



GI Disorders

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A brief overview

RED FLAGS

Red Flags

- Acute pain with fever and elevated white blood cell count may suggest [diverticulitis](#), while subacute or chronic pain and diarrhea are typical in inflammatory bowel disease.
- In older adults, pain associated with a change in bowel habits and [iron deficiency anemia](#) can be the first signs of [colorectal cancer](#).
- Lower abdominal pain may also radiate down from upper abdominal structures or up from the pelvis, such as genitourinary causes like [cystitis](#), [pyelonephritis](#), [ectopic pregnancy](#), or [ovarian torsion](#).
- Some conditions cause diffuse abdominal pain that can't be localized.
- A mixture of vomiting and diarrhea can be due to acute infectious [gastroenteritis](#) or toxin-mediated food poisoning.
- On the other hand, [celiac disease](#) is generally associated with chronic diarrhea, malabsorption, and in children it can cause a growth delay.
- A surgical emergency is an [abdominal aortic aneurysm](#) that has ruptured. This can cause pain that radiates to the back, and a pulsating sensation in the abdomen.

Blood Tests

Alanine transaminase (ALT) test

[Alanine transaminase \(ALT\)](#) is used by your body to metabolize protein. If the liver is damaged or not functioning properly, ALT can be released into the blood. This causes ALT levels to increase. A higher than normal result on this test can be a sign of liver damage.

According to the [American College of Gastroenterology](#), an ALT above 25 IU/L (international units per liter) in females and 33 IU/L in males typically requires further testing and evaluation.

Aspartate aminotransferase (AST) test

[Aspartate aminotransferase \(AST\)](#) is an enzyme found in several parts of your body, including the [heart](#), liver, and muscles. Since AST levels aren't as specific for liver damage as ALT, it's usually measured together with ALT to check for liver problems.

When the liver is damaged, AST can be released into the bloodstream. A high result on an AST test might indicate a problem with the liver or muscles.

The [normal range for AST](#) is typically up to 40 IU/L in adults and may be higher in infants and young children.

Alkaline phosphatase (ALP) test

[Alkaline phosphatase \(ALP\)](#) is an enzyme found in your bones, bile ducts, and liver. An ALP test is typically ordered in combination with several other tests. High levels of ALP may indicate liver inflammation, [blockage of the bile ducts](#), or a bone disease.

Children and adolescents may have elevated levels of ALP because their bones are growing. Pregnancy can also raise ALP levels.

The [normal range for ALP](#) is typically up to 120 U/L in adults.

Albumin test

[Albumin](#) is the main protein made by your liver. It performs many important bodily functions. For example, albumin: stops fluid from leaking out of your blood vessels nourishes your tissues transports hormones, vitamins, and other substances throughout your body. An albumin test measures how well your liver is making this particular protein. A low result on this test can indicate that your liver isn't functioning properly.

