Long cases in medicine

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Introduction to the long case

Taking a good history

- The most important aspect of the long case is the component on history taking. The history should have all the usual components and have a good flow

Components of the history

Presenting complaint

History of the presenting complaint

- This is the most important aspect of the history. First describe all the symptoms, their onset and progression
- Now think of the differential diagnosis for the presentation
- Ask direct questions related to each differential diagnosis
- The history of presenting complaint will therefore contain components of the past medical history, surgical history, family history and social history
- Spend most of your time to complete the history of the presenting complaint as this is usually the only component that the examiner is interested in

Review of the systems

- Most of the symptoms associated with the systems will be asked during the history of the presenting complaint

Past medical and surgical history

Drug history

Allergic history

Family history

Social history

- This will be an important component in some long cases. Especially chronic diseases. The following is a guide to take a detailed social history
- Introduction to the patient and the family
- Personal habits of the patient
- Describe the impact of the disease on the patient
- Impact on the disease on the other members of the family
- Support available – from the immediate family and the extended family
- Medical facilities available

Examination

- The key is to perform a quick and targeted examination

- Do the examination after completion of the history of presenting complaint and ask the other details during the examination to save time

Presenting your case

- Be confident in presentation
- You will be asked to present a summary at the end
- Prepare a problem list
  Define the medical and non medical problems and list them in order of priority
- Prepare a differential diagnosis for your medical problems

Acute fever

Presenting complaint

- Fever
- State the duration

History of the presenting complaint

Description of the fever

Remember that the details should be stated in a definite chronological order

- Describe the onset of the fever and state if there are any specific preceding events
- Describe how the fever was assessed and the value of the height of the fever
- The exact duration of the fever
- Describe the response of the fever to antipyretics and the duration taken for the resolution of the fever
- If there is a recurrence of the fever state the time at which the fever comes back
- Describe the state of the patient in between episodes of fever
- Are there associated chills and rigors?
- Describe the pattern of fever as intermittent, remittent or continuous (however this is unreliable with the use of antipyretics)

Associated features

- Ask for symptoms related to the important symptoms to try to identify a focus of infection and to think of a differential diagnosis

Disease	Symptoms
Dengue fever	Headache, retro –orbital pain, arthralgia and myalgia, anorexia, nausea and vomiting **Warning signs** Abdominal pain, mucosal bleeding and other bleeding manifestations, lethargy and restlessness
Respiratory tract infection	Ask for Cough, sputum (if sputum is associated state the color and amount), rhinorrhoea, chest pain associated with breathing and difficulty in breathing
Ear infection	Ear pain and discharge
Pharyngitis	Ask for sore throat, pain on swallowing
CNS infection (Meningitis and encephalitis)	Headache, photophobia, altered behavior and loss of consciousness, seizures
GI infection	Ask for passage of loose stools
Hepatitis	Yellowish discoloration of the eyes, darkening of

	the urine
Leptospirosis	Exposure to muddy water/ possible contaminated water
Septic arthritis and osteomyelitis	Bone pain, joint pain and swelling
Urinary tract infection	Crying on passage of urine, frequency, hematuria

History of exposure and epidemiological history of the fever

- Ask for history of contact with infected or otherwise ill persons
- Travel history if relevant
- History of cases of fever especially dengue fever in the community

Past medical history and surgical history

Other components of the history

Social history

Environment

- Describe the surrounding environment of the house especially with regard to possible mosquito breeding sites
- Ask if the garbage sites are cleaned regularly and ask if mosquito spraying is done regularly in the area
- Ask for the involvement of the MOH, PHI and other staff for dengue prevention in the area
- Ask for possible breeding sites within the house
- Inquire about the environment of the patient's workplace

Other details

Prolonged fever

Presenting complaint

- Fever
- State the duration

History of the presenting complaint

Description of the fever

Remember that the details should be stated in a definite chronological order

- Describe the onset of the fever and state if there are any specific preceding events
- Describe the onset and progression of the fever
- Describe the fever pattern and based on the history- this is best done using a graphical representation of the fever
- State the temperature at the height of the fever, the duration of a fever spike and the duration of the fever free period
- Describe the symptoms associated with a fever spike
- Also go on to state how the patient feel in between episodes of fever
- Next think of the possible differential diagnosis and ask specific questions

