss.

What is the most appropriate management for this patient?

A. Prophylactic antibiotics

B. Advise avoidance of seeds, nuts, popcorn and fruit skins

C. Advise a healthy, balanced diet

D. Sigmoid colectomy

E. Bulk-forming laxatives

Correct Answer:Advise a healthy, balanced diet

Explanation:

According to NICE guidance, patients with diverticulosis do not require any specific treatments but should be advised to eat a healthy, balanced diet.

It is an old misconception that patients should be advised to avoid seeds, nuts, popcorn and fruit skins, as it was previously thought that these could become stuck in the diverticula and lead to diverticulitis. This has now been disproved.

Bulk-forming laxatives may be used to treat diverticular disease with constipation where the patient cannot tolerate a high-fibre diet, however, this patient is asymptomatic and, therefore, by definition, does not have diverticular disease.

Antibiotics may be used to treat diverticulitis, however, prophylactic antibiotics do not play a role in the management of asymptomatic diverticulosis.

A sigmoid colectomy may be used to treat complicated diverticulitis, however, it is not used to treat asymptomatic diverticulosis.

Further reading:

https://www.nice.org.uk/guidance/ng147/chapter/Recommendations#diverticulosis

Question:

A 55-year-old man has presented with penile pain during erections and angulation of his penis. He notes this has been going on for 6 months and is worsening. These only occur during erection and he otherwise has no other genitourinary symptoms. He has been married to his wife for 40 years and states there has been no change in circumstances. He feels well in himself and his past medical history includes Dupuytren's contracture and diabetes mellitus. On examination his penis is flaccid and there are no abnormalities noted.

What is the most likely diagnosis?

A. Autonomic erectile dysfunction

B. Peyronie's disease

C. Sarcoma of the penis

D. Physiological erectile dysfunction

E. Chronic balanitis

Correct Answer:Peyronie's disease

Explanation:

Peyronie’s disease is a connective tissue disorder characterised by fibrous thickening of the tunica-albuginea, this leads to penile pain and angulation of the penis. This can occur in a progressive manner and early symptoms may only occur during erection (hence the normal examination findings in this scenario). Peyronie's disease is associated with Dupuytren's contracture and diabetes. A potential differential diagnosis for Peyronies’ disease is sarcoma of the penis, however, this is a much rarer diagnosis and you would expect some constitutionals symptoms to be present (i.e. weight loss etc).

The gentleman did not have erectile dysfunction of any type as he mentions the symptoms occur during erection.

Chronic balanitis involves inflammation of the glans penis, characterised by pain, erythema and phimosis. This patient has had progressive symptoms over months and had no abnormalities on examination, making the diagnosis less likely.

Further reading:

https://patient.info/doctor/peyronies-disease-pro#nav-0

Question:

A 32-year-old female presents with her husband complaining of difficulty conceiving. They have been having regular unprotected intercourse for 8 months. On further questioning, she complains of dyspareunia, menorrhagia and dysmenorrhoea. She has no other medical problems. An ultrasound scan reveals a 5.4cm submucosal uterine fibroid.

Which of the following treatment options is most appropriate?

A. Uterine artery embolisation

B. Hysterectomy

C. Tranexamic acid

D. Myomectomy

E. Combined oral contraceptive pill

Correct Answer:Myomectomy

Explanation:

The most appropriate management choice for this patient's fibroid would be a myomectomy. Myomectomy allows patients to maintain their reproductive potential.

Fibroids are tumours of the smooth muscle cells of the uterine myometrium. They are extremely common and treatment is only required if they are symptomatic or are potentially causing issues with fertility.

Fibroids are classified based upon their position within the uterine wall:

Intramural (within the uterine wall) - most common

Submucosal - growing into the uterine cavity - more likely to cause issues with fertility

Subserosal - growing outwards from the uterus

Fibroids are most commonly asymptomatic, however, they can present with menorrhagia, abdominal/pelvic pain and iron deficiency anaemia. Other more sinister causes should be excluded before symptoms are attributed to fibroids. Submucosal fibroids can present with miscarriage or infertility.

Removal of submucosal fibroids via myomectomy restores fertility to baseline rates. Myomectomy can be performed laparoscopically, hysteroscopically or via an abdominal approach.

Hysterectomy is often used to manage patients with excessive uterine bleeding and/or multiple fibroids. This management option is only appropriate for patients who do not wish to have further children.

The combined oral contraceptive pill can be used in the management of fibroids with excessive menstrual bleeding, whilst also providing contraception. It would not be an appropriate option in this scenario given the patient is trying to conceive.

Tranexamic acid can be used to reduce menorrhagia associated with uterine fibroids, however, it would have no impact on improving the patient's fertility.

Uterine artery embolisation is effective for managing multiple fibroids and can allow a patient to keep their uterus. However, the effects on pregnancy and fertility are uncertain, therefore it would not be an appropriate option in this scenario.

Further reading:

https://patient.info/doctor/fibroids-pro

Question:

A 55-year-old man presents to the emergency department with right groin pain. He reports having had a lump there for some time, which became acutely swollen and painful after lifting some heavy boxes two days ago. There is no associated fever or vomiting, and he opened his bowels normally this morning.

On examination, his observations are normal, and his abdomen is soft and non-tender. There is a tender irreducible swelling in the right groin, which is located above and medial to the pubic tubercle. The scrotum and testes are normal.

What is the most likely diagnosis?

A. Obturator hernia

B. Spigelian hernia

C. Richter's hernia

D. Femoral hernia

E. Inguinal hernia

Correct Answer:Inguinal hernia

Explanation:

The most likely diagnosis, in this case, is an incarcerated inguinal hernia. Inguinal hernias pass through the inguinal canal into the groin. They run along the upper edge of the inguinal ligament and are typically located above and medial to the pubic tubercle. They are the commonest type of hernia and are much more likely to occur in men. Longstanding inguinal hernias tend to slowly increase in size and are likely to become incarcerated and irreducible eventually if they are not repaired. This may occur acutely, for example, following a sudden increase in intra-abdominal pressure or chronically due to gradual adherence to surrounding structures over time.

Femoral hernias are a less common type of groin hernia. They pass through the femoral canal into the upper medial thigh. They pass behind the inguinal ligament and are typically located below and lateral to the pubic tubercle. They are at very high risk of obstruction or strangulation, as the femoral canal is a narrow space bordered medially by the sharp edge of the lacunar ligament. Femoral hernias are much more common in older women.

Obturator hernias are very rare. They pass through the obturator foramen of the bony pelvis into the upper medial thigh. They typically present with small bowel obstruction and are often impalpable on clinical examination due to their small size and deep location within the tissues. They mostly occur in elderly women, especially those who are very thin or have had multiple pregnancies in the past.

Spigelian hernias are a type of anterior abdominal wall (or ventral) hernia. They pass through the Spigelian fascia lateral to the rectus sheath. They are usually very small and present with localised pain or a lump immediately lateral to the rectus abdominis muscle.

A Richter’s hernia involves the partial herniation of one edge of the bowel wall as opposed to its whole circumference. This phenomenon can affect any type of hernia and may result in serious complications, as the herniated portion of the bowel wall can rapidly become strangulated and ischaemic. This patient is unlikely to have a Richter’s hernia as he has been symptomatic for two days yet has remained systemically well with normal vital signs.

Further reading:

https://geekymedics.com/hernias/

Question:

A 25-year-old male attends his GP with a 2-day history of right-sided scrotal swelling and increasing tenderness. He also describes symptoms of dysuria but denies urethral discharge. He denies any abdominal pain, nausea, vomiting or fever. The patient has recently had a breakdown in his longterm relationship and has slept with multiple sexual partners.

On examination, there is tenderness on the right side of the scrotum with mild erythema. There is also a palpable swelling between the lower and upper pole of the right testis. The cremasteric reflex is present.

What is the most likely diagnosis?

A. Epididymal cyst

B. Testicular torsion

C. Epididymo-orchitis

D. Varicocele

E. Hydrocele

Correct Answer:Epididymo-orchitis

Explanation:

The most likely diagnosis is epididymo-orchitis, given the history of scrotal pain, right-sided scrotal swelling and dysuria. The cost common cause of epididymo-orchitis is men under the age of 35 is chlamydia, which is supported by the history of multiple sexual partners and dysuria. Epididymo-orchitis typically presents with unilateral scrotal pain and swelling over the course of a few days. If chlamydia is the underlying cause, the patient may experience dysuria and urethral discharge.

Clinical examination typically reveals unilateral scrotal tenderness with a palpable swelling o the epididymis (which extends from the lower to the upper pole of the testicle). The testicle itself may also be swollen. There may also be erythema of the scrotum and fever.

Hydrocele can occur secondary to epididymo-orchitis or as a primary condition. Primary hydrocele presents with painless scrotal swelling. The testis is typically difficult to palpate due to the excess fluid and the scrotum should transilluminate.

Varicocele occurs due to malfunctioning valves in the testicular veins resulting in dilation of the veins in the pampiniform venous plexus. They typically present with a lump on the left side of the scrotum that feels like a bag of worms. There should be no associated tenderness and no dysuria.

Epididymal cysts present as a painless scrotal lump, which can be palpated separately from the testicle, helping to distinguish it from testicular cancer.

Testicular torsion needs to be considered in all cases of acute testicular pain as if the diagnosis is missed it can result in loss of the affected testis due to ischaemia. This condition typically presents with acute onset, severe unilateral testicular pain. Nausea, vomiting and lower abdominal pain may also be present. Clinical examination may reveal erythema of the scrotal skin and a swollen, tender testis that is retracted upwards. The cremasteric reflex is typically absent.

Further reading:

https://patient.info/doctor/epididymo-orchitis-pro

Question:

Mary Wilson, 54, is receiving intravenous flucloxacillin for cellulitis of the right leg. You are called to see her as she is feeling unwell and complaining of tongue swelling. Her oxygen saturations are 97% on room air, blood pressure is 105/67mmHg and her heart rate is 109bpm. She has no significant past medical history and is not known to have any allergies.

What is the most appropriate initial step in management?

A. Hydrocortisone 200mg IV

B. Insertion of airway adjunct

C. Stop the flucloxacillin infusion

D. Adrenaline 1mg (10ml of 1:10000)

E. Adrenaline 500mcg (0.5ml of 1:1000)

Correct Answer:Stop the flucloxacillin infusion

Explanation:

This patient is likely to be suffering from anaphylaxis. The first step in management is to immediately withdraw the triggering agent where possible. You can then perform an ABCDE assessment to confirm your suspicions. In this case, the intravenous antibiotics are a likely cause and therefore they should be stopped immediately, whilst someone goes to retrieve emergency drugs. The standard treatment for anaphylaxis in adults is 500mcg of adrenaline (0.5ml of 1:1000) given intramuscularly as soon as possible. Other treatment includes 200mg of intramuscular hydrocortisone and 10mg of intramuscular chlorphenamine.

Although all are important, IM adrenaline is required to restore the patient to haemodynamic stability and therefore should be the drug given first.

1mg of adrenaline (10ml of 1:10000) is the dose of adrenaline used in adult cardiac arrest and is given intravenously.

Airway adjuncts may cause trauma in the context of mucosal swelling and should be avoided. Help from the anaesthetic team is required in the presence of airway swelling as this is an emergency.

Further reading:

https://www.resus.org.uk/anaphylaxis/emergency-treatment-of-anaphylactic-reactions/

Question:

You are an SHO working in Paediatrics. A 14-year-old female patient attends her yearly Paediatric appointment to review her mobility. She suffers from right unilateral hemiplegia that affects her right arm to a greater extent than her leg with facial sparing. On examination, you note that her right hand is held in a permanent fist, with her elbow flexed and forearm pronated. Lower limb neurological examination reveals brisk tendon reflexes and an extensor plantar response on the right. When assessing her gait, you note she is tip-toe walking with her right leg. She was diagnosed with her condition at aged 12 months.

What is the most common NON-MOTOR condition associated with the condition described?

A. Learning difficulties

B. Hearing impairment

C. Strabismus

D. Cardiomyopathy

E. Epilepsy

Correct Answer:Learning difficulties

Explanation:

The condition described is most likely spastic type cerebral palsy.

Cerebral palsy can be classified into 5 main categories:

spastic type (the most common)

dyskinetic type

ataxic type

hypotonic type

mixed type

Spastic type cerebral palsy can be subdivided into hemiplegia, quadriplegia and diplegia. The clinical features of this form of cerebral palsy are related to a persistently increased state of tone that is velocity-dependent (i.e. the greater the muscle is stretched, the greater the resistance). Clinical features of hemiplegic cerebral palsy include fisting of the affected hand, forearm pronation, elbow flexion, asymmetric reaching and tip-toe walking. Learning difficulties are the most common non-motor condition associated with cerebral palsy, affecting 60% of individuals.

Epilepsy is associated with cerebral palsy but is not as commonly associated as learning difficulties are.

Strabismus is associated with cerebral palsy but is not as commonly associated as learning difficulties are.

Hearing impairment is associated with cerebral palsy but is not as commonly associated as learning difficulties are.

Cardiomyopathy is not associated with cerebral palsy.

Further reading:

https://patient.info/doctor/cerebral-palsy-pro

Question:

A 35-year-old man presents with nausea, headaches, and shortness of breath. He has visited multiple different healthcare providers and has been admitted to hospital multiple times. Investigations are unremarkable and private investigations he ordered, including a CT and MRI of the head, are normal. He has previously been offered codeine for his headaches. Despite reassurance, he has revisited healthcare providers for the last three years and is adamant that the symptoms are present.

What is the most likely diagnosis?

A. Hypochondriasis

B. Factitious disorder

C. Conversion disorder

D. Somatisation disorder

E. Malingering

Correct Answer:Somatisation disorder

Explanation:

Somatisation disorder is correct. This patient has visited multiple healthcare providers with worries regarding symptoms that have persisted for three years despite reassurance and negative test results. This suggests the presence of somatisation disorder. Somatisation disorder is worrying about multiple physical symptoms despite negative test results and reassurance for at least two years (a helpful way of remembering this is that multiple symptoms and somatisation both contain the letter S).

Hypochondriasis is incorrect. This would apply if the patient were worried about a serious underlying disease, which does not apply here as the patient is concerned regarding his multiple symptoms. Hypochondriasis (or illness anxiety disorder) describes a persistent belief in the presence of a serious underlying disease despite repeated reassurance and negative testing. A helpful way of remembering this is hypochondriasis is worrying about cancer (as they both contain the letter C, which is an example of a serious underlying disease).

Malingering is incorrect. This is a fraudulent simulation or exaggeration of symptoms with the intention of financial or other gains (e.g. pain relief). It would not be a surprise that this patient has been offered stronger pain relief given the timeframe and severity of their symptoms, and it would be reasonable to ask for more. This patient is not exaggerating their symptoms with the intent of any goal, nor does the question mention any possible gain he may want.

Factitious disorder is incorrect. Also known as Munchausen's syndrome, this is the intentional production of physical or psychological problems with the intent to assume a sick role or be deceptive towards the healthcare provider. Patients tend to have a history of recurrent hospitalisation, travelling to see different doctors and dramatic and exaggerated stories of their past experiences. This patient is not trying to deceive the examiner, nor is there any clear benefit as to why they would be feigning their symptoms.

Conversion disorder is incorrect. These are functional neurological symptoms such as numbness, paralysis, and seizures with no associated clear cause except a previous psychological trigger. These patients are not consciously feigning or exaggerating the symptoms and may even be indifferent to their symptoms. In this scenario, this patient is well aware of their symptoms.

Further reading:

https://patient.info/doctor/somatic-symptom-disorder

Question:

A 71-year-old lady presents to the GP with a four-month history of increased shortness of breath. She used to only get breathless with strenuous exercise but now gets out of breath walking into town (about 20 minutes). She has also developed a cough but never brings any sputum up. She had a number of urinary tract infections over the past three years but has no other past medical history. She has never smoked. On examination, fine inspiratory crackles are heard at both lung bases.

What is the most likely underlying cause of the condition?

A. Long-term nitrofurantoin use

B. Idiopathic

C. Hypertension

D. Smoking

E. Long-term trimethoprim use

Correct Answer:Long-term nitrofurantoin use

Explanation:

This is likely a case of nitrofurantoin-induced pulmonary fibrosis. Long term use of this antibiotic can cause fibrosis, mainly in the lower lobes of the lungs. Recurrent urinary tract infections can be an indication for a regular prophylactic dose of nitrofurantoin. It is important to immediately stop the antibiotic to reduce the progression of the disease although there is unlikely to be a reversal of the fibrotic process.

Although idiopathic pulmonary fibrosis is seen in patients of this age, this is more common in male patients and the history of recurrent urinary tract infections makes nitrofurantoin the more likely cause.

Trimethoprim is not known to cause pulmonary fibrosis but is commonly used to treat urinary tract infections.

Hypertension is a common cause of heart failure but this would present with a previous history of hypertension, as well as other signs and symptoms such as orthopnea, paroxysmal nocturnal dyspnoea and peripheral oedema.

Smoking is the most common cause of COPD but this is unlikely in this patient due to the absence of wheeze and the lack of smoking history. COPD caused by alpha-1 anti-trypsin deficiency would likely present at a younger age and is less common.

Further reading:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2408600/

Question:

A 5-year old child is brought to the GP by his parents. He has been experiencing coryzal symptoms for the last 3 days, but over the last day, his parents have noticed he has developed very dark urine despite normal oral intake, with a mild fever and increasing drowsiness.

He currently has a temperature of 38.1⁰C with a heart rate of 120bpm and respiratory rate of 25bpm. On examination, he is drowsy and irritable, and you note a slight yellowish tinge to the skin. On abdominal examination, you note fullness on palpation of the left upper quadrant. A urine sample is obtained which appears dark but is negative for nitrates and protein on dipstick testing.

His past medical history is unremarkable, and he has attended all routine childhood GP appointments with no abnormalities detected. His red book demonstrates normal growth along his centile and all of his vaccinations are up to date. He was delivered by C-section at 39 weeks with a normal neonatal assessment. He has no known allergies and is not taking any medications.

Upon questioning there is a family history of similar episodes occurring in a maternal uncle, which have never been formally diagnosed. Nobody else at home is ill, and there is no recent travel history.

A blood sample is obtained. This demonstrates a raised reticulocyte count and a raised mean cell volume. A blood film is also performed, which shows Heinz bodies and bite cells. Blood tests reveal an elevated bilirubin and lactate dehydrogenase. The GP arranges a further blood test to confirm the diagnosis.

What is the most likely diagnosis?

A. Glucose-6-Phosphate-Dehydrogenase (G6PD) deficiency

B. Autoimmune haemolytic anaemia

C. Sickle cell disease

D. Gilbert syndrome

E. Hereditary spherocytosis

Correct Answer:Glucose-6-Phosphate-Dehydrogenase (G6PD) deficiency

Explanation:

The most likely diagnosis is G6PD deficiency. This is a genetic X-linked condition that mainly affects males. G6PD is an enzyme in the pentose phosphate pathway that is required to prevent oxidative damage to red blood cells; as a result, deficiency leads to increased oxidant-induced haemolysis. It can present as neonatal jaundice, as well as acute haemolytic episodes that can be triggered by infections (as appears to be the case in this patient) as well as certain drugs (such as antimalarials and antibiotics), fava beans and mothballs (that contain naphthalene). It results in intravascular haemolysis, which can present with dark urine and splenomegaly. Blood films of patients affected by G6PD deficiency will generally reveal an increased reticulocyte count (resulting in a macrocytosis) as well as characteristic Heinz bodies (denatured haemoglobin) and bite cells (red cells with ‘bites’ from the cell margin). Diagnosis can be confirmed by measuring reduced G6PD enzyme activity in red blood cells. It is important to note that in between the episodes there will be a normal blood film however, as no haemolysis is taking place.

This is unlikely to be a case of autoimmune haemolytic anaemia. Yellowing of the skin and dark urine can also occur as a result of autoimmune haemolytic anaemia due to the breakdown of red blood cells. Lactate dehydrogenase and bilirubin would also be raised in autoimmune haemolytic anaemia. Heinz bodies and bite cells, however, are typical of G6PD deficiency. Autoimmune haemolytic anaemia may be primary with an unknown cause but may occur secondary to lymphoproliferative disease or infection. Direct agglutinin tests can be performed to support the diagnosis.

Sickle cell disease is not the most likely diagnosis. This can result in haemolytic crises as sickle cells are more prone to haemolysis, but this history is not typical of a sickle cell disease patient and the blood film would not show bite cells and Heinz bodies; instead, there would be characteristic sickled cells and Howell-Joly bodies (nuclear remnants within red blood cells) as a result of hyposplenism.

Gilbert syndrome is a syndrome in which there is a raised level of unconjugated bilirubin in the blood. Mild jaundice can result during stress or infection, but other symptoms are rare and there would not be signs of haemolysis such as the abnormal blood film or dark urine as occurring in this case.

Hereditary spherocytosis is also a cause of haemolysis, caused by a defect in the membrane proteins of red blood cells. The blood film will typically only reveal spherocytes and fragmented red cells rather than Heinz bodies and bite cells. It can be diagnosed by the osmotic fragility test, in which red cells exposed to hypotonic saline swell and lyse; in hereditary spherocytosis red cells will lyse with less resistance.

Further reading:

https://patient.info/doctor/glucose-6-phosphate-dehydrogenase-deficiency

Question:

An 80-year-old female patient attends her GP with an unusual skin lesion located on the right side of her forehead. She reports that the lesion appeared around 6 months previously and has become progressively larger. On further questioning, the patient admits that she has consistently sun-bathed since a young adult. On examination, the patient has a very pale complexion. The skin lesion measures 1 x 2 inches, is erythematous, well-demarcated, has an irregular margin, is mildly fissured, hyperkeratotic and is scaly in texture. The patient is referred to Dermatology and a skin biopsy highlights the following findings: ‘windblown’ appearance of the keratinocytes and the presence of Pagetoid cells.

What is the most likely diagnosis?

A. Tinea corporis

B. Plaque psoriasis

C. Bowen's disease

D. Actinic keratosis

E. Basal cell carcinoma

Correct Answer:Bowen's disease

Explanation:

The most likely diagnosis is Bowen's disease (a.k.a. intraepidermal carcinoma / squamous cell carcinoma in situ). This condition can be defined as carcinoma of keratinocytes. The main complication of Bowen's disease is the development of squamous cell carcinoma. Major risk factors for this condition include increasing age (particular above the age of 60 years) and pale skin that has been chronically exposed to the sun. Typical clinical features of Bowen's disease include a lesion that is asymptomatic (i.e. not itchy, painful etc), erythematous, progressively increasing in size, fissured or ulcerated, hyperkeratotic and irregular in shape with a well-demarcated border. Bowen's disease plaques usually present individually on sun-exposed areas (e.g. head, neck, cheeks) although they have been known to present elsewhere. Investigations for this condition include skin biopsy with histological analysis (showing ‘windblown’ keratinocytes and may show Pagetoid cells) to confirm the diagnosis.

Actinic keratosis may also be complicated by the development of squamous cell carcinoma. This condition presents as multiple, ‘sandpaper-like’ lesions on sun-exposed areas.

Basal cell carcinoma is less likely in this case. This condition presents with pearlescent lesions with associated telangiectasia.

Plaque psoriasis more commonly presents on extensor surfaces (e.g. elbows).

Tinea corporis typically presents with an annular, pruritic plaque.

Further reading:

https://www.dermnetnz.org/topics/intraepidermal-carcinoma/

Question:

A 15-year-old patient, Fabian Khan, attends the Paediatric Emergency Department with abdominal pain. Fabian was playing hockey at school when he suddenly experienced a sharp pain in his lower abdomen which has now radiated towards his left testicle. Fabian has vomited twice since the pain started and passed loose stool once. Fabian's past medical history includes childhood asthma and hayfever. He is up to date with immunisations, he takes no regular medications and has no drug allergies.

On examination, Fabian looks worried and in pain, but he is well perfused. Abdominal examination reveals a soft abdomen with no rebound tenderness, guarding or organomegaly. Bowel sounds are present and normal. Fabian’s left testicle appears red and slightly swollen, the cremasteric reflex is absent.

Vital signs are as follows:

O2 98%

HR 99 bpm

RR 18

BP 115/80 mmHg

Temp 36 oC

What is the most likely cause of this patient's presentation?

A. Orchitis

B. Testicular torsion

C. Hydrocele

D. Appendicitis

E. Epididymitis

Correct Answer:Testicular torsion

Explanation:

The most likely diagnosis is testicular torsion.

Testicular torsion (TT) is a common urological emergency among adolescent boys and young men. Acute swelling of the scrotum is TT until proven otherwise!

Patients with TT usually present with sudden severe pain in one testis, usually associated with abdominal pain, nausea and vomiting. Clinical examination often reveals a swollen, tender, red scrotum with retracted testes and an absent cremasteric reflex. This patient presents with classic features of TT and should be referred urgently to the emergency paediatric or urological surgeons for surgical exploration.

Infectious causes of testicular pain such as epididymitis or orchitis, are usually secondary to urinary reflux or sexually transmitted infections. Infectious causes are more often associated with a less acute history, systemic symptoms such as fever, and a tender epididymis. For this patient, TT must be excluded prior to consideration of infectious differentials.

This patient does not present with ‘classic’ features of appendicitis such as localised right iliac fossa pain, guarding or rebound tenderness. His abdomen is also soft on examination. Appendicitis is still a reasonable differential diagnosis for this patient, however, and if the surgical exploration of the scrotum was inconclusive, then consideration of appendicitis would be indicated.

A hydrocele is an accumulation of fluid within the tunica vaginalis, it is usually painless, chronic, and on examination, the scrotum will transilluminate with a torch.

Further reading:

https://patient.info/doctor/torsion-of-the-testis-pro

Question:

Steven is a 58-year-old gentleman who has been living with HIV for 20 years. Despite being on anti-retroviral therapy, Steven has encountered non-compliance issues with his medication. At a routine appointment, his latest CD4 cell count was revealed to be less than 200/uL.

Steven presents to his local emergency department with a non-productive cough and shortness of breath, which he reports has been worsening over the past couple of weeks.

Following a sputum culture and an X-ray, Steven is diagnosed with pneumocystis pneumonia (PCP).

Which of the following is the first-line antimicrobial used to treat this condition?

A. Co-trimoxazole

B. Amoxicillin

C. Clindamycin

D. Erythromycin

E. Vancomycin

Correct Answer:Co-trimoxazole

Explanation:

PCP is an AIDS-defining illness, caused by Pneumocystis jirovecii. This is an important diagnosis to consider in any HIV patient presenting with infective symptoms in the context of a low CD4 count.

Typical clinical features include progressively worsening dry cough (due to thick secretions preventing expectoration), shortness of breath, fever, night sweats and weight loss.

The first-line treatment of mild-to-moderate PCP is high dose co-trimoxazole (trimethoprim-sulfamethoxazole). If a patient is intolerant to co-trimoxazole, atovaquone suspension or dapsone with trimethoprim can be considered.

In cases of severe infection, first-line treatment revolves around intravenous or oral high-dose co-trimoxazole. If a patient is unable to tolerate this, intravenous pentamidine isetionate can be administered. The use of pentamidine isetionate can lead to severe hypotension during or following intravenous infusion; therefore blood pressure must be monitored closely.

Corticosteroid therapy is used in cases of severe PCP. Treatment is started concurrently with antimicrobial therapy, and withdrawn before the antimicrobial therapy is completed.

Further reading:

https://bnf.nice.org.uk/treatment-summary/pneumocystis-pneumonia.html

Question:

A 64-year-old woman presents to the emergency department with sudden onset lower back pain, which started on standing. The pain is 8/10, does not radiate, and she has no pain anywhere else. She has no bowel or urinary symptoms. Neurological examination is normal. She has no weight loss or any other symptoms. She has a past medical history of COPD and suffers from frequent exacerbations, having had four courses of treatment in the past six months. Besides inhalers, she is not prescribed any regular medications.

What is the most likely diagnosis?

A. Vertebral disc prolapse

B. Muscular pain

C. Metastasis to the spine

D. Vertebral crush fracture

E. Osteoarthritis

Correct Answer:Vertebral crush fracture

Explanation:

The most likely diagnosis is a vertebral crush fracture, given the history of sudden onset severe pain in a specific region of the spine associated with standing up. The clue is the frequent exacerbations of COPD. COPD exacerbations are typically treated with antibiotics and steroids. Steroid use is a significant risk factor for osteoporosis (especially in post-menopausal women). Osteoporosis commonly presents with an initial fracture, which then triggers further investigations.

The pain is unlikely to be muscular, and nothing points to a muscular history in the question – this would normally be associated with heavy lifting and shouldn’t really come on so suddenly just from standing up from a chair.

Osteoarthritis typically presents with chronic joint pain that is worse after exertion. Sudden onset of pain in a specific region of the spine is much more likely to be a fracture.

Vertebral disc prolapse or spinal metastasis are unlikely, given the absence of any neurological or constitutional symptoms (i.e. weight loss).

Further reading:

https://patient.info/doctor/fragility-fractures

Question:

A 12-year-old boy presents with a new rash, first noticed on his back two days ago. He was recently diagnosed with viral pharyngitis by his GP, three weeks ago. He is otherwise well and is up-to-date with his immunisations.

On examination, he is alert, has a heart rate of 89bpm, a respiratory rate of 18/min, a blood pressure of 110/90 mmHg, and a temperature of 36.8ºC. Numerous pink, scaly teardrop papules are scattered across the patient's back. No other lesions are present.

What is the most likely diagnosis?

A. Pityriasis rosea

B. Pityriasis versicolor

C. Plaque psoriasis

D. Erythema multiforme

E. Guttate psoriasis

Correct Answer:Guttate psoriasis

Explanation:

The patient has features of guttate psoriasis, an acute-onset psoriatic rash characterised by scaly teardrop papules on the back following viral pharyngitis. It is the second most common type of psoriasis in children and young adults and usually resolves spontaneously in 4-6 months.

Erythema multiforme is a self-limiting, immune-mediated condition characterised by 'target lesions. Although erythema multiforme can be triggered by infection, the description of the lesions in the vignette does not support this diagnosis.

Pityriasis rosea is also a self-limiting rash which can develop following viral pharyngitis. However, pityriasis rosea is typically associated with a large oval patch in the lower back (a herald patch), followed by smaller, scaly oval patches in a Christmas tree-like distribution. The rash distribution and morphology in the vignette are more consistent with guttate psoriasis.

Pityriasis versicolor is a fungal infection (caused by Malassezia furfur) which results in patches of hypo- or hyperpigmentation in the back or chest. It is not associated with a viral infection and is a benign and chronic condition.

Plaque psoriasis is the most common form of psoriasis in children. The scattered distribution and eruption of the rash following viral pharyngitis are more consistent with guttate psoriasis. A diagnosis of plaque psoriasis may be considered if the patient's rash becomes more widespread and fails to resolve spontaneously.

Further reading:

https://geekymedics.com/psoriasis/

Question:

A 71-year-old patient, Mrs Amina Patel, attends the GP complaining of a headache. Mrs Patel states that the headache began 24 hours ago and is severe. She gestures that the pain is worse felt around her left temporal and occipital regions. She has also been feeling lethargic and ‘run down’ for the last few days with generalised muscle aching and fevers.

Mrs Patel has a past medical history of migraines and gallstones. Her regular medications include propranolol, paracetamol and ondansetron. She is a non-smoker and mobilises with a stick.

On examination, her scalp is tender on palpation over the left temporal region. Cranial nerve examination reveals diplopia during the assessment of cranial nerves 3,4 and 6. Fundoscopy is unremarkable.

Her vital signs are as follows:

O2 96%

HR 95 bpm

RR 15

BP 142/80 mmHg

Temp 37.6 oC

What is the next most appropriate management step for this patient?

A. Sumatriptan injection

B. Oral prednisolone

C. Amitriptyline

D. Supplemental oxygen

E. Routine ophthalmology referral

Correct Answer:Oral prednisolone

Explanation:

Of the options presented, the most appropriate next management step would be prescribing a course of oral prednisolone.

This patient presents with a new-onset, severe, unilateral, localised headache that is associated with visual disturbance, tenderness in the temporal area and systemic features. From this history, the most likely diagnosis is giant cell arteritis (GCA), an immune-mediated vasculitis of the temporal artery. GCA is considered a medical emergency due to its imminent irreversible threat to sight. The management of GCA includes immediate administration of oral steroids (Prednisolone) followed by an urgent referral to an ophthalmologist and GCA specialist for a temporal artery biopsy.

Amitriptyline is a first-line agent for migraine prophylaxis along with beta-blocker therapy. This patient presents with symptoms unlike her usual migraine manifestation (including visual disturbance and localised pain). These features make migraine a less likely diagnosis for this patient.

A reasonable differential diagnosis for a severe unilateral headache is a ‘cluster headache’. Cluster headaches present with sudden severe unilateral head pain typically around the eye or temple and lasting 15-90 minutes. Supplemental oxygen and sumatriptan injection are first-line treatments for a patient presenting with a ‘cluster headache’. This patient has some features in keeping with a ‘cluster headache’, however, the longer duration of her symptoms, the lack of multiple attacks, her advanced age make GCA is a more likely diagnosis.

Further reading:

https://cks.nice.org.uk/giant-cell-arteritis

Question:

A new screening programme for abdominal aortic aneurysms in women is rolled out. This involves a one-off ultrasound at 65 years and subsequent follow-up if an aneurysm is found. In its first year, the programme had an uptake of 60% and identified abdominal aortic aneurysms in 0.5% of women. A researcher uses this data, concluding that the prevalence of abdominal aortic aneurysms in women aged 65 years is 0.5%.

What form of bias is most likely to be present in this study?