Red Flags

- Associated symptoms can also help narrow the diagnosis. Common ones are nausea, vomiting, constipation, diarrhea, and changes in stool like the presence of blood or mucus, a foul smell, or changes in stool caliber.
- In terms of vomiting, bilious vomiting may be caused by an obstruction distal to the duodenum, or there might be hematemesis from an upper gastrointestinal bleed.
- A gastrointestinal bleed might also cause melaena or hematochezia.
- In females, it's important to always rule out the possibility of pregnancy. Then, we should ask for genitourinary symptoms, such as dysuria, frequency, and hematuria - which can occur with a urinary tract infection or kidney stones.
- Constitutional symptoms like fevers, chills, fatigue, and weight loss, would raise concern for an infection, malignancy, or systemic illness like inflammatory bowel disease.
- And epigastric pain associated with cardiac risk factors or other symptoms like chest pain, cough, dyspnea, orthopnea, and exertional dyspnea suggest a pulmonary or cardiac cause.
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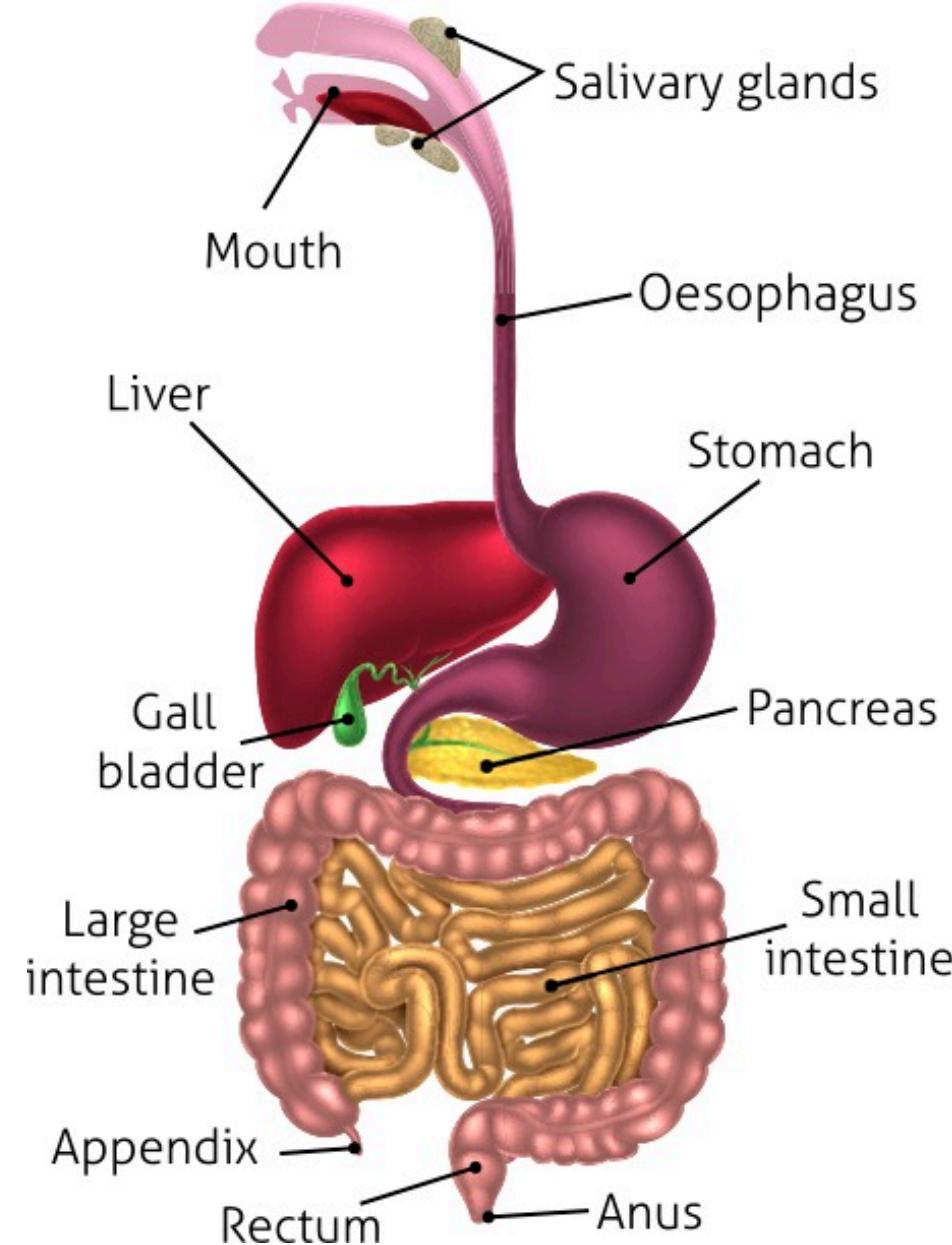
Examination

- To evaluate abdominal pain, the first step is inspection.
- First, there's the person's general appearance and how they're positioned given their pain. For example, if they're perfectly still in bed with knees bent that's concerning for [peritonitis](#). Other features include how a person is breathing, signs of abdominal distention, and scars from past surgeries.
- Next is auscultation to hear bowel sounds. Normally there are two to twelve medium-pitched gurgles per minute.
- Decreased bowel sounds or periodic high-pitched bowel sounds over two minutes suggests a [bowel obstruction](#) or [peritonitis](#), whereas hyperactive medium-pitched gurgles are associated with inflammation within the [gastrointestinal tract](#).
- An abdominal bruit may be heard when there's an [abdominal aortic aneurysm](#).
- Next, there's percussion. The [gastrointestinal tract](#) is normally filled with gas, so percussion creates a tympanitic sound.
- But if there's tympany over a protuberant abdomen, that indicates air accumulation, which could be due to an [intestinal obstruction](#) leading to a distended bowel.
- On the other hand, dullness is heard when there's fluid or stool accumulation, or when there are enlarged organs like hepatomegaly or splenomegaly.