Fever pattern	Description	Clinical examples
Intermittent	High spiking fever which reach the baseline	Pyogenic infections TB, lymphoma, systemic onset JIA
Remittent	Fluctuating fever which does not reach the baseline	Viral infections, IE, lymphoma
Continuous	Sustained fever with little or no fluctuation	Typhoid, typhus
Relapsing	Febrile episodes separated by one or more days without fever	Malaria, lymphoma

The next step is to make a probable diagnosis. The list of differential diagnosis in a patient with prolonged fever is extensive but the common causes should be excluded in the history.

- The main categories of causes of prolonged fever should be dealt with. These are,
- Infective
- Inflammatory
- Connective tissue diseases
- Neoplasms
- Other rare causes

Category	Diseases	Specific points in the history
Infective Localized	Respiratory tract infections	Cough, sputum, nasal or ear discharge, sore throat
	Gastrointestinal infections and localized intra abdominal abscesses	Ask for alteration of bowel habits, recurrent episodes of abdominal pain
	Urinary tract infections	Dysuria, frequency, hematuria and other urinary tract symptoms
	Infections of the bones and joints	Ask for joint pain and swelling, limping,
Generalized	Infective endocarditis	Past history of heart disease, rheumatic fever with evidence of a predisposing event for bacteraemia
	IMN	Associated sore throat
	TB	Contact history of TB, chronic cough, hemoptysis
	Typhoid fever	Ask for possible exposure to unhygienic food Initially presents with a slowly rising fever. Then during the 2nd week of illness classically they have high fever, abdominal distension, “pea soup” diarrhoea, constipation. The 3rd week of illness is characterized by complications – intestinal perforation
	Malaria	Visit to a malarial endemic area
	Other zoonotic infections	Contact history with animals
	HIV	Multiple sexual partners, unprotected sexual intercourse, contact with blood or blood products
Inflammatory	Still’s disease	Ask for a evanescent salmon pink maculopapular rash, associated joint pain and early morning joint stiffness
	SLE	History of facial rashes and joint pain
Neoplastic	Hematological malignancy Other malignancies	Evidence of bleeding, ask for the features of anaemia, history of bone pain, past history of recurrent infections
Other	Drugs Factitious fever	Drug history

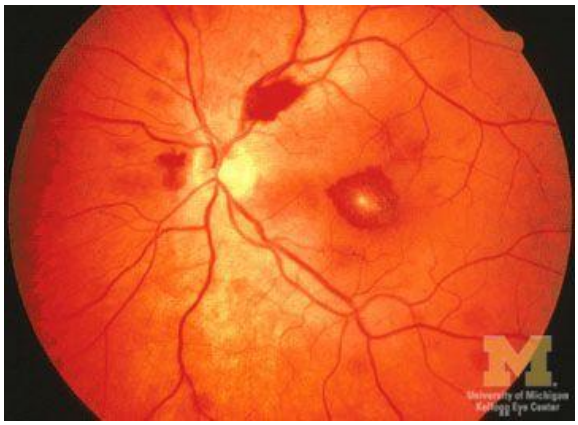
Complete the other components of the history – But remember the most important part of the history is the history of the presenting complaint

Examination

General examination

Perform a thorough general examination

Eyes



- Look for pallor and Icterus
- Red eye associated with connective tissue diseases – uveitis and scleritis
- Examine the fundus for Roth spots in infective endocarditis (see picture) and choroidal tubercles in TB

Head and neck

- Examine for cervical lymphadenopathy
- Examine the ears for discharge and the tympanic membrane

Mouth

- Look for dental caries
- Inflamed throat, tonsillar enlargement

Hands and fingers

- Finger clubbing
- Splinter hemorrhages
- Janeway lesions
- Vasculitic lesions

Skin

- Skin rashes
- IV injection sites
- Venous catheters

CVS

- Look for murmurs (IE)

RS

- Examine for features of consolidation or pleural effusion (TB)

Abdomen

- Look for hepatosplenomegaly
- Palpable masses in the abdomen
- Ascites
- Do not forget to examine the external genitalia
- Do a per rectal examination

Musculoskeletal system

- Joint swelling and tenderness

Nervous system

- Signs of meningism (chronic meningitis)
- Focal neurological signs

Discussion

What is the definition of pyrexia of unknown origin?