A. Observer bias

B. Measurement bias

C. Selection bias

D. Procedure bias

E. Attrition bias

Correct Answer:Selection bias

Explanation:

Using data gathered from a screening programme with a 60% uptake rate introduces the possibility of selection bias. This is the bias that arises from the way in which participants are selected for a study, and it results in a sample population that differs from the general population. In this scenario, those who choose to participate in a screening program may be more concerned about their health than those who opt out, and they may therefore be less likely to smoke and more likely to lead a healthier lifestyle. These factors could result in the sample population having a lower incidence of abdominal aortic aneurysms than the general population.

Attrition bias is the bias that can arise from patients being lost to follow-up.

Measurement bias is the bias that arises from an inaccuracy in the way in which the variable is being measured, for example, using an inaccurate measuring tool.

Observer bias is the bias that arises due to a researcher’s expectations or preconceptions affecting the way they perceive and record a variable.

Procedure bias is the bias that arises from the conditions in which a study is undertaken, for example, not giving participants enough time to complete a questionnaire or interviewing participants in a non-private room.

Further reading:

https://geekymedics.com/statistics-for-medical-students/

Question:

A 70-year-old man presents to GP with a 3-month history of fatigue and a loss of appetite. More recently, he has been awoken at night due to excessive sweating. On examination, the GP notes marked splenomegaly.

Blood tests reveal a normocytic anaemia and an elevated white cell count, specifically elevated basophils and eosinophils.

Following a bone marrow biopsy, cytogenetics reveal the presence of a chromosomal translocation between chromosome 9 and chromosome 22, resulting in an ABL1-BCR fusion gene.

Based on these clinical findings, what is the most appropriate treatment?

A. Ruxolitinib

B. Rasburicase

C. Imatinib (Gleevac)

D. All-trans retinoic acid

E. Bortezomib (Velcade)

Correct Answer:Imatinib (Gleevac)

Explanation:

Imatinib is a tyrosine kinase inhibitor, used in the treatment of CML that is Philadelphia chromosome-positive (ABL1-BCR).

Bortezomib is a proteasome inhibitor, used in the treatment of multiple myeloma and mantle cell lymphoma.

Ruxolitinib is a protein kinase inhibitor, that specifically targets the JAK1 and JAK2 genes. It is used in the treatment of myelofibrosis and polycythaemia vera.

Rasburicase is given to patients receiving chemotherapy for leukaemia and lymphomas, to prevent and manage tumour lysis syndrome.

All-trans retinoic acid is used in the treatment of acute promyelocytic leukaemia.

Further reading:

https://patient.info/doctor/chronic-myeloid-leukaemia-pro

Question:

An 11-month-old boy is brought into the hospital with a three-day history of coryza and fever. An hour ago, he had a self-terminating seizure which lasted for around four minutes. He has no significant past medical history, however, his cousin has a diagnosis of epilepsy.

On examination, his temperature is 40.2°C. He has no known medical conditions and takes no regular medications.

What risk factor does this child have for the recurrence of this type of seizure?

A. Family history of epilepsy

B. Early onset (<18 months)

C. Several days of fever prior to the seizure

D. Having a high-grade fever (>39.0°C)

E. The seizure lasting <5 minutes

Correct Answer:Early onset (<18 months)

Explanation:

The most likely diagnosis, in this case, is a febrile seizure. According to NICE, there are a number of risk factors for recurrent febrile seizures and the more risk factors a child has, the greater the risk of recurrence. In most cases, febrile seizures are self-limiting, and children go on to have normal growth and development. An early onset, before 18 months of age, is a risk factor for recurrent febrile seizures. According to one study, 50% of children <12 months old and 30% of children >12 months old have recurrent febrile seizures.

In this case, a family history of epilepsy is not a risk factor as it is not in a first-degree relative. To be a risk factor for recurrent febrile seizures, there must be a history of febrile seizures or epilepsy in a first-degree relative

A high-grade fever (>39.0°C) is not a risk factor, however, a low-grade fever (<39.0°C) associated with seizure onset is.

A short duration of fever (<1 hour) before a seizure is a risk factor for recurrent febrile seizures but several days of fever prior to the seizure is not.

The seizure lasting <5 minutes is not a risk factor; however, prolonged seizures lasting >15 minutes are a risk factor for recurrence.

Other risk factors include complex febrile seizures and multiple seizures in 24 hours (or in the same episode). Attendance at nursery or daycare also increases the risk of recurrent febrile seizures due to the increased viral exposure and increased frequency of febrile illness.

Further reading:

https://geekymedics.com/febrile-seizures/

Question:

You see a 65-year-old man with lower back pain and bilateral leg pain. The lower back pain has been present for 2 years but gradually getting worse. Recently he has noticed that his legs ache when he walks further than about 500 metres. He is normally very fit and active. The pain radiates to his buttocks, thighs and legs bilaterally (but his left leg is worse than his right). He describes the pain as ‘cramping and burning’. If he walks further than 500m his legs become weak and numb. If he sits down and leans forward the symptoms go, and then he can carry on for another 500 metres. He says that the pain is better when he walks uphill. He finds standing exacerbates the symptoms but he can cycle on his static bike without any problems.

He has no relevant past medical history and has never smoked.

You find no abnormalities on examination. His peripheral pulses are good.

Given the most likely diagnosis, what is the first-line investigation to confirm this?

A. Lower-limb dopplers

B. CT spine

C. Lumbar spine x-ray

D. MRI spine

E. Abdominal USS to assess the aorta

Correct Answer:MRI spine

Explanation:

Spinal stenosis (or narrowing) is a common condition that occurs when the small spinal canal, which contains the nerve roots and spinal cord, becomes compressed. This causes a “pinching” of the spinal cord and/or nerve roots, which leads to pain, cramping, weakness or numbness. Depending on where the narrowing takes place, you may feel these symptoms in the lower back and legs, neck, shoulder or arms.

MRI spine is the gold standard investigation for spinal pathology. If contraindications were present CT spine or less appropriately lumbar spine X-ray could be alternatives.

Further reading:

https://patient.info/doctor/spinal-stenosis-pro

Question:

A 60-year-old lady presents to her GP with a 2-day history of shortness of breath. She has a productive cough, bringing up what she describes as yellow-green sputum and sharp chest pain on inspiration. She appears dyspnoeic, and on examination, there are some coarse crackles and dullness to percussion over the right lung base. She does not appear confused but has a temperature of 38°C.

She has no significant past medical history and no recent hospital admissions but is allergic to penicillin. She does not smoke and takes no other medications. Her vital signs are otherwise normal.

Which of the following is the most appropriate antibiotic for management?

A. Levofloxacin

B. Cefalexin

C. Amoxicillin

D. Clarithromycin

E. Co-amoxiclav

Correct Answer:Clarithromycin

Explanation:

The most likely diagnosis here is community-acquired pneumonia (CAP). The above is a classic example, but it can vary in severity and often also presents with bronchial breathing and haemoptysis.

NICE guidelines recommend using the CRB-65 score to estimate severity (CURB-65 if hospital-acquired) and to determine the course of treatment:

Confusion (new disorientation in person, place, or time)

Urea ≥ 7 (not used in CAP)

Respiratory rate ≥ 30

Blood pressure < 90 systolic or ≤ 60 diastolic

Age ≥ 65

This patient has a CRB-65 score of 0, suggesting mild pneumonia that can be treated with oral antibiotics without hospital admission. Due to her penicillin allergy, the most appropriate management is clarithromycin, 500mg twice a day for 5 days.

Amoxicillin is first-line for CAP, however, as this patient is allergic to penicillin this is inappropriate.

Levofloxacin is an appropriate alternative in penicillin allergy but is given only for severe pneumonia.

Co-amoxiclav is given only in severe or hospital-acquired pneumonia. It is also a penicillin which is not suitable for this patient.

Cefalexin is recommended for the treatment of hospital-acquired pneumonia.

Further reading:

https://www.nice.org.uk/guidance/ng138

Question:

A 12-year-old boy attends his GP accompanied by his mother. The mother worries that her son is more inattentive and hyperactive compared to her elder son. She has been aware of these behaviours for the past two years. He often doesn't pay attention when spoken to and has trouble finishing activities.

The boy constantly taps his hands and feet and interrupts the conversation. During the consultation, the patient stands up and starts walking around the room. On further questioning, you establish that the boy is not functioning at school, and also having difficulty maintaining friendships.

Based on the likely diagnosis, what is the first-line pharmacological management?

A. Fluoxetine

B. Dexamfetamine

C. Methylphenidate

D. Atomoxetine

E. Citalopram

Correct Answer:Methylphenidate

Explanation:

The condition described is most likely attention deficit hyperactivity disorder (ADHD). Methylphenidate (Ritalin) is the first-line pharmacological management for this condition. Specialist referral is needed to confirm the diagnosis and to start management. Pharmacological management of ADHD may be secondary to conservative management in some cases, including adopting a watch-and-wait approach or offering various psychosocial interventions.

ADHD is characterised by inattention (manifested here by having difficulty completing activities and not listening to conversations), hyperactivity (manifested as constant movement) and impulsivity (manifested as interrupting conversations and abruptly getting up and moving). As a result, children with ADHD often struggle with activities at school and in social interaction.

Atomoxetine is used as second-line drug therapy for ADHD.

Dexamfetamine may be used as third-line drug therapy for ADHD.

Fluoxetine is an SSRI which is not indicated for use in ADHD. SSRIs are instead indicated for conditions such as depression.

Citalopram is an SSRI which is not indicated for use in ADHD. SSRIs are instead indicated for conditions such as depression.

Further reading:

https://patient.info/doctor/attention-deficit-hyperactivity-disorder-pro

Question:

A 44-year-old gardener presents to the emergency department after a small branch collided with his right eye approximately three hours ago. Since then, the patient has experienced right eye pain and difficulty opening the eye. He states that he is a regular contact lens wearer, although he is not wearing his contact lenses at the moment. He has no past medical or surgical history.

Ophthalmic examination reveals reduced visual acuity of the right eye relative to the left eye. Fluorescein examination confirms a corneal abrasion.

Given the fact that the patient is a contact lens wearer, what is the most appropriate treatment for this patient?

A. Topical corticosteroids

B. Patching of the right eye

C. Topical sulfacetamide

D. Topical erythromycin

E. Topical ciprofloxacin

Correct Answer:Topical ciprofloxacin

Explanation:

This patient has presented with right eye pain, a reluctance to open the right eye and a loss of visual acuity with a recent history of local trauma. Fluorescein examination has confirmed a corneal abrasion. Treatment with a topical antibiotic is recommended for these patients in order to prevent bacterial superinfection. As this patient is a contact lens wearer, antibiotic coverage for pathogens including Pseudomonas aeruginosa should be provided with a medication like such as topical ciprofloxacin.

Topical erythromycin can be used for the management of corneal abrasions if the patient does not have a history of contact lens use.

Patching of the affected eye is not recommended and has the added disadvantage of causing monocular vision loss.

Topical corticosteroids are contraindicated in patients with corneal abrasions as they slow corneal healing and increase the risk of bacterial superinfection.

Topical sulfacetamide can be used for the management of corneal abrasions if the patient does not have a history of contact lens use.

Further reading:

https://patient.info/doctor/corneal-foreign-bodies-injuries-and-abrasions

Question:

A 52-year-old woman presents to her GP with a 3-month history of a lump in her right breast. On examination, there is a hard lump in the upper outer quadrant of the right breast, which appears tethered to the overlying skin. Following triple assessment, the mass is found to be malignant. Her past medical history includes type 1 diabetes and Hodgkin’s lymphoma, which was treated with mantle irradiation 30 years ago.

She began her periods at age 15 and went through menopause at 50. She gave birth to her two daughters at the age of 29 and 32. She does not smoke or drink alcohol.

Which aspect of this patient’s history is most likely to be a risk factor for her likely diagnosis?

A. Age of menarche

B. Age of second pregnancy

C. Age of first pregnancy

D. Age of menopause

E. Mantle irradiation

Correct Answer:Mantle irradiation

Explanation:

The only aspect of this patient’s history that is a risk factor for breast cancer is previous mantle irradiation. Becoming pregnant for the first time after the age of 35 is a risk factor for pregnancy, however, an age of first pregnancy before 35 and the age of second pregnancy are not associated with breast cancer. An early age of menarche or late age of menopause would also be risk factors, however, this patient started and ended her periods at a normal age.

There are many risk factors for breast cancer to remember, and it can be useful to group them into those that are common to all cancers and those that are specific to breast cancer.

Common to all cancers:

Older age

Smoking

Alcohol

Irradiation (specifically mantle irradiation)

Specific to breast cancer:

Previous breast cancer

Family history of breast cancer or genetic predisposition

Uninterrupted oestrogen exposure:

Early menarche, late menopause or nulliparity

First pregnancy after age 35

Not breastfeeding

Obesity

COCP (combined oral contraceptive pill) use

HRT (hormone replacement therapy) use

Further reading:

https://www.cancer.net/cancer-types/breast-cancer/risk-factors-and-prevention

Question:

A 50-year-old man presents to his GP with a rash on one side of his abdomen that has developed over the past 2 days. He reports the rash is painful, burning and with a tingly sensation. He feels generally unwell and before the rash appeared he had a fever and a headache. He has never experienced anything like this before and has no significant past medical history except that he reports having chickenpox as a child. He has also reported feeling stressed recently having gone through a divorce.

On examination, you notice that the rash appears in a dermatome distribution and is erythematous with multiple clusters of vesicles.

What is the most likely diagnosis?

A. Shingles

B. Psoriasis

C. Contact Dermatitis

D. Chickenpox

E. Monkeypox

Correct Answer:Shingles

Explanation:

The most likely diagnosis is shingles from a reactivated varicella-zoster virus, the virus which causes chickenpox. Shingles (herpes zoster) is a viral infection of an individual nerve and the skin surface that is served by the nerve (dermatome). It is characterised by a prodromal period of pain in the affected dermatome, headache and fever. Shingles typically presents with a rash in a dermatomal distribution, it starts as maculopapular lesions and then develops into clusters of vesicles. The rash is usually painful, itchy, and/or tingly, and, unlike other rashes, does not cross the midline of the body. It is not fully known what causes the reactivation of the virus but increasing age and stressful periods are risk factors for shingles.

Chickenpox typically presents with a rash which is spread all over the entire body with small, erythematous macules appearing on the scalp, face, trunk, and proximal limbs, which progress over 12–14 hours to papules, clear vesicles (which are intensely itchy), and pustules. Usually, once an individual has chickenpox they are immune to it.

Monkeypox rash starts as raised spots, which turn into small blisters filled with fluid. Often it begins on the face and then spreads to other parts of the body including the genitals.

Contact dermatitis causes the skin to become itchy, blistered, dry and cracked. This reaction usually occurs within a few hours or days of exposure to an irritant or allergen. Symptoms can affect any part of the body but most commonly the hands and face.

Psoriasis typically causes patches of skin that are dry and covered in scales. Most cases of psoriasis go through cycles, causing problems for a few weeks or months before easing or stopping.

Further reading:

https://cks.nice.org.uk/topics/shingles/diagnosis/diagnosis/

Question:

A 45-year-old woman presents to the emergency department with severe constant pain under her ribs on the right-hand side. She appears confused and is unable to provide a full history, however, she explains the pain started yesterday evening. Her sclera appears yellow.

Her observations are

Oxygen saturation: 98% on room air

Respiratory rate: 20 breaths per minute

Heart rate: 110 beats per minute

Blood pressure: 92/59 mmHg

Temperature: 38.5 °C

What is the most likely diagnosis?

A. Acute cholecystitis

B. Biliary colic

C. Gilbert's syndrome

D. Hepatitis

E. Ascending cholangitis

Correct Answer:Ascending cholangitis

Explanation:

This patient is presenting with Charcot’s triad (right upper quadrant pain, fever and jaundice) and Reynold’s pentad (added features of shock and altered mental status). Therefore, the most likely diagnosis is ascending cholangitis.

Acute cholecystitis presents with right upper quadrant pain and fever. It does not typically cause jaundice.

Biliary colic presents with colicky right upper quadrant pain. It does not cause a fever or jaundice.

Although hepatitis can cause right upper quadrant pain, fever and jaundice, it often has a longer history with a suggestive travel history or blood-borne virus risk factors.

Gilbert’s syndrome is typically asymptomatic or causes mild jaundice following an infection, fasting or stress. It would not present with abdominal pain and fever.

Further reading:

https://geekymedics.com/cholangitis/

Question:

A 52-year-old man presents to the GP, complaining of worsening hearing loss in his right ear, which started six months ago. He denies otalgia, otorrhoea, tinnitus, vertigo, and weakness and has no past medical history of note; nobody in his family has a history of hearing loss. He works as a banker, and is not frequently exposed to loud noises.

Examination of the ear including reveals no abnormalities, and Rinne's test is positive; however, there is lateralisation on Weber's towards the left ear. Audiometry reveals reduced hearing in the right ear, which is worse at higher frequencies. Audiometry of the left ear is unremarkable.

What is the most likely diagnosis?

A. Stroke

B. Exposure to ototoxic substances

C. Meniere's disease

D. Acoustic neuroma

E. Noise-induced hearing loss

Correct Answer:Acoustic neuroma

Explanation:

An acoustic neuroma (also referred to as a vestibular schwannoma) is a benign tumour of Schwann cells; this most commonly develops in the cerebellopontine angle and can compress the internal auditory meatus and vestibulocochlear nerve, resulting in sensorineural hearing loss (demonstrated in this patient by the findings of Weber's test, as well as the audiometry result). There should be a high index of suspicion of the condition in any patient with unilateral sensorineural hearing loss confirmed on audiometry; the more common causes of sensorineural hearing loss, such as presbyacusis, are usually bilateral, and therefore unilateral disease may be indicative of focal pathology.

An MRI head should generally be arranged for any patient presenting with unilateral sensorineural hearing loss; this will usually allow for the identification of the mass. Surgical resection is usually carried out for masses causing significant hearing loss, or tumours of significant size; further growth of an acoustic neuroma can potentially cause involvement of CN V and CN VII, due to their adjacent location to the cerebellopontine angle. Facial paraesthesia or weakness would likely indicate the involvement of these nerves.

Noise-induced hearing loss is another potential cause of unilateral sensorineural loss if the noise in question mainly affects one ear - one such example would be regular rifle shooting, where the rifle is rested beside one ear in particular. However, there is no history to suggest that this is likely, and audiometry will often reveal sensorineural loss that is worse at one particular frequency; this was not the case in this scenario.

Meniere's disease is a poorly understood disease that can cause debilitating episodes of sensorineural hearing loss, tinnitus and vertigo. The lack of accompanying symptoms to the patient's hearing loss makes this unlikely in this case.

The patient does not reveal anything in the history to suggest that he has been exposed to ototoxic substances (drugs such as aminoglycosides are possible culprits), therefore, this is less likely to account for his symptoms. Bilateral involvement would also be expected.

Stroke is a key consideration in any patient with a possible neurological presentation; given that the patient's symptoms have been gradually worsening over a 6 month period, it is unlikely in this case.

Further reading:

https://patient.info/doctor/acoustic-neuromas

Question:

A 45-year-old man is brought to A&E by ambulance after he collapsed at home, holding his head. He now has a reduced level of consciousness; his GCS is recorded as 6, and the paramedics have secured the airway via intubation. His partner is incredibly distressed but is able to inform you that he has never had an episode like this before, and has been otherwise well. There was no history of trauma before the event, with the collapse being reported as 'coming out of the blue'.

Examination carried out as part of the initial assessment reveals bradycardia and hypertension; there is immediate concern regarding raised intracranial pressure. Hyperreflexia and increased tone are noted on further neurological assessment, with significant neck stiffness also documented. Kernig's sign is positive. The patient is booked in for an emergency CT head, which reveals hyperdensity within the basal cisterns. An urgent transfer to a specialist tertiary centre is arranged. The patient's partner is desperate to know why this has happened, and whether it could have been prevented.

Given the likely diagnosis, which of the following is a known risk factor for the condition?

A. Oral contraceptive pill use

B. Acquired immunodeficiency syndrome

C. DiGeorge syndrome

D. Hyperhomocysteinemia

E. Vascular Ehler's Danlos syndrome

Correct Answer:Vascular Ehler's Danlos syndrome

Explanation:

Whilst it is difficult to determine the exact cause of this patient's symptoms given the sudden onset with limited history, subarachnoid haemorrhage (SAH) is the most likely diagnosis, given the finding of blood in the basal/subarachnoid cisterns of the brain on imaging. This can arise due to trauma, or (as is most probable in this scenario) due to the rupture of an aneurysm within the Circle of Willis, allowing for blood to enter the subarachnoid space. The meningism displayed on examination (neck stiffness and positive Kernig's) also support the diagnosis; the blood can irritate the meninges, resulting in these findings.

There are several risk factors for the development of subarachnoid haemorrhage; these include:

Head trauma

Smoking

Hypertension

Factors increasing the risk of aneurysm formation - polycystic kidney syndrome, vascular Ehler's Danlos syndrome

Known arteriovenous malformation

This patient will need an urgent CT scan and potentially angiography to confirm the diagnosis, and a neurosurgical referral is likely to be required. The management of a subarachnoid haemorrhage usually involves identification of the source of the bleeding, and the use of clips or coiling to close the defect.

Hyperhomocysteinemia is a condition characterised by a high level of homocysteine in the blood; it may arise due to a deficiency of a number of vitamins. It can result in an increased risk of thrombosis but is not associated with subarachnoid haemorrhage.

Acquired immunodeficiency syndrome (AIDS) and DiGeorge syndrome will both increase the risk of infective pathology due to their impact on the immune system, however, SAH is not an infective disease.

The oral contraceptive pill can carry an increased risk of thrombosis, but it is not associated with the development of subarachnoid haemorrhage (it would also obviously not be a risk factor in this male patient).

Further reading:

https://patient.info/doctor/subarachnoid-haemorrhage-pro

Question:

A previously well 72-year-old man is brought to the emergency department by ambulance after suffering a seizure. He denies any head injury or history of epilepsy. A collateral history from his partner reveals a 7-day history of forgetfulness, with a new and progressively worsening headache. On examination, he is disoriented to time and place and has a temperature of 39.1oC,

What initial antimicrobial treatment would be most appropriate to commence?

A. Ceftriaxone with amoxicillin and aciclovir

B. Ceftriaxone with aciclovir and corticosteroids

C. Ceftriaxone with amphoteracin and aciclovir

D. Ceftriaxone with amoxicillin and corticosteroids

E. Amoxicillin with aciclovir and corticosteroids

Correct Answer:Ceftriaxone with amoxicillin and aciclovir

Explanation:

The most appropriate initial antimicrobial treatment in this scenario would be to commence ceftriaxone with amoxicillin and aciclovir. This is a typical presentation of encephalitis, but the differential would also include meningitis. The immediate priority is to treat possible intracranial infection (encephalitis or meningitis) since a delay in treatment is associated with poor outcomes. If viral encephalitis is suspected (the most important cause being herpes simplex virus), treatment with high dose IV aciclovir should be started as soon as possible. A definitive diagnosis can be sought by doing HSV PCR on CSF and looking for typical changes on MRI brain imaging. Empiric treatment should also cover acute bacterial meningitis, with common organisms in this age group being Streptococcus pneumoniae, Neisseria meningitidis, Haemophillus influenzae and Listeria monocytogenes. High-dose ceftriaxone penetrates the blood-brain barrier well, achieving high levels in the CSF, providing broad coverage for most organisms - with the exception of Listeria. For this reason, adding amoxicillin to ceftriaxone is an important part of empiric treatment in groups, particularly at risk of Listeria meningitis (typically infants ≤21 days old and adults >55 years old). Current guidelines suggest adults with suspected bacterial meningitis should be given dexamethasone before or up to 12 hours after antibiotics are started. Steroids should be stopped if a cause other than Streptococcus pneumoniae is identified.

Giving ceftriaxone with amoxicillin and corticosteroids would cover most organisms causing acute bacterial meningitis, including Listeria but would exclude aciclovir which is essential for treating potential viral encephalitis, which would form part of the differential given this presentation.

Equally, administering ceftriaxone with aciclovir and corticosteroids provides cover for acute bacterial meningitis and viral encephalitis, but without amoxicillin would not cover Listeria. This patient is at particularly high risk for Listeria meningitis given his age (>55 years old), so aciclovir cover would be important.

Pairing ceftriaxone with amphotericin and acyclovir provides broad cover for both bacterial meningitis and viral encephalitis, which need to be treated, but antifungal agents such amphotericin would not routinely be used for empiric first-line treatment in this case unless there is evidence of underlying immunosuppression such HIV or previous organ transplantation, which pose a greater risk for developing fungal infections. Amphotericin is used routinely in the treatment of cryptococcal meningitis.

Amoxicillin with aciclovir and corticosteroids ignores ceftriaxone which is given routinely as first-line empiric treatment for acute meningitis due to its broad coverage against the most common causes of bacterial meningitis including Streptococcus pneumoniae, Neisseria meningitidis and Haemophillus influenzae (with the exception of Listeria which would be covered by amoxicillin).

Further reading:

https://www.journalofinfection.com/article/S0163-4453%2811%2900563-9/fulltext

Question:

A 26-year-old woman presents to the out-of-hours general practitioner with a 1-day history of facial weakness and drooling. PMH: asthma. DH: salbutamol 100mcg INH as required, no known allergies.

On examination

Temperature 36.7°C, HR 64/min and rhythm regular, BP 110/65 mmHg, RR 16/min

Right-sided facial droop with forehead involvement and loss of the right nasolabial fold

Otherwise normal cranial nerve examination

Normal lower and upper limb neurological examination

No vesicular lesions

Select the most appropriate management option at this stage

A. Clopidogrel 300mg PO

B. Prednisolone 50mg PO

C. Aspirin 300mg PO

D. Aciclovir 200mg PO

E. Prednisolone 10mg PO

Correct Answer:Prednisolone 50mg PO

Explanation:

This patient has developed a Bell’s palsy. The most appropriate initial management is prednisolone 50mg PO for 10 days.

Prednisolone 10mg PO is incorrect as the dose is inappropriately low for the management of Bell’s palsy.

Aciclovir 200mg PO is incorrect as antiviral medications are not recommended for the initial management of Bell’s palsy in primary care.

Aspirin 300mg PO and clopidogrel 300mg PO are incorrect as antiplatelet medications are not used in the management of Bell’s palsy.

Further reading:

https://cks.nice.org.uk/bells-palsy

Question:

A 62-year-old woman presents with severe central tearing chest pain radiating through to her back, between her scapulae. She rates the pain as 10 out of 10, and says that it started 4-hours ago and has been increasing in intensity. She has never experienced anything like it. She has a background of hypertension, type-2 diabetes mellitus, and hypercholesterolemia.

Investigations:

Left arm blood pressure 170/110 mmHg

Right arm blood pressure 210/120 mmHg

Pulse rate 90 beats per minute

ECG - sinus rhythm, no ST elevation or depression.

As urgent imaging is being organised, which of the following medication would you administer?

A. Sodium nitroprusside

B. Labetalol

C. Glyceryl trinitrate

D. Amlodipine

E. Hydralazine

Correct Answer:Labetalol

Explanation:

The patient presents with signs and symptoms of an acute thoracic aorta dissection. Anti-impulse therapy needs to be initiated to reduce the shearing forces against the aorta walls and, therefore, stop the dissection from propagating. Propagation of the dissection can lead to aneurysm formation and rupture. Initial management aims to bring the heart rate down to less than 60 beats per minute while maintaining the blood pressure of less than 120/80 mmHg. This is achieved with either labetalol or esmolol. Beta-blockers will lower the heart rate and lower blood pressure.

Once the heart rate has been reduced to less than 60, other antihypertensive mediation can be started if the blood pressure remains above 120/80 mmHg, whilst ensuring perfusion of the main organs. This includes the possible use of hydralazine or infusions of sodium nitroprusside or glyceryl trinitrate.

It is also important to adequately treat the patient's pain and control the sympathetic response this causes. A possible analgesic would be fentanyl for acute pain management.

If the patient is hypotensive on arrival then resuscitation is necessary.

Amlodipine would not be appropriate in this scenario.

Further reading:

https://www.uptodate.com/contents/management-of-acute-type-b-aortic-dissection

Question:

A 12-hour old baby girl has yellow sclera. She was born by spontaneous vaginal delivery to a primip. The mother is a UK national and has been breastfeeding successfully. The mother has experienced no fevers.

What is the most likely diagnosis?

A. Sepsis

B. ABO incompatibility

C. Physiological neonatal jaundice

D. Carotenaemia

E. Breast milk jaundice

Correct Answer:ABO incompatibility

Explanation:

The most likely cause of the patient's jaundice is ABO compatibility which is not picked up on ante-natal screening.

Neonatal jaundice that presents within 24 hours is always pathological. This rules out breastmilk jaundice and physiological neonatal jaundice as these are not pathological and present after 24 hours of life. Jaundice is physiological if it happens on postnatal day 2 and resolves by a week of life and transcutaneous measurement is normal.

Coomb's test is done if jaundice occurs < 24 hours of birth, if the Coombs' test is positive, the ABO and Rh blood groups of the mother and neonate must be determined. If the results are negative, direct serum bilirubin levels must be determined.

In the UK, pregnant women are screened for their rhesus status. Rhesus disease, however, does not usually affect primips, as a sensitising event is needed within a prior pregnancy.

Carotenaemia is a condition causing yellow discolouration of the skin but not the sclerae, which remain normal. It is usually due to excess consumption of carotene containing substances such as carrots or mangoes.

Sepsis is a cause of neonatal jaundice but is less likely as the mother is clinically well.

Further reading:

https://www.nice.org.uk/guidance/cg98

Question:

A 65-year-old male presents to the emergency department with a severe headache that started acutely two hours ago. The patient states that it feels like he was 'kicked in the back of the head’. The pain is localised to the occipital area with no radiation. He denies any weakness, double vision, nausea, vomiting, photophobia or neck stiffness. He has no previous history of headaches. He has a past medical history of poorly controlled hypertension.

Physical examination is normal and a subsequent computed tomography (CT) scan of the brain shows no acute abnormalities.

What is the most appropriate next step in management?

A. Lumbar puncture

B. Propranolol

C. Brain biopsy

D. Sumatriptan

E. High flow oxygen

Correct Answer:Lumbar puncture

Explanation:

The clinical presentation in the above scenario is concerning for subarachnoid haemorrhage (SAH). Typical characteristics of SAH include ‘thunderclap’ headache, vomiting and collapse which can be followed by seizures and coma. Risk factors include poorly controlled hypertension, smoking history and bleeding disorders. CT scan of the brain should be the initial investigation of choice; however, this can be normal in up to 10% of cases of SAH. If the CT scan is normal, this is typically followed by a lumbar puncture (after 12 or more hours from the onset of the headache) to evaluate the cerebrospinal fluid (CSF) for red blood cells, xanthochromia and/or increased opening pressures.

Sumatriptan is used in the acute management of cluster headaches and migraines. The patient in the above clinical vignette has clinical manifestations more consistent with SAH.

Nonspecific beta-blockers such as propranolol are used in the prophylaxis of migraines and oesophageal variceal bleeding. They are not indicated in the treatment of SAH.

Brain biopsy can be used to differentiate between cerebral toxoplasmosis and primary CNS lymphoma in patients who are profoundly immunocompromised.

High flow oxygen can be used in the acute management of cluster headaches. Cluster headaches typically present in male patients with severe retro-orbital pain, excessive tearing and conjunctival injection.

Further reading:

https://www.nice.org.uk/guidance/ng228

Question:

An 8-year-old boy presents to the GP with pain in his right knee. The pain started spontaneously 2 days ago, with no history of trauma. The pain is increased during weight-bearing. He feels otherwise well and denies any fevers.

The child appears well at rest, with a normal body mass index and vital signs. Observation of gait reveals a limp. Examination of the right knee is unremarkable, however, an examination of the right hip reveals reduced range of motion, particularly internal rotation and abduction.

What is the most likely diagnosis?

A. Slipped upper femoral epiphysis (SUFE)

B. Perthes disease

C. Iliotibial tract syndrome

D. Septic arthritis

E. Patellofemoral pain syndrome

Correct Answer:Perthes disease

Explanation:

The most likely diagnosis is Perthes disease. This condition most commonly affects males between the ages of 5 and 10. It is caused by avascular necrosis of the femoral head, leading to abnormal growth of the epiphysis and eventual remodelling of the bone.

Perthes disease typically presents with pain in the hip or knee (referred) causing a limp. Clinical examination usually reveals a reduced range of motion in the affected hip joint, particularly abduction and internal rotation.

Early X-rays (frog lateral) may reveal a widened hip joint space and later changes may include a reduction in the size of the nuclear femoral head with patchy density. In late-stage disease, collapse and deformity of the femoral head may be noted.

Slipped upper femoral epiphysis (SUFE) typically affects obese children over the age of 9, making it less likely in this scenario. Presenting features can include hip/groin discomfort or severe pain with an associated limp or inability to weight bear. Clinical examination often reveals a significantly reduced range of hip joint motion due to pain, particularly abduction and internal rotation.

Septic arthritis should always be considered in children presenting with joint pain. The diagnosis is less likely in this scenario given the patient is otherwise well, with no systemic symptoms or fever. There is also no suggestion of obvious joint swelling or warmth (although this can be absent in septic arthritis of the hip joint).

Patellofemoral pain syndrome presents with aching behind the patella which is increased on prolonged sitting or climbing the stairs. This is commonly seen in young athletes and on examination of the knee, there will be tenderness of the patella medially.

Iliotibial tract syndrome typically presents with lateral knee pain and tenderness over the lateral femoral epicondyle.

Further reading:

https://patient.info/doctor/perthes-disease-pro

Question:

A 34-year-old man is admitted to ITU with severe community-acquired pneumonia. He is heavily sedated, intubated, ventilated and haemodynamically stable. The ventilator is set to volume control ventilation with tidal volumes of 8ml/kg, a PEEP of 10 and Fio2 of 80% at 14 breaths per minute. The plateau pressure is 22.