Palpation

- First lightly and then more deeply, and usually starting away from the area of discomfort.
- If an individual tightens their abdominal muscles during palpation, that's called guarding, and it's an important and early sign of peritoneal inflammation.
- Sometimes the guarding can involve just one region, like in a [diverticular abscess](#). Other times guarding can be diffuse like in [peritonitis](#).
- Blumberg's sign, also referred to as rebound tenderness, refers to palpation and quick release, with pain felt upon release of pressure - again a sign of [peritonitis](#).
- Then there's McBurney's sign which is tenderness at McBurney's point - which is located one-third of the distance from the [anterior superior iliac spine](#) to the belly button. That's a classic sign of [appendicitis](#).
- Another sign of [appendicitis](#) is Rovsing's sign, which is when palpation of the left lower quadrant causes pain in the right lower quadrant.
- Then there's Murphy's sign which is where a hand is placed below the right costal margin at the midclavicular line, when a person breathes out. Then the individual is asked to [breathe](#) in.
- Normally, during inspiration, the lungs move down and that pushes the diaphragm and the abdominal contents down as well. If the person suddenly stops breathing in because of gallbladder tenderness, that's a positive Murphy's sign.
- Finally, there's the Courvoisier sign which is when [the gallbladder](#) becomes a firm and painless mass, and this can be a sign of malignancy or chronic biliary tree obstruction

Abdominal System





Abdominal System

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Case study

A 54 yr old man attends complaining of an episode of haematemesis. He has a history of Atrial Fibrillation but has been asymptomatic and is otherwise well. He takes a low dose of warfarin, has no allergies. He used to drink alcohol in large quantities which had contributed to his incarceration in prison 6 months ago.

•What are the most common causes of haematemesis?

- Why is taking a thorough drug history particularly important in this case?**
- What is an endoscopy and why would it be useful in managing upper GI bleeding?**
- Describe the features that would lead you to diagnose a peptic ulcer?**
- What is the most likely cause of a duodenal ulcer and how would this knowledge affect treatment?**
- What other differential diagnoses would you consider?**

https://www.osmosis.org/learn/Portal_hypertension



Case study

A 27yr old male presents with a 3week history of worsening diarrhoea. At first he thought it was because of something he had eaten. Prison food is not the most appetizing. However, instead of improving the diarrhoea has got worse. He has also noted blood in his stools which has worried him He otherwise feels quite well and has no significant past medical history.

- What other history would you take?
- Name 3 conditions at the top of your differential diagnoses.
- If this was an infectious episode, which organisms would be the most likely culprits.

Case study

- His stool sample shows has not grown any pathogenic organisms. The diarrhoea has not improved. The gastroenterologist performs rigid sigmoidoscopy which shows an inflamed, bleeding, friable rectal mucosa. He suspects ulcerative colitis and takes multiple rectal biopsies.
- What microscopic appearances would you expect in the rectal biopsy if this was indeed ulcerative colitis?
- Why do you think it is important to take biopsies from multiple points around the colon?
- If diagnosed confirmed as ulcerative colitis. How should this patient be followed up in the future?

https://www.osmosis.org/learn/Inflammatory_bowel_disease:_Pathology_review

Diverticular Disease

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Diverticular disease: antimicrobial prescribing NICE National Institute for Health and Care Excellence

Background

- Diverticulosis is a digestive condition in which small pouches (diverticula) protrude from the walls of the large intestine, without symptoms
- About 10–15% of people with diverticulosis develop symptoms
- Diverticular disease is the presence of diverticula with mild abdominal pain or tenderness
- Acute diverticulitis is inflammation or infection of diverticula. Symptoms include constant abdominal pain, usually severe and on the lower left side, fever and low-grade symptoms
- Complications of acute diverticulitis include perforation, abscess, sepsis, haemorrhage, fistula and obstruction

Diet and lifestyle

Give advice on:

- eating a healthy, balanced diet including whole grains, fruit and vegetables
- increasing fibre intake for people with constipation and a low-fibre diet
- drinking adequate fluids
- the benefits of exercise, weight loss and stopping smoking

Microbiological testing

If a diverticular abscess greater than 3 cm is drained, send pus samples to the microbiology laboratory and tailor antibiotic therapy to the results.