- PUO is defined as fever > 38.3 degrees Celsius
- Lasting for more than 3 weeks
- Where a cause has not been found after1 week of rational inpatient investigations or 3 outpatient visits

What is you diagnosis or differential diagnosis?

- Remember that your diagnosis or differential diagnosis should be based on the history and examination
- Given below are the common cases given for the exam

History	Examination	Differential diagnosis
PUO **Past history of rheumatic fever/ congenital heart disease**	Peripheral stigmata of IE (rare) Cardiac murmur (MR, AR)	Infective endocarditis
PUO **Chronic cough, hemoptysis** **+/- Contact history of TB**	Pleural effusion	TB
PUO **+/- symptoms of bone marrow suppression**	Pallor Lymphadenopathy Hepatosplenomegaly	Leukaemia Lymphoma

What are the initial investigations you would like to perform in this patient?

- This will be based on your clinical diagnosis or differential diagnosis

Clinical diagnosis	Investigations	What to look for
IE	**Blood culture** **Echo**	These are required for the confirmation of the diagnosis
TB	**CXR** **Mantoux test**	
Hematological malignancy	**FBC** **Blood picture** **USS of the abdomen** **Bone marrow biopsy**	Look for pancytopenia Look for abnormal cells (blasts) Confirm the organomegaly Look for para aortic lymph nodes

Discussion on infective endocarditis

What are the diagnostic criteria of infective endocarditis?

The diagnosis of infective endocarditis is based on the modified Duke's criteria

Major criteria	Minor criteria
Positive blood culture	**Predisposing valvular or cardiac anomaly**
Typical organism from two cultures	**IV drug use**
Persistent positive blood cultures taken > 12 hours apart	**Pyrexia > 38 Celsius**
	Embolic phenomenon
Three or more positive cultures taken over > 1h	**Vasculitic phenomenon**
	Positive cultures not achieving major criteria
Positive echocardiogram	**Positive echo not achieving major criteria**
Vegetations	
New valvular regurgitation	

Definitive endocarditis is diagnosed with 2 major criteria, or 1 major and 3 minor or 5 minor

What are the principles of management of a patient with infective endocarditis?

- A patient with infective endocarditis is usually managed medically. However there are certain indications for surgical management
- The patient should be started on high dose intravenous empirical antibiotic therapy. This is usually a combination of benzyl penicillin and gentamicin
- Treatment is continued for a minimum of 2 weeks
- Surgery is indicated in the following circumstances
  Severe heart failure due to valvular damage
  Failure of antibiotic therapy
  Large vegetations with evidence of systemic emboli
  Abscess formation in the heart

As a house officer how would you manage a patient with infective endocarditis?

- Admit the patient
- Give a bed
- Commence monitoring of the patient – Fever chart, input output chart