The patient's ABG shows:

pH 7.26

PCO2 7.4

PO2 9.8

BE -3.2

Lac 2.2

What is the most appropriate alteration to the patient's ventilator settings?

A. Decrease PEEP

B. Increase tidal volume

C. Decrease FiO2

D. Increase respiratory rate

E. Decrease tidal volume

Correct Answer:Increase respiratory rate

Explanation:

This man has a predominantly respiratory acidosis (mixed acidosis). He needs an increased minute volume to “blow-off” his CO2. The best way to do this would be to increase his respiratory rate.

You could increase the tidal volumes (minute volume = tidal volume x respiratory rate) but ideally, he should have tidal volumes of between 6 to 8 ml/kg and since they are already at 8ml/kg increasing them further risks volume trauma to the lungs.

Reducing the tidal volumes would worsen the respiratory acidosis.

The PO2 is adequate. FiO2 and PEEP should not be altered and these would not significantly affect the CO2. There is an argument for “permissive hypercapnia” in this situation, but since the plateau pressure is less than 30 it is not necessary.

Further reading:

https://lifeinthefastlane.com/ccc/protective-lung-ventilation/

Question:

A 50-year-old male presents to the ED with a painful left-sided neck swelling. He describes it starting yesterday after eating with the swelling and pain getting worse throughout the day. He reports having similar episodes a few months ago after meals, but these settled after a few hours. He reports a foul taste in his mouth and feels feverish. He has a past medical history of hypertension for which he takes indapamide. He is a heavy smoker (20 pack-year history) and drinks alcohol socially.

Clinical observations are all within normal range except a temperature of 37.9°c. Examination reveals a tender erythematous left anterior triangle neck swelling that is firm and hot to touch. The swelling is non-pulsatile and there are no bruits on auscultation. There is facial hair overlying the swelling, but no obvious punctum visible. There is associated cervical lymphadenopathy. There is no obvious facial nerve deficit or reported facial numbness. Intra-oral examination reveals dry mucous membranes and no pooling of saliva in the floor of the mouth.

What is the most likely diagnosis?

A. Infected branchial cyst

B. Acinic cell salivary gland tumour

C. Carotid body tumour

D. Sialolithiasis (salivary gland calculi)

E. Infected epidermoid (sebaceous) cyst

Correct Answer:Sialolithiasis (salivary gland calculi)

Explanation:

The most likely diagnosis, in this case, is sialolithiasis (salivary gland calculi). This condition typically presents as intermittent unilateral facial swelling associated with eating which can be painful (especially if infected) or painless. Intraoral palpation may reveal a stone in the duct in some cases or the stone may sometimes be visualised in the floor of the mouth. Depending upon how much the stone is occluding the duct, very little or no saliva will be visible coming from the duct.

Sialolithiasis most commonly affects the submandibular gland due to the long anatomical path the submandibular duct takes and the flow of saliva against gravity when it empties into the floor of the mouth. Common risk factors include medications (diuretics or anticholinergics), dehydration, gout and smoking.

An epidermoid cyst is the most common cutaneous cyst of the head and neck region, derived from a hair follicle containing keratin and fatty deposits. When infected it can present similarly as a firm painful swelling, however, usually, a central punctum is visible and the symptoms would not be associated with eating.

An acinic cell salivary gland tumour is the most common malignant salivary gland tumour of the head and neck. This classically presents as a painful slow-growing firm, fixed swelling in patients in their 5th decade who are heavy smokers. However this tumour usually involves the parotid as appose to the submandibular gland and facial nerve involvement is common, causing facial weakness.

A branchial cyst is a congenital mass arising from incomplete branchial cleft obliteration, that typically presents in the anterior triangle of the neck, post-trauma or infection in patients aged 10-40 years old. It is usually slow-growing and fluctuant and typically painless.

Carotid body tumour is a rare benign neuroendocrine tumour arising from the paraganglion cells of the carotid body. This also presents in the anterior triangle of the neck at the level of the carotid bifurcation, but is usually pulsatile in nature and classically the swelling moves side to side but not up and down. Bruits are also commonly heard on auscultation.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK549845/

Question:

A 44-year-old gentleman presents to the GP with a persistent itching feeling. He states this affects his whole body and is becoming increasingly hard to deal with. He denies any rashes and is bemused and frustrated about the origin of his symptoms. He informs the doctor that he has also experienced an uncomfortable burning sensation in his hands and feet, accompanied by an increased redness of these areas; this seems to be sporadic in nature.

His past medical history is limited, other than two recent admissions for deep vein thromboses; these seemed to occur without a trigger, and as a result, he is currently taking apixaban. The only other medication he takes is paracetamol, which he reports using frequently to deal with a chronic headache.

On examination, the patient is of normal height and weight, and a thorough examination reveals no rashes, nor any other abnormalities. Nevertheless, the GP is concerned about the patient's symptoms and orders a set of blood tests. TFT's, U+E's and a blood film are all normal, but a full blood count reveals the following:

Haemoglobin - 189g/L

MCV - 64

Haematocrit - 0.6L/L

WBC - 12x109/L

Platelets - 450x109/L

Given the likely diagnosis, which of the following may be involved in the management of the condition?

A. Repeated transfusions

B. Rituximab

C. Hydroxycarbamide

D. Idarucizumab

E. Desferrioxamine

Correct Answer:Hydroxycarbamide

Explanation:

This patient is describing symptoms of polycythaemia vera; a form of haematological malignancy involving the abnormal proliferation of erythrocytes. The full blood count reveals a raised haemoglobin level and a slightly raised WBC and platelet level, all of which are in keeping with the condition. The MCV is low, as is often the case in the disease, as there are insufficient iron stores to accommodate for the increased level of red blood cell production, and the haematocrit is raised, as the increase in red blood cells increase the erythrocyte: plasma ratio. Testing for a JAK2 mutation is likely to be carried out to confirm the diagnosis.

Venesection is normally utilised in the management of polycythaemia vera to reduce the abnormal number of erythrocytes within the blood. Aspirin is also frequently given to reduce the risk of thrombosis. Given this patient's significant thrombotic history, hydroxycarbamide may also be added as part of the therapy. This is a form of chemotherapy/cytoreductive therapy that can be used to reduce the red blood cell count more drastically, in order to prevent further thromboses. The drug can have a number of unwanted side effects, included nausea and vomiting, neutropenia, hallucinations and dizziness, and is therefore reserved for patients considered to be at a high risk of thrombosis.

Rituximab is a monoclonal antibody that targets CD20, a receptor found specifically on B cells. It is used in a number of B-cell mediated conditions, including autoimmune haemolytic anaemia, immune thrombocytopenic purpura and as part of the RCHOP chemotherapy regime for Non-Hodgkin's lymphoma.

Desferrioxamine is a chelation agent that can be used to bind excess iron and aluminium. It is frequently used in iron overload, such as that suffered by patients requiring repeated transfusions for thalassemia. Patients with polycythaemia vera often have low iron levels due to excessive red blood cell production, therefore this would not be an appropriate therapy for this patient.

Venesection, rather than repeated transfusions, is used in the management of polycythaemia vera in order to reduce the red blood cell count. Repeated transfusions would worsen the clinical picture.

Idarucizumab is the reversal agent for the direct oral anticoagulant dabigatran; it is not used in the management of polycythaemia vera.

Further reading:

https://patient.info/doctor/polycythaemia-vera-pro

Question:

A 25-year-old male attends his GP because of problems with his scalp and face. He reports that he has been suffering from excessive dandruff and a constant, mild itch all over his scalp for the past 2 years. On further questioning, the patient mentions that he occasionally develops scaly, red eyelid margins for a couple of days at a time and has persistent dry patches of skin on either side of his mouth and nose. The patient’s symptoms are worse in the winter months and slightly improve during summer.

What is the FIRST-LINE management of this condition?

A. Phototherapy

B. Anti-fungal shampoo

C. Oral steroid

D. Calcineurin inhibitor

E. White petrolatum

Correct Answer:Anti-fungal shampoo

Explanation:

The patient is most likely suffering from seborrhoeic dermatitis. First-line therapy for this condition usually includes an anti-fungal shampoo (with Ketoconazole being the primary active ingredient) and a topical corticosteroid. This condition most commonly affects babies under 3 months of age, young adults, the elderly and those with a combination of oily and dry skin. It is exacerbated by cold weather and partially relieved by sun exposure. It presents with diffuse scalp scale, blepharitis and scaly skin located in the facial folds (i.e. on either side of the mouth).

Calcineurin inhibitors may indeed be used in the management of severe seborrhoeic dermatitis but are not first-line.

Oral steroids are rarely used in the treatment of seborrhoeic dermatitis.

White petrolatum is often used in the management of this condition in infants, not adults.

Phototherapy may indeed be used in the management of moderate to severe seborrhoeic dermatitis but is not first-line.

Further reading:

https://www.dermnetnz.org/topics/seborrhoeic-dermatitis/

Question:

A 72-year-old man with a known history of type 2 diabetes mellitus presents to his GP with bouts of light-headedness. Triggers for the light-headedness include standing up after sitting in his armchair and getting out of bed in the morning too quickly. On questioning, he admits that he has been having difficulty with constipation and erectile dysfunction in the preceding few months, and has been managing these independently with over-the-counter medications. Aside from his diabetes, he has no medical conditions. His current regular medications include metformin and sildenafil, and he sometimes uses a laxative if his constipation becomes severe. On examination, his blood pressure when sitting is 137/95mmHg, and 110/82mmHg when standing.

What is the most likely diagnosis?

A. Hypoglycaemia

B. Age-related postural hypotension

C. Autonomic neuropathy

D. Symmetrical polyneuropathy

E. Metformin side effects

Correct Answer:Autonomic neuropathy

Explanation:

The most likely diagnosis is autonomic neuropathy. Autonomic neuropathy is characterised by postural hypotension, constipation due to gastric paresis, erectile dysfunction, bladder dysfunction, and diarrhoea. Like other forms of diabetic neuropathy, it is caused by glucose-mediated neuronal damage. The management of autonomic neuropathy is symptom-based, and all patients should have their diabetic control checked and be screened for complications.

Symmetrical polyneuropathy is more likely to be characterised by glove and stocking distribution weakness and paraesthesia, rather than autonomic symptoms.

While age-related postural hypotension is a possible diagnosis and presents similarly with postural light-headedness or dizziness, autonomic neuropathy is more likely given the history of diabetes mellitus and the constellation of associated symptoms.

Hypoglycaemia may also result in feeling light-headed and is a concern among patients with longstanding diabetes due to the potential for hypoglycaemic unawareness. However, the finding of a significant postural drop on blood pressure assessment makes this diagnosis less likely.

Metformin side effects are very common, and metformin is often associated with gastrointestinal upset. However, metformin is more likely to cause diarrhoea than constipation and is not known to cause postural hypotension or erectile dysfunction.

Further reading:

https://patient.info/doctor/autonomic-neuropathy

Question:

A 71-year-old man presents to his GP with a 2-week history of severe facial pain and nasal discharge. The discharge is purulent and the pain is focused around the right maxillary area. The symptoms initially improved but have worsened again. On examination his right maxillary sinus is tender and he has a temperature of 38.5 degrees, the rest of his observations being unremarkable. He has a background of congestive cardiac failure and has no known allergies.

What is the most appropriate step in management at this point?

A. Arrange admission for IV antibiotics

B. Oral antibiotics in the community

C. Arrange urgent CT sinuses

D. Continue to monitor conservatively

E. Oral corticosteroids in the community

Correct Answer:Oral antibiotics in the community

Explanation:

This history suggests a diagnosis of acute sinusitis – the majority of the time this is due to a viral infection, however, the possibility of a bacterial infection is suggested if there is purulent discharge and focal maxillary tenderness alongside symptoms that worsen after initial improvement. NICE suggest oral antibiotics if there is suspicion of bacterial sinusitis or if there is a high risk of complications (e.g. due to significant comorbidities such as heart failure). This may be phenoxymethylpenicillin or co-amoxiclav depending on severity. Those who are septic, or with signs of intracranial/orbital involvement, should be admitted to hospital for treatment. CT scanning may have a role in chronic or recurrent symptoms but is usually not required in the acute outpatient setting. Corticosteroids are also not recommended. Conservative management is recommended for most cases of sinusitis, especially when symptoms have lasted less than 10 days.

Further reading:

https://cks.nice.org.uk/sinusitis#!scenario

Question:

A 31-year-old man presents with a mild fever, reduced appetite and jaundice. Upon further questioning, you discover he has recently returned from a trip to Nepal 3 weeks ago and he admits to drinking tap water during his stay. On examination, his abdomen is soft and non-tender and there is no organomegaly. Vital signs reveal a temperature of 38 oC, a heart rate of 80 bpm and a respiratory rate of 14.

What is the most likely diagnosis?

A. Malaria

B. Hepatitis B

C. Hepatitis E

D. Hepatocellular carcinoma

E. Alcoholic liver disease

Correct Answer:Hepatitis E

Explanation:

Hepatitis E is spread via the faecal-oral route, most commonly through contaminated water. Areas, where the disease is most prevalent, include the Indian subcontinent, Central and Southeast Asia, the Middle East and some parts of Africa.

Hepatitis E has an incubation period of 3-10 weeks and typically presents with nausea, vomiting, myalgia, fatigue, right upper quadrant pain, photophobia and headache. It usually causes acute self-limiting illness (lasting 1-4 weeks), similar to the hepatitis A virus. 10% of patients develop life-threatening hepatitis E.

Hepatocellular carcinoma is most commonly associated with chronic liver disease (i.e. chronic hepatitis B and C). The condition typically presents with features of late-stage liver disease, including weight loss, jaundice, ascites, splenomegaly, pruritis and right upper quadrant pain.

Alcoholic liver disease is unlikely in this scenario, given the absence of a significant history of alcohol excess and the presence of fever, more suggestive of an infective cause.

Hepatitis B usually spread via blood and bodily fluids (rather than contaminated water). It also has a longer incubation period of between 6-20 weeks, which doesn't fit with the history of the patient in this scenario. It typically presents with a flu-like illness which can progress to jaundice, anorexia and right upper abdominal pain.

Malaria is less likely given the area the patient travelled to and the history of drinking tap water (both making hepatitis E more likely). Malaria typically presents with fever, chills, headache, myalgia, cough, hepatomegaly and jaundice.

Further reading:

https://patient.info/doctor/viral-hepatitis-particularly-d-and-e

Question:

A 42-year-old woman presents to A&E with right upper quadrant pain. She has been experiencing similar self-resolving episodes for the past few months, but the pain is particularly bad today which prompted her to attend A&E. She describes that the pain first appeared after dinner and has now been present for around 2 hours.

She has a past medical history of hypertension and hypercholesterolaemia. She has also been informed that she is pre-diabetic and her BMI is 25. Otherwise, she has not previously been admitted to hospital and has not previously undergone any surgical procedures.

On examination her observations are stable. She has right upper quadrant tenderness but no signs of guarding and is Murphy’s sign negative.

Blood tests are conducted, which demonstrate a slightly raised ALP but no other abnormalities.

What is the most likely diagnosis in this patient?

A. Acute cholangitis

B. Biliary colic

C. Acute cholecystitis

D. Peptic ulcer disease

E. Acute pancreatitis

Correct Answer:Biliary colic

Explanation:

The most likely diagnosis in this patient is biliary colic which typically presents with right upper quadrant pain after the consumption of food. The episodes of pain will commonly last between 30 minutes and several hours. This diagnosis is supported by her examination findings, the history of her presenting complaint and demographics (female, raised BMI, age).

Although peptic ulcer disease also presents with abdominal pain that is worsened by eating, the pain is typically a burning or gnawing pain in the epigastric region rather than the right upper quadrant. Risk factors for peptic ulcer disease also differ, and include smoking, NSAID use and positive family history of peptic ulcer disease.

Cholecystitis is a complication of gallstones, and biliary colic is commonly experienced before the development of cholecystitis. However, at this stage, it would be inappropriate to define this as cholecystitis, as cholecystitis involves inflammation of the gallbladder (confirmed using ultrasound) and a systemic inflammatory response including fever and raised inflammatory markers.

Pancreatitis presents with epigastric pain that classically radiates to the back. There would also likely be a rise in serum amylase and lipase, which is not demonstrated on this patient’s blood results.

Acute cholangitis classically presents with ‘Charcot’s triad’ of fever and chills, jaundice and abdominal pain – with around 50-70% of patients developing all three symptoms. Only abdominal pain is present in this patient, and there is no dramatic derangement in LFTs.

Further reading:

https://patient.info/doctor/gallstones-and-cholecystitis

Question:

A new medication is developed for Alzheimer’s disease and is tested in a double-blind randomised controlled trial involving 1000 patients with Alzheimer’s disease. 500 of the study participants are given the new drug, while the other half receive a sugar pill. Neither the participants nor the researchers know which patients are taking the new drug and which are taking the sugar pill.

What is the main purpose of double-blinding in this study?

A. To prevent observer bias

B. To prevent measurement bias

C. To prevent attrition bias

D. To prevent selection bias

E. To prevent recall bias

Correct Answer:To prevent observer bias

Explanation:

A double-blind trial is one in which neither the patient nor the researcher is aware of which treatment the patient is receiving. While blinding the patient (a single-blind trial) prevents the placebo effect, simultaneously blinding the researcher (a double-blind trial) prevents observer bias. Observer bias is the bias that arises due to a researcher’s expectations or preconceptions affecting the way they perceive and record a variable.

Recall bias, also known as reporting bias or responder bias, is the bias that arises from participants inaccurately recalling past events or omitting details. It is a particularly big problem in retrospective studies that rely on participants providing information.

Attrition bias is the bias that can arise from patients being lost to follow-up.

Measurement bias is the bias that arises from an inaccuracy in the way in which the variable is being measured, for example using an inaccurate measuring tool.

Selection bias is the bias that arises when the way in which participants are selected for a study results in a sample population that is very different to the general population which they are intended to represent.

Further reading:

https://guides.himmelfarb.gwu.edu/prevention\_and\_community\_health/types-of-studies

Question:

A 45-year-old female is reviewed in the breast oncology clinic. She has advanced, metastatic breast cancer that was not amenable to surgical resection at presentation. She has tolerated two courses of different chemotherapy but this has not been successful in reducing the tumour. Her consultant is considering starting trastuzumab as the next line therapy.

Which of the following test results would be most supportive for commencing treatment with trastuzumab?

A. Human epidermal growth factor receptor 2 (HER2) positive

B. Oestrogen receptor (ER) negative

C. BRCA1 gene mutation positive

D. Human epidermal growth factor receptor 2 (HER2) negative

E. Oestrogen receptor (ER) positive

Correct Answer:Human epidermal growth factor receptor 2 (HER2) positive

Explanation:

Trastuzumab is sold under the trade name Herceptin, amongst others. Herceptin is licensed for use in human epidermal growth factor receptor 2 (HER2) positive cancers but there are several caveats to its use. It is reserved for patients who have had no success with two other agents, including an anthracycline and taxane, or for patients who would not tolerate an anthracycline. It is licensed for use with Paclitaxel.

HER2 negativity would, therefore, render the use of trastuzumab inappropriate. Oestrogen receptor (ER) positivity or negativity is not relevant to the use of trastuzumab and BRCA1 gene mutations would also not influence decision making regarding this.

Further reading:

https://www.nice.org.uk/guidance/cg81/chapter/Recommendations

Question:

A 30-year-old man presents to the emergency department with severe pain in his right foot. The pain started two days ago, gradually worsening over several hours, and is now described as a "9/10" severity. He also complains of night sweats and malaise. He has no history of trauma and has a past medical history of type 1 diabetes mellitus with an allergy to clarithromycin.

On examination, there is tenderness over the dorsum of the right foot, and it is markedly swollen.

Osteomyelitis is confirmed with MRI. Blood cultures grow methicillin-resistant Staphylococcus aureus (MRSA).

Which is the most appropriate antibiotic to initially prescribe?

A. Vancomycin

B. Flucloxacillin

C. Metronidazole

D. Fusidic acid

E. Clindamycin

Correct Answer:Vancomycin

Explanation:

This patient has presented with osteomyelitis, which classically presents with severe pain (often acutely but may be chronic) along with bacteremia, fever, general malaise, and potentially sepsis. The affected joint is classically swollen, tender, and erythematous, and the severe pain is exacerbated by movement. Sickle cell anaemia and diabetes are risk factors for osteomyelitis. It can be challenging to differentiate osteomyelitis or septic arthritis from history and examination alone.

Vancomycin is recommended first-line for MRSA by the British National Formulary (BNF). Local guidelines and microbiology advice should be sought before prescribing but vancomycin is generally accepted as the best antibiotic for MRSA.

Teicoplanin and/or fusidic acid may be added to vancomycin for severe infections. Teicoplanin has excellent gram-positive cover and a longer action of duration than vancomycin.

Fusidic acid has a very narrow spectrum of cover and is mainly reserved for Staphylococcus aureus infections, however, it does have good bone penetration. Fusidic acid is not used on its own for osteomyelitis and is generally reserved for milder infections such as impetigo or as an add-on to other antibiotics for more severe infections. This is because osteomyelitis is an extremely difficult infection to treat, usually requiring surgery to completely cure a patient, and requires more potent antibiotics than fusidic acid alone.

Flucloxacillin with fusidic acid (to provide better bone penetration) is usually the first line for Staphylococcus aureus and Staphylococcus epidermidis but MRSA is commonly resistant to this regime.

Clindamycin is second-line for osteomyelitis, often used in patients with a penicillin allergy. However, MRSA is usually resistant to clindamycin.

Metronidazole has poor bone penetration and is typically used to treat anaerobic infections. It is unlikely to be effective in osteomyelitis, commonly caused by aerobic bacteria such as Staphylococcus aureus.

Further reading:

https://bnf.nice.org.uk/treatment-summaries/musculoskeletal-system-infections-antibacterial-therapy/

Question:

A 60-year-old gentleman attends his routine annual appointment in the cardiology clinic. Five years ago he had a myocardial infarction and underwent percutaneous coronary intervention (PCI) to insert a stent into his right coronary artery. An echocardiogram performed at the time of his procedure revealed an incidental finding of mild aortic stenosis. Since his procedure, he has remained asymptomatic.

On examination today he is comfortable at rest and his basic observations are heart rate 80bpm, respiratory rate 20 and blood pressure 140/90 mmHg.

He has a past medical history of hypertension and is diabetic. His current medications include ramipril, bisoprolol, aspirin, clopidogrel, atorvastatin and metformin.

ECG recordings are obtained at rest and during exercise, with no acute changes elicited on exercise. An echocardiogram is performed which demonstrates a slight decrease in the aortic valve area and increase in the aortic pressure gradient, but an unchanged left ventricular ejection fraction of 50%.

His ECG recording shows a sinus rhythm with a rate of 80bpm. QRS of duration 130ms, with a deep S wave in lead V1 and notched R wave in lead V6. T wave inversion is also present in the lateral leads. There is no ST elevation or depression.

Based on the ECG findings and clinical history, what is the most likely diagnosis?

A. Wolff-Parkinson White syndrome

B. Left bundle branch block (LBBB)

C. Right bundle branch block (RBBB)

D. Trifascicular block

E. Left ventricular hypertrophy

Correct Answer:Left bundle branch block (LBBB)

Explanation:

The most likely diagnosis in this clinical scenario is left bundle branch block (LBBB). The right and left bundle branches conduct electrical impulses from the bundle of His to stimulate simultaneous right and left ventricular depolarisation. In LBBB, left ventricular depolarisation is delayed as impulses are first conducted to the right ventricle through the right bundle branch before passing to the left ventricle across the septum, resulting in some distinct ECG changes. The QRS is prolonged (it should normally be <120ms) due to a longer period of ventricular depolarisation, deep S waves occur in lead V1 due to the right to left direction of depolarisation, and the sequential rather than simultaneous ventricular depolarisation produces a notched R wave in V6. These changes are commonly referred to as producing a ‘W-shaped’ QRS complex in lead V1 and an ‘M-shaped’ QRS complex in lead V6. LBBB rarely occurs without the presence of background cardiovascular diseases such as hypertension, aortic stenosis and ischaemic heart disease (particularly anterior MI).

Right bundle branch block (RBBB) occurs when the right (rather than the left) bundle branch is blocked, which instead delays right ventricular depolarisation, producing characteristic ECG changes. The QRS is prolonged (>120ms) due to a longer period of ventricular depolarisation and the delay in right ventricle depolarisation forms an additional R wave in lead V1 and a wide slurred S wave in lead V6. These changes are commonly referred to as producing an ‘M-shaped’ QRS complex in V1 and a ‘W-shaped’ QRS complex in lead V6. It is useful to recall the ECG changes in bundle branch blocks using the phrase ‘WiLLiaM MaRRoW’ in which the first and last letters of each word refer to the morphology of the QRS in leads V1 and V6 respectively, with the middle letter indicating left (L) or right (R) bundle branch block.

Trifascicular block occurs when there is a block of the right bundle branch as well as the anterior and posterior fascicles of the left bundle branch. It can also occur on a background of ischaemic heart disease and hypertension but it would not produce the ECG changes as described above. The most common ECG abnormality observed in trifascicular block is the presence of RBBB, varying degrees of LBBB (depending on the extent to which the anterior and posterior fascicles are affected) as well as 1st degree AV block (in which the PR interval is prolonged >200ms).

Hypertension and aortic stenosis can cause left ventricular hypertrophy (LVH) because there is increased afterload for the left ventricle to overcome in order to eject blood. However, ECG changes would differ from those described above. Classically the ‘Sokolow-Lyon’ criteria are used for ECG diagnosis of LVH, which defines LVH as: S wave in lead V1 + R wave in leads V5 ­or V6 (whichever is larger) ≥ 35mm AND R wave in lead aVL ≥ 11mm. Although the criteria are not perfect they are a good indication of the likelihood of LVH being present in a predisposed patient.

Wolff-Parkinson White (WPW) syndrome is a condition in which patients have an accessory pathway providing an alternative route for depolarisation signals to pass between the atria and ventricles. This can generate a re-entrant tachycardia that classically causes episodes of palpitations. At rest, the ECG of a patient with WPW syndrome will typically reveal a delta wave (or slurred upstroke) preceding the QRS complex.

Further reading:

https://litfl.com/left-bundle-branch-block-lbbb-ecg-library/

Question:

A 26-year-old man presents with severe abdominal pain for the past 24 hours. The pain started in the right iliac fossa but is now more central and diffuse. He has vomited once, with no green bile or blood. He has noticed no change in bowel habit. On examination, there is voluntary guarding over his whole abdomen. Following further investigation, a diagnosis of appendicitis is suspected and the patient is prepared for surgery. His ECG is shown below.

Which of the following is the most likely diagnosis, considering the ECG findings?

Source: By Andrewmeyerson [CC BY-SA 3.0], from Wikimedia Commons

A. Second-degree heart block (Mobitz type 2)

B. First-degree heart block

C. Brugada syndrome

D. Second-degree heart block (Mobitz type 1)

E. Complete heart block

Correct Answer:First-degree heart block

Explanation:

This ECG shows a first-degree heart block, which would be consistent with this man’s lack of cardiac symptoms and his age. First-degree heart block involves the prolongation of the PR interval (>200 ms). There would be no need to delay this patient’s operation.

This is unlikely to be a presentation of second-degree heart block as this would show different signs on an ECG. Mobitz type I (Wenckebach phenomenon) would show a gradually lengthening PR interval before a dropped beat where the P wave is not followed by a QRS complex. This only needs treatment if symptomatic. Mobitz type II would show intermittent non-conducted P waves without the gradual lengthening of the PR interval seen in type I. This carries a higher risk of progression to third-degree heart block and sudden cardiac death so should ideally be managed with immediate admission for cardiac monitoring and eventually a pacemaker.

Complete heart block is not the diagnosis as this would show different ECG signs and would usually be symptomatic with symptoms of dizziness and syncope. The P waves and QRS complexes would be completely unrelated and the ventricular and atrial rate would be different. This is managed with immediate admission for monitoring and a permanent pacemaker.

Brugada syndrome is a good differential for an asymptomatic ECG abnormality but is not the abnormality seen here. Furthermore, to diagnose Brugada syndrome, specific clinical features need to be present in addition to the ECG changes. ECG changes associated with Brugada syndrome include ‘coved ST-segment elevation >2mm in >1 of V1-V3 followed by a negative T wave’. The condition is managed using an implantable cardioverter-defibrillator.

Further reading:

https://lifeinthefastlane.com/ecg-library/basics/first-degree-heart-block/

Question:

A 32-year-old man presents to his GP with a 4-month history of bilateral gritty eyes. He notes his eyes are often red and feel like they're burning especially first thing on a morning.

The patient has no significant past medical history. He reports he used to wear contact lenses but can no longer tolerate them due to the irritation in his eyes.

On examination, there is bilateral crusting and erythema of the eyelids as well as mild conjunctival hyperaemia. The patient explains this is normal for him with no recent changes. Visual acuity is normal.

What is the most likely diagnosis?

A. Blepharitis

B. Molluscum contagiosum

C. Anterior uveitis

D. Chalazion

E. Scleritis

Correct Answer:Blepharitis

Explanation:

The most likely diagnosis in the patient is blepharitis - a group of disorders characterised by inflammation of the eyelids and adnexal structures (skin, lashes, meibomian glands). NICE guidelines describe the typical presentation of blepharitis as bilateral burning, itching and/or crusting of the eyelids, contact lens intolerance, red-eye, and worsening of symptoms in the morning. Blepharitis is typically subdivided into anterior and posterior blepharitis. However, it is often not possible to differentiate between the different types of blepharitis clinically and both often co-exist.

A chalazion presents with a nodule on the eyelid secondary to blocked meibomian glands. Whilst a chalazion may indicate underlying blepharitis, this patient does not have a palpable nodule, making this a less likely diagnosis.

Patients with anterior uveitis typically present acutely with progressive pain, red-eye and photophobia. Examination classically shows a small, irregular pupil and conjunctival injection around the corneal limbus. This patient has a 4-month history of irritation and does not have any features consistent with uveitis on examination.

In scleritis, there is transmural inflammation of the sclera resulting in focal eye pain with tenderness to palpation of the eye. Patients describe the pain as boring and made worse by eye movement. Typically it is associated with an underlying systemic disorder. This patient does not have any features consistent with scleritis.

Molluscum contagiosum (MC) is a viral infection that typically presents in children. MC classically presents with smooth, pearl-like umbilicated papules on the skin. If MC affects the eyelids, it can lead to red-eye and itching. However, the examination of this patient did not reveal any skin changes consistent with MC; therefore, this is an unlikely diagnosis.

Further reading:

https://cks.nice.org.uk/topics/blepharitis/

Question:

A 56-year-old man presents to his GP with double vision and a constant headache that has come on over the past 2 weeks. He has a background of type 2 diabetes and well-controlled hypertension. On examination, there is drooping of the left eyelid, deviation of the left eye downwards and outwards, and a dilated left pupil.

What is the most likely cause of his symptoms?

A. Horner syndrome

B. Diabetes

C. Hypertension

D. Adie syndrome

E. Posterior communicating artery aneurysm

Correct Answer:Posterior communicating artery aneurysm

Explanation:

The combination of ptosis and a down and outwardly deviated eye indicates a third nerve palsy, while the dilated pupil points towards a surgical cause rather than a medical cause - the parasympathetic fibres that supply the pupillary sphincter run along the outside of the third cranial nerve and therefore will be the first to be compressed by an external mass. A surgical third nerve palsy combined with a history of a constant headache makes a posterior communicating artery aneurysm the most likely diagnosis.

Diabetes and hypertension typically cause a medical third nerve palsy. It affects the centre of the third cranial nerve, sparing the outermost parasympathetic fibres, and therefore would not cause a dilated pupil.

Adie syndrome describes an idiopathic unilateral dilated pupil. It would not cause ptosis or eye deviation.

Although Horner syndrome would explain the ptosis, it causes a constricted pupil rather than a dilated pupil.

Further reading:

https://oxfordmedicaleducation.com/clinical-examinations/neurological-examination/oculomotor-trochlear-abducens-questions/#:~:text=Parasympathetic%20fibres%20are%20situated%20on,a%20posterior%20commun

Question:

A 35-year-old man presents to the A&E department with a sudden loss of vision in his left eye. He was sat working on the computer when he experienced a shower of sparks and floaters in his vision. This was quickly followed by the sensation of a ‘curtain falling down’ and covering his visual field. He had no pain or any other symptoms associated with the event. He is concerned as he has never experienced anything like this before.

His past medical history is significant for Marfan syndrome and myopia, which is corrected with lenses. He takes no medications.

On examination, there is reduced visual acuity and visual fields in the left eye only. Further neurological examination and vital signs are all within normal limits.

What is the most appropriate initial investigation?

A. B-scan ultrasonography

B. MRI orbit

C. CT head

D. CT orbit

E. Slit-lamp examination

Correct Answer:Slit-lamp examination

Explanation:

The most likely diagnosis is retinal detachment - a cause of sudden and painless visual loss due to the separation of the retina from the underlying retinal pigment epithelium. In keeping with NICE guidelines, a slit-lamp examination should be performed in all patients with suspected retinal detachment. Slit-lamp examination and indirect ophthalmoscopy are typically the first investigations of choice performed by an ophthalmologist.

A CT orbit or an MRI orbit are not typically recommended for the investigation of retinal detachment unless there is a history of trauma to the eye. An MRI orbit should not be ordered if a metallic intraocular foreign body could be present.

If any media opacity prevents visualisation of the fundus (e.g. vitreous haemorrhage), then B-scan ultrasonography of the affected eye can be used to identify a retinal detachment.

A CT head would not be indicated in this patient. The presentation does not meet the criteria for a CT head, i.e. there is no history of trauma or indication that the visual loss is secondary to a cerebrovascular accident.