Systemically well

Systemically unwell or immunosuppressed or with significant comorbidities but does not meet the criteria for referral for suspected complicated acute diverticulitis

Hospital management of suspected or confirmed complicated acute diverticulitis, including suspected diverticular abscess

Advise on:

- diet and lifestyle
- the course of the disease and the likelihood of progression
- symptoms and symptom management (for example, paracetamol for pain and bulk-forming laxatives for constipation or diarrhoea)
- symptoms that indicate complications or progression
- when and how to seek medical advice

For people with acute diverticulitis, also advise on:

- possible investigations and treatments
- the risks of treatments and how invasive these are
- the role of surgery and outcomes

Consider not prescribing antibiotics

Offer oral antibiotics

Offer IV antibiotics

Review within 48 hours or after scanning if sooner, and consider switching to oral antibiotics when possible

If uncomplicated acute diverticulitis is confirmed by scanning, review the need for antibiotics and discharge

If diverticular abscess is not confirmed by scanning, review the need for antibiotics

For diverticular abscesses less than 3 cm, switch to oral antibiotics where possible

November 2019

This is a summary of the recommendations on antibiotic prescribing from NICE's guideline on diverticular disease. See the original guidance at www.nice.org.uk/guidance/NG147

Diverticular disease: antimicrobial prescribing

NICE National Institute for
Health and Care Excellence

Choice of antibiotic for adults aged 18 years and over with suspected or confirmed acute diverticulitis

Antibiotic ¹	Dosage and course length ²
First-choice oral antibiotic for suspected or confirmed uncomplicated acute diverticulitis	
Co-amoxiclav	500/125 mg three times a day for 5 days
Alternative first-choice oral antibiotics if penicillin allergy or co-amoxiclav unsuitable	
Cefalexin (caution in penicillin allergy) with metronidazole	Cefalexin: 500 mg twice or three times a day (up to 1 to 1.5 g three or four times a day for severe infection) for 5 days Metronidazole: 400 mg three times a day for 5 days
Trimethoprim with metronidazole	Trimethoprim: 200 mg twice a day for 5 days Metronidazole: 400 mg three times a day for 5 days
Ciprofloxacin (only if switching from IV ciprofloxacin with specialist advice; consider safety issues ³) with metronidazole	Ciprofloxacin: 500 mg twice a day for 5 days Metronidazole: 400 mg three times a day for 5 days
First-choice intravenous antibiotics ⁴ for suspected or confirmed complicated acute diverticulitis	
Co-amoxiclav	1.2 g three times a day
Cefuroxime with metronidazole	Cefuroxime: 750 mg three or four times a day (increased to 1.5 g three or four times a day if severe infection) Metronidazole: 500 mg three times a day
Amoxicillin with gentamicin and metronidazole	Amoxicillin: 500 mg three times a day (increased to 1 g four times a day if severe infection) Gentamicin: Initially 5 to 7 mg/kg once a day, subsequent doses adjusted according to serum gentamicin concentration ⁵ Metronidazole: 500 mg three times a day
Ciprofloxacin ⁶ (consider safety issues ³) with metronidazole	Ciprofloxacin: 400 mg twice or three times a day Metronidazole: 500 mg three times a day
Alternative intravenous antibiotics	
Consult local microbiologist	

¹See [BNF](#) for appropriate use and dosing in specific populations, for example, hepatic impairment, renal impairment, pregnancy and breastfeeding and administering intravenous (or, where appropriate, intramuscular) antibiotics.