Monitoring of the patient on the daily ward round

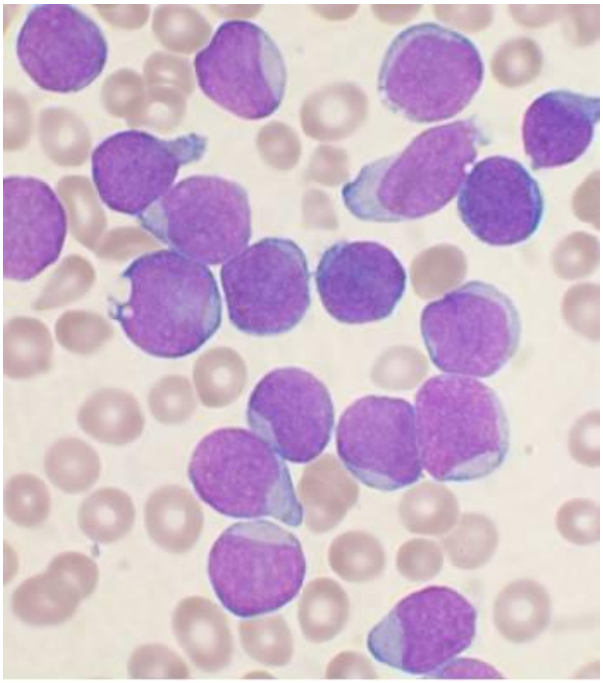
- Ask the patient how he or she feels
- Examine the patient
  Document the fever in not already done
  Examine the cardiovascular system and grade the intensity of the murmur
  Assess the response to antibiotic therapy
  Look for complications of the disease – Heart failure, evidence of systemic embolization
- Order or arrange the relevant investigations
- Review the plan for the patient

What are the causes for continued fever in a patient with infective endocarditis?

- Incorrect antibiotic
- Inadequate dose
- Complications – abscess formation
- Distal embolization

Hematological malignancies

Acute leukaemia



How would you diagnose an acute leukaemia?

- The diagnosis starts with the history and examination
- FBC
  White cell count may be decreased, increased or normal
  May show evidence of pancytopenia
- The blood picture will show blast cells
- Bone marrow examination will reveal hypercellular marrow with leukaemic blast cells >20% of the total number of cells
- Further differentiation between AML and ALL is done using special stains and immunological studies
- Chromosome analysis may be performed to assess the prognosis of the condition

What are the principles of management in a patient with an acute leukaemia?

General management

- Establish good fluid and electrolyte balance
- Nutritional support
- Analgesics for pain
- Antiemetics for nausea and vomiting
- Manage anaemia with red cell concentrate transfusions and thrombocytopenia with platelet transfusions
- Manage any coagulopathy if present with vitamin K and FFP
- Manage infections with broad spectrum antibiotics
- Offer adequate psychological support

Specific management

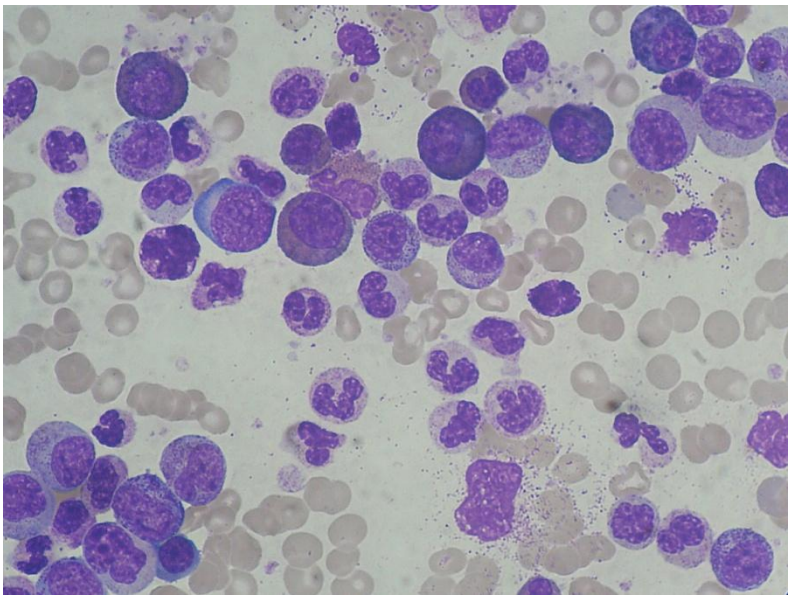
- Chemotherapy is given in three phases
  Remission induction
  Remission consolidation
  Remission maintenance (ALL)

- Apart from this special CNS prophylactic chemotherapy is given for patients with ALL using intrathecal administration and high dose IV methotrexate
- Consider bone marrow transplantation

Chronic leukaemia

CML

How would you diagnose CML?