Further reading:

https://cks.nice.org.uk/topics/retinal-detachment/management/management-of-suspected-retinal-detachment/

Question:

A 43-year-old man presents to the GP complaining of persistent joint pain, particularly in the back and knees, and a generalised itch. The pain is worse in the morning, but he finds that swimming helps. On further questioning, he reports suffering from diarrhoea and abdominal pain for a number of years and also describes a few occasions of self-resolving painful lesions on his shins. He takes no regular medication and has no family history of any relevant medical conditions.

On examination, there is no notable erythema of any of the joints; however, there is sacroiliac joint tenderness and slight discomfort on palpation of both knees. The patient is able to walk unassisted despite the pain, and observations are unremarkable. The GP is unsure of the exact diagnosis but wonders if the arthralgia is linked to the patient's previous medical history.

What is a recognised risk factor for the probable diagnosis?

A. Known NOD2 mutation

B. Family history of rheumatoid arthritis

C. Previous abdominal surgery

D. Immunodeficiency

E. Chronic alcohol consumption

Correct Answer:Known NOD2 mutation

Explanation:

The history of arthralgia, in combination with vague abdominal symptoms and erythema nodosum (the likely explanation for the patient's shin lesions), should lead to a consideration of inflammatory bowel disease (IBD) as a possible diagnosis. Enteropathic arthritis and erythema nodosum are relatively common extra-articular manifestations of both Crohn's and ulcerative colitis, and whilst irritable bowel syndrome could account for the patient's symptoms, this is a diagnosis of exclusion, and the history given suggests that the patient has not sought medical advice for his medical symptoms previously.

The aetiology of inflammatory bowel disease is poorly understood, and there are only a handful of known risk factors:

Smoking (a risk factor in Crohn's, but protective in ulcerative colitis)

Family history - NOD2 mutations, HLA-B27 positive have both been linked

White ethnicity - a risk factor for ulcerative colitis

A faecal calprotectin measurement would be an appropriate next investigation; this is a non-specific marker but would be expected to be raised if inflammatory bowel disease is indeed the cause of the patient's symptoms. A full blood count and inflammatory markers would also be beneficial to screen for general signs of inflammation. Should the results of these tests imply that IBD is a possibility, referral to the hospital for colonoscopy and biopsy for confirmation would be necessary.

A family history of rheumatoid arthritis would be a significant risk factor for this patient developing the same condition. However, this is not the most likely diagnosis in this scenario; whilst this can present with inflammatory-type joint pain, and could involve the joints involved in this patient's case, the distribution is less classical, and the abdominal pain and diarrhoea fit less well with this diagnosis.

Chronic alcohol consumption is a risk factor for a number of medical conditions, including a number of GI malignancies. Whilst these must be considered in patients with a history of change in bowel habit, as this patient has described, the transient nature of the symptoms make this less common, along with the patient's age (bowel cancer frequency increases with age).

Previous abdominal surgery is not known to be associated with the development of IBD; interestingly, patients with a previous appendectomy have a reduced incidence of ulcerative colitis.

Those with immunodeficiency do not have an increased risk of inflammatory bowel disease.

Further reading:

https://cks.nice.org.uk/topics/crohns-disease/background-information/extra-intestinal-manifestations/

Question:

An 80-year-old female patient attends her GP with sore joints. She mentions that her hands have been getting progressively more painful over the past 10 years and that her right hip has become increasingly sore over the past 1 year. She describes that her hands and right hip feel very stiff after rest. Additionally, she mentions that her hip pain radiates into her groin, down her thigh and into her knee. The patient is obese with a BMI of 32, has an antalgic gait, restricted joint movement (especially of her distal interphalangeal joints and right hip), joint-line tenderness, Heberden’s nodes, gluteal muscle wasting, as well as joint effusion and crepitus of the aforementioned affected joints.

What X-Ray changes are associated with the condition described?

A. Thick bone, localised osteosclerosis circumscripta and osteolysis

B. Pseudofractures

C. Osteophytes, joint space narrowing, subchondral sclerosis and cyst formation

D. Chondrocalcinosis

E. ‘Punched-out’ bone erosions with soft tissue swelling

Correct Answer:Osteophytes, joint space narrowing, subchondral sclerosis and cyst formation

Explanation:

The most likely diagnosis, in this case, is osteoarthritis (the most common form of arthritis). Risk factors for this condition include other conditions that result in joint deformity (e.g. hip dysplasia, ligament damage), repetitive trauma (e.g. weight lifting), occupational injury (e.g. farming, mining), increasing age, obesity and female gender. Joints affected by osteoarthritis, in order of decreasing frequency, include the hip, knee, hands, and spine. Clinical features include joint pain, transient stiffness after rest, restriction of movement, palpable bony swellings (i.e. Heberden's nodes, Bouchard's nodes), antalgic gait, muscle wasting, joint effusion and crepitus. X-ray of a joint affected by osteoarthritis may highlight bone proliferation (i.e. osteophytes), joint space narrowing, subchondral sclerosis and cyst formation.

Thick bone, localised osteosclerosis circumscripta and osteolysis are all radiological features of Paget’s disease. This condition may present with bone pain, hearing loss, bone expansion and deformity, and increased temperature over affected joints amongst other features.

‘Punched-out’ bone erosions are associated with gout (most commonly observed in the 1st metatarsal phalangeal joint). Gout usually presents with a sudden onset, tender, erythematous, hot and swollen joint.

Chondrocalcinosis is associated with pseudogout. Pseudogout presents similarly to gout, however it typically affects the knee joint.

Pseudofractures are associated with osteomalacia. This condition presents with bone pain, tenderness, proximal muscle weakness, fractures and a waddling gait.

Further reading:

https://patient.info/doctor/osteoarthritis-pro

Question:

A 19-year-old man presents to his GP. He was involved in a car accident two weeks ago. A large lorry collided with another car and he swerved to avoid them, hitting a lamp post. Two weeks after the incident, he continues to have flashbacks and nightmares and cannot sleep. He wants to request some time off work as he does not want to start driving yet.

What is the most likely diagnosis?

A. Post-traumatic stress disorder

B. Generalised anxiety disorder

C. Acute stress disorder

D. Panic disorder

E. Depression

Correct Answer:Acute stress disorder

Explanation:

The correct answer is an acute stress disorder. This is defined as an acute stress reaction occurring in response to a major traumatic event. It must occur within the first 4 weeks of the event. Symptoms of acute stress disorder include nightmares, flashbacks and avoidance of triggers. Whilst there is an overlap of symptoms between acute stress disorder and post-traumatic stress disorder, the latter can only be diagnosed after 4 weeks.

Post-traumatic stress disorder is incorrect. Whilst this man's presentation (flashbacks, nightmares and avoidance of triggers) does align with the symptoms of post-traumatic stress disorder, this can only be diagnosed once 4 weeks have passed. As this man has only had symptoms for 2 weeks, a diagnosis of acute stress disorder is more likely.

Generalised anxiety disorder typically presents with other features such as excessive worry, low mood etc. The symptoms would also have to be persistent all the time. Generalised anxiety disorder is also not confined to a specific situation, with patients usually describing 'free-floating' anxiety which is present all the time. In addition, a diagnosis of generalised anxiety disorder can only be made after a time of 6 months has passed. Therefore this is unlikely to be the correct diagnosis.

Panic disorder would present in an episodic manner, with each episode lasting typically between 30 seconds to a few minutes. Panic attacks usually present with palpitations, shortness of breath and chest pain, and are not restricted to specific situations/stimuli. This patient is not presenting with any symptoms of panic disorder, which makes this diagnosis unlikely.

Depression typically includes a triad of low mood, anergia (loss of energy) and anhedonia (loss of interest in activities normally enjoyed). Other features may include reduced appetite and disruption in sleep. ICD-10 states that for a diagnosis of depression to be made, at least two of the triad must be met, for more than 2 weeks. Whilst this man has had his symptoms for 2 weeks, he does not meet the other specific criteria for a diagnosis of depression.

Further reading:

https://geekymedics.com/anxiety-disorders/

Question:

You are the Foundation Year 1 doctor working in the orthopaedics department. A 23-year-old man is an inpatient on the orthopaedic trauma ward after breaking his tibia playing football. His right leg has been in a cast for the last day but in the last 2 hours has become increasingly painful. He is now writhing in pain despite regular paracetamol and codeine. On examination of his right foot, he is able to wiggle his toes and light touch sensation is intact. His right foot is cool to touch but both his dorsalis pedis and posterior tibial pulses are palpable. Passively dorsiflexing and plantarflexing his ankle causes intense pain in his right leg under the cast.

What is the most appropriate first step to take in this situation?

A. Ultrasound right leg

B. Urgent senior orthopaedic review

C. Stop codeine and start oral morphine 10mg every 4 hours

D. X-ray right tibia/fibula

E. Urgent bloods including inflammatory markers

Correct Answer:Urgent senior orthopaedic review

Explanation:

This situation is concerning for the development of compartment syndrome. This is a serious complication of fractures, such as tibial and forearm fractures, whereby fascial compartment pressure increases uncontrollably and eventually compromises blood flow to distal structures. Signs include severe pain out of proportion to clinical findings and worsening pain on passive stretching of the compartment. Neurovascular compromise is a relatively late sign so maintained sensation and movement, as well as palpable distal pulses, are not necessarily reassuring. Any clinical suspicion, therefore, warrants urgent orthopaedic review for consideration of fasciotomy. Analgesia is important but secondary to this. An x-ray may be useful once compartment syndrome is ruled out to look for fracture displacement. An ultrasound would be indicated if suspecting deep vein thrombosis, a potential complication of lower limb fractures. Blood tests are not typically helpful in acute compartment syndrome.

Further reading:

https://www.orthobullets.com/trauma/1001/leg-compartment-syndrome

Question:

A 71-year-old female attends A&E with a productive cough and oxygen saturations of 80%. She states the cough has become progressively worse over the last two weeks and is associated with chills and rigors. On examination, she is noted to have crackles in the right mid to lower zone.

An ABG is performed:

pH 7.39

PaCO2 6

PaO2 5

SPO2 81 %

What is the next step in the immediate management of this patient?

A. Non-invasive ventilation

B. Administration of oxygen

C. Salbutamol nebuliser

D. Chest X-ray

E. Intravenous antibiotics

Correct Answer:Administration of oxygen

Explanation:

This patient has presented with symptoms and signs of community-acquired pneumonia and an ABG shows type 1 respiratory failure. An ABCDE approach should be applied to this scenario, with the administration of oxygen being the next most appropriate management option.

A salbutamol nebuliser may be helpful, however, there is no history of asthma or COPD given and no evidence of wheeze on examination.

Intravenous antibiotics and a chest X-ray will both be required, but the administration of oxygen takes priority over both of these options.

Non-invasive ventilation is typically used for patients in type 2 respiratory failure, which is not the case in this scenario. If the patient were to continue to develop worsening type 1 respiratory failure despite oxygen therapy, continuous positive airway pressure ventilation may be required in the context of an ITU admission.

Further reading:

https://patient.info/doctor/pneumonia-pro

Question:

A 15-year-old female patient attends her GP accompanied by her mother regarding behavioural change. Her mother is concerned that her daughter is constantly preoccupied with her nose size and shape. She reports that her daughter spends several hours a day either looking at her nose in the mirror, verbally comparing her nose in appearance to that of others’ in magazines and tries to change the shape of her nose with excessive amounts of make-up. When the patient is asked if she thinks there is a problem with her perception of her facial appearance, she vehemently denies any. It is also discovered that she is avoiding social contact as much as possible as a result of her negative self-perception. On examination, you note no abnormality with the patient’s nose.

What is the FIRST-LINE management for the condition described?

A. Selective serotonin reuptake inhibitor

B. Cognitive behavioural therapy plus a selective serotonin re-uptake inhibitor

C. Cognitive behavioural therapy

D. Antipsychotic medication

E. In-patient management

Correct Answer:Cognitive behavioural therapy

Explanation:

The most likely diagnosis is body dysmorphic disorder. The first-line management for this condition is a trial of cognitive behavioural therapy. This sometimes occurs alongside exposure and response prevention. Body dysmorphic disorder can be defined as an obsession with an envisaged problem in appearance or uncontrolled concern over a small physical abnormality. Clinical features for body dysmorphic disorder include excessive gazing at the presumed anomaly (e.g. in the mirror), reassurance seeking, comparison of presumed abnormality with others, as well as the continuous attempt to hide the imagined defect. The risk factors for this condition include adolescence and regular attendance to surgery and dermatology clinics.

Selective serotonin reuptake inhibitors (e.g. fluoxetine) are indeed used in the management of this condition, however, they are not used as first-line therapy.

Cognitive behavioural therapy plus a selective serotonin reuptake inhibitor is usually indicated when a trial of cognitive behavioural therapy alone has proved insufficient.

Anti-psychotics are rarely used in the management of body dysmorphic disorder. When they are utilised they are used to increase the effect of a concomitant selective serotonin re-uptake inhibitor.

In-patient management is rarely necessary for patients with this condition.

Further reading:

https://patient.info/doctor/body-dysmorphic-disorder-pro

Question:

A 61-year-old man presents to his GP with a two-day history of right calf pain and swelling. He denies chest pain or dyspnoea. He has a history of hypertension and type 2 diabetes mellitus and is recovering from a lower respiratory tract infection after being bedbound for the past four days. On examination, the right calf is 3.5cm greater in circumference than the left, and there is tenderness along the deep venous system. His Wells' score is calculated to be 4.

What is the most appropriate initial investigation?

A. Ventilation-perfusion (V/Q) scan

B. Arterial blood gas

C. D-dimer

D. CT pulmonary angiogram

E. Proximal leg ultrasound scan

Correct Answer:Proximal leg ultrasound scan

Explanation:

This case demonstrates a deep venous thrombosis (DVT). The history of a painful, swollen leg alongside a recent period of immobilisation points towards this diagnosis. The two-level Wells' Criteria for DVT can be used to determine the next steps in investigating a suspected DVT. The risk of DVT is likely if the score is ≥2 and unlikely if the score is ≤1. The risk of a DVT in this patient is likely, and so they require a proximal leg vein ultrasound scan within 4 hours.

In a patient with a low risk of a DVT (Wells' ≤1), a D-dimer test should be offered within 4 hours. If this is positive, then a proximal leg vein ultrasound scan should be offered. If negative, an alternative diagnosis should be considered.

A CT pulmonary angiogram (CTPA) is indicated in patients where the diagnosis is likely a pulmonary embolism (PE). A V/Q scan is an alternative where CTPA is contraindicated, e.g. poor renal function or contrast allergy. This patient has no chest pain or dyspnoea, so a PE is not the likely diagnosis.

This patient is not acutely short of breath or demonstrating signs of hypoxia, and so an arterial blood gas is not indicated.

Further reading:

https://cks.nice.org.uk/topics/deep-vein-thrombosis/

Question:

A 78-year-old man complains of chronic difficulty with feeding. He has a history of a stroke from 2 years ago; a neurology report identifies ischaemic changes to his right mid-pontine region.

On examination, you notice wasting of the right masseter and temporalis muscles. He can swallow water without aspiration.

What cranial nerve has most likely been affected by this man's stroke?

A. Trigeminal nerve

B. Vagus nerve

C. Hypoglossal nerve

D. Facial nerve

E. Trochlear nerve

Correct Answer:Trigeminal nerve

Explanation:

When patients report difficulty with eating, it is important to determine whether the cause is due to a defective swallow.

The trigeminal nerve (CN V) innervates the muscles of mastication. Damage to this nerve, which can occur due to stroke and other causes, causes ipsilateral paresis or paralysis of these muscles, as only the fourth cranial nerve crosses the midline. As his stroke was 2 years ago, this man has some wasting of the mastication muscles (upper motor neurone lesions like strokes can cause wasting in a chronic setting from disuse atrophy). As a result, he most likely has eating difficulties due to his poor ability to chew food, as his swallow is preserved.

While the facial nerve is responsible for many of the movements of the face, it does not supply the muscles of mastication. Lower motor neurone damage to this nerve would result in facial weakness that is not forehead sparing. Confusingly, upper motor neurone damage to this nerve (as in the case of a stroke) is forehead sparing due to the collateral innervation of the forehead.

The hypoglossal nerve is responsible for the movements of the tongue. Damage to one side of the nerve would result in deviation towards the side of the lesion due to an overpowering of the contralateral tongue muscles. While it could be argued this may somewhat affect the ability of a person to eat, it would not explain the pattern of wasting seen in the stem.

The only muscle the trochlear nerve innervates is the superior oblique muscle. This is responsible for the depression, internal rotation, and abduction of the eye. It is not involved in eating.

The vagus nerve is important in the function of swallowing. It could be that this man's stroke has affected his vagus nerve and therefore his ability to eat, although the stem indicates his swallow is functional. Therefore, along with the pattern of mastication muscle wasting, it is more likely this man's ability to chew is affected, which is innervated by the trigeminal nerve.

Further reading:

https://www.youtube.com/watch?v=hDbWV0EZCAU

Question:

A 45-year-old man is brought to the emergency department ambulance with confusion and drowsiness. He was found on the floor at home by his cleaner. He vomited once in the ambulance. No collateral history is available. He has no obvious focal neurology.

His vital signs are as follows:

Heart rate 90 bpm

Blood pressure 140/95 mmHg

Respiratory rate 22/min

Temperature is 38.8 oC

Blood tests reveal a WCC of 20 x109 cells/L (3.6 – 11.0) and a CRP of 150 ng/L (<5). A CT head shows a 3 cm wide hypodense lesion with ring enhancement in his frontal lobe.

What is the most likely underlying cause of the lesion?

A. Infective foci adjacent to the brain

B. HIV

C. Pulmonary infection

D. Infective endocarditis

E. Malignancy

Correct Answer:Infective foci adjacent to the brain

Explanation:

This man is suffering from a cerebral abscess. Other differentials for a ring-enhancing lesion include malignancy and subacute infarcts; however the marked fever and raised inflammatory markers make an infection more likely. Forty to fifty percent of cerebral abscesses arise from bacterial infections adjacent to the brain, the most common of which are sinusitis, mastoiditis, otitis media, and dental infections. There may well be evidence of these on the CT head.

The next most common cause is trauma (10-30%).

Infective endocarditis, pulmonary infection, and HIV (which predisposes to CNS lymphoma or cerebral toxoplasmosis) are infective causes of ring-enhanced lesions that are important to consider and rule out; however, they are less common than cerebral abscesses caused by adjacent infective foci.

Further reading:

https://patient.info/doctor/intracranial-abscesses#nav-2

Question:

A 61-year-old man presents to his GP with lower back pain, which has developed over the last two months. There was no precipitating event to his symptoms, and he describes the pain as “shooting” down the outside of his left leg. He denies any bladder or bowel incontinence. He has no past medical history and takes no regular medications. On examination, there is reduced strength on foot dorsiflexion of the left leg. There is also notable sensory loss on the lateral aspect of the calf and dorsum of the foot in the left leg. The right leg is unremarkable. There is no noticeable sensory loss in the perineum.

What is the most likely cause of his symptoms?

A. L3 radiculopathy

B. S1 radiculopathy

C. S2 radiculopathy

D. L5 radiculopathy

E. L1 radiculopathy

Correct Answer:L5 radiculopathy

Explanation:

L5 radiculopathy is the correct answer. This man is suffering from a radiculopathy, which is a lesion or compression of the spinal nerve roots. There are many causes of this condition, but the most common are degenerative changes in the spinal column causing prolapse of the intravertebral discs and compression a unilateral spinal nerve root. Therefore, as the disc prolapses to one side, the symptoms are most commonly unilateral. There are two cardinal features of radiculopathy, lower back pain and neurological signs – the pain is commonly referred to as ‘sciatica’. This man has presented with a loss of foot dorsiflexion with reduced sensation on the left lateral calf and foot dorsum. These are the classic signs of L5 radiculopathy, as the L5 nerve root contributes fibres to the common peroneal nerve (L4-S2) which is responsible for innervating the leg muscles required for foot dorsiflexion. L5 radiculopathy is the most common radiculopathy.

Sensory loss in the perineum and bladder/bowel incontinence are features of cauda equina syndrome, which is the compression of the bundle of nerve roots below the end of the spinal cord (known as the cauda eqiuna). It contains the nerve roots from the sacral and lumbar regions, therefore compression of many fibres at once produces more severe symptoms, such as bilateral leg pain, bilateral motor/sensory deficits, urinary retention, perineal anaesthesia and urinary or bowel incontinence. The absence of such features points away from this condition.

S1 radiculopathy is incorrect. While the S1 root contributes to the same nerves as the L5 root, it has different myotomes and dermatomes. It would present with weakness of plantar flexion with a sensory loss on the posterior aspect of the leg and lateral edge of the foot. While L5 contributes to the common peroneal nerve, S1 contributes mainly to the tibial nerve (L4-S2) – they are both the terminal branches of the sciatic nerve (L4-S3). It is the second most common radiculopathy.

L1 radiculopathy is incorrect. It contributes only to the femoral nerve (L2-L4) and it presents with pain and sensory loss in the inguinal region.

S2 radiculopathy is incorrect. It is part of the triad of S2/S3/S4 radiculopathies, which all present with similar symptoms. It would present with sacral pain that radiates down the posterior aspect of the leg and the perineum. It also causes urinary or faecal incontinence with sexual dysfunction. It is often remembered with the mnemonic, “S2, 3, 4 keeps poo off the floor”.

L3 radiculopathy is incorrect. It is part of the triad of L2/L3/L4 radiculopathies, which all present with similar symptoms. It is a major contributor to the femoral nerve (L2-L3) which innervates the anterior compartment of the leg. Therefore, there is a weakness in hip flexion and knee extension. It would result in a sensory loss on the anterior aspect of the thigh.

Further reading:

https://www.physio-pedia.com/Lumbar\_Radiculopathy

Question:

A 45-year-old man is referred to the surgical assessment unit after his GP noticed a bulge on his abdominal wall during a routine examination. The patient says this has been present for a long time and has not been causing him any symptoms. He is obese and has had a previous open cholecystectomy.

On examination, there is a Kocher’s incision scar and a soft reducible midline swelling 2cm above the umbilicus.

What is the most likely diagnosis?

A. Epigastric hernia

B. Divarication of the recti

C. Spigelian hernia

D. Paraumbilical hernia

E. Incisional hernia

Correct Answer:Paraumbilical hernia

Explanation:

The most likely diagnosis, in this case, is a paraumbilical hernia. Paraumbilical hernias are the most common type of ventral hernia. They pass through a fascial defect in the linea alba within 3cm of the umbilical ring. The majority are small and asymptomatic and can safely be managed conservatively. They are more likely to affect women, especially during or after pregnancy, but are more likely to cause problems requiring surgery in men. Obesity is an important risk factor for all types of ventral hernia as it causes raised intra-abdominal pressure and weakens the fascial layers of the abdominal wall. Paraumbilical hernias are also common in patients with ascites secondary to liver disease.

Epigastric hernias are a less common type of ventral hernia. They pass through the linea alba in the upper midline above the umbilical territory. They are often asymptomatic and have a low risk of obstruction or strangulation as they usually only contain extraperitoneal fat.

Spigelian hernias are a rare type of lateral ventral hernia. They pass through the Spigelian fascia lateral to the rectus sheath. They are usually very small and present with localised pain or a lump immediately lateral to the rectus abdominis muscle. They have a fairly high risk of obstruction or strangulation due to the tight fascial layers around the hernia neck.

Incisional hernias are ventral hernias which pass through the site of a previous surgical incision. They occur because the fascial closure of the abdominal wall failed to heal properly. This patient has had an open cholecystectomy. This is usually performed via a Kocher’s incision, which is an oblique subcostal incision on the right-hand side that extends to the midline just below the xiphoid process. This incision would not be related to a hernia near the umbilicus.

Divarication of the recti, also known as rectus diastasis, is an important differential diagnosis for a midline abdominal swelling. It occurs when the rectus abdominis muscles separate, stretching the linea alba to a width of more than 2cm. This causes a prominent midline bulge which can look quite striking on examination. However, it is not a hernia as there is no underlying fascial defect. It is usually treated with physiotherapy and exercise programmes and rarely requires surgery.

Further reading:

https://geekymedics.com/hernias/

Question:

An 11-year-old boy presents to the local child and adolescent mental health service (CAMHS) after a diagnosis of attention deficit hyperactivity disorder (ADHD). His parents have tried to implement behavioural strategies for several months, which have been ineffective, and the child's hyperactivity symptoms appear to be worsening. The decision is made to start the child on drug therapy.

What investigation would be most appropriate before initiating drug treatment?

A. Weight and height measurement

B. Urea and electrolytes

C. Full blood count

D. Liver function tests

E. Chest X-ray

Correct Answer:Weight and height measurement

Explanation:

In children with ADHD, the most common first-line medication is methylphenidate. This is a type of stimulant that primarily acts as a dopamine/noradrenaline reuptake inhibitor. Methylphenidate can potentially lead to stunted growth, and for this reason, it is important to measure the weight and height of the child regularly at 6-month intervals. A baseline weight and height measurement should also be taken before starting methylphenidate to act as a comparator for future measurements. If any concerns regarding growth arise, weight/height measurements should be taken more frequently, and the medication may be adjusted accordingly.

Full blood count is usually monitored in patients who take atypical antipsychotics (e.g. olanzapine) due to the risk of agranulocytosis. Although this may be indicated in the initial work-up of a child with ADHD, measuring the weight and height would be more appropriate before starting methylphenidate.

Urea and electrolytes may be monitored in patients before starting diuretics (e.g. spironolactone). However, they are not a requirement before starting methylphenidate.

Chest X-rays do not form part of the initial investigations before starting methylphenidate.

Liver function tests are usually conducted in patients before starting a statin, as opposed to methylphenidate.

Further reading:

https://bnf.nice.org.uk/drugs/methylphenidate-hydrochloride/

Question:

A 32-year-old man presents with a two-day history of acutely worsening perianal pain. He has a past medical history of haemorrhoids though he describes no pain prior to this episode. He denies any itching or discharge. He does not smoke and works as a fitness coach. On examination, there is a tender, purple, solid nodule visualised at the 3 o’clock position on the edge of the anal canal.

What is the most likely diagnosis?

A. Anal fissure

B. Thrombosed haemorrhoid

C. Rectal prolapse

D. Anal skin tag

E. Anal fistula

Correct Answer:Thrombosed haemorrhoid

Explanation:

The correct answer is a thrombosed haemorrhoid. Patients with simple haemorrhoids are at risk of developing thrombosis of the lesion, causing a purple or dark blue appearance and pain. They may bleed but are not typically associated with itch or discharge. Triggers for thrombosis of a pre-existing haemorrhoid include heavy lifting and vigorous exercise. On examination, they present as tender, solid nodules at the verge of the anal canal.

Anal fissure is incorrect. Anal fissures present with extreme anal pain, worst when defecating, and can be associated with rectal bleeding. However, an anal fissure typically presents with a visible tear in the midline of the anus rather than as a solid nodule at the 3 o’clock position, as described in this question.

Rectal prolapse is incorrect. A prolapse presents as a mass protruding through the anal canal as opposed to a nodule at the edge of the anal canal. It usually presents with a feeling of fullness, or a dragging sensation rather than with acute pain.

Anal fistulas typically present with a break in the skin adjacent to the anus, in the perianal skin. They cause pain but are typically associated with discharge and pus if an abscess develops. They do not fit the presentation given in this question.

Anal skin tags are often seen in patients with Crohn’s disease. They are waxy, skin-coloured lesions in the perianal area that are usually not painful but may be itchy. The lesion in this scenario is purple in colour and painful, making this diagnosis unlikely.

Further reading:

https://cks.nice.org.uk/topics/haemorrhoids/

Question:

A 37-year-old lady sees her GP due to a 1-year history of fatigue. She reports no weight loss or fever. Her bowels open regularly once per day and she has regular, light periods every 28 days. She has no significant family history and clinical examination is unremarkable.

A full blood count reveals the following:

Hb = 87 g/L (115-160)

MCV = 69 fL (76-96)

WCC = 8.3 x 109/L (4.0-11.0)

Neutrophils = 5.1 x 109/L (1.5-8.0)

Platelets = 312 x 109/L (150-400)

Ferritin = 9 ng/L (12-150)

Which of the following would be the next most appropriate step?

A. No further investigations required

B. Tissue-transglutaminase autoantibodies

C. Ultrasound abdomen/pelvis

D. Intrinsic factor autoantibodies

E. Oesophageal gastro-duodenoscopy (OGD)

Correct Answer:Tissue-transglutaminase autoantibodies

Explanation:

The most appropriate next step would be to check for the presence of tissue-transglutaminase autoantibodies. The patient has a microcytic anaemia (low haemoglobin and low MCV), which is most likely the result of iron deficiency given the low ferritin level. Ferritin is an acute-phase protein, so can be raised in conditions causing an inflammatory response. As a result, even if the ferritin level were normal it would not exclude iron deficiency.

According to NICE guidance, all patients with iron deficiency anaemia (IDA) need further investigation to establish the cause. The investigations required depends on individual patient characteristics such as age, gender, family history of bowel malignancy and symptoms (i.e. upper or lower gastrointestinal symptoms). Coeliac disease should be excluded in all patients with IDA. The most commonly used investigations to screen for coeliac disease include tissue-transglutaminase or tissue endomysial autoantibodies. If one of these tests is positive, the patient would then undergo an OGD to confirm the diagnosis.

Menstruating young females with no gastrointestinal symptoms and no history of colorectal cancer do not require any further investigation beyond screening for coeliac disease.

Other tests to consider depending on the patient's symptoms and risk factors include upper and lower gastrointestinal endoscopy, urinalysis and imaging (i.e. USS and/or CT).

Intrinsic factor autoantibodies are associated with pernicious anaemia. Pernicious anaemia causes B12 deficiency, resulting in the development of macrocytic anaemia.

Further reading:

https://cks.nice.org.uk/anaemia-iron-deficiency#!scenariorecommendation:1

Question:

An 82-year-old is found collapsed at home by her relatives and brought into hospital. They are unsure how long she was on the floor, but became worried when they had not heard from the patient for 3 days and went round to check on her. They report that she was previously independent, and was able to organise her own shopping and cooking - however, the family were beginning to have concerns surrounding her mobility. The patient is unable to provide any form of history; whilst she is conscious, she appears very confused and increasingly lethargic.

On examination, the patient has bruising on her arms, but no signs of focal tenderness or fracture. A brief neurological examination reveals no abnormalities in tone or reflexes. The patient is not shivering, and a tympanic thermometer gives a reading of 36 degrees. Notably, the patient has a pulse rate of 38 bpm, and her blood pressure is recorded at 90/48 mmHg. The admitting doctor is extremely concerned about the patient's presentation and orders further investigations.

Given the patient's history and examination findings, which of the following would be the most appropriate next management step?

A. Administer 500mg atropine

B. Order an urgent MRI head

C. Take blood cultures

D. Re-measure the temperature using a specialist PR thermometer

E. Arrange urgent DC cardioversion

Correct Answer:Re-measure the temperature using a specialist PR thermometer

Explanation:

This patient has presented with a history of a long lie; there is no way of determining exactly how long she was on the ground, but there is a chance that she may have been immobile for as long as 3 days. In any patient who has been immobile for such a time, it is crucial to consider the potential for severe hypothermia, especially in elderly individuals, whose ability to regulate their body temperature may be impaired. Bradycardia, hypotension, confusion and lethargy are all possible symptoms of this condition.

In this case, both the lack of shivering and low-grade temperature drop detected on the thermometer may be falsely reassuring. Regular tympanic thermometers can often fail to register extremely low temperatures; therefore, in any patient who records a temperature below 36.5 degrees, it is essential to use a rectal, low-reading thermometer to ascertain the exact temperature. At very low temperatures, the shivering mechanism will often fail; thus, the lack of shivering in combination with a recorded temperature of 36 degrees should be worrying rather than reassuring.

Imaging may be useful as part of this patient's workup; a CT head may be beneficial later down the line, to rule out stroke or intracranial haemorrhage. However, an MRI would not be appropriate for acute trauma imaging, and it is far more pressing to rule out hypothermia in this scenario.

The patient's bradycardia in combination with hypotension may lead to the consideration of providing atropine to increase the heart rate and aid haemodynamic stability. However, this does not help to ascertain the underlying cause, and 500 milligrams is far too high a dose of the drug; 500 micrograms is the dosage used in a resuscitation scenario.

DC cardioversion can be used to treat acute arrhythmias causing haemodynamic instability; whilst usually utilised for tachyarrhythmias, it can be useful in some cases of bradycardia, such as slow AF. However, as with atropine, this will not help to establish the underlying cause, and would not be carried out until an ECG had confirmed an arrhythmia. This patient's bradycardia and hypotension are likely to be indicative of her reduced core body temperature.

It is recommended to take a number of blood tests in patients with hypothermia; blood cultures often being included. However, they are unlikely to form the initial management - sepsis is unlikely to account for all of the patient's symptoms.

Further reading:

https://patient.info/doctor/hypothermia-pro

Question:

A 49-year-old woman presents to her general practitioner with a 2-month history of visual disturbances and generalised fatigue. Her vision is apparently excellent when she wakes, though it deteriorates as the day goes on. These visual symptoms improve when she is able to rest her eyes. On further questioning, the patient mentions that she has lost 4 kg of weight over the last 4-months.

The patient appears cachectic on general examination. Examination of the face reveals bilateral ptosis.

Further investigations reveal that the patient has acetylcholine receptor autoantibodies. A paraneoplastic neuromuscular disorder is suspected.

What malignancy may be responsible for this patient's presentation?

A. Thymoma

B. Follicular lymphoma

C. Renal cell carcinoma

D. Small cell lung cancer

E. Breast cancer

Correct Answer:Thymoma

Explanation:

The correct answer is thymoma. Thymomas are tumours of the thymus, an organ involved in T cell maturation that classically begins to atrophy after puberty. The patient's presentation is in keeping with myasthenia gravis, characterised by blurred vision that worsens throughout the day. Patients with myasthenia gravis classically have acetylcholine receptor autoantibodies, leading to weakness that worsens with continued use. 15% of patients diagnosed with myasthenia gravis are thought to have an underlying thymoma. Another paraneoplastic neuromuscular disorder is Lambert-Eaton myasthenic syndrome, caused by small cell lung cancer and associated with voltage-gated calcium channels autoantibodies.