²A longer course may be needed based on clinical assessment. Continue antibiotics for up to 14 days in people with CT-confirmed diverticular abscess.

³See [MHRA advice](#) for restrictions and precautions for using fluoroquinolones due to very rare reports of disabling and potentially long-lasting or irreversible side effects affecting musculoskeletal and nervous systems. Warnings include: stopping treatment at first signs of a serious adverse reaction (such as tendonitis), prescribing with special caution for people over 60 years and avoiding coadministration with a corticosteroid (March 2019).

⁴Review intravenous antibiotics within 48 hours or after scanning if sooner and consider stepping down to oral antibiotics where possible.

⁵Therapeutic drug monitoring and assessment of renal function is required ([BNF](#), August 2019).

⁶Only in people with allergy to penicillins and cephalosporins.





Case study

- A 74 year old pain comes to you complaining of haematemesis . His wife tells you he otherwise well except for an irregular heart.
- **What are the most common causes of haematemesis?**
- **Why is taking a thorough drug history particularly important in this case? How would you ensure you get all the relevant history from this man – e.g. would you use a mnemonic and what would this be? What would you include in your review of systems.**
- **What would be the investigations for this man?**
- **Describe your differentials and rationales for these.**
- **Describe the features that would lead you to suspect two differentials**
- **Give the treatment plan for two of your differentials including longer term care and management.**

MCQs

A 45-year-old man comes to the surgery with family members looking very drowsy and barely responsive. An ambulance is called and he is sent to the emergency department by which stage he becomes unresponsive with fixed dilated pupils. His breath has a fruity odour. BP: 96/52 P130 RR22.

Physical examination shows the liver edge is palpable 4cm below the rib border. Laboratory data reveals a metabolic acidosis with a high anion gap and normal glucose levels.

Which of the following is the most likely diagnosis in this patient?

- a. Diabetic ketoacidosis
- b. Opiod withdrawal
- c. Uraemia
- d. Alcoholic ketoacidosis
- e. Hypothermia

Case Study

A 38-year-old man attends the surgery because he received electric shocks while working on the powerlines. He is taken to the emergency department and subsequently goes in to ventricular fibrillation. He is shocked back into sinus rhythm. He is now unconscious and monitored. He is able to breath on his own. Examination shows a full thickness burn to his right wrist and a 2cm burn to the dorsum of his rt foot.

Which of the following is the most likely complication that needs to be prevented in this patient's condition?

- a. Acute kidney injury
- b. Acute MI
- c. Acute respiratory distress syndrome
- d. Haemothorax
- e. Tension pneumothorax

Diarrhoea and vomiting

James presents with a low-grade fever and complaining of fatigue and nausea for the past 24hrs. He also describes his urine as being dark and states that he has had four bowel movements in the past 24hrs, all of which were light coloured. Upon further questioning, James states he has no history of jaundice and that he returned from a business trip to the Philippines' a month ago.

- a. What is the likely diagnosis?
- b. Discuss why the urine was dark and stools light coloured?
- c. What would your treatment options be in this case?

Case Study

25yr old male pt informs you she has had diarrhoea, nausea and cramping for almost 12hrs now. He also presents with low grade fever and informs you as far as he can tell the symptoms developed very suddenly. Stool is negative for occult blood. He informs you that some his cell mates have also had similar symptoms since a fish meal they ate a few days ago.

a. What is the likely diagnosis?

b. How is it spread?

c. How would you treat?

Case 10:

35yr old male has just returned from Latin America following 2 day business trip. Reports having eaten several meals of fish bought from street vendors around the hotel. Feels ill with profuse watery diarrhoea and vomiting.

- a. What is the likely diagnosis?
- b. How is it spread?
- c. What tests would you do to confirm diagnosis?
- d. How would you treat?

Genitourinary Quiz

25-year-old man comes to the surgery because of severe leg cramps. He says that he has "dark urine" and that earlier in the morning he had trouble lifting a glass object. Physical examination shows tenderness in his hamstrings and quadriceps when palpated. Urine dipstick is positive for blood. Which of the following is most likely a potential complication of this patient's condition?