- Is based on the history, examination and investigations
- Usually a very significant splenomegaly is noted on examination
- FBC
  Usually a leucocytosis is present
  Platelet count is also usually high
- Blood picture
  The complete range of myeloid cells are seen on the blood picture from blasts to mature cells
- Bone marrow is performed to diagnose the disease, for genetic studies (Philadelphia chromosome) and to estimate the prognosis of the disease

What are the principles of management?

- The management of CML differs on the clinical stage of the disease
- **Chronic stage**
  Tyrosine kinase inhibitors
  Accelerated phase or blast crisis
  Hydroxycarbamide

CLL

How would you diagnose CLL?

- Lymphocytosis is seen on the FBC
- There also may be associated warm autoimmune hemolytic anaemia
- Further special stains and immunological studies are performed to confirm the diagnosis and assess the prognosis

What are the principles of management of CLL?

- Specific treatment is required only in special circumstances. These are,

Evidence of bone marrow failure
Progressive systemic symptoms
Autoimmune hemolytic anaemia

- Treated initially with chlorambucil

Lymphomas

	Hodgkin's lymphoma	Non Hodgkin's lymphoma
Clinical	Lymphadenopathy usually begins from 1 group of peripheral lymph nodes and spreads contiguously to the others Can have mediastinal involvement Extra nodal spread rare Leukaemic phase rare Constitutional symptoms common	Has a more unpredictable and haphazard spread Involves oropharyngeal lymph nodes Extra nodal spread common Leukaemic phase more common Constitutional symptoms rare
Investigations	Lymph node biopsy shows Reed – Sternberg cells	No RS cells
Management	**Early stage disease** Radiotherapy **Advanced disease** Chemotherapy +/- radiotherapy	Multi agent chemotherapy

Central chest pain

Presenting complaint

- Chest pain – This is usually of acute onset

History of the presenting complaint

- Describe the following basic characteristics of the chest pain
- Site
- Onset
- Character – throbbing, aching or tightening type pain
- Radiation and referral of the pain
- Associated features of the pain – especially features of sympathetic overactivity
- Timing of the pain – At this point make a graphical representation of the pain and mark the time taken for the pain to reach a peak, the duration of the pain, resolution and the pain free period
- Exacerbating and relieving factors of the pain
- Severity – Ask the patient to grade the pain and assess the severity
- Describe the chronological order of events up to the present state

Check if you have asked the points to address each of the differential diagnosis of central chest pain (see discussion below)

System	Diseases
Cardiovascular	MI, unstable angina, aortic dissection, acute pericarditis
Respiratory	Spontaneous pneumothorax, pulmonary embolism
Gastrointestinal	Oesophageal spasm, peptic ulcer disease, acute pancreatitis

Past medical history

- This is an important component of the history in a patient presenting with chest pain. Ask for the following
- Previous episodes of chest pain
- Past history of diabetes mellitus, hypertension, hyperlipidaemia
- **Always remember to take a detailed history of each of the above co morbidities if they are present (See the individual long cases on diabetes and hypertension)**
- Ask for any other significant co morbidities
- Ask for smoking and use of alcohol

Family history

- Ask for a family history of IHD, DM, hypertension, hyperlipidaemia

Complete the other components of the history

Examination

General examination

- Get a general impression of the patient
- Look for features of marfan's syndrome – can present with aortic dissection)
- Look for peripheral signs of hypercholesterolemia (Xanthelasma, corneal arcus)
- Pallor (Can aggravate ischaemic heart disease)
- Examine the fundi
- Examine the limbs for features of DVT (pulmonary embolism)
- Look for ankle edema

CVS

- Measure the blood pressure – remember to measure this in both hands (can differ in aortic dissection)
- Examine the pulse for bradycardia (heart block associated with MI)
- Look for features of cardiac failure – cardiac dilation, S3, gallop rhythm
- Look for a pericardial rub (acute pericarditis)
- Examine for murmurs
  MR – Acute MI due to rupture of papillary muscles
  VSD – Complication of MI
  AR – Aortic dissection
- Loud P2 – pulmonary embolism

RS

- Examine for bi basal crepitations – heart failure
- Exclude any respiratory pathology – especially a pneumothorax

Abdomen

- Palpate the abdomen – especially in the epigastrium and right hypochondrium for tenderness

Discussion

What is your diagnosis?