Breast cancer is incorrect, as this is not associated with myasthenia gravis. Breast cancer classically presents with a painless breast lump in early disease and may be associated with axillary lymphadenopathy or breast skin changes.

Follicular lymphoma is incorrect, as this is not associated with myasthenia gravis. Follicular lymphoma classically presents with 'B symptoms', including night sweats, fevers, and weight loss.

Small cell lung cancer is incorrect, as this may be associated with Lambert-Eaton myasthenic syndrome, a distinct condition from myasthenia gravis. Lambert-Eaton myasthenic syndrome differs from myasthenia gravis as fatigue improves with repeated use, as opposed to patients with myasthenia gravis, who become increasingly fatigued with increased use. Lambert-Eaton myasthenic syndrome is associated with voltage-gated calcium channels autoantibodies, whereas myasthenia gravis is associated with acetylcholine receptor autoantibodies.

Renal cell carcinoma is incorrect, as this is not associated with myasthenia gravis. Patients with renal cell classically present with the triad of haematuria, flank pain, and an abdominal mass. Paraneoplastic erythrocytosis/polycythaemia may be observed in patients with renal cell carcinoma.

Further reading:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3155972/

Question:

A 21-year-old medical student presents to the GP after discovering a lump in her right breast when showering; she appears visibly distressed. She frequently checks her breasts as recommended, and has not previously noticed any masses. She denies any changes in the skin around her breasts or her nipples and has not noticed any masses anywhere else, nor any nipple discharge.

The patient has no other relevant past medical history, and nobody in her family has previously had breast cancer. She began menstruating at age 14, and takes the combined oral contraceptive pill for primary dysmenorrhoea, although this was only started 6 months previously. She does not smoke or drink alcohol.

Examination of the breast reveals a single, well-defined mass in the inferior outer quadrant of the right breast. This is motile within the breast and feels rubbery to the touch. There are no nipple or skin changes visible, and axillary examination reveals no lymphadenopathy.

According to NICE, what is the most appropriate next step for the GP in this scenario?

A. Reassure patient and stop oral contraceptive pill

B. 2 week-wait referral to breast clinic

C. Reassure patient and discharge

D. Urgent referral to obstetrics and gynaecology for exploration of menstrual symptoms

E. Non-urgent breast clinic referral

Correct Answer:Non-urgent breast clinic referral

Explanation:

The most likely diagnosis, in this case, is a fibroadenoma, a benign breast lesion most common in women aged 15-35. The usual presentation is of a motile, well-defined, smooth mass within the breast; there will be an absence of other worrying features such as lymphadenopathy. The exact pathophysiology of these lesions is unknown, although there appears to be a relationship with hormonal changes such as starting the combined oral contraceptive pill.

NICE recommends a 2-week wait referral for women aged 30 years and over who have an unexplained breast lump with or without pain; there is a low threshold for suspecting breast cancer. However, in this patient, and other patients under 30 with a mass likely to indicate a fibroadenoma, a non-urgent referral to breast clinic is more appropriate; fibroadenomas almost never undergo malignant change. Imaging may be used to confirm the diagnosis, and simple observation is usually adequate. Whilst hormonal changes are linked to the disease, there is no need to stop the oral contraceptive pill in patients with a fibroadenoma, due to its benign nature.

It would be inappropriate to reassure the patient and discharge her. Whilst this lesion is most likely to represent a fibroadenoma, this should still be confirmed, so as not to miss an underlying malignancy, albeit unlikely. This patient is visibly distressed and therefore simply discharging them without a confirmed diagnosis may cause further worry.

Primary dysmenorrhoea is very common amongst young women, and there is no documented link between this and fibroadenoma. Therefore an urgent referral to obstetrics and gynaecology for exploration of menstrual symptoms is not appropriate in this scenario.

There is a very low threshold for a 2 week-wait referral to breast clinic due to the guidance set out by NICE. It is not necessary in this case, however, given the patient's age and less concerning symptoms.

Further reading:

https://cks.nice.org.uk/topics/breast-cancer-recognition-referral/management/referral-for-breast-cancer/

Question:

A 36-year-old male is reviewed in general practice after a recent set of routine blood tests found that his total serum cholesterol was significantly raised at 13 mmol/L. He has no medical problems, takes no regular medications and is otherwise well.

The patient reports that his father suffered a heart attack at the age of 56 and, in addition, his grandfather died of a heart attack at the age of 51.

What is the most likely diagnosis?

A. Use of retinoic acid for acne

B. Hypothyroidism

C. Familial hypercholesterolaemia

D. Chronic kidney disease

E. Alcohol excess

Correct Answer:Familial hypercholesterolaemia

Explanation:

The most likely diagnosis is familial cholesterolaemia. This is a relatively common familial condition and should be considered in any adult with a total serum cholesterol level of greater than 7.5 mmol/L and a personal or family history (first-degree relative) of premature coronary heart disease. This is practically defined as an event occurring before the age of 60.

Hypothyroidism, alcohol excess, chronic kidney disease and retinoic acid use are all potential causes of elevated triglyceride levels and are less likely here.

Further reading:

https://patient.info/doctor/hyperlipidaemia-pro

Question:

A 48-year-old woman presents to her GP with a lump in the upper outer quadrant of her right breast. She denies any pain or nipple discharge. Following triple assessment, the mass is found to be malignant. Her past medical history includes rheumatoid arthritis and polycystic ovary syndrome (PCOS), and she had breast implants inserted five years ago. Her body mass index (BMI) is 35kg/m2.

She began her periods at age 14 and is still having regular periods. She gave birth to her daughter at the age of 24. She does not smoke or drink alcohol.

Which aspect of this patient’s history is most likely to be a risk factor for her diagnosis?

A. Age of menarche

B. Breast implants

C. Rheumatoid arthritis

D. BMI

E. PCOS

Correct Answer:BMI

Explanation:

The only aspect of this patient's history that is a risk factor for breast cancer is her raised BMI. People with rheumatoid arthritis are at a reduced risk of breast cancer. PCOS can increase the risk of endometrial cancer, however, it does not increase the risk of breast cancer. Breast implants can increase the risk of developing anaplastic large cell lymphoma, a type of non-Hodgkin lymphoma, however, they do not increase the risk of breast cancer. An early age of menarche would be a risk factor for breast cancer, however, this patient started her periods at a normal age.

There are many risk factors for breast cancer to remember, and it can be useful to group them into those common to all cancers and those specific to breast cancer.

Common to all cancers:

Older age

Smoking

Alcohol

Irradiation (specifically mantle irradiation)

Specific to breast cancer:

Previous breast cancer

Family history of breast cancer or genetic predisposition

Uninterrupted oestrogen exposure

Early menarche, late menopause or nulliparity

First pregnancy after age 35

Not breastfeeding

Obesity

COCP (combined oral contraceptive pill) use

HRT (hormone replacement therapy) use

Further reading:

https://www.cancer.net/cancer-types/breast-cancer/risk-factors-and-prevention

Question:

A 29-year-old woman is brought to the GP by her partner, who reports that she has been exhibiting some strange behaviour. He informs the doctor that she has recently been diagnosed with depression, and has been struggling to leave the house for the past few months after being made redundant. The patient was unwilling to attend CBT and was therefore prescribed sertraline; this appeared to improve the patient's mood, and she displayed increased energy, motivation, and began re-engaging with her previous hobbies.

However, her partner is now concerned with some of her recent changes in behaviour; over the last 10 days, her energy levels have increased to a level where she states that she no longer needs to sleep to feel rested. She has begun to exercise excessively, despite previously showing little interest in this, and her libido is markedly increased; placing increased pressure on her partner to have sexual intercourse multiple times daily. She is described to appear to be 'in a constant hurry', with rapid speech and frequent flitting between activities. She appears disinterested in interacting with her partner or others, instead choosing to engage in a running conversation with herself.

Her partner wonders if these symptoms are due to her antidepressant medication, and enquires whether the GP can adjust the dose of the drug. She has no past medical history or family history of note and does not use recreational drugs and he cannot think of another explanation. However, the GP is concerned about the patient's symptoms and enquires whether she would be willing to be referred to the hospital.

What is the most likely diagnosis in this case?

A. Psychotic depression

B. Delirium secondary to sertraline

C. Type 2 bipolar disorder

D. Cyclothymia

E. Type 1 bipolar disorder

Correct Answer:Type 1 bipolar disorder

Explanation:

This patient appears to be exhibiting features of a manic episode, which would be in keeping with a diagnosis of type 1 bipolar disorder. A manic episode is defined by a period of abnormally elevated mood, lasting at least 7 days that is sufficient enough to affect social functioning or is accompanied by psychotic features. Given that the patient's symptoms have been present for 10 days, and are affecting her social interactions, a manic episode is the most likely explanation.

For diagnosis of type 1 bipolar disorder to be made only a single manic episode is required. This may, as in this scenario, be accompanied by a history of depressive symptoms, but these are not always present. If the patient does have a history of depression, the prescription of antidepressant medication is a relatively frequent trigger for mania in those who are predisposed; it is, therefore, important to enquire about a history of such behaviour before prescribing these drugs to anyone with depression.

Whilst this patient is exhibiting abnormal behaviour, she does not appear to be displaying psychotic features such as delusions, thought disorders or hallucinations, which makes a diagnosis of psychotic depression less likely. If this were present, nihilistic delusions would be more typical.

Antidepressants can be a potential cause of delirium in those started on the drugs; however, this is relatively uncommon in the young, and this patient does not appear to have reduced cognition nor altered consciousness (both common features of delirium) and instead has symptoms more in keeping with a manic episode.

Type 2 bipolar disorder is defined by the presence of a combination of both depressive episodes and hypomania (at least 4 days of mildly elevated mood, but lasting less than 7 days and without psychosis or marked impairment of function). For this to be diagnosed, the patient must not have suffered any manic episodes.

Cyclothymia refers to a condition where patients exhibit symptoms of both a depressive episode and elevated mood, but these are too mild for a diagnosis of a hypomanic episode and thus bipolar disorder to be made. This does not fit with the presentation of the patient in this scenario.

Further reading:

https://cks.nice.org.uk/topics/bipolar-disorder/background-information/definition/

Question:

A 22-year-old-man presents with a 4-day history of severe pain on passing stool. He describes the pain as ‘like passing glass’ with each bowel movement and he has an increasing reluctance to defecate as a result. On further questioning, a history of blood on the surface of the stool is elicited, but no fresh PR bleeding or mucus is noted. External examination reveals a split in the anal mucosa; the patient refuses internal examination due to fear of pain. He has no significant past medical history, takes no regular medications, and is otherwise systemically well.

What is the most appropriate next step in this patient’s management?

A. Botulinum toxin (‘Botox’) injection

B. Topical glyceryl trinitrate

C. Increase dietary fibre

D. Topical diltiazem

E. Referral for consideration of surgery

Correct Answer:Increase dietary fibre

Explanation:

This patient is suffering from an anal fissure. NICE recommend ensuring stools are soft and easy to pass as the first-line management strategy for anal fissures. Conservative measures such as increased dietary fibre, laxatives, increased fluid intake and, where required, topical analgesia should be considered, particularly in the acute setting such as this (chronic fissures are those which have been present for 6 weeks or more).

Topical glyceryl trinitrate ointment can be considered for those with a primary anal fissure for a week or more without improvement. It is important to advise patients that a prolonged course consisting of twice daily application for 6-8 weeks is required. GTN is not suitable for pregnant and lactating women.

Topical GTN may not be suitable or effective for all patients, and in a number of cases, it may not be tolerated due to headache. In such cases of inadequate adherence to GTN, NICE recommend that it may be appropriate to consider topical diltiazem, which has been found to be as efficacious as GTN, but with a lower side effect profile.

Botulinum toxin injection may be considered if there is a failure of medical treatment, though the number of injections that can be performed is limited by the risk of damage to the anal sphincter.

Referral for consideration of surgery is appropriate for patients with unhealed fissures after 6-8 weeks of adequate therapy, or if fissuring recurs after the initial episode has healed. Have a lower threshold for referral in high-risk groups such as the elderly, in whom the likelihood of underlying malignancy is higher.

Further reading:

https://bjgp.org/content/69/685/409

Question:

A 62-year-old lady with a background of hypothyroidism presents to her GP with a 6 months history of fatigue, weakness, forgetfulness and pins and needles in her fingers.

On examination, she is found to have an ataxic gait with a positive Romberg’s test. Chest and abdominal examination are normal and vital signs within normal limits.

Her blood results show Hb 93g/dL (115-165 g/dL) and MCV 122fL (80-100fL). The rest of her blood results are within normal limits including routine checks of TFTs, U&Es and LFTs.

Intrinsic factor antibodies are detected on further investigation.

What is the most likely diagnosis?

A. Vitamin B12 deficiency

B. Folate deficiency

C. Vitamin B3 (niacin) deficiency

D. Vitamin B1 (thiamine) deficiency

E. Iron deficiency anaemia

Correct Answer:Vitamin B12 deficiency

Explanation:

Vitamin B12 deficiency is the most likely diagnosis due to the macrocytic anaemia and presence of intrinsic factor antibodies suggesting pernicious anaemia. Pernicious anaemia is an autoimmune condition (more likely in this case as the patient already has a history of hypothyroidism) which causes destruction of the gastric parietal cells, causing impaired absorption of vitamin B12. As well as macrocytic anaemia, vitamin B12 deficiency can present with neurological manifestations affecting the posterolateral column of the spinal cord causing loss of proprioception and vibration sensation (dorsal column) and spastic weakness (corticospinal). It can also cause psychiatric symptoms such as depression, memory impairment and confusion. Other conditions causing impaired absorption of vitamin B12 could be linked to a vegan diet and patients with ileal disease/resection such as those with Crohn's or those who have had a total/partial gastrectomy.

Vitamin B1 (Thiamine) deficiency is a clinical diagnosis based on risk factors and symptoms. The main risk factor being chronic alcohol excess, particularly in the context of poor nutritional intake and malnutrition. Other risk factors include recurrent vomiting/chronic diarrhoea and total parenteral nutrition. Patients with risk factors presenting with symptoms should be treated with thiamine replacement immediately to prevent irreversible damage. Clinical features can vary but include Wernicke’s encephalopathy (mental state changes, ataxia and ocular abnormalities), wet beriberi (cardiac sequelae) and dry beriberi (distal peripheral neuropathy that occurs with a chronic deficiency). In this case, despite the history of memory impairment and ataxia, there are no risk factors given in the history, making it the less likely diagnosis.

Folate deficiency classically presents with megaloblastic, macrocytic anaemia but (unlike in this case) without neuropathy. Also, the intrinsic factor antibodies point towards pernicious anaemia and vitamin B12 deficiency. Folate deficiencies usually arise due to malabsorption, drugs e.g. methotrexate, dietary deficiency or increase demand (e.g. pregnancy). If folate deficiency is suspected underlying vitamin B12 testing should always be carried out.

Vitamin B3 (Niacin) deficiency is suspected when clinical features are evident, questions will elude to the 3 D’s – diarrhoea, dermatitis and dementia. This is a less likely option here due to the lack of symptom of diarrhoea or dermatological manifestations, and lack of association with intrinsic factor antibodies.

Iron deficiency anaemia would usually present with microcytic anaemia and without neurological symptoms. Serum ferritin and transferrin saturations are also low in iron deficiency anaemia.

Further reading:

https://patient.info/doctor/pernicious-anaemia-and-b12-deficiency

Question:

A 65-year-old man is referred for abnormal urine dipstick, found incidentally when he moved into the area. He has a past medical history of hypertension, obesity, obstructive sleep apnoea and a left nephrectomy for renal cell carcinoma 20 years ago. He does not smoke but drinks 10 pints of beer per week. He takes amlodipine only and uses a nocturnal continuous positive air pressure (CPAP) mask at night.

Clinical examination is unremarkable except for obesity. No oedema is present. Blood pressure is 155/78 mmHg. Urine dipstick shows protein (++++) and blood (+).

Blood tests demonstrate:

Result Reference range

Haemoglobin (Hb) 156 (130 – 180 g/L)

Na+ 139 (133–146 mmol/L)

K+ 4.5 (3.5–5.3 mmol/L)

Urea 6.1 (2.5 - 7.8 mmol/L)

Creatinine 87 (59–104 μmol/L)

Albumin 37 (35–50 g/L)

HbA1c 44 (< 42 mmol/mol)

Urine protein/creatinine ratio is 290 (<15 mg/mmol).

What is the most likely cause of this patient's abnormal urinalysis?

A. Minimal change disease

B. Focal segmental glomerulosclerosis

C. IgA nephropathy

D. Chronic interstitial nephritis

E. Amyloidosis

Correct Answer:Focal segmental glomerulosclerosis

Explanation:

Prior to kidney biopsy results, it can be difficult to classify patients with proteinuria on clinical grounds alone. In this case, the features of morbid obesity, hypertension and previous nephrectomy make secondary focal segmental glomerulosclerosis (FSGS) the most likely diagnosis among those presented. Secondary FSGS arises as a maladaptive response to hyperfiltration. Causes include obesity, hypertension and reduced nephron number (e.g. a remnant kidney post nephrectomy). In total, 50-70% of patients with FSGS will present with nephrotic syndrome. Secondary FSGS characteristically has subnephrotic levels of proteinuria and a normal serum albumin whereas primary FSGS is more likely to exhibit full-blown nephrotic syndrome.

IgA nephropathy characteristically presents with subnephrotic range proteinuria and haematuria making this possible but the heavy proteinuria with preserved renal function and risk factors in the history make FSGS more likely here.

Minimal change disease is an example of a primary glomerulopathy. These tend to present with higher levels of proteinuria and frank nephrotic syndrome, not present here. Interstitial nephritis would not present with heavy proteinuria as it is not a glomerular disorder.

Further reading:

https://patient.info/doctor/glomerulonephritis-pro

Question:

An 60-year-old man is admitted to the surgical assessment unit with acute urinary retention. On examination, your colleague incidentally finds a murmur and carries out an ECG. The ECG shows tall QRS complexes, giant T wave inversion in V2-4, and prominent Q waves are seen in leads II, III, aVF. His blood pressure is 125/85mmHg in both arms.

Which one of the following diagnoses is most in concordance with the ECG changes and clinical presentation?

A. Hypertrophic cardiomyopathy

B. Aortic stenosis

C. Mitral stenosis

D. Coarctation of the aorta

E. Pulmonary regurgitation

Correct Answer:Hypertrophic cardiomyopathy

Explanation:

The most frequently encountered ECG anomaly for hypertrophic cardiomyopathy is aberrant ST or T waves, which may manifest as ST depression or large T-wave inversion. In 20% to 50% of patients, prominent Q waves are detected in leads II, III, aVF, V5, and V6. QRS complexes that are the tallest in the mid-precordial leads indicate left ventricular hypertrophy. In HCM there might be an S4 and cardiac murmur audible at the lower-left edge, accentuated by exercise and standing and lessened by lying supine or squatting.

Aortic stenosis causes a narrowing of the outflow tract of blood out of the left ventricle. This means that the left ventricle now has to work harder to push blood out through the narrowed space. Over time this leads to thickening of the left ventricle (causing deviation of electrical activity more towards this side of the heart - LAD) and stronger contractions (causing larger QRS complexes which represent ventricular depolarisation/contraction).

Mitral stenosis and pulmonary regurgitation would not give you these ECG changes.

Coarctation of the aorta is unlikely given the normal blood pressure reading in both arms (there is normally a difference between arms).

Further reading:

https://lifeinthefastlane.com/ecg-library/basics/left-ventricular-hypertrophy/

Question:

A 46-year-old man presents to the emergency department by ambulance following a fall whilst on a winter mountain expedition. He was rescued by the mountain rescue team following a prolonged period of exposure to the cold weather.

Examination reveals oxygen saturations of 95% on air, respiratory rate of 24/min, heart rate of 48 bpm, blood pressure of 100/50 mmHg and temperature of 30.8°C.

A 12-lead ECG is recorded:

Source: WikiSysop. Licence: [CC BY 3.0] via Wikimedia Commons.

What does the ECG show?

A. ST-elevation

B. Delta waves

C. J waves

D. U waves

E. Complete heart block

Correct Answer:J waves

Explanation:

The patient is experiencing moderate hypothermia secondary to environmental exposure. The ECG shows the presence of J waves alongside atrial fibrillation, both of which are common ECG changes seen in hypothermia. J waves, also known as Osborn waves, are positive deflections seen at the J point on an ECG and are typically observed when body temperature falls below 30-31°C. The J waves and atrial fibrillation will typically resolve spontaneously as the patient is warmed.

ST-elevation involves elevation of the ST segment on an ECG and can be confused with J waves. This is typically observed in acute myocardial infarction.

Complete heart block involves complete dissociation between the atria and ventricles. This is observed on an ECG as independent atrial and ventricular contractions with no association.

Delta waves are a slurred upstroke in the QRS complex, which are most commonly associated with Wolff-Parkinson-White syndrome.

U waves are a deflection following the T wave on an ECG, which likely represents the repolarisation of the Purkinje fibres. It is a normal component of an ECG but may not always be observed due to its small size.

Further reading:

https://litfl.com/hypothermia-ecg-library/

Question:

A 15-year-old male patient attends the Accident and Emergency department accompanied by his parents. He reports a 3-day history of worsening nausea and vomiting, abdominal pain, abdominal distension and constipation. He has no relevant past medical or surgical history.

Clinical examination reveals the following:

A heart rate of 120 bpm

Abdominal distension with ‘tinkling’, hyperactive bowel sounds

Some investigations are requested, with the following results:

Hb: 130 g/L

Cr: 120 μmol/ L

Urea: 11 mmol/L

Lactate: 3 mmol/L

Abdominal x-ray: dilated small-bowel loops with air-fluid levels.

Erect chest x-ray: normal

The patient undergoes an emergency laparoscopy and a Meckel’s diverticulum is discovered.

What is the MOST LIKELY complication that has occurred as a result of the patient’s underlying Meckel’s diverticulum?

A. Small bowel obstruction

B. Umbilical fistula

C. Diverticulitis

D. Bowel perforation

E. Haemorrhage

Correct Answer:Small bowel obstruction

Explanation:

The most likely diagnosis is small bowel obstruction as a result of Meckel’s diverticulum. This condition can be defined as an embryological remnant of the vitellointestinal duct. The condition is typically asymptomatic and discovered as an incidental finding during surgery.

Meckel’s diverticula become symptomatic when complications develop, including small bowel obstruction, haemorrhage, perforation, diverticulitis and umbilical anomalies.

Meckel’s diverticula follow the rule of 2’s:

~2cm in length

located ~2ft from the ileocaecal valve within the distal ileum

affects ~2% of the general population

The most important risk factor for developing a symptomatic Meckel’s diverticulum is male gender. Resection of a Meckel’s diverticulum is indicated when the previously mentioned complications develop. The resection of an incidentally discovered, asymptomatic Meckel’s diverticulum remains controversial.

As in this scenario, small bowel obstruction typically presents with nausea, vomiting, absolute constipation (failure to pass faeces or flatus), abdominal pain, abdominal distension and ‘tinkling’, hyperactive bowel sounds on auscultation. Abdominal x-ray usually highlights distended bowel loops (+/- air-fluid levels).

Perforation is less likely in this case (although this could potentially develop if left untreated). This would more likely present with fever, tachycardia, peritonism, absent bowel sounds on examination and free air under the diaphragm on erect chest x-ray.

Haemorrhage would more likely present with a picture of circulatory collapse (e.g. hypotension, tachycardia) and rectal bleeding.

Diverticulitis is less likely in this case. This would typically present in the elderly population with ‘crampy’ abdominal pain localised in the left iliac fossa, coupled with raised inflammatory markers on laboratory investigation.

Umbilical fistula is not likely in this case. Umbilical fistula formation with a Meckel’s diverticulum may present with intestinal mucosa visible on the skin surface.

Further reading:

https://patient.info/doctor/meckels-diverticulum

Question:

A 34-year-old lady presents to the GP complaining of feeling like the whole room is spinning around her. She reports that this only happens occasionally and notes that it commonly occurs in bed when she turns over. Clinical examination is unremarkable. She is otherwise fit and well and takes no regular medications.

Which of the following tests is most likely to be useful in confirming the diagnosis?

A. Electrophysiological studies

B. Epley manoeuvre

C. Otoscopy

D. Dix-Hallpike test

E. MRI head

Correct Answer:Dix-Hallpike test

Explanation:

The most likely diagnosis is benign paroxysmal positional vertigo (BPPV) given the description of brief episodes of vertigo triggered by specific movements of the head (i.e. turning over in bed). BPPV occurs due to inner ear dysfunction, with otoliths becoming detached from the macula and then migrating into the semicircular canals. Typical presenting symptoms include sudden onset vertigo triggered by specific head movements. Attacks of vertigo usually only last 20-30 seconds with rapid resolution of symptoms. The patient's often experience associated nausea, but rarely vomiting.

The Dix-Hallpike test can be used to confirm posterior canal BPPV. It involves a sequence of movements to provoke the symptoms and signs of BPPV (included at the end of this explanation).

The Epley manoeuvre is another sequence of movements that can be used to reposition the otoliths back into the utricles. It is not useful in the initial diagnosis of BPPV.

An MRI head would be more appropriate if there were concerns regarding a potential diagnosis of acoustic neuroma. However, the lack of sensorineural hearing loss, tinnitus or an absent corneal reflex makes this diagnosis much less likely.

Otoscopy would be appropriate to perform, to rule out any other pathology in the ears, however, in the case of BPPV, it would not provide any useful information.

Electrophysiological studies have no role in the diagnosis of BPPV.

Dix-Hallpike test

Throughout this sequence of movements, make sure to warn the patient in advance of each step, so that they know what to expect.

1. Ask the patient to sit upright on the examination couch.

2. Adjust the patient’s position so that when supine, their head will hang over the edge of the bed, allowing for head extension below the horizontal plane.

3. Position yourself standing behind the patient (who should be sitting upright on the bed).

4. Turn the patient’s head 45º to one side.

5. Whilst supporting the neck, move the patient from their sitting position to a supine position (in one brisk smooth motion), ensuring their head hangs over the bed 30º below the horizontal plane.

6. Ask the patient to keep their eyes open throughout this process.

7. Inspect the patient’s eyes carefully for evidence of nystagmus for at least 30 seconds.

8. If no nystagmus is observed, the test is then complete for that side and you should carefully sit the patient up.

9. After a short break, the test should be repeated on the other side (turning the patient’s head in the opposite direction in step 4).

Further reading:

https://patient.info/doctor/benign-paroxysmal-positional-vertigo-pro

Question:

A 67-year-old woman presents to her General Practitioner regarding an event which occurred earlier that day. She was sat at her breakfast table when she had sudden-onset of left arm weakness and heaviness. This lasted for about 15 minutes before resolving spontaneously. She had no headache or any other symptoms accompanying this episode and now, 5 hours later, feels completely back to normal. She reports a similar episode which happened the previous night and also lasted around 15 minutes.

She has a past medical history of hypertension and migraine and takes amlodipine 5mg daily. She has no known allergies.

On examination she has a normal neurological examination, is slightly hypertensive at 159/86 mmHg and has an irregularly-irregular heartbeat at a rate of 105 beats per minute.

What is the single most appropriate initial management step for this patient?

A. Arrange urgent outpatient appointment for an ECG

B. Commence anticoagulation with warfarin or direct oral anticoagulant (DOAC)

C. Give aspirin 300mg and arrange a TIA outpatient clinic review for the following day

D. Give aspirin 300mg and discuss with hospital stroke physician regarding urgent same-day assessment

E. Administer a nasal triptan

Correct Answer:Give aspirin 300mg and discuss with hospital stroke physician regarding urgent same-day assessment

Explanation:

This patient has clinically had a transient ischaemic attack (TIA) - an episode of sudden onset neurological deficit which lasted for less than one hour. It is likely that the previous episode was also a TIA. A possible underlying aetiology of this is atrial fibrillation, as the patient has a slightly fast irregularly-irregular heartbeat. Given that the patient has had more than one TIA with a possible cardio-embolic source, the most appropriate step in management is to give 300mg aspirin and contact a hospital stroke physician regarding urgent same-day assessment. This is in keeping with NICE guidance regarding stroke and TIA management, and the patient has no contraindications to aspirin therapy.

Giving aspirin 300mg and arranging a next-day TIA outpatient clinic appointment without first discussing with a stroke specialist is not appropriate for this patient, as they are at high-risk for a stroke because they have had more than one TIA and a possible cardioembolic source.

Commencing anticoagulation will likely be indicated in future, especially if atrial fibrillation is confirmed, but is inappropriate without further assessment and investigation.

A nasal triptan may be useful in cases of migraine but is not indicated here. Although neurological deficit can occur with some types of migraine, new sudden-onset neurological deficit requires prompt investigation for cerebrovascular causes regardless of the presence or absence of headache.

An urgent outpatient ECG is not appropriate for this patient given the presence of neurological deficit likely secondary to the underlying arrhythmia. An ECG needs to be performed more urgently than this to aid diagnosis and plan management to prevent stroke.

Further reading:

https://cks.nice.org.uk/stroke-and-tia#!scenario:1

Question:

A 64-year-old Caucasian man presents with left lower quadrant pain, bloody diarrhoea and fevers. He has a medical history of diverticulosis, type 2 diabetes, hypertension and dyslipidaemia, all of which are well-managed. His current regular medications include atorvastatin, enalapril and metformin. He has a 25-pack-year history of smoking and consumes 10 units of alcohol per week.

His BMI, blood pressure, lipid profile and HbA1c are all within normal limits. A CT abdomen reveals an incidental finding of an abdominal aortic diameter of 34mm.

What is the most appropriate advice to best reduce the risk of further aneurysm growth?

A. Promote reduction in alcohol consumption

B. Start the patient on insulin

C. Increase the dose of enalapril

D. Start the patient on metoprolol

E. Promote the cessation of smoking

Correct Answer:Promote the cessation of smoking

Explanation:

This patient has incidentally been found to have an asymptomatic abdominal aortic aneurysm (AAA). He has other comorbidities that may contribute to the cause and progression of the AAA; however, they are all well-managed with medication. Smoking is strongly associated with the formation and progression of an AAA. Smoking cessation carries a strong protective effect and will also positively impact other independent risk factors such as lipid profile, inflammatory markers and blood pressure, further reducing the risk of progression.

Whilst hypertension is a risk factor in AAA progression, his hypertension is well managed, and so increasing the dose of enalapril would not be recommended.

This patient's diabetes is well controlled with metformin alone, and therefore, prescribing insulin would have no beneficial effect. Insulin has no direct role in decreasing the progression of an AAA.

The use of a beta-blocker (e.g. metoprolol) in the prevention of AAA progression has shown potential in animal models. However, this is not recommended as a method of direct prevention. A beta-blocker may be considered if the patient remained hypertensive following first and second-line treatment.

Whilst reducing alcohol consumption provides some benefits, this is not the most significant causative factor for an AAA. Furthermore, this patient's alcohol consumption is within the national guidelines recommendation.

Further reading:

https://teachmesurgery.com/vascular/arterial/abdominal-aorta-aneurysm/

Question:

A 41-year-old female presents to the emergency department with a 12-hour history of sudden-onset abdominal pain. The pain is felt in her epigastric region and radiates through to her back. She has vomited multiple times since the onset of the pain. She has had no diarrhoea and no bloating.

She has a past medical history of cholecystitis and is awaiting an appointment for a cholecystectomy. She does not drink alcohol and smokes 10 cigarettes per day.

On examination, the patient looks unwell and appears jaundiced. She is warm to touch with a pulse rate of 120 beats per minute and regular rhythm. Her blood pressure is 82/49 mmHg and her temperature is 37.2 degrees. In addition, she is requiring 2 litres of oxygen via nasal cannula to maintain an oxygen saturation of 98%. Her abdomen is soft but very tender in the epigastrium. Bowel sounds are present and she is not actively vomiting.

What is the most appropriate initial step in management?

A. High flow oxygen via non-rebreathe mask

B. Fluid resuscitation

C. Intravenous antiemetics

D. Emergency laparotomy

E. NG tube placement

Correct Answer:Fluid resuscitation

Explanation:

Given her presentation and background of gallstone disease, the likelihood is that this patient has acute pancreatitis. She is tachycardic and hypotensive, and the most appropriate initial step in management is, therefore, fluid resuscitation.

Intravenous antiemetics are not indicated immediately, especially as the patient is not actively vomiting.

Emergency laparotomy is not usually performed for uncomplicated pancreatitis, and indeed many complications can now be managed with percutaneous approaches.

NG tube placement below the level of the ligament of Treitz (at the level of the duodenum) and subsequent enteral feeding has been shown to yield better outcomes in patients requiring intensive care treatment for pancreatitis, providing there is no ileus. However, it is not indicated acutely, particularly as this patient is not vomiting and the diagnosis is not confirmed.

High-flow oxygen is not needed currently as the patient has a good oxygen saturation level with 2L of oxygen via nasal cannula.

Further reading:

https://patient.info/doctor/acute-pancreatitis-pro

Question:

A 61-year-old man presents to his GP with a 3-month history of recurrent nosebleeds and a 'blocked nose' that is always worse on the right side. When asking about associated symptoms, he describes a "strange numbness" and "intermittent pain" in his face. He also reports frequent headaches.

He does not have any significant personal or family past medical history. He is a non-smoker and non-drinker. He describes a lot of stress recently as he and his family immigrated from Hong Kong; as a result, he thinks he might have lost some weight during this time.

On examination, all vital signs are recorded as normal; however, you note right-sided, non-tender cervical lymphadenopathy.