- a. Acute Myocardial Infarction
- b. Acute kidney injury
- c. Haemothorax
- d. Acute respiratory distress syndrome
- e. Tension pneumothorax

Case 12:

A 48-year-old woman comes to the emergency department because of 'burning, bloody urine'. She has been urinating more frequently for the past 2 days, but she denies polydipsia, vaginal discharge, back pain, abdominal pain, nausea, vomiting, or fevers. Physical examination shows that she is afebrile and her other vital signs are stable. Her abdomen is soft, non-tender and there is no flank tenderness. Urine dipstick is positive for leukocyte esterase and nitrites.

Which of the following is the most appropriate initial treatment option?

- a. Doxycycline
- b. amoxycillin
- c. Nitrofurantoin
- d. Trimethoprim
- e. Cephalexin

**Which of the following
is the most likely
diagnosis?**

A 62-year-old woman comes to the surgery because of intermittent flank pain for 2 days. Describes the pain as cramping and says that is worse after drinking fluids. Medical history includes recurrent Urinary tract infection. Temperature is 36.8°C (98°F), Pulse 82, RR16, BP 120/82. Abdominal exam reveals a possible left-sided flank mass. Urine dipstick is negative for leucocytes.

- a. Pyelonephritis
- b. Renal cell carcinoma
- c. Polycystic kidney disease
- d. Ureteropelvic junction obstruction
- e. Bladder calculi

Case 14:

A 27-year-old man comes to the surgery because of severe flank pain for an hour. The pain woke him from his sleep, He rates the pain as a 10 on a 10-point scale. Temperature is 36.7°. He appears to be constantly moving and unable to get comfortable. No medical problems. Had kidney stones about a year ago but since then he has been well.

What is the likely diagnosis?

- a. AAA Abdominal aortic aneurysm
- b. Appendicitis
- c. Ruptured bladder
- d. Small bowel obstruction
- e. Hydronephrosis

Case

A 50-year-old woman comes to the surgery because of severe, colicky left-sided abdominal pain. Urinalysis shows trace of blood. Her T: 37.2° , P:70. RR18 and BP: 160/90 mm Hg. Her BMI is 23. Her medical history is significant for celiac disease that was diagnosed 20 years ago. She avoids gluten and takes vitamins to "stay healthy".

Which of the following is most likely present in this patient?

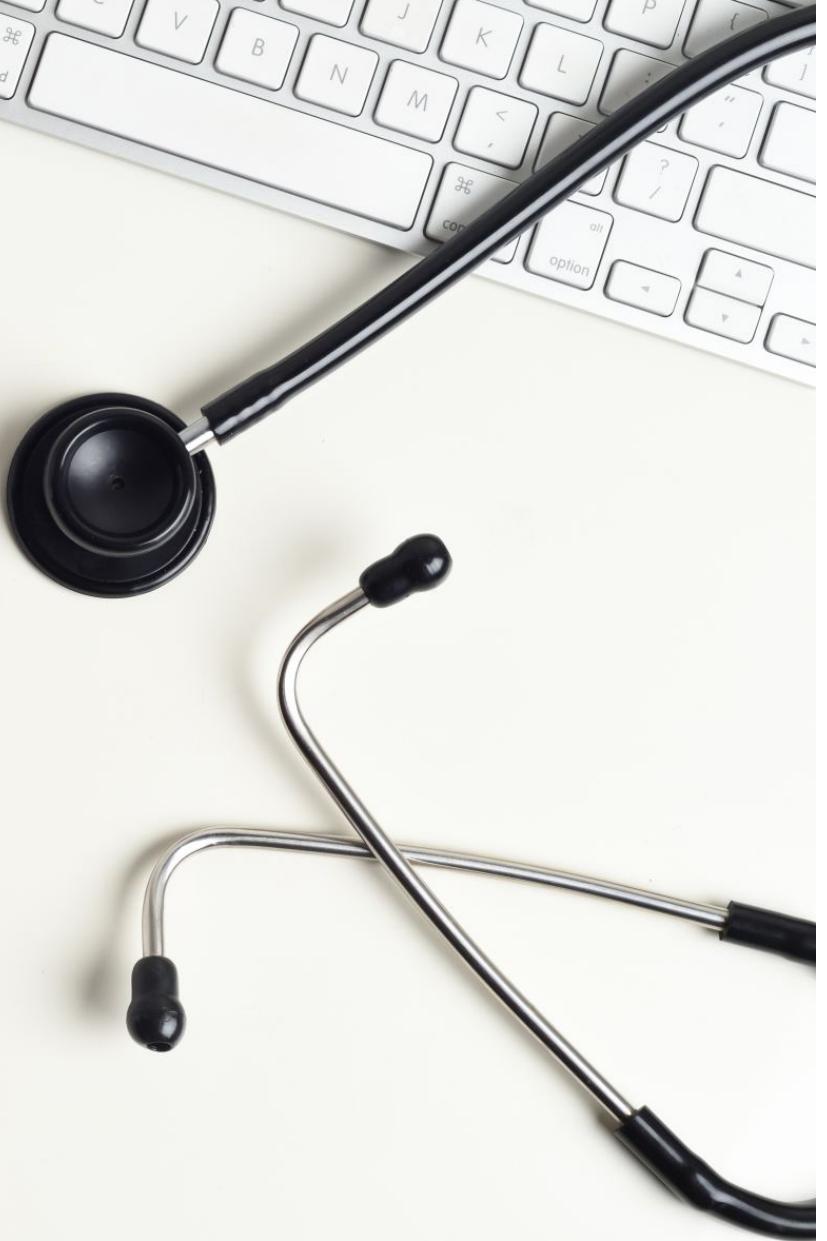
- a. Osteomalacia
- b. Vitamin D excess
- c. Vitamin D deficiency
- d. Vitamin C deficiency
- e. Hypophosphatemia