Which of the following is the most likely underlying diagnosis in this patient?

A. Acute rhinosinusitis

B. Nasopharyngeal carcinoma

C. Acute myeloid leukaemia

D. Angiofibroma

E. Osler-Webber-Rendu syndrome

Correct Answer:Nasopharyngeal carcinoma

Explanation:

This patient is experiencing recurrent epistaxis, most likely due to an underlying nasopharyngeal carcinoma. Clinically suggestive features in this patient's history include recurrent headaches, facial numbness ± pain, recurrent epistaxis, unilateral nasal obstruction and weight loss. Examination importantly reveals unilateral and non-tender cervical lymphadenopathy. Nasopharyngeal carcinoma is commonly associated with Epstein-Barr virus (EBV) and is most commonly seen in people older than 50 years of age, in those with occupational exposure to wood dust or chemicals, and (for nasopharyngeal cancer) in people of South Chinese or North African family origin.

An angiofibroma is a rare benign nasal tumour, usually found in young males aged 12–20 years of age. The key features of angiofibroma include a history of nasal obstruction and severe epistaxis. Therefore, this is an unlikely diagnosis in this patient.

Hereditary haemorrhagic telangiectasia (HHT), also known as Osler-Webber-Rendu syndrome, is an autosomal dominant genetic disorder characterised by the formation of telangiectasia on the skin and mucosa. Patients with HHT typically report significant family history, recurrent severe epistaxis, and telangiectasia visible on the skin ± mucous membranes. This patient does not have any features to suggest this is a likely diagnosis.

Patients with haematological cancers, such as leukaemia, typically present with pallor, bruising, recurrent or persistent infection, generalised lymphadenopathy and variable bleeding. This patient does not have any features to suggest this is a likely diagnosis. Furthermore, the presence of isolated, unilateral, non-tender cervical lymphadenopathy in the context of unilateral nasal symptoms and weight loss, is highly suggestive of the presence of head and neck cancer.

Patients with acute rhinosinusitis typically present with symptoms lasting <4 weeks (depending on viral or bacterial aetiology), nasal discharge, nasal obstruction and facial pain or pressure. Acute rhinosinusitis should not cause symptoms lasting 3-months, frequent epistaxis or weight loss. Therefore, this is an unlikely diagnosis in this patient.

Further reading:

https://cks.nice.org.uk/topics/epistaxis-nosebleeds/

Question:

A 44-year-old man presents to his general practitioner complaining of fatigue, occasional shivers, bilateral flank pain and a rash on the torso. His past medical history includes ischaemic heart disease, type 2 diabetes mellitus, Barrett's oesophagus and hypertension. His medications include aspirin, clopidogrel, metformin, lansoprazole, ramipril, bisoprolol and amlodipine.

Blood tests demonstrate a creatinine of 289 umol, which was 65 umol only several weeks ago when the patient was admitted for surveillance endoscopy. The patient is admitted to hospital where it is noted that he has a normal urine output, urine dipstick showing (1+pro, 1+ blood) and normal observations.

The following day, the creatinine increases to 329 umol and the patient undergoes a renal biopsy that reveals marked lymphocytic infiltration of the tubulointerstitial compartment without granulomata and normal glomeruli. The findings are felt to be completely in keeping with tubulointerstitial nephritis.

What is the most likely cause of the presentation?

A. Tuberculosis

B. Hantavirus nephropathy

C. ANCA vasculitis

D. Lansoprazole

E. Sarcoidosis

Correct Answer:Lansoprazole

Explanation:

This patient is presenting with acute interstitial nephritis (AIN), the commonest cause for which among the possible answers is lansoprazole. AIN can occur after either short or long-term exposure to proton pump inhibitors and must be considered in the setting of a patient presenting with non-oliguric acute kidney injury and allergic-type symptoms such as a rash.

Whilst ANCA vasculitis, tuberculosis and sarcoidosis can all cause AIN, they are much less common causes of AIN and will often present with granulomata because they are granulomatous diseases.

Hantavirus, spread by rodents, is also a recognised cause of AIN, but is very rare compared to allergic causes of AIN such as lansoprazole. Hantavirus will often present with a systemic syndrome, either hantavirus pulmonary syndrome or haemorrhagic fever.

Further reading:

https://www.aafp.org/afp/2003/0615/p2527.html

Question:

A 53-year-old woman is brought to the emergency department by her son because of confusion, agitation and aggression. She cannot give an accurate history personally. The son explains she has a history of alcohol misuse but has never acted like this before.

On examination, she appears unkempt and agitated; her temperature is 37.2°C, pulse 79/min, blood pressure 132/93mmHg and SpO2 97% on room air. On neurological examination, she is oriented only to person; there is bilateral horizontal nystagmus, finger-nose incoordination and a broad-based gait.

What is the most appropriate initial management in this patient?

A. Parenteral thiamine

B. Oral thiamine

C. Intramuscular hydroxocobalamin

D. Oral glucose

E. Oral lorazepam

Correct Answer:Parenteral thiamine

Explanation:

The most likely diagnosis in this patient is Wernicke's encephalopathy - an acute but reversible condition caused by severe thiamine (vitamin B1) deficiency. Suggestive features in this patient include a history of alcohol misuse and the presentation of acute cognitive dysfunction, ataxia, impaired balance and nystagmus. NICE guidelines state that all patients with suspected Wernicke's encephalopathy should receive parenteral thiamine. Wernicke's encephalopathy is a neurological emergency, and treatment should be initiated as soon as possible to prevent progression to Korsakoff syndrome.

NICE guidelines suggest that oral thiamine should be considered in dependent drinkers who are malnourished, have decompensated liver disease or are in acute withdrawal. However, for patients with suspected Wernicke's encephalopathy, parenteral thiamine should be given first, for a minimum of five days or until Wernicke's encephalopathy has been excluded. Only after this time should oral preparations be started.

It is essential to consider hypoglycaemia as a potential cause of confusion in any patient. However, given this patient's history of chronic alcohol misuse, the primary concern is a vitamin deficiency, notably thiamine deficiency. In patients with thiamine deficiency, glucose administration alone worsens the deficit and should only be administered once parental thiamine has been initiated.

Intramuscular hydroxocobalamin is recommended in patients with suspected vitamin B12 deficiency. Whilst the difficulty walking and neurological symptoms could be secondary to B12 deficiency, the presence of nystagmus suggests Wernicke's encephalopathy as the more likely diagnosis. Therefore, vitamin B12 supplementation is not the most pressing issue in this patient.

NICE guidelines recommend oral lorazepam as first-line management in patients with suspected delirium tremens. This patient does not have any features to suggest they are experiencing complications of alcohol withdrawal, such as autonomic dysfunction; therefore, this would not be the most appropriate initial management.

Further reading:

https://www.nice.org.uk/guidance/cg100/chapter/Recommendations

Question:

A 22-year-old man presents to his GP as he has been feeling increasingly anxious over the past few weeks. He explains that he feels “exhausted all the time” because he is “constantly worrying about everything” and it takes him hours to fall asleep most nights. The GP makes the diagnosis of generalised anxiety disorder and a mutual decision to prescribe sertraline is made.

How soon after prescribing this SSRI should this man be seen again by his GP?

A. 48 hours

B. 2 weeks

C. 1 month

D. 6-10 months

E. 1 week

Correct Answer:1 week

Explanation:

Anxiety is associated with a risk of self-harming behaviour and suicide. SSRIs and SNRIs can increase this risk, especially in young people, within the first week of treatment. This is possibly due to the activation caused by the antidepressant as a result of increased serotonin levels. NICE and the MHRA recommend that persons under the age of 30 should be seen within 1 week of starting an SSRI or SNRI for anxiety, to safely assess for any adverse effects.

Further reading:

https://www.nice.org.uk/guidance/cg113

Question:

Debra Stones, a 38-year-old female, presents to her GP with dizziness. She says that she has been suffering from attacks where the room feels like it is spinning, her hearing is reduced and a ringing sound starts in her left ear. She also experiences sensations of fullness in her left ear. The patient reports having these attacks around once a week and they are lasting for around 90 minutes each time.

There is no obvious trigger for the attacks, they are not brought on by head movement and she has not had a recent illness. She has no family history of hearing loss at this age. Otoscopy reveals no abnormalities. Her corneal reflex is present.

Which of the following is the most likely diagnosis?

A. Ménière's disease

B. Acoustic neuroma

C. Benign paroxysmal positional vertigo

D. Otosclerosis

E. Vestibular neuronitis

Correct Answer:Ménière's disease

Explanation:

The correct answer is Ménière's disease, a condition of unknown cause characterised by excessive pressure and progressive dilation of the endolymphatic system of the inner ear. Patients suffer from attacks of vertigo, tinnitus, hearing loss and a sensation of fullness, originally affecting one ear but becoming bilateral over time. Symptoms usually resolve after 10 years, but permanent hearing loss is possible.

Referral to an ENT consultant is needed to confirm the diagnosis. To reduce the severity of symptoms during attacks, buccal or intramuscular prochlorperazine can be given. Betahistine can help reduce the frequency of future attacks.

Vestibular neuronitis would produce attacks of vertigo, but this condition is usually triggered by a viral illness and would not affect hearing. This condition should not be confused with labyrinthitis, in which a recent viral infection causes sudden hearing loss as well as nausea and vertigo.

Otosclerosis can cause tinnitus and conductive hearing loss in this age group, however, it is an autosomal dominant condition and Debra has no family history. It would present gradually, not intermittently.

Benign paroxysmal positional vertigo is caused by a small calcified otolith freely moving through the inner ear, causing a short attack of vertigo (less than a minute) when an individual moves their head. It can be diagnosed by the Dix-Hallpike manoeuvre and treated with the Epley manoeuvre.

Acoustic neuroma (vestibular schwannoma) is a noncancerous and usually slow-growing tumour that develops on the vestibular nerve and is an important diagnosis to consider. It could also present with unilateral hearing loss, tinnitus and vertigo, however, it would typically present gradually, not intermittently. If large enough, it could also cause headaches and visual problems. On examination, the corneal reflex may be reduced or absent even in the early stages. Audiometry and MRI are indicated if suspected.

Further reading:

https://patient.info/doctor/menieres-disease-pro

Question:

A 31-year-old woman presents to the emergency department with intermittent crampy abdominal pain and low volume non-mucoid diarrhoea associated with weight loss over several months. On examination, she has mouth ulcers, marked tenderness in her lower abdomen on palpation, and a perianal fistula is noted. Colonoscopy shows cobblestone ulceration with areas of elevated and inflamed mucosa.

What is the most likely diagnosis?

A. Ischaemic colitis

B. Ulcerative colitis

C. Shigellosis

D. Crohn's disease

E. Diverticulitis

Correct Answer:Crohn's disease

Explanation:

The most likely diagnosis in this scenario is Crohn’s disease. The history and examination findings (a young patient presenting with abdominal pain and diarrhoea with mouth ulcers and evidence of anal fistulas) are characteristic of Crohn’s disease, which affects any part of the gastrointestinal tract from mouth to anus, with the terminal ileum and colon most commonly affected. Initial primary investigations for this lady would typically include blood tests to screen for anaemia and nutritional status (due to increased risk of B12, folate or iron deficiency secondary to malabsorption), infection (a raised CRP/ESR correlates with disease activity and indicates inflammation and active infection), intestinal inflammation (a faecal calprotectin is >90% sensitive and specific for the diagnosis of IBD in adults), electrolyte disturbance and dehydration (urea and electrolyte monitoring), coeliac serology to exclude coeliac disease and a stool MCS to exclude infective gastritis or pseudomembranous colitis (including Clostridium difficile toxin). The diagnosis is confirmed with colonoscopy to identify mucosal inflammation, deep ulceration, skip lesions and cobblestoning of the bowel mucosa. Histological analysis of colonic biopsies typically shows transmural inflammation (inflammation occurring in all layers down to the serosa), granuloma formation and goblet cells.

In ulcerative colitis, inflammation is primarily limited to the submucosa and only involves the colon and (rarely) the rectum. It classically presents with bloody, mucoid diarrhoea.

Ischaemic colitis typically affects older patients with risk factors for cardiovascular disease and often involves water-shed areas of the bowel (e.g. near the splenic flexure). Patients may also be diagnosed with atrial fibrillation, which increases their risk of thromboembolic events.

Diverticulitis is an infective complication of diverticular disease and so typically causes severe lower abdominal pain, fever, malaise and occasional rectal bleeding and most commonly affects those aged 50 years old and above.

Shigellosis is a cause of infective colitis but often presents with acute bloody diarrhoea, which often resolves over 1-3 days rather than over many months but is important to exclude as part of a stool infection screen in any patient presenting with a history of diarrhoea.

Further reading:

https://cks.nice.org.uk/topics/crohns-disease/#!topicSummary

Question:

A lumbar puncture is performed on a patient with a headache.

The results are as follows:

Appearance: Slightly yellow tinge

White cell count: 15

Red cell count: 204 in bottle one, 228 in bottle three, 219 in bottle four

Protein: 0.55

Glucose: 3.12

Xanthochromia: Positive

Gram stain: Negative

Opening pressure: 16

What is the most likely diagnosis to explain these findings?

A. Normal lumbar puncture

B. Subarachnoid haemorrhage

C. Fungal meningitis

D. Viral meningitis

E. Bacterial meningitis

Correct Answer:Subarachnoid haemorrhage

Explanation:

These typical CSF findings are seen in subarachnoid haemorrhage. A raised red cell count in the CSF, which is either static or increasing from bottles 1 to 4, and a positive xanthochromia result suggests blood coming from the subarachnoid space rather than secondary to a 'traumatic tap'. Mildly raised white cell count and protein is also often seen.

Bacterial meningitis typically yields cloudy or turbid CSF which is rich in white cells, of which most are polymorphonuclear leucocytes. The protein level is often raised and the glucose level is low. In contrast, viral meningitis usually presents with clear CSF and a raised white cell count with lymphocytes predominating. Glucose is usually normal and protein is raised. Fungal meningitis CSF may give a similar analysis to bacterial meningitis - the gram stain is often a key discriminator as well as history, as fungal meningitis is more common in immunocompromised individuals. Given the multiple abnormalities present in the sample above, it is safe to say this is not a normal lumbar puncture result.

Any laboratory results must always be correlated with the clinical scenario. This is especially important if you are asked to 'chase' the results of an investigation carried out earlier such as CSF analysis - it is important to review the patient in the context of the results before jumping to conclusions.

Further reading:

https://patient.info/doctor/subarachnoid-haemorrhage-pro

Question:

A 50-year-old woman presents to A&E with a 24-hour history of worsening abdominal pain, distension, and vomiting. She has no notable past medical or surgical history. On examination, she has a distended abdomen and a tender inguinal hernia.

Your initial impression is of small bowel obstruction and you place a nasogastric tube for decompression. Your registrar requests a CT scan to investigate the cause of obstruction.

CT confirms a small bowel obstruction with an incarcerated tubular structure, which is thought to be the appendix, in an inguinal hernia sac.

What is the name of the hernia causing this obstruction?

A. Cooper’s hernia

B. Garengoff’s hernia

C. Amyand’s hernia

D. Littre’s hernia

E. Richter’s hernia

Correct Answer:Amyand’s hernia

Explanation:

Amyand’s hernia describes an inguinal hernia sac that contains the appendix. The CT results of this case are consistent with this diagnosis.

Garengoff’s hernia describes a femoral hernia sac that contains the appendix. The CT results of this case describe an inguinal hernia (excluding Garengoff’s and Cooper’s hernia) with an incarcerated appendix.

Littre’s hernia describes a hernia sac that contains Meckel’s diverticulum. On imaging, it is described as a blind-ending fluid-filled and/or gas-filled tubular structure in continuity with the distal ileum. The CT results of this case describe an inguinal hernia with an incarcerated appendix and no other tubular structure (excluding Littre’s hernia).

Richter’s hernia describes a hernia with only half of the intestinal wall is protruding into the hernia sac, most commonly seen in femoral and obturator hernias. Imaging often describes a focal protrusion of the antimesenteric wall of a bowel loop into the hernia sac. The CT results of this case describe an incarcerated appendix (excluding a Richter’s hernia).

Cooper’s hernia describes a femoral hernia with two sacs, the first sac is in the femoral canal, and the second sac passes through a defect in the superficial fascia and appears immediately beneath the skin. The CT results of this case describe an inguinal hernia (excluding Garengoff’s and Cooper’s hernia).

Other types of hernias

A pantaloon hernia describes a combination of a direct and an indirect inguinal hernia. It is called a pantaloon hernia because the inferior epigastric vessels divide the hernia sac and create a hernia that looks like a pair of pantaloons.

A spigelian hernia describes a hernia sac passing through the spigelian (a.k.a. semilunaris) fascia.

Further reading:

https://patient.info/doctor/abdominal-wall-hernias

Question:

Amy, a 28-year-old woman, presents to her GP surgery requesting contraception. She gave birth to her first child five months ago and is currently breastfeeding. She smokes 30 cigarettes a day and has a BMI of 45. Her past medical history includes recently diagnosed cervical dysplasia for which she is currently undergoing investigation.

She mentions that she would like to get pregnant again within the next year and that she doesn't want anything that will make her periods any heavier or more painful if that can be avoided.

What is the most suitable contraceptive option to prescribe?

A. Depot injection

B. Combined oral contraceptive pill (COCP)

C. Copper coil

D. Mirena intrauterine system (IUS)

E. Progesterone-only pill

Correct Answer:Progesterone-only pill

Explanation:

The most suitable contraceptive option available in this scenario is the progesterone-only pill (POP). The POP works via the inhibiting ovulation, thickening cervical mucus, and thinning the endometrium to prevent implantation of the blastocyst. If the POP is used correctly, it is 99% effective.

Advantages of the POP include:

It is a non-invasive method of contraception

It is effective (if taken correctly)

Periods typically become less painful and lighter

It is safe to use during breastfeeding

The COCP is contraindicated in patients with a BMI of greater than 35 and therefore it is not a suitable option in this scenario. NICE states that combined hormonal contraceptives (CHC) can be used whilst a woman is breastfeeding as long as she is more than 6 weeks postpartum.

The depot injection would not be appropriate in this scenario as the patient wants to get pregnant again soon. There can be up to a 1 year delay between stopping the depot injection and fertility being restored. In addition, the depot injection can cause significant weight gain, particularly in women who already have a high BMI.

The Mirena IUS would be contraindicated due to the patient's recent diagnosis of cervical dysplasia, in addition there is an increased risk of uterine perforation in women who are currently breastfeeding (2 in 1000 insertions).

The copper coil would not be an ideal choice as it is well recognised that patients may experience heavier and more painful periods after insertion of a copper coil.

Further reading:

https://geekymedics.com/progesterone-only-pill-pop-counselling-osce-guide/

Question:

An adolescent is diagnosed with juvenile myoclonic epilepsy by his neurologist. Treatment with sodium valproate is commenced.

Which adverse effect is most likely to be seen as a result of this medication?

A. Hepatotoxicity

B. Metallic taste

C. Drug-induced lupus

D. Hypernatremia

E. Gingival hyperplasia

Correct Answer:Hepatotoxicity

Explanation:

Sodium valproate is an anti-epileptic drug that is used for several seizure disorders. Common adverse effects include hepatotoxicity, gastrointestinal symptoms (nausea, vomiting), hair loss and tremor. Hepatotoxicity is particularly important as it typically occurs in the first 6 months of treatment, and is rarely associated with fulminant liver failure and death.

Common medications that cause hypernatremia include loop diuretics, corticosteroids and lithium.

Commonly used medications that cause gingival hyperplasia include cyclosporine, tacrolimus, phenytoin and dihydropyridine calcium channel blockers.

Drug-induced lupus classically presents with cutaneous and lung findings, with the central nervous system and kidneys rarely being affected. Medications such as procainamide, hydralazine, quinidine and isoniazid are the main culprits. Anti-histone antibodies are positive in approximately 95% of cases.

Commonly used medications that cause a metallic taste in the mouth include metformin and metronidazole.

Further reading:

https://bnf.nice.org.uk/drug/sodium-valproate.html

Question:

A 45-year-old woman presents to her GP with shortness of breath. Blood tests reveal she has a haemoglobin level of 45 g/L.

She is referred for admission for a blood transfusion with three units of blood. During the transfusion, the following observations were made:

Respiratory rate: 15/min

Blood pressure: 99/70 mmHg

Temperature: 38.2ºC

The patient complains of abdominal pain. Her chest is clear on auscultation.

What is the most likely diagnosis?

A. Acute haemolytic reaction

B. Transfusion-associated circulatory overload (TACO)

C. Minor allergic reaction

D. Non-haemolytic febrile reaction

E. Transfusion-related acute lung injury (TRALI)

Correct Answer:Acute haemolytic reaction

Explanation:

Acute haemolytic reaction: There are a variety of complications of blood transfusions; an acute haemolytic reaction is down to human error. This is because the incorrect ABO blood has been administered. This woman's immune system is attacking what it recognises as foreign cells, causing fever, abdominal pain, and hypotension. Management includes stopping the transfusion, giving fluids, checking the patient's details and those of the blood products used, then sending her blood for repeat cross-matching.

A non-haemolytic febrile reaction would present as fever and chills and does not account for the patient's hypotension and abdominal pain. This is a less serious complication that is thought to be caused by an immune reaction to the products of blood transfusion (for example, inflammatory cytokines can leak out during storage). Paracetamol would be the second step in the management after slowing the transfusion.

Minor allergic reaction presents with urticaria and pruritus and does not account for the patient's systemic features. It is managed by temporarily stopping the transfusion, giving antihistamines, and observation for any progression into more serious (anaphylactoid) reactions.

Transfusion-associated circulatory overload (TACO) is when the transfusion occurs too quickly for the patient's body to distribute the transfusion properly. This leads to pulmonary oedema and respiratory failure, which this patient is unlikely to have due to the normal respiratory rate and auscultation findings. Risk factors include pre-existing chronic anaemia with normo/hypervolaemia prior to infusion and heart failure.

Transfusion-related acute lung injury (TRALI) is a rare complication of a blood transfusion which occurs in the hours after a transfusion, already ruling it out. It occurs in those who are already fluid overloaded, usually on a background of heart failure, and presents similar to TACO.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK499824/

Question:

A 43-year-old woman presents to the walk-in eye clinic complaining of a 3 day history of decline in vision in her right eye. She reports that 'colours look funny' when she closes her left eye, and that moving her right eye causes her pain. She denies photophobia, itch or discharge from either eye. This is the first such episode that she has experienced, and has had no previous issues with her vision.

The patient's past medical history is unremarkable and she takes no regular medication. On examination, visual acuity (assessed via Snellen chart) in the left eye is 6/6, compared to the right which is 6/24. The swinging flashlight test reveals that when the torch is swung towards the right eye after being shone into the left eye, it dilates rather than constricting. Fundoscopy reveals a normal red reflex and no abnormalities of the retina are visualised.

The admitting doctor informs the patient that treatment for this condition will speed up the visual recovery but is unlikely to affect the final visual outcome, which is favourable. He warns her of a few side-effects of the treatment so that the patient is aware of these.

Given the likely diagnosis and treatment initiated, which of the following side effects would it be most appropriate to warn the patient about?

A. Weight loss

B. Agranulocytosis

C. Fluid retention

D. Hypoglycaemia

E. Increased risk of Clostridium difficile infection

Correct Answer:Fluid retention

Explanation:

The most likely diagnosis, in this case, is optic neuritis. Loss of colour vision, pain during eye movement, and a relative afferent pupillary defect (RAPD) on examination are all common features of the condition, that arises due to inflammation of the optic nerve. A relative afferent pupillary defect indicates the presence of asymmetrical retinal or optic nerve pathology, with optic neuritis, retinal detachment, anterior ischaemic optic neuropathy being common culprits.

Multiple sclerosis (MS) is the most common underlying cause identified in the setting of optic neuritis, with the patient fitting the usual demographic for this disease (women aged 15-45). The diagnosis may be confirmed via MRI of the brain and spinal cord as well as of the optic nerves to assess for the presence of demyelination.

Treatment of optic neuritis involves the provision of high-dose intravenous methylprednisolone; an extremely potent corticosteroid, with the aim of reducing inflammation and restoring visual acuity. Corticosteroids can have a number of side effects, and it is important that patients are made aware of these before starting treatment, particularly if they are to be continued long-term, or if the dose is particularly high, as in this case. Important adverse effects to consider include:

Reduced bone density and increased risk of fractures

Reduced immune response and increased infection risk

Hyperglycaemia

Weight gain and potential Cushing's syndrome

Skin thinning

Fluid retention and possible oedema (corticosteroids can exert an effect on the kidneys, encouraging increased reabsorption of sodium and free water)

Gastrointestinal inflammation/haemorrhage

Adrenal gland suppression (in the setting of long-term steroid treatment)

Whilst corticosteroids can suppress the immune system, they are not classically associated with an increased risk of Clostridium difficile infection. This usually develops in patients taking antibiotics such as clindamycin or ciprofloxacin that can negatively impact the normal gastrointestinal flora.

As corticosteroids can cause both weight gain and hyperglycaemia, it would not be correct to warn the patient about weight loss or hypoglycaemia.

A whole range of medications can carry a risk of agranulocytosis, however, methylprednisolone is not a drug with which this is commonly associated, unlike carbimazole or carbamazepine.

Further reading:

https://geekymedics.com/optic-neuritis/

Question:

A man brings his 5-year-old daughter to see her GP. She has an acute illness manifesting as mouth ulcers, fever, and vesicles on her palms and feet. The GP diagnoses this as hand, foot and mouth disease.

What is the most likely causative organism?

A. Cytomegalovirus

B. Human herpesvirus 6

C. Human immunodeficiency virus

D. Streptococcus pyogenes

E. Coxsackievirus A16

Correct Answer:Coxsackievirus A16

Explanation:

Coxsackievirus A16, along with enterovirus, can cause hand, foot and mouth disease. This is a self-limiting and common condition in paediatrics which is managed conservatively and does not require isolation from school. It commonly presents as described in the stem.

Cytomegalovirus is a common virus that tends to only cause disease in the immunocompromised. However, it can also cause congenital infections, which may have long-lasting effects such as slowed growth, the striking 'blueberry muffin' appearance, sensorineural deafness, encephalitis, and more.

Human herpesvirus 6, or HHV-6, causes roseola infantum, a common cause of rash most likely seen in under 2-year-olds. It is self-limiting, and its management is conservative.

Human immunodeficiency virus causes AIDS, which manifests in a variety of ways depending on concurrent infections, CD4 cell count, and subsequent disease progression. It could initially present as a fever, sore throat, and rash, but it does not cause hand, foot and mouth disease.

Streptococcus pyogenes is a common cause of upper respiratory airway infection, with this genus of bacteria being associated with post-streptococcal glomerulonephritis. It does not typically present with a rash.

Further reading:

https://www.ncbi.nlm.nih.gov/books/NBK431082/

Question:

You are a junior doctor working in the endocrinology department. Your supervising consultant is reviewing a patient who you have seen in the outpatient clinic with a suspected phaeochromocytoma.

What is the most appropriate test to arrange to investigate further?

A. Morning Cortisol level

B. Full blood count

C. Abdominal ultrasound

D. Insulin-like growth factor 1 (IGF-1) level

E. 24-hour urine collection for free metadrenaline and normetadrenaline

Correct Answer:24-hour urine collection for free metadrenaline and normetadrenaline

Explanation:

The first step in the investigation is to biochemically confirm the presence of a catecholamine-secreting tumour. The most appropriate test to arrange for this is 24-hour urine collection for free metadrenaline & normetadrenaline levels, coupled with plasma levels. Abdominal ultrasound is not recommended to locate the tumour as CT or MRI imaging is more effective.

A full blood count may demonstrate an elevated white cell count or haemoglobin but will not yield specific diagnostic information. A morning cortisol level will not be helpful here as it is primarily utilised for investigating steroid disorders. Insulin-like growth factor 1 (IGF-1) testing is recommended in the investigation of acromegaly.

Further reading:

https://patient.info/doctor/phaeochromocytoma-pro

Question:

A 23-year-old woman is undergoing laparoscopic appendicectomy for appendicitis. Other than abdominal pain and fevers she is stable. She has no significant past medical history. Following induction of general anaesthesia, she is administered a dose of co-amoxiclav. She subsequently develops profound hypotension and bilateral wheeze requiring boluses of IV adrenaline to maintain her blood pressure.

What is the most likely explanation for her hypotension?

A. Cardiogenic shock from acute myocardial infarction

B. Distributive shock from sepsis

C. Obstructive shock from tension pneumothorax

D. Distributive shock from anaphylaxis

E. Distributive shock from general anaesthesia

Correct Answer:Distributive shock from anaphylaxis

Explanation:

This lady has had an anaphylactic reaction to the antibiotics administered, with hypotension and bronchospasm. General anaesthesia does cause hypotension, although this on its own would not explain the need for a vasopressor as potent as adrenaline.

Septic patients have a more exaggerated cardiovascular response to general anaesthesia, however, the fact that she was stable pre-operatively rules out septic shock.

A tension pneumothorax could occur due to positive pressure ventilation, however she has a bilateral wheeze suggesting bilateral air entry.

A myocardial infarction would be very unlikely in somebody this age without significant risk factors.

Further reading:

https://lifeinthefastlane.com/ccc/shock-ddx/

Question:

An 8-year-old boy is brought to the emergency department by his mother after complaining of pain in his left hip over the last few hours; she is not sure of exactly how the injury happened, but the boy appears very unhappy and is hobbling. She wonders if he fell at school, as the hip joint now appears slightly red. The child is reported to have been otherwise well up until this point, with the exception of a recent bout of diarrhoea and vomiting which was attributed to a norovirus outbreak at school.

On examination, there is a small amount of erythema over the left hip joint, although there is a negligible temperature difference between the two sides. The patient is not keen to walk but can put weight on the affected leg. He has a temperature of 38.9 degrees, with his pulse elevated at 130 beats per minute. The doctor notes a number of partially healed cuts and grazes over the boy's arms and legs, he and his mother both inform you that these are from playing football, and the injuries are in keeping with this.

Investigations:

Erythrocyte sedimentation rate: 47 (3 – 9)

White blood cell count: 15.4 (3.6 – 11.0 x 109/L)

Which of the following criteria may be used to help to identify the most likely diagnosis in this case?

A. Amsel criteria

B. Centor criteria

C. Awaji criteria

D. Kocher criteria

E. Bell's criteria

Correct Answer:Kocher criteria

Explanation:

A hot, swollen joint is a commonly encountered clinical dilemma in a hospital setting. With the history provided in this scenario, a septic joint is an essential diagnosis to exclude, however, there is a significant overlap with the features experienced in transient synovitis; a self-limiting infection that often follows a viral infection. In scenarios such as this where there is diagnostic doubt, the Kocher criteria can be beneficial. This is a 4-point checklist, consisting of the following:

Non-weight-bearing on the affected side

Erythrocyte sedimentation rate > 40

Fever > 38.5 °C

White blood cell count > 12,000

The presence of 3 or more of these features corresponds to a 93% probability that septic arthritis is present. Whilst this boy is able to weight-bear, he meets the other 3 criteria, and it is therefore likely that his presentation is due to septic arthritis. Transient synovitis is still a possibility, but the approach to investigation and management should be of a septic presentation, with blood cultures, joint aspiration and IV antibiotics all important.

The breakdown of the white blood cell results would also have been useful in differentiating between the two most probable presentations, although they were not provided in this case. As transient synovitis is usually due to a viral infection, lymphocytosis would be expected, rather than the neutrophilia that is classically seen in septic arthritis.

The Centor criteria can be used in the setting of suspected pharyngitis to help to determine whether the disease is likely to be due to streptococcal infection, thus warranting the provision of antibiotics.

Bell's criteria may be used in the setting of necrotising enterocolitis to help to grade the severity of disease, and the Awaji criteria are a medical tool sometimes employed to assist in diagnosing amyotrophic lateral sclerosis (motor neuron disease).

The Amsel criteria are a checklist that may be used in patients presenting with symptoms in keeping with bacterial vaginosis to help to make the diagnosis.

Further reading:

https://www.orthobullets.com/pediatrics/4032/hip-septic-arthritis--pediatric

Question:

A 36-year-old man presents to his GP with local weakness in his right hand. He has no associated tingling or numbness.

On examination, he has 1/5 power when trying to make a pincer grip between the thumb and index finger of his right hand, with associated weakened pronation. He can adduct and abduct his thumb normally.

What nerve is most likely damaged?

A. Anterior interosseous nerve

B. Recurrent branch of the median nerve

C. Palmar cutaneous nerve

D. Deep branch of radial nerve

E. Superficial branch of the radial nerve

Correct Answer:Anterior interosseous nerve

Explanation:

The anterior interosseous nerve is a branch of the median nerve that passes between the head of pronator teres and therefore is prone to compression. It has purely motor function, which is why this man had no associated sensory loss. This nerve innervates the deep flexors of the forearm, which is why he has difficulty flexing his thumb and index finger together.

Anterior interosseous nerve compression syndrome may cause paralysis of the flexor digitorum profundus, flexor pollicis longus, and pronator quadratus with no associated sensory loss. This results in an inability to make the pincer grip between the thumb and index finger. Recovery usually occurs within 2-3 months, or else surgical exploration is indicated.

The deep branch of the radial nerve is responsible for most of the extensor innervation of the forearm and so would not affect this man's flexor power.

The palmar cutaneous nerve is a branch of the median nerve that innervates the lateral skin of the palm and does not provide motor function.

The recurrent branch of the median nerve is a branch of the median nerve that innervates the thenar muscles needed for abduction, adduction, and opposition. While one of these is flexor pollicis brevis, this man has conserved abduction and adduction, making compression to this nerve unlikely.

The superficial branch of the radial nerve is responsible for the sensory innervation of the dorsal hand and fingers rather than motor function.

Further reading:

https://www.physio-pedia.com/Posterior\_Interosseous\_Nerve\_Syndrome

Question:

James is a 2-week-old who is brought to the GP by his dad for a general check-up.

On initial inspection, James appears to be healthy and his parents have no concerns regarding his health.

When auscultating James’ chest you hear a murmur.

Which of the following collection of findings is unlikely to represent an innocent heart murmur?

A. Musical mid-systolic murmur on mid-left sternal border

B. Low pitched ejection-systolic murmur on supra-clavicular areas

C. Harsh continuous murmur on upper left sternal border

D. Grating mid-systolic murmur on upper left sternal border

E. Blowing continuous murmur on infra-clavicular areas

Correct Answer:Harsh continuous murmur on upper left sternal border

Explanation:

Heart murmurs are a common finding in children. Most are ‘innocent’ and do not indicate an underlying cardiac abnormality. These functional heart murmurs typically arise from normal patterns of blood flow through the heart and surrounding vessels.

A harsh continuous murmur heard over the upper left sternal border can indicate a patent ductus arteriosus. This means that the connection between the aorta and pulmonary artery remains open. It is physiologically innocent in newborns but pathological if it persists. It is typically described as a continuous machine-like sound heard best in the pulmonary area, radiating to the left clavicle.

A grating mid-systolic murmur can indicate a pulmonic outflow tract murmur. This is the turbulent flow of blood through a physiologically normal pulmonary valve. The intensity of the murmur increases in the supine position.

Still’s murmur is classically described as a ‘musical’ low-pitched vibratory murmur. Its cause isn’t completely understood, but it is thought to be due to vibrations through the pulmonary valve leaflets. It is best heard over the mid-left sternal border and the intensity typically increases when the patient is in the supine position.

A continuous blowing murmur describes a venous hum. These are due to turbulent blood flow in the veins returning to the heart. They can be heard below either clavicle. The intensity increases in diastole and decreases when the internal jugular vein is compressed.

Supraclavicular arterial bruits cause a low-pitched systolic murmur above the clavicles. They are due to turbulent blood flow through a large diameter aorta into a smaller carotid or brachiocephalic artery.

Further reading:

https://patient.info/doctor/heart-murmurs-in-children

Question:

You are an FY2 working in general practice. A 36-year-old lady comes in to see you as she has gained a lot of weight over the past 12 months despite not changing her diet or physical activity. On further questioning, she has gained 6 stone over the past 12 months and appears to eat normally. On examination, the patient is overweight and has increased fat particularly around the abdomen, face, and neck. Some purple striae are also noted across the abdomen. She has no past medical history and does not take any medication.

Which of the following is the test of choice in confirming the most likely diagnosis?

A. Adrenocorticotropic hormone (ACTH) levels

B. HbA1c

C. Full blood count

D. Overnight dexamethasone suppression test

E. Thyroid stimulating hormone levels

Correct Answer:Overnight dexamethasone suppression test

Explanation:

This lady is presenting with Cushing’s syndrome. The correct answer here is, therefore, an overnight dexamethasone suppression test although multiple tests may be used, including 24-hour free urinary cortisol. An overnight dexamethasone test involves giving a patient a low dose of dexamethasone, an exogenous steroid, at night and then measuring their serum cortisol levels the following morning. As part of the negative feedback loop at work in the hypothalamic-pituitary axis this should, therefore, suppress the amount of ACTH being produced and therefore reduce the amount of cortisol in the body. When this exogenous steroid fails to reduce the amount of cortisol in the blood the following morning then the patient likely has Cushing’s syndrome.

Although you may carry out most/all of the other tests as part of a workup for this patient the question asks which would be most likely in confirming the diagnosis.

TSH levels are looking for issues with the thyroid.

ACTH levels, although perhaps helpful down the line when looking at localising the source of the Cushing’s syndrome, would not confirm the diagnosis at this stage.

Full blood count would not confirm a diagnosis of Cushing’s syndrome.

HbA1c is used in the diagnosis of diabetes and, although important to consider in someone with Cushing’s disease, would not confirm its diagnosis.

Further reading:

https://patient.info/doctor/cushings-syndrome-pro#nav-4

Question:

A 40-year-old woman (G2P2) presents with a 6-month history of heavy menstrual bleeding. She describes having to change sanitary products every 2-hours. Her menstrual cycle is regular (29 days), and she does not currently use any long-acting contraception. There is no intermenstrual bleeding, post-coital bleeding nor significant dysmenorrhoea. There is no significant past medical history or drug history. She states she does not want to take tablets regularly.

General examination reveals no signs of anaemia. Speculum and bimanual examination are unremarkable.

Outpatient pelvic ultrasound and hysteroscopy reveals a 2.3 cm fibroid with an otherwise healthy uterus.

What is the most appropriate initial management step?

A. Hysterectomy

B. Levonorgestrel-releasing intrauterine system (LNG-IUS)

C. Copper intrauterine device (IUD)

D. Combined oral contraceptive pill (COCP)

E. Endometrial ablation

Correct Answer:Levonorgestrel-releasing intrauterine system (LNG-IUS)

Explanation:

NICE recommends LNG-IUS (often known as a "Mirena coil") as the first-line management of heavy menstrual bleeding (HMB). This includes HMB caused by small fibroids (3 cm), which do not distort the uterine cavity. See further reading link to NICE guidelines. Other treatment options for HMB include tranexamic acid, COCP and cyclical oral progestogens.

A copper IUD may worsen HMB and cause intermenstrual bleeding. Therefore, it is not appropriate for this patient.

A COCP is an appropriate option for managing HMB. However, it is not first-line (according to NICE) and would not be appropriate for this patient as she has stated that she does not want to take tablets regularly.

Endometrial ablation has a role in managing fibroids, but it is a procedure that carries more risk than inserting an LNG-IUS. Endometrial ablation is only recommended for those who no longer wish to conceive.

Hysterectomy is a significant operation. While it has a role in the management of fibroids, it is not first-line due to the risks involved.

Further reading:

https://cks.nice.org.uk/topics/menorrhagia/management/management/

Question:

A 53-year-old woman attends the multiple sclerosis clinic for regular follow-up. She was diagnosed with multiple sclerosis at the age of 24.

She is currently troubled by spasticity, tremor and fatigue. Her regular medications include baclofen and dimethyl fumarate.

In the past, she has required approximately one course of methylprednisolone per year to treat relapses. She states that for the past two years she has experienced a general worsening of her symptoms and mobility without any episodes requiring prednisolone. She has been unable to continue working due to this decline.

What is the most accurate description of her current disease course?

A. Primary progressive multiple sclerosis

B. Relapsing-remitting multiple sclerosis

C. Secondary progressive multiple sclerosis

D. Benign multiple sclerosis

E. Clinically isolated syndrome

Correct Answer:Secondary progressive multiple sclerosis

Explanation:

This lady describes a history of regular relapses but is now experiencing a progressive worsening of symptoms. Therefore the most appropriate description is secondary progressive multiple sclerosis (MS).

Secondary progressive multiple sclerosis describes an initial period of relapsing-remitting MS followed by a steady decline of symptoms over years. It is common for relapsing-remitting MS to evolve into secondary progressive MS after a period of decades.

Relapsing-remitting MS is the most common pattern of MS at diagnosis. It is characterised by episodes of symptoms which appear over days and recover over weeks. These relapses are treated with methylprednisolone. Between relapses, they may or may not fully recover to their previous functional level.

In primary-progressive MS there is a progressive worsening of the disease from diagnosis, without significant remission or relapse.

Benign MS is a term used to describe MS in which there are long periods of time (many years) separating relapses. It is a form of relapsing-remitting MS.

Clinically isolated syndrome is the term used to describe the first episode of signs/symptoms due to demyelination. However, because there has only been one episode the patient cannot yet be diagnosed with MS. Not all patients with a clinically isolate syndrome will go on to be diagnosed with MS.

Further reading:

https://geekymedics.com/multiple-sclerosis/

Question:

A 58-year-old man presents with shortness of breath and chest pain on exertion. His past medical history includes a myocardial infarction 3 years ago, asthma and type 1 diabetes. He is currently taking aspirin, ramipril, atorvastatin, a salbutamol inhaler, and insulin. On examination, he has pitting oedema up to his knees, a raised jugular venous pressure (JVP), and a slow-rising pulse. Auscultation of the chest reveals an ejection systolic murmur radiating to the carotids.

Blood results are below:

Test Result Reference Range

Haemoglobin 130 g/L 130 – 180 g/L

Na+ 135 mmol/L 133 – 146 mmol/L

K+ 5.7 mmol/L 3.5 – 5.3 mmol/L

Ca2+ (adjusted) 2.0 mmol/L 2.2 – 2.6 mmol/L

Creatinine 200 μmol/L 59 – 104 μmol/L

What is the most appropriate initial medical management?

A. Warfarin

B. Dapagliflozin

C. Carvedilol

D. Furosemide

E. Clopidogrel

Correct Answer:Furosemide

Explanation:

This patient has aortic stenosis (commonly associated with an ejection systolic murmur that radiates to the carotids) and is presenting with the known complication of heart failure (indicated via symptoms such as pitting oedema, exertional dyspnoea, and raised JVP). The definitive management for symptomatic aortic stenosis would be surgical intervention via aortic valve replacement, however, despite having no prognostic benefit, diuretics can be given in the meantime to manage the symptoms of heart failure. As such, the correct answer is furosemide.

Another type of medication which is often used to treat heart failure is beta-blockers, such as carvedilol, however, in this particular case, they are contraindicated due to the patient's asthma.

Sodium-glucose co-transporter 2 (SGLT2) inhibitors like dapagliflozin are a class of drugs that are used in the treatment of diabetes. More recently they have also been shown to have benefits in the treatment of heart failure, though their exact mechanism of action is unknown. In this particular case, however, they are inappropriate as they are contraindicated for use with insulin due to the risk of hypoglycaemia.

Warfarin has no role in the treatment of heart failure and, in addition, this patient would need to undergo a surgical procedure for aortic valve replacement, making warfarin inappropriate due to the risk of bleeding.

Clopidogrel is incorrect as the myocardial infarction (MI) occurred 3 years ago. NICE guidelines recommend dual antiplatelet therapy for 12 months post MI, with aspirin then continued indefinitely (unless contraindicated).

Further reading:

https://www.nice.org.uk/guidance/ng208/chapter/recommendations

Question:

A 60-year-old man undergoes an elective open mesh repair of a left inguinal hernia. The operation note states that he was found to have a “pantaloon” type hernia involving both direct and indirect components.

What is the anatomical course of an indirect inguinal hernia?

A. Exits medial to the deep ring and passes along the inguinal canal

B. Exits through the deep ring and passes along the inguinal canal

C. Exits through a defect in the inguinal ligament and passes along the inguinal canal

D. Exits indirectly, bypassing the inguinal canal

E. Exits lateral to the deep ring and passes along the inguinal canal

Correct Answer:Exits through the deep ring and passes along the inguinal canal

Explanation:

An indirect inguinal hernia exits the abdomen through the deep ring, passes along the length of the inguinal canal and emerges via the superficial ring, as shown below. The deep inguinal ring is located lateral to the inferior epigastric vessels.

A direct inguinal hernia follows a different trajectory. It is caused by a weakness in the posterior wall of the inguinal canal in an area known as Hesselbach’s triangle, which is located medial to the deep ring. Abdominal contents are forced “directly” through this defect into the inguinal canal. A direct hernia therefore exits the abdomen medial to the deep ring, passes along the inguinal canal and emerges via the superficial ring, as shown below. The fascial defect is located medial to the inferior epigastric vessels.

The remaining three options are not anatomically feasible.

By definition any hernia leaving the abdomen via the superficial ring must enter the inguinal canal first – it is not possible for an inguinal hernia to bypass the inguinal canal.

The area lateral to the deep ring is reinforced by the layered abdominal flat muscles and does not contain an anatomical defect or space for abdominal contents to herniate into.

The inguinal ligament is a thick band of connective tissue created by the rolled-up lower edge of the external oblique aponeurosis. It forms the floor of the inguinal canal and represents the anatomical boundary between the anterior abdominal wall and the thigh. It is much stronger than the rest of the soft tissue structures around the inguinal canal and virtually always remains intact.

Further reading:

https://geekymedics.com/hernias/

Question:

A 60-year-old man presents to his GP with a 2-month history of a painful leg when lying in bed at night. On examination, both feet are cool to touch, and the left foot is purple with a necrotic area at the tip of the second toe.

His past medical history includes poorly controlled type 2 diabetes and heart failure. He does not wish to undergo surgery.

What is the most appropriate definitive treatment for the most likely diagnosis?

A. Chemical sympathectomy

B. Amputation

C. Heparin infusion

D. Bypass surgery

E. Angioplasty

Correct Answer:Angioplasty

Explanation:

This patient has features of critical limb ischaemia – rest pain or tissue loss (either ulcers or gangrene) resulting from insufficient arterial supply. The definitive management for critical limb ischaemia is angioplasty or bypass surgery, depending on the patient’s comorbidities, pattern of disease, availability of a vein and patient preference. As this patient has significant comorbidities and does not wish to undergo surgery, the most appropriate definitive treatment is angioplasty.

Chemical sympathectomy uses chemicals to destroy the lumbar sympathetic chain. It can prevent amputation and is sometimes used in patients who are unsuitable for surgery. However, according to NICE guidelines, it should not be offered to people with critical limb ischaemic pain.

A heparin infusion is used in the treatment of acute limb ischaemia. It is not used to treat critical limb ischaemia.

Amputation should not be offered for critical limb ischaemia until all options for revascularisation have been considered by a vascular multi-disciplinary team.

Further reading:

https://www.nice.org.uk/guidance/cg147/chapter/recommendations#management-of-critical-limb-ischaemia

Question:

A 21-year-old female patient attends her GP after developing lower abdominal pain. She describes the pain as mild and comments that she has also noticed a new, mucopurulent vaginal discharge. The patient explains that her symptoms have developed gradually over the past month and that she also experiences deep dyspareunia. She has a regular 28-day menstrual cycle and denies any menorrhagia, intermenstrual bleeding, dysuria or changes in urinary frequency.

She is sexually active with multiple partners and uses only an intrauterine device (IUD) as contraception.

On bimanual vaginal examination, the GP notes the presence of cervical motion tenderness as well as uterine tenderness. A tympanic temperature recording gives a value of 38.2°C.

Which of the following is the most likely diagnosis?

A. Acute appendicitis

B. Uterine fibroids

C. Urinary tract infection (UTI)

D. Endometriosis

E. Pelvic inflammatory disease (PID)

Correct Answer:Pelvic inflammatory disease (PID)

Explanation:

Pelvic inflammatory disease (PID) describes a spectrum of inflammatory conditions that affect the upper genital tract. PID is characterised by symptoms such as lower abdominal pain, vaginal discharge and deep dyspareunia. Patients may be pyrexial, and the presence of uterine and cervical motion tenderness is highly suggestive of a diagnosis of PID. Sexual activity with multiple partners without barrier contraception is a strong risk factor for developing PID.

Uterine fibroids are benign tumours made up of smooth muscle and connective tissue. They are commonly asymptomatic but are also associated with menorrhagia, intermenstrual bleeding and abdominal bloating. Symptomatic uterine fibroids are very rare in a person under 25 years of age.

Acute appendicitis is an important differential in this case, as it can also present with abdominal pain and fever. However, the presence of cervical motion tenderness and uterine tenderness suggests a gynaecological cause of this patient’s symptoms. Also, the duration of her symptoms is not consistent with acute appendicitis, which usually develops over hours or days.

While a urinary tract infection (UTI) can cause abdominal pain and fever, a UTI is unlikely to be present in the absence of dysuria or changes in urinary frequency. UTIs only affect the urinary tract, and so would not account for the bimanual examination findings in this case.

Endometriosis refers to the presence of endometrial tissue outside of the uterine cavity. It is a common cause of pelvic pain and deep dyspareunia. However, endometriosis is not associated with a vaginal discharge and it would not account for the pyrexia in this patient.

Further reading:

https://patient.info/doctor/pelvic-inflammatory-disease-pro

Question:

Jack is a 57-year-old caucasian male who presents to the Acute Medical Unit with dyspnoea and a dry cough. Clinical examination reveals decreased vocal resonance and stony dullness on percussion over the left lung base. Chest expansion is also reduced on the left side. A chest x-ray reveals uniform opacity in the left lower lobe with an apparent fluid level. Vital signs reveal a respiratory rate of 23 and an SpO2 of 91% on room air.

Which of the following investigations would be most likely to assist in determining a definitive diagnosis?

A. High-resolution CT scan of the chest

B. Arterial blood gas (ABG)

C. Pleural aspiration

D. Spirometry

E. CT chest, abdomen and pelvis (CT CAP)

Correct Answer:Pleural aspiration

Explanation:

This clinical findings and chest x-ray results suggest the presence of a unilateral pleural effusion. Amongst other investigations, it is important to conduct a diagnostic pleural aspiration for pleural fluid analysis. The pleural fluid is sent for pH, protein, LDH, glucose, cytology and microbiology to help ascertain the cause of the pleural effusion.

An arterial blood gas may be conducted in this scenario, but is unlikely to indicate the cause of the pleural effusion.

CT CAP would be appropriate if considering malignancy, to look for evidence of a primary malignancy or to assess the extent of metastatic spread. This would likely be performed once malignancy was confirmed from a pleural aspiration.

A high-resolution CT scan of the chest may be conducted to assess the overall architecture of lung tissue within the thorax. This can be useful for assessing lung tumours and other lung pathologies, such as inflammation and fibrosis.

Lung function tests would be useful to perform if there was a suspicion of obstructive or restrictive lung disease (i.e. COPD vs pulmonary fibrosis). This investigation would not be performed at this stage however, as it would be unlikely to assist in making a diagnosis.

Further reading:

https://patient.info/doctor/pleural-effusion-pro#nav-3

Question:

A 24-year-old primigravida of twin pregnancy at 33 weeks gestation presents to the Maternity Assessment Unit with a two-day history of worsening itching of her palms and soles. The patient denies abdominal pain, history of gallstones or change in the colour of her stools/urine. There is no history of fever or vomiting.

On examination, there is no evidence of any rash and abdominal examination is unremarkable. Liver function tests reveal raised ALT, AST and bile salts. Serology for hepatitis B and C are negative.

What is the most likely diagnosis?

A. Obstetric cholestasis

B. Atopic eruption of pregnancy

C. Polymorphic eruption of pregnancy

D. Gastroenteritis

E. Acute cholecystitis

Correct Answer:Obstetric cholestasis

Explanation:

Obstetric cholestasis is a multifactorial condition affecting 0.7% of pregnancies. It is characterised by abnormal LFTs (typically AST & ALT) and intense pruritis that most commonly affects the palms of the hands and soles of the feet. The cause of the condition remains unclear.

Obstetric cholestasis is associated with an increased risk of intrauterine death and premature birth and therefore it is an important diagnosis to make. The condition also has a significant impact on the patient, with the symptoms making sleep and day to day life difficult.

Risk factors include obstetric cholestasis in previous pregnancies, multiple pregnancies and family history of the condition.

Atopic eruption of pregnancy (AEP) groups together a number of conditions with similar features. AEP is the most common of the pregnancy dermatoses, with women experiencing dry skin, rough erythematous patches and/or itchy bumps that can affect any part of the body. It does not cause harm to the baby.

Polymorphic eruption of pregnancy (PEP) is another relatively common pregnancy dermatosis that causes very itchy red bumps to appear over the abdomen. The condition develops late in pregnancy and usually resolves after birth. It does not cause harm to the baby.

Acute cholecystitis is unlikely in this scenario, given the absence of abdominal pain, fever or significantly raised ALP. Acute cholecystitis typically presents with right upper quadrant pain, fever and deranged LFTs (particularly ALP).

Gastroenteritis is again unlikely given the absence of abdominal pain or diarrhoea.

Further reading:

https://www.rcog.org.uk/globalassets/documents/guidelines/gtg\_43.pdf

Question:

A 67-year-old man presents to the emergency department with a 40-minute history of central chest pain. He describes the pain as a ‘heavy pressure’ on his chest, radiating to his left jaw. It started whilst sitting and watching TV at home. On further questioning, he has experienced two previous episodes like this over the last week whilst at rest; they each did not last longer than 15 minutes and he did not seek help.

Given the likely diagnosis, what is the most appropriate initial management option?

A. Aspirin 300mg

B. Apixaban

C. Oxygen 15L

D. Paracetamol 1g

E. Percutaneous coronary intervention

Correct Answer:Aspirin 300mg

Explanation:

This patient is experiencing a central, pressure-type chest pain at rest which radiates to the left jaw. This makes acute coronary syndrome (ACS) the likely diagnosis. The history of two similar sounding episodes over the last week increases the likelihood of ACS. Aspirin 300mg should be given as soon as possible in suspected ACS, unless contraindicated, i.e. allergy.

Analgesia is important in these patients as they are likely to experience significant pain. However, an opioid (e.g. IV morphine) would be more appropriate than paracetamol as they are fast-acting and provide greater pain relief.

Oxygen is only indicated in patients experiencing ACS, if they are hypoxic. Hyperoxygenation can lead to the production of oxygen free radicals and further myocardial damage. This patient's observations are stable.

Apixaban is a direct oral anticoagulant, which is not commonly used in the management of ACS. Other intravenous anticoagulants such as fondaparinux and unfractionated heparin are used in preference.

Patients with ACS may require urgent percutaneous coronary intervention or invasive angiography, however, this would not be carried out immediately. Medical management with antiplatelets, anticoagulation and analgesia would be carried out first.

Further reading:

https://patient.info/doctor/acute-coronary-syndrome-pro

Question:

A 57-year-old man is brought to the emergency department following an out-of-hospital cardiac arrest. His wife mentions that he complained of chest pain earlier in the day and had seemed breathless while sitting reading. He has a past medical history of hypertension and Factor V Leiden mutation. He has smoked 5-10 cigarettes per day for 40 years and drinks around 20 units of alcohol per week. His temperature is 37.2°C.

Based on the likely diagnosis, what is the most appropriate immediate management?

A. Warmed IV 0.9% sodium chloride

B. IV lidocaine

C. IV alteplase

D. IV calcium chloride

E. IM naloxone

Correct Answer:IV alteplase

Explanation:

The reversible causes of cardiac arrest can be divided into the '4 Hs' (hypoxia, hypokalaemia/hyperkalaemia, hypothermia/hyperthermia, hypovolaemia) and '4 Ts' (tension pneumothorax tamponade, thrombosis, toxins).

Based on this patient's medical history, smoking history and the reports of chest pain/ shortness of breath, the most likely cause of his cardiac arrest is a massive pulmonary embolism (i.e. 'thrombus' ). Based on this, a thrombolytic drug, such as IV alteplase, should be given as part of the advanced life support (ALS) algorithm. Extended (60-90 minutes) cardiopulmonary resuscitation (CPR) should also be performed if a thrombotic cause is suspected.

IV calcium chloride should be given to stabilise the cardiac membrane when hyperkalaemia has been confirmed as the cause of cardiac arrest. This is then followed by a rapid insulin dextrose infusion to shift the potassium intracellularly.

Warmed IV 0.9% sodium chloride can be given in hypothermia to prevent further heat loss. The priorities in hypothermia are steady rewarming and maintenance of physiological parameters. The preferred method of rewarming is with extracorporeal life support (ECMO), however, very few UK hospitals have this, so a combination of warm fluids, warm air warming devices and UV heat lamps are most commonly used instead.

IM naloxone would be given if an opiate overdose was suspected to be the cause of cardiac arrest (i.e. 'toxins').

IV lidocaine can be used instead of amiodarone in the ALS algorithm for patients with ventricular fibrillation or pulseless ventricular tachycardia after 3 shocks.

Further reading:

https://geekymedics.com/reversible-causes-of-cardiac-arrest/

Question:

A research article is published on a recent retrospective cohort study examining the effects of maternal alcohol consumption on the rate of attention deficit hyperactivity disorder (ADHD) in children. The study finds that maternal alcohol consumption is associated with ADHD and states a risk ratio of 1.8 (95% confidence interval 1.6 – 2.0).

What is the most accurate interpretation of this risk ratio?

A. Maternal alcohol consumption increases the risk of ADHD by 80%

B. Maternal alcohol consumption increases the risk of ADHD by 1.8%

C. Maternal alcohol consumption increases the risk of ADHD by a factor of 8

D. Maternal alcohol consumption increases the risk of ADHD by 180%

E. Maternal alcohol consumption does not have a statistically significant effect on the risk of ADHD

Correct Answer:Maternal alcohol consumption increases the risk of ADHD by 80%

Explanation:

The relative risk (or risk ratio) is the ratio of the risk of developing the condition in the exposed group compared to the risk of developing the condition in the unexposed group. For example, a risk ratio of 1.8 means the population is 80% more likely to develop the condition if exposed to the risk factor than if unexposed. Therefore, the correct interpretation of the risk ratio is that maternal alcohol consumption increases the risk of ADHD by 80%.

Further reading:

https://geekymedics.com/statistics-for-medical-students/

Question:

A 12-year-old boy presented to the GP with satellite lesions spreading to his chin and neck over the past three days. He also has multiple golden-crusted lesions around his mouth and on his cheeks. Before crusting, the lesions looked like thin-walled vesicles. He does not have a fever, however, the lesions are mildly itchy. His past medical history is positive for chickenpox at the age of 7.

What is the most likely causative organism?

A. Morbillivirus

B. Staphylococcus aureus

C. Auto-antibodies

D. Herpes simplex virus

E. Varicella-Zoster virus

Correct Answer:Staphylococcus aureus

Explanation:

Impetigo can start as tiny pustules or vesicles that rapidly become honey-coloured crusted plaques (or golden-coloured like in this stem). They are mostly present around the mouth and nose. Non-bullous impetigo is caused by Staphylococcus aureus, Streptococcus pyogenes or a combination of both.

Herpes simplex virus causes cold sores which present with similar symptoms. However, they are recurrent, have prodromal pain, and are more common in adults than in children.

Varicella-Zoster virus causes chickenpox. However, it is mentioned in the stem that the child already had chickenpox at the age of 7. Which makes him immune to the virus.

Morbillivirus causes measles. The measles rash is accompanied by high-grade fever and maculopapular rash with cough, coryza and flu-like symptoms, These features are absent in the given scenario.

Auto-antibodies are responsible for pemphigus vulgaris, which is an auto-immune disease in which painful erosions and blisters develop on the skin and mucous membranes.

Further reading:

https://cks.nice.org.uk/topics/impetigo/background-information/causes/

Question:

An 85-year-old woman presents to her GP complaining of shortness of breath on mild exertion. She explains that she previously only became breathless when climbing the stairs or walking long distances.

She has a past medical history of hypertension and lives alone. There is no family history of cardiac or respiratory disease.

On examination, there is an audible ejection systolic murmur (S2 is diminished and single). Examination is otherwise unremarkable and vital signs are normal.

An ECG shows signs suggestive of left ventricular hypertrophy and a transthoracic echocardiogram demonstrates an elevated aortic pressure gradient.

What is the most likely diagnosis?

A. Aortic regurgitation

B. Aortic sclerosis

C. Mitral regurgitation

D. Aortic stenosis

E. Mitral stenosis

Correct Answer:Aortic stenosis

Explanation:

The most likely diagnosis is aortic stenosis given the history of progressive exertional shortness of breath, ejection systolic murmur (soft s2 due to valve calcification), left ventricular hypertrophy (due to forceful contraction against a narrowed outlet) and an increased pressure gradient across the aortic valve on echocardiography.

Aortic sclerosis can also present with an ejection systolic murmur, however, S2 is typically normal (not soft) and split (not singular). In addition, the presence of an elevated pressure gradient across the aortic valve is not a typical finding in aortic sclerosis.

Aortic regurgitation typically features an early diastolic murmur.

Mitral stenosis typically features a mid-diastolic murmur.

Mitral regurgitation typically features a pan-systolic murmur

Further reading:

https://patient.info/doctor/aortic-stenosis-pro

Question:

A 70-year-old man attends his regular 6-monthly neurology appointment complaining that he can no longer keep his right leg still. He was diagnosed with Parkinson’s disease four years ago and was prescribed co-careldopa which has so far controlled his symptoms.

On examination, he has a subtle pill-rolling tremor in his right hand. His right leg is bobbing and swaying, and he is unable to control its movement.

Which is the most appropriate management plan?

A. Switch co-careldopa to selegiline

B. Switch co-careldopa to rasagiline

C. Add orphenadrine

D. Add entacapone

E. Deep brain stimulation

Correct Answer:Add entacapone

Explanation:

This patient has developed dyskinesia due to long-term use of levodopa. NICE suggest that, in this situation, an oral catechol-O-methyl transferase (COMT) inhibitor like entacapone is given in combination with levodopa and carbidopa.

Oral monoamine oxidase-B inhibitors like selegiline and rasagiline can be used as an alternative first-line medication but would not be used to treat the development of dyskinesia.

Anticholinergics like orphenadrine are used to treat drug-induced extrapyramidal symptoms, but not dyskinesia or motor fluctuations.

Deep brain stimulation is beneficial in patients with advanced Parkinson’s disease with motor complications, but it should not be used until optimal medical management has failed.

Further reading:

https://cks.nice.org.uk/topics/parkinsons-disease/management/confirmed-parkinsons-disease

Question:

A 59-year-old male presents to the emergency department with nausea and worsening vomiting. There has been no blood or bile in the vomit. He has had gradually worsening abdominal distension and not moved his bowels for the last 4 days, which is unusual for the patient as he usually moves his bowels twice per day.

His past medical history is significant for major depressive disorder and poorly controlled type two diabetes for which he takes escitalopram and metformin respectively. He has had multiple abdominal surgeries in the past.

The patient's observations are normal. Physical examination is significant for mild abdominal distention but there is no guarding or rigidity.

His clinical presentation is concerning for small bowel obstruction.

Which of the following medications is contraindicated in this patient?

A. Escitalopram

B. Ceftriaxone

C. Metoclopramide

D. Vancomycin

E. Metronidazole

Correct Answer:Metoclopramide

Explanation:

This patient has been diagnosed with small bowel obstruction and the question focuses on medications that should be avoided in this clinical setting. Metoclopramide is a dopamine antagonist used in the management of constipation and diabetic gastroparesis. However, it is contraindicated in patients with small bowel obstruction due to the risk of perforation, and those with Parkinson's disease due to the adverse effects of dopamine receptor blockade.

Escitalopram is a selective serotonin reuptake inhibitor (SSRI) used in the management of depression and anxiety disorders. SSRIs should be avoided in patients who are taking other medications which increase serotonin, such as monoamine oxidase inhibitors, as this can precipitate serotonin syndrome.

Metronidazole is an antibiotic often used for anaerobic pathogen coverage in cases of small bowels perforation. The above patient does not have signs of perforation.

Ceftriaxone is a third-generation cephalosporin that is not contraindicated in the setting of small bowel obstruction.

Vancomycin is useful in severe infections where methicillin-resistant Staphylococcus aureus (MRSA) is thought to be the cause but is not contraindicated in patients with small bowel obstruction.

Further reading:

https://bnf.nice.org.uk/drug/metoclopramide-hydrochloride.html

Question:

A 19-year-old male is admitted from the emergency department following an overdose. He has taken an unknown number of diazepam tablets and has drunk a bottle of wine. He has a background of generalised anxiety disorder. On examination, he is drowsy with a GCS of 12 (E3, V4, M5) but his observations are unremarkable and he has no focal neurological signs.

What is the next most appropriate step?

A. Observation only

B. Haemodialysis

C. Administer flumazenil

D. Administer naloxone

E. Administer N-acetylcysteine (Parvolex)

Correct Answer:Observation only

Explanation:

Benzodiazepine overdose is relatively common and typically presents with drowsiness and features similar to alcohol intoxication. Occasionally it can cause respiratory depression and coma, but this is rare and so the majority of patients are managed with observation alone.

Flumazenil is a benzodiazepine antagonist and can be used in the treatment of benzodiazepine overdose. However, it is not commonly used since there are several risks associated with this medication. Firstly, in benzodiazepine-dependent patients it can precipitate seizures and so should be avoided. It is also often avoided if there is a possibility of a mixed overdose since the benzodiazepine may actually be inhibiting some of the harmful effects of the other drugs that have been taken and flumazenil can reverse this protective effect, precipitating features such as seizures and cardiac arrhythmias from the other drugs.

Since this patient is clinically stable and there is a possibility that they have benzodiazepine dependence from their psychiatric history, flumazenil would not be appropriate and observation alone is the most appropriate step.

Naloxone is an opioid antagonist and should be used in opioid overdose, which is there is no suggestion of here.

N-acetylcysteine is used to treat paracetamol overdose, which would not be appropriate at this stage since there is no evidence of this from the history or examination. However, measuring paracetamol levels should certainly be considered in cases such as this where the history is unclear.

Benzodiazepine overdose is not treated with haemodialysis.

Further reading:

https://patient.info/doctor/acute-poisoning-general-measures

Question:

A 30-year-old women has been admitted to the acute medical ward with a pulmonary embolus. She works in a factory and spends most of her time walking around the factory floor, there was no recent history of immobility of long-haul flights. She is a non-smoker and drinks only occasionally. Her past medical history includes exercise-induced asthma, a previous deep vein thrombosis a year ago and two recent miscarriages in early pregnancy. Her current medications include salbutamol (as required\_ and over the counter paracetamol for intermittent headaches. Blood tests have been ordered but are yet to be reported.

Given the history, which of the following investigation abnormalities would you expect?

A. Thrombocytosis

B. APTT decreased

C. Negative D-dimer

D. Negative lupus-anticoagulant

E. APTT raised

Correct Answer:APTT raised

Explanation:

This patient most likely has a diagnosis of anti-phospholipid syndrome, given the history of a young female with multiple thrombotic events (with no clear risk factors) and multiple miscarriages.