Case Study

A 25-year-old previously healthy woman comes to the surgery because of 2 days of mild nausea and vomiting. She denies recent sick contacts or eating anything out of the ordinary. She has maintained good oral intake of food and fluids over the past two days, but has noticed increasing malaise and a dull pain on her right side. She endorses mild dysuria and urinary frequency for the past 2 days. Medical history is negative for kidney stones T:38.3P:100 RR:18 BP: 11/70 Physical examination shows no definite CVA tenderness. Urine dipstick positive for leucocytes.

Which of the following is the most likely diagnosis?

- a. UTI
- b. Acute cystitis
- c. Kidney stones
- d. Appendicitis
- e. Pyelonephritis



Clinical Pearls

- Pregnancy test should be checked in all females of childbearing age.
- Individuals with significant upper or mid abdominal pain should have an AST and ALT checked to assess liver damage and a lipase and amylase to assess pancreatic damage.
- Serum amylase or lipase levels 3 times higher than the upper limit of normal indicate pancreatitis.
- If [appendicitis](#) or [peritonitis](#) is suspected, there's usually an elevated white blood cell count.
- Faecal occult blood testing is often done to look for evidence of gastrointestinal bleeding, which often occurs in individuals with [diverticulitis](#) or [colorectal cancer](#).
- Individuals with suspected genitourinary causes should have a urinalysis and culture for [cystitis](#) or [pyelonephritis](#).
- Urinalysis may reveal the presence of pyuria, proteinuria, and hematuria.
- Finally, imaging can be done. Plain radiographs can be helpful when [bowel obstruction](#) or perforation is suspected.
- When [intestinal obstruction](#) occurs, both fluid and gas collect in the intestine and produce air-fluid levels.
- On the other hand, free intraperitoneal air will be visible in the case of bowel perforation, and this is called [pneumoperitoneum](#).



Investigations

- Radiographs may be done for suspected [kidney stones](#) or [gallstones](#).
- About 90% of [kidney stones](#) and about 10% of [gallstones](#) have enough calcium to be seen on a radiograph, so although they can help, they're not the best imaging tool for these conditions.
- Ultrasound is rapid and can be done at the bedside, so it's the study of choice when [kidney stones](#), gallbladder disease including [gallstones](#), or [abdominal aortic aneurysm](#), are suspected.
- Ultrasound can also provide useful information about other conditions, like [ectopic pregnancy](#), [ovarian torsion](#), hemoperitoneum, pancreatitis, and arterial or venous thromboembolism.

Clinical Pearls