Anti-phospholipid syndrome (APS) is an autoimmune disorder characterised by arterial/venous thrombosis and adverse pregnancy outcomes (i.e. miscarriage). Patients have raised levels of antiphospholipid antibodies on testing.

The characteristics of APS can be remembered with the mnemonic CLOTS:

Coagulopathy - recurrent venous thromboembolism, stroke or renal thrombosis with a paradoxical rise in APTT (thought to be due to an ex-vivo reaction of lupus anti-coagulant with the coagulation cascade)

Livedo reticularis

Obstetric loss (recurrent miscarriage)

Thrombocytopenia

Systemic lupus erythematosus (30% of those with APS have SLE)

Diagnosis of APS involves identifying the previously mentioned clinical features in addition to lupus anticoagulant, anti-cardiolipin and anti-b2 glycoprotein being positive at two separate occasions at least 12 weeks apart.

Further reading:

https://patient.info/doctor/antiphospholipid-syndrome-pro

Question:

A 28-year-old woman presents to the assessment unit with abdominal pain and vaginal bleeding. She is currently 22 weeks pregnant. She has no other children and has never been pregnant before. On examination, there is tenderness to the lower abdomen, and the cervical os is open with blood visualized.

What type of miscarriage is the patient most likely to have presented with?

A. Complete

B. Threatened

C. Missed

D. Incomplete

E. Inevitable

Correct Answer:Inevitable

Explanation:

This patient has presented with abdominal pain, vaginal bleeding and the cervical os is found to be open on examination – these are the key features of an inevitable miscarriage.

During a threatened miscarriage the cervical os is closed, therefore this diagnosis is less likely as this patient’s cervical os was found to be open.

The products of conception have not yet passed therefore it is not yet an incomplete miscarriage either.

In a complete miscarriage, you would expect the products of conception to have passed and the cervical os to be closed, therefore this is not likely to be a complete miscarriage as the cervical os is open.

Finally, a missed miscarriage relates to nonviable intrauterine pregnancy that has remained in the uterus without vaginal bleeding and without the passing of products, therefore the patient is unlikely to have had a missed miscarriage.

Further reading:

https://patient.info/doctor/miscarriage-pro

Question:

A concerned mother presents to the accident and Emergency Department with her 3-year-old daughter. Since this morning, the child has complained of a sore throat, with progressively worsening pain on swallowing, and of feeling hot; she has not had a cough. On examination, she is found to be sitting forwards, resting her hands on her knees. She is febrile and tachycardic, drooling, and speaking in a quiet voice in response to questions.

What is the most likely diagnosis?

A. Croup

B. Tonsillitis

C. Epiglottitis

D. Pharyngitis

E. Inhaled foreign body

Correct Answer:Epiglottitis

Explanation:

This child is suffering from epiglottitis. This refers to inflammation of the epiglottis, usually as the result of infection, or non-infective causes such as thermal injury or ingestion of toxins. Historically, the most common cause was infection with Haemophilus Influenzae B, the incidence of which has dropped dramatically since the introduction of the HiB vaccine to the childhood vaccination program. Children will often appear extremely unwell, with dysphagia, drooling, and fever. The child, in this case, is sitting in the ‘tripod’ position; a response often seen in an attempt to open the airways by bringing the epiglottis forwards. It is important to secure the airway in any child with suspected epiglottitis, and not perform any examination (such as with a tongue depressor) or procedure (such as taking blood) which may upset the child and risk worsening airway compromise.

Croup, or laryngotracheobronchitis, describes inflammation of the airways most commonly as the result of a viral infection such as parainfluenza, leading to upper airway obstruction. Croup may present in a similar way to epiglottitis, with fever (typically lower than that of epiglottitis) and stridor, but it typically runs a slower course and does not commonly feature drooling. In addition, unlike epiglottitis, croup is characterised by an acute onset ‘barking’ cough, and children may appear well, unlike the ‘toxic’ appearance seen in epiglottitis.

While tonsillitis may present with fever and pain on swallowing, it is usually less severe than that of epiglottitis. Often, there will be purulent exudate on the tonsils (especially in cases of Streptococcal tonsillitis), or erythema of the tonsils. The most common age range affected by tonsillitis is 5-15 (i.e. school age).

There are many causes of acute pharyngitis, including viruses such as Epstein-Barr, and bacteria such as group A Streptococcus. The acuity of this patient’s symptoms, drooling, and respiratory distress, make epiglottitis the most likely diagnosis.

Foreign body aspiration may present similarly to epiglottitis, but the absence of cough, and symptom progression without rapid loss of consciousness, make epiglottitis the most likely diagnosis.

Further reading:

https://bestpractice.bmj.com/topics/en-gb/452

Question:

A 44-year-old woman presents to the GP complaining of an uncomfortable sensation in her left thigh; she reports that this came on approximately 2 days ago, and has worsened since then. She describes a low-level pain that is more of an 'annoyance' than anything else and reports that the outside of her left thigh now has a constant, burning sensation.

The patient has little past medical history of note, although she admits to having put on a significant amount of weight over the recent COVID-19 lockdowns. She describes a previous episode of eye pain that came on during the cinema, and that was treated surgically in hospital. She takes no regular medication, however, and describes herself as fit and well.

A full neurological examination reveals normal tone, power and reflexes, with a well-demarcated area of reduced sensation over the lateral aspect of the left lower limb. No other abnormalities were detected. The GP suspects peripheral nerve compression, but is concerned about the potential for lumbar radiculopathy, and refers the patient to hospital for nerve conduction studies and spinal imaging. These investigations rule out spinal involvement, instead indicating that a peripheral nerve problem is likely to be the cause.

Which of the following nerves is most likely to be implicated in the patient's symptoms?

A. Lateral cutaneous nerve of the thigh

B. Sciatic nerve

C. Obturator nerve

D. Femoral nerve

E. Sural nerve

Correct Answer:Lateral cutaneous nerve of the thigh

Explanation:

The most likely diagnosis, in this case, is meralgia paraesthetica; a condition that classically arises due to compression of the lateral cutaneous nerve of the thigh. The reason for this is often not detected, although it is more common in those with recent weight gain, as this can make clothing tighten on the area through which the nerve runs. Occupations that involve wearing tight belts or harnesses can also carry greater risk. The usual presentation is of burning, tingling, numbness or pain, affecting the outer side of the thigh; this may radiate to the groin in some cases. The exact presentation can vary between individuals, with some complaining of itch and discomfort rather than acute pain. The condition is frequently self-limiting, with modification of clothing often recommended; analgesia may be given to relieve the pain.

L2 radiculopathy is another important differential; as this can present with very similar symptoms, due to the areas supplied by the L2 nerve root. Imaging and nerve conduction studies are often required if there is diagnostic doubt, as clinical examination can be inconclusive.

The obturator nerve emerges from the obturator hiatus and supplies sensory and motor innervation to the medial aspect of the thigh. It does not supply the lateral portion and is unlikely to be affected in this case.

The femoral nerve provides sensory innervation to the front of the thigh but does not supply the lateral portion. The nerve also has significant motor functions; if this was the nerve affected, the symptoms would be expected to be more extensive.

The sural nerve supplies sensory innervation to the calf region; it does not have any impact on the sensation within the anterior aspect of the leg.

The sciatic nerve runs posteriorly, and does not supply the structures on the anterior aspect of the leg; it is, therefore, unlikely to account for the patient's symptoms.

Further reading:

https://patient.info/brain-nerves/meralgia-paraesthetica-leaflet

Question:

A 35-year-old woman is referred to the general surgery clinic. She noticed a bulge on her abdominal wall during a recent pregnancy which has persisted since she gave birth. It tends to be more prominent when she is up and about but is otherwise asymptomatic. She is obese and has had a previous laparoscopic cholecystectomy.

On examination, she has port site incision scars and a soft reducible swelling immediately above the umbilicus.

What is the most likely diagnosis?

A. Divarication of the recti

B. Spigelian hernia

C. Paraumbilical hernia

D. Epigastric hernia

E. Incisional hernia

Correct Answer:Incisional hernia

Explanation:

The most likely diagnosis, in this case, is an incisional hernia at a supraumbilical port site. Incisional hernias are ventral hernias which pass through the site of a previous surgical incision. They occur because the fascial closure of the abdominal wall failed to heal properly. Risk factors include suboptimal surgical technique, certain comorbidities, emergency procedures and post-operative wound infections. Obesity is another important risk factor for all types of ventral hernia as it causes raised intra-abdominal pressure and weakens the fascial layers of the abdominal wall. This patient has had a laparoscopic cholecystectomy, which usually involves four port site incisions, including one just above or below the umbilicus. A supraumbilical port is often preferred in obese patients with large abdomens. Port site hernias should be repaired, as they have tiny fascial defects and are at high risk of obstruction or strangulation.

Paraumbilical hernias are the most common type of ventral hernia. They pass through a fascial defect in the linea alba within 3cm of the umbilical ring. The majority are small and asymptomatic and can safely be managed conservatively. Paraumbilical hernias are more common in women, especially during or after pregnancy.

Epigastric hernias are a less common type of ventral hernia. They pass through the linea alba in the upper midline above the umbilical territory. They are often asymptomatic and have a low risk of obstruction or strangulation as they usually only contain extraperitoneal fat. Epigastric hernias are more likely to occur in men.

Spigelian hernias are a rare type of lateral ventral hernia. They pass through the Spigelian fascia lateral to the rectus sheath. They are usually very small and present with localised pain or a lump immediately lateral to the rectus abdominis muscle.

Divarication of the recti, also known as rectus diastasis, is an important differential diagnosis for a primary midline abdominal wall swelling. It occurs when the rectus abdominis muscles separate, stretching the linea alba to a width of more than 2cm. This causes a prominent midline bulge which can look quite striking on clinical examination. However, it is not a hernia as there is no underlying fascial defect. It is usually treated with physiotherapy and exercise programmes and rarely requires surgery.

Further reading:

https://geekymedics.com/hernias/

Question:

A 43-year-old man presents to the emergency department after vomiting a cup full of fresh red blood. He is a current smoker (15/day), and drinks 20 units of alcohol a day. On examination, he is pale, peripherally cool, and his vital signs reveal a pulse of 120bpm and a BP 90/40 mmHg.

What is the most important initial management option?

A. Fluid resuscitation

B. Urgent endoscopy

C. Blood transfusion

D. Terlipressin

E. Intravenous proton-pump inhibitor

Correct Answer:Fluid resuscitation

Explanation:

The most appropriate initial management of this patient is to establish IV access and administer intravenous fluids to resuscitate and stabilise him. The patient has a history suggestive of upper gastrointestinal haemorrhage (either from an ulcer or varices), however, this can only be confirmed with endoscopy. At the same time, it is important to take routine blood tests and crossmatch blood products which are likely to be needed in a massive bleed (alongside IV fluid resuscitation).

He will likely need urgent endoscopy to stop the bleeding, however, this is safer if the patient is more haemodynamically stable following resuscitation with fluids and takes time to organise with the endoscopist and theatre staff.

IV proton-pump inhibitors are unlikely to have much benefit in this situation, and NICE guidelines recommend PPI therapy after endoscopy confirms non-variceal bleeding or stigmata of recent haemorrhage.

Terlipressin should be offered for variceal bleeds after resuscitation has commenced.

Further reading:

https://www.nice.org.uk/guidance/CG141/chapter/1-Guidance#ftn.footnote\_1

Question:

A mother attends the GP with her 14-month-old girl who has been unsettled with fever (which has gone up to 39.5ºC) for the last 48 hours. The girl has had no significant past medical history and has no known allergies. All of her immunisations are up to date.

Vital signs are as follows:

Temperature is 39.9ºC

Pulse is 124 beats/min

Blood pressure is 90/53 mmHg

Respirations are 20 breaths/min

On examination, she is unsettled but consolable. Otoscopy reveals inflamed, bulging, immobile tympanic membranes bilaterally. The rest of the examination is unremarkable.

Which of the following is the most appropriate management choice for this child?

A. Oral azithromycin

B. Intramuscular ceftriaxone

C. High-dose oral amoxicillin

D. Reassurance

E. High-dose oral co-amoxiclav

Correct Answer:High-dose oral amoxicillin

Explanation:

The child’s history of a two-day fever and clinical findings are indicative of severe bilateral acute otitis media (AOM).

Antibiotic therapy is usually indicated for children of any age with severe AOM, defined by moderate or severe otalgia or otalgia for ≥48 hours or temperature ≥39°C.

Antibiotic therapy is also indicated for children <24 months of age with non-severe bilateral AOM, defined by mild otalgia for <48 hours and temperature <39°C.

High-dose amoxicillin is the first-line therapy for AOM for patients as in the case above, who:

Have not received amoxicillin in the past thirty days

Do not have purulent conjunctivitis

Are not allergic to penicillin

High-dose amoxicillin-clavulanate (co-amoxiclav) is the first-line therapy for AOM for children who:

Have received amoxicillin in the last 30 days.

Have AOM accompanied by purulent conjunctivitis (most often caused by H. influenzae, which is less often susceptible to amoxicillin than S. pneumoniae).

Have a history of recurrent AOM unresponsive to amoxicillin.

Amoxicillin-clavulanate offers more effective coverage for beta-lactam resistant organisms, such as Moraxella catarrhalis and beta-lactamase-producing H. influenzae.

Resistance to macrolides, such as azithromycin, is common in S. pneumoniae, and these antibiotics are generally not effective against H. influenzae. Therefore azithromycin is not a first-line therapy for AOM.

Reassurance is not appropriate management for this child because of her age and findings consistent with bilateral AOM.

IM ceftriaxone is an alternative therapy for AOM for children who

have a penicillin allergy AND do not have a history of a recent or severe reaction

have persistent vomiting or cannot tolerate oral medication for another reason

Further reading:

https://patient.info/doctor/otitis-externa-and-painful-discharging-ears

Question:

A 56-year-old female attends the emergency department complaining of a severe headache. She explains that it came on within one minute, and describes the pain as the worst she has ever experienced. The patient also comments that they have vomited once and that they find the bright lights of the emergency department increasingly intolerable. She denies any recent trauma.

Her past medical history is significant for hypertension, and she has a 20-pack-year smoking history.

Cranial nerve examination is normal. Kernig's sign is positive, and her vital signs are within normal limits.

Which of the following is the most likely diagnosis?

A. Extradural haemorrhage

B. Migraine

C. Subarachnoid haemorrhage

D. Total anterior circulation stroke

E. Bacterial meningitis

Correct Answer:Subarachnoid haemorrhage

Explanation:

The presence of a rapid-onset, severe headache accompanied by photophobia and meningism is highly suggestive of a subarachnoid haemorrhage. This term describes bleeding between the arachnoid and pia mater meningeal layers, which is most commonly caused by a rupture of a berry aneurysm. In this case, Kernig’s sign indicates the presence of meningism. Risk factors for a subarachnoid haemorrhage include older age, hypertension and smoking.

Bacterial meningitis is an important differential in this case, as it can also present with a severe headache, neck stiffness and photophobia. However, symptoms of bacterial meningitis usually develop over hours rather than minutes, and a fever is usually present as well.

While a migraine is associated with a headache, photophobia and nausea, the extreme severity of this patient’s symptoms suggests an alternative diagnosis. Also, a migraine is not associated with meningism.

A normal cranial nerve examination rules out a total anterior circulation stroke, which presents with hemiplegia, homonymous hemianopia and higher cerebral dysfunction. Symptoms such as pain and photophobia are not features of a stroke and suggest a different diagnosis.

An extradural haemorrhage describes bleeding between the dura mater and the inner surface of the skull, most commonly due to bleeding of the middle meningeal artery. There is often a history of trauma, after which a lucid interval may occur. Patients may then present with an altered mental status and progressively worsening focal neurological deficits.

Further reading:

https://geekymedics.com/subarachnoid-haemorrhage-an-overview/

Question:

A scientist develops a new stool test for the detection of bowel cancer. He wishes to determine the specificity of the test. 300 patients with suspected bowel cancer are tested first with the new stool test, then receive a colonoscopy to provide a definitive diagnosis. The results are shown below.

Colonoscopy positive Colonoscopy negative

New stool test positive 40 20

New stool test negative 160 80

What is the specificity of the new breath test?

A. 80%

B. 95%

C. 50%

D. 90%

E. 75%

Correct Answer:80%

Explanation:

The correct answer is 80%.

The specificity of a test is the proportion of individuals without the condition who will test negative, for example, a 80% specificity means that 80% of individuals without the condition will test negative.

Therefore, to calculate the specificity, you need to divide the number of individuals without the condition who test negative (80) by the total number of individuals without the condition (20 + 80 = 100). Finally, multiply by 100 to convert this decimal into a percentage.

This is summarised by the formula and table below:

Sensitivity = [d/(b+d)] x 100

Have the condition (according to the gold standard investigation) Do not have the condition (according to the gold standard investigation)

Test positive a b

Test negative c d

Further reading:

https://geekymedics.com/sensitivity-specificity-ppv-and-npv/#:~:text=Sensitivity%20is%20the%20percentage%20of,target%20disease%20will%20test%20negative

Question:

A 2-year-old boy is brought to the GP by his mother after complaining of ear pain for the last 2 days. She explains that he has been repeatedly rubbing his ear and has been generally irritable. A few hours ago, the boy complained of an episode of severe pain, and his mother has since noticed some green discharge from the affected ear, which prompted her to bring her child to see a doctor. A COVID-19 swab taken on admission to the surgery is negative.

Otoscopy carried out by the GP reveals that the tympanic membrane is red and inflamed; the cone of light is absent. A small, well-defined perforation is visible in the superior aspect, through which the ossicles bones can be viewed. The external auditory meatus appears unobstructed, with no signs of erythema.

Which of the following is the most likely diagnosis?

A. Wax impaction

B. Acute otitis media

C. Gradenigo syndrome

D. Otitis externa

E. Cholesteatoma

Correct Answer:Acute otitis media

Explanation:

The most likely diagnosis in this scenario is acute otitis media, a condition that classically affects younger children and those with underlying risk factors such as craniofacial abnormalities, exposure to cigarette smoke, and allergies. The classic presentation in young children such as that described in this scenario is often non-specific; children may tug at the affected ear, may have a fever, cry, or sleep poorly.

On otoscopy, an erythematous or yellow bulging tympanic membrane is usually visualised; more severe forms of the disease can increase the pressure in the middle ear to an extent that causes tympanic membrane rupture, allowing for the discharge of inflammatory contents out of the external auditory meatus. An effusion may be present (which can persist to cause so-called 'glue ear') as an air-fluid level behind the membrane.

Otitis externa can present similarly to otitis media, with ear pain, discomfort and itch often being described. However, this arises due to inflammation confined to the external auditory meatus itself; otoscopy carried out for this patient revealed no signs of erythema or involvement of the ear canal. Otitis media can result in tympanic membrane perforation, but this is far less common than in otitis media and therefore it is less likely to be the diagnosis in this case.

Cholesteatoma is another differential for otorrhoea, a key presenting complaint of this patient. It arises due to the accumulation of squamous cells within the middle ear, usually secondary to a chronic tympanic membrane perforation in the attic region. The usual presentation is of prolonged, malodorous discharge from the affected ear, usually over a number of days and weeks. Given the acute nature of the presentation, it is unlikely to be the cause of symptoms in this patient.

Gradenigo syndrome is a very rare pathology that can arise due to infection within the petrous portion of the temporal bone. Whilst this can arise from acute otitis media, for its diagnosis, patients must also demonstrate facial pain and abducens nerve palsy, which occur due to the spread of infection. There is no suggestion of such features in this particular history.

Wax impaction is a very common problem encountered in primary care; usually affecting older patients, and gives hearing loss rather than otalgia. Otoscopy would be challenging due to the wax obstructing the view of the scope.

Further reading:

https://cks.nice.org.uk/topics/otitis-media-acute/diagnosis/diagnosis/

Question:

A 2-month-old infant presents with decreased conscious level, a bulging fontanelle and vomiting. Cranial imaging reveals enlargement of the lateral and third ventricles and evidence of obstructive hydrocephalus.

Which of the following is enables CSF flow between the third and fourth ventricle?

A. Aqueduct of Sylvius

B. Choroid plexus

C. Foramen of Magendie

D. Foramen of Luschka

E. Foramen of Monro

Correct Answer:Aqueduct of Sylvius

Explanation:

The ventricular system is a collection of cerebrospinal fluid (CSF) filled cavities within the brain. CSF itself is produced by the choroid plexus, which produces around 450ml of CSF per day. The ventricular system consists of the two lateral ventricles, the third ventricle and the fourth ventricle. The lateral ventricles are C-shaped cavities which span the frontal, parietal and temporal lobe, with an additional posterior projection to the occipital lobe.

Two foramen (the foramen of Monro) connect each lateral ventricle to the underlying third ventricle. The third ventricle itself sits between the thalamus and hypothalamus. From the third ventricle, CSF travels along the Aqueduct of Sylvius (cerebral aqueduct) into the fourth ventricle, located within the posterior fossa. CSF is then able to exit the ventricular system into the subarachnoid space via the lateral foramen of Luschka or midline foramen of Magendie.

Further reading:

https://radiopaedia.org/articles/cerebral-aqueduct-of-sylvius

Question:

A 5-year-old girl is seen in the allergy clinic after repeated episodes of urticaria, lip swelling, and respiratory distress occurring at mealtimes. This has happened twice in the past three months, with the latest episode occurring one month ago. Both episodes required intramuscular adrenaline injections and observation in the emergency department. Mum is exasperated as she hasn't been able to identify the culprit ingredients.

Today, the patient is well and playing with toys in the consultation room. She has no significant past medical history and takes no regular medication. There is a family history of atopic diseases, including asthma, eczema, and hay fever.

What is the most appropriate investigation for this patient?

A. Skin prick test

B. Food challenge test

C. Patch testing

D. Blood test for IgM antibodies

E. Blood test for IgG antibodies

Correct Answer:Skin prick test

Explanation:

This patient is likely to have an IgE-mediated food allergy. This is a type 1 hypersensitivity reaction which results in mast cell degranulation and widespread histamine release causing an urticarial rash, angioedema and potentially respiratory distress which is a medical emergency. In the allergy clinic, a skin prick test will be performed to identify common foodstuffs which may be responsible for symptoms. This may be combined with a blood test to detect raised IgE antibodies. If these tests are negative or inconclusive, a food elimination regime may be attempted to identify the culprit allergen.

In the acute emergency phase, sequential mast cell tryptase testing may be done, but is not necessary for recurrent episodes of anaphylaxis when diagnosis of anaphylaxis is definite.

Patch testing is the investigation of choice for type 4 delayed hypersensitivity reactions which are mediated by T cells. This investigation may prove useful for patients with allergic contact dermatitis (e.g a delayed papulovesicular rash caused by gloves, a watch strap or belt buckle).

A food challenge test may provoke symptoms of food allergy but is unwise given this child's history of anaphylaxis.

Blood tests for IgM and IgG antibodies are distractor answers as these antibodies do not mediate the type 1 hypersensitivity reaction responsible for this child's symptoms.

Further reading:

https://www.nice.org.uk/guidance/qs118/chapter/quality-statement-2-diagnosing-igemediated-food-allergy

Question:

A 24-year-old student attends the gastrointestinal clinic for a follow-up for his Crohn’s disease, which was diagnosed 2 years ago. He is now managed on azathioprine and has had relatively few acute episodes since. However, he has suffered from increasing anal pain over the past few weeks.

On examination, there is an abnormal external opening on the perineum, from which purulent discharge is emerging.

What is the most appropriate management option?

A. Conservative management alone

B. Injection botulinum toxin

C. Rubber band ligation

D. Sphincterotomy

E. Seton stitching

Correct Answer:Seton stitching

Explanation:

This patient is likely suffering from an anal fistula; an abnormal connection between two epithelial surfaces; in this case, the anal canal and the perineum. Anal fistulae most commonly develop from an initial anal abscess, both are relatively common complications in those with Crohn's disease. The presentation is usually with pain and discharge from the abnormal opening; MRI will often be used to visualise the tract and plan the approach to management.

Management of symptomatic anal fistulae is normally via a surgical approach; there are two main options. The site of the fistula can be laid open via a procedure referred to as fistulotomy. Time can then be given for the site to heal via secondary intention. Alternatively, seton stitching can be used to close the fistula. This approach involves placing a stitch into the tract itself and using this to pull the sides closed; the process may need to be repeated a number of times for successful completion.

Injection of botulinum toxin and sphincterotomy are both surgical options for anal fissures that have failed to respond to conservative or medical management. They are not indicated in the setting of a fistula, where the abnormal connection needs addressing.

Rubber band ligation is a procedure used to treat internal haemorrhoids; there is no target for such a procedure in a fistula and it is not an appropriate surgical option in this case.

Conservative management is a possible strategy in asymptomatic fistulae as self-resolution will sometimes occur. However, given the severity of the patient's symptoms and underlying Crohn's disease, it is unlikely to be a feasible option in this case.

Further reading:

https://patient.info/doctor/crohns-disease-pro

Question:

A 74-year-old man presents to the GP with pain and swelling in his hands. He lives alone, and the pain is preventing him from doing many tasks around the house including cooking and cleaning. He has had a few previous episodes of this pain which have self-resolved, but this pain is intolerable.

He has a past medical history of CKD, with an eGFR of 30. He has no known drug allergies. He consumes 2-3 units of alcohol per day.

On examination, several distal and proximal interphalangeal joints are erythematous and swollen, and he has a very weak grip. On light palpation of the joints, he is very tender and withdraws his hands in pain. There are some palpable nodules at the lateral aspects of some of the affected joints. His observations are stable and he is apyrexial.

Blood tests are performed which demonstrate a raised uric acid level of 0.67 mmol/L (0.23–0.46). Arthrocentesis demonstrates a synovial fluid WCC of 3x109/L and examination of the fluid under polarised light shows negatively birefringent needle-shaped crystals.

What is the most appropriate management of this patient?

A. Manage pain with colchicine today and commence allopurinol in 3 weeks

B. Commence allopurinol 800mg PO OD today

C. Commence allopurinol 100mg PO OD today

D. Manage pain with NSAIDs as uric acid is normal

E. Provide NSAIDs and refer for an outpatient appointment for IV pegloticase in 3weeks

Correct Answer:Manage pain with colchicine today and commence allopurinol in 3 weeks

Explanation:

The most likely diagnosis in this patient is gout. Gout is characterised by sudden onset severe joint pain, and patients will often present with swelling and erythema of the affected joint. It is caused by hyperuricaemia (typically defined in men as a serum uric acid level of >0.46 mmol/L in males, which results in the deposition of uric acid crystals in joints. Commonly affected joints include the first toe, foot and ankle, but it can also affect joints such as those in the hands and the knee. Multiple acute episodes can lead to joint destruction. Diagnosis is achieved by arthrocentesis of the affected joint, which will typically demonstrate synovial fluid containing needle-shaped crystals that are negatively birefringent under polarised light. The synovial fluid will also typically demonstrate an elevated white blood cell count (i.e. >2x109/L).

Acute episodes are typically treated with NSAIDs such as ibuprofen or naproxen, or colchicine. NSAIDs will need to be co-prescribed with a gastro-protective agent such as a proton pump inhibitor. NSAIDs are typically avoided in the context of significant renal impairment and colchicine is used instead. In the long-term, usually 2-3 weeks after the acute episode resolves, a uric acid lowering agent such as allopurinol can be administered, which is a xanthine oxidase inhibitor.

Given that the most likely diagnosis is gout, the most appropriate management of this patient would involve managing pain with colchicine today and commencing allopurinol in 3 weeks time. Given that he has a past medical history of CKD, colchicine is more appropriate for acute management than an NSAID.

It would be inappropriate to commence allopurinol 100mg PO OD today. Allopurinol is a uric acid lowering agent, which interferes with the xanthine oxidase pathway for uric acid production. Serum uric acid levels should only be lowered 2-3 weeks after the acute episode resolves. It would also be inappropriate to commence allopurinol 800mg PO OD today; 2-3 weeks following the acute episode 100mg OD is the usual starting dose, and it will be titrated up if it is failing to lower uric acid levels.

Finally, it is incorrect to provide NSAIDs and refer for an outpatient appointment for IV pegloticase. Not only are NSAIDs contraindicated due to the patient's history of CKD, IV pegloticase is not a first-line uric acid lowering agent.

Further reading:

https://patient.info/doctor/gout-pro

Question:

A 79-year-old man presents to the emergency department with central chest pain radiating to his right shoulder. He has a past medical history of hypertension and type 2 diabetes, for which he takes amlodipine and metformin.

Observations are: HR 76 beats/minute (regular), BP 136/76 mmHg, RR 20 breaths/minute, SpO2 97% on air, temperature 37.6°C.

Blood troponin T levels are found to be elevated. An ECG shows no regions of ST-elevation, although there is some T-wave inversion seen in lead III and aVF.

Given the most likely diagnosis, what scoring system should be used to determine management?

A. DAS28 score

B. Wells score

C. GRACE score

D. Centor score

E. Rockall score

Correct Answer:GRACE score

Explanation:

This patient presents with characteristic signs and symptoms of acute coronary syndrome (ACS). The absence of ST-elevation on the ECG, combined with the raised blood troponin T levels, suggests that this is a non-ST-elevation myocardial infarction (NSTEMI). The main scoring system recommended by NICE on NSTEMIs is the GRACE score (global registry of acute cardiac events score) which takes into account multiple factors including:

Patient age

Heart rate/blood pressure

Cardiac function

Renal function

ECG findings

Troponin levels

The result of the GRACE score is used to calculate the predicted 6-month mortality following an NSTEMI. Percutaneous coronary intervention should be the main treatment option if the GRACE score is greater than 3% (or if the patient is haemodynamically compromised). If the GRACE score is less than 3%, conservative management may be initially trialled, usually with ticagrelor and aspirin.

The Wells score calculates the probability of a patient having a pulmonary embolism or deep vein thrombosis, as opposed to acute coronary syndrome. A pulmonary embolism would classically present with pleuritic chest pain, tachycardia and a history of recent inactivity. There may also be S1Q3T3 changes on an ECG, meaning a large S wave in lead I, a Q wave in lead III and an inverted T wave in lead II.

The Rockall score determines the severity of an upper gastrointestinal bleed.

The DAS28 score (disease activity score) is used to measure the disease severity of 28 different joints in rheumatoid arthritis.

The Centor score predicts the probability of a sore throat being caused by a streptococcal infection.

Further reading:

https://www.nice.org.uk/guidance/ng185/chapter/Recommendations#nstemi-and-unstable-angina-early-management

Question:

A 75-year-old woman presents with crushing chest pain that radiates to her jaw and left shoulder. She has a past medical history of hypercholesterolaemia and hypertension, for which she takes atorvastatin and amlodipine. ECG results and serial troponin results confirm a STEMI which is treated with PCI (percutaneous coronary intervention), and she makes a good recovery.

Ten days later, a repeat ECG is made in the cardiology clinic to assess for complications. The ECG shows ST elevation in the anterior leads. She has no pain and serial troponin levels are normal.

What is the most likely complication that she has suffered?

A. Ventricular septal defect

B. Left ventricular aneurysm

C. Mitral regurgitation

D. Myocarditis

E. Dressler syndrome

Correct Answer:Left ventricular aneurysm

Explanation:

The lady has suffered a left ventricular aneurysm secondary to a myocardial infarction. This often presents with persistent ST elevation with no pain. The other options are all common complications of a myocardial infarction; however, Dressler syndrome presents similarly to pericarditis post-MI with fever, chest pain worse lying down and persistent saddle-shaped ST elevation.

Mitral regurgitation would present with a pansystolic murmur but not ST elevation.

Myocarditis presents with fever, pain, arrhythmias and widespread ST elevation which would also show raised troponin.

Ventricular septal defect would present with a murmur, breathlessness

Further reading:

https://patient.info/doctor/complications-of-acute-myocardial-infarction

Question:

A 72-year-old male is being reviewed on the geriatric ward round. He complains to the medical team of increasing bone pain across both his legs over the last week, as well as occasional right-sided flank pain. The patient goes on to comment that he feels more thirsty than usual and that he is passing large volumes of urine. On further questioning, he appears confused and is no longer orientated to place.

His past medical history is significant only for ongoing lung cancer which is being treated with radiotherapy.

Physical examination reveals dry mucous membranes but is otherwise normal. The patient’s notes indicate that his last two bowel motions were type 1 on the Bristol Stool Form Scale.

Which of the following is the most likely diagnosis?

A. Hypocalcaemia

B. Fibromyalgia

C. Hypercalcaemia

D. Osteoarthritis

E. Vitamin D deficiency

Correct Answer:Hypercalcaemia

Explanation:

Patients with cancer are at significant risk of developing hypercalcaemia, which typically presents with symptoms such as bone pain, constipation, renal colic and confusion. Hypercalcaemia may also precipitate nephrogenic diabetes insipidus, and so patients may present with polydipsia and polyuria. Management of hypercalcaemia is dependent on the clinical circumstances and advice should be sought from the patient's oncologist or palliative care specialist as appropriate.

Osteoarthritis is a degenerative joint disease associated with the long-term mechanical wearing of the joints. The most commonly affected joints are the knees, hips and metacarpophalangeal joints. Symptoms of osteoarthritis are limited only to the affected joint or joints and include pain, swelling and stiffness that does not improve with exercise.

While severe, prolonged vitamin D deficiency can lead to bone pain and muscle weakness, it is not associated with many of the other clinical features in this case such as confusion, dehydration and polyuria.

Hypocalcaemia is not associated with an ongoing malignancy. Its clinical presentation depends on the extent of hypocalcaemia, and severe cases are associated with tetany, paraesthesia and seizures.

Fibromyalgia refers to a chronic pain syndrome that is associated with a variety of further symptoms, including fatigue, insomnia and memory loss. It rarely presents for the first time in patients of advanced age.

Further reading:

https://cks.nice.org.uk/topics/hypercalcaemia/diagnosis/diagnosis/