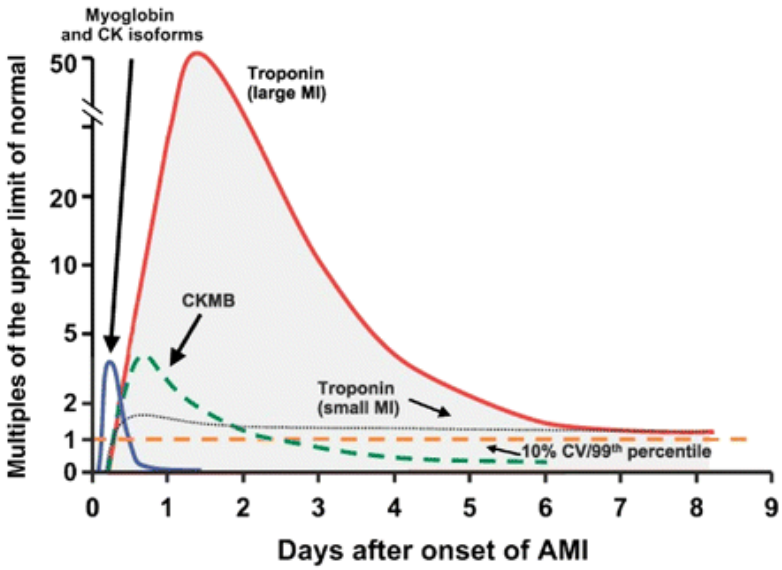
Discuss this question based on the following points

Condition	History	Examination
MI	• Acute onset central chest pain, Tightening in nature • Radiating along the left arm and to the jaw • Lasts for more than 30 minutes • Associated with autonomic symptoms such as sweating • Not relived by rest or GTN. • Risk factors +	Peripheral stigmata of hypercholesterolemia **Evidence of complications** Heart failure MR due to papillary muscle rupture Pericarditis
UA	• Similar to the above but duration may be less	
Aortic dissection	• Sudden onset tearing chest pain radiating to the interscapular region. • Pain is usually maximal at the onset • Risk factors – HT, Marfan syndrome	HT, hypotension, unequal pulses/ absent pulses, AR
Acute percarditis	• Central chest pain • Referred to neck arm or left shoulder • Increased with inspiration and lying supine • Decreased on bending forwards	Pericardial friction rub, look out for cardiac tamponade if there is subsequent effusion.
PE	• Associated SOB and hemoptysis • Pleuritic type chest pain • Risk factors for DVT	Signs of RHF, pleural rub
Pneumothorax	• Usually causes peripheral chest pain	Mediastinal shift Reduced breath sounds with hyper resonant percussion note in the hemithorax
Oesophageal pain	• Past history of dyspeptic symptoms	
Peptic ulcer disease	• Past history of dyspeptic symptoms, acute abdominal pain, hematemesis and malaena	Epigastric tenderness, features of peritonitis if perforated peptic ulcer
Acute pancreatitis	• Associated epigastric pain radiating through the back, relieved with the patient bending forwards	Epigastric tenderness

How would you manage a patient who presents with acute chest pain to the casualty ward?

- Admit the patient
- Give a bed close to the nurses' station
- Check A, B, C and correct as necessary. Administer oxygen
- Connect to a cardiac monitor if available
- After initial resuscitation take a quick history and do a targeted clinical examination with 3 objectives in mind
    - Exclude differential diagnosis
    - Look for associated complications
    - Co morbidities which will directly affect the management
- Look for complications
    - Cardiac failure
    - Arrhythmias
- After making a clinical diagnosis of MI based on the history and examination it is important to proceed with investigations
- Blood – FBC, SE, BU, SC, lipid profile, cardiac biomarkers, blood sugar

Cardiac biomarker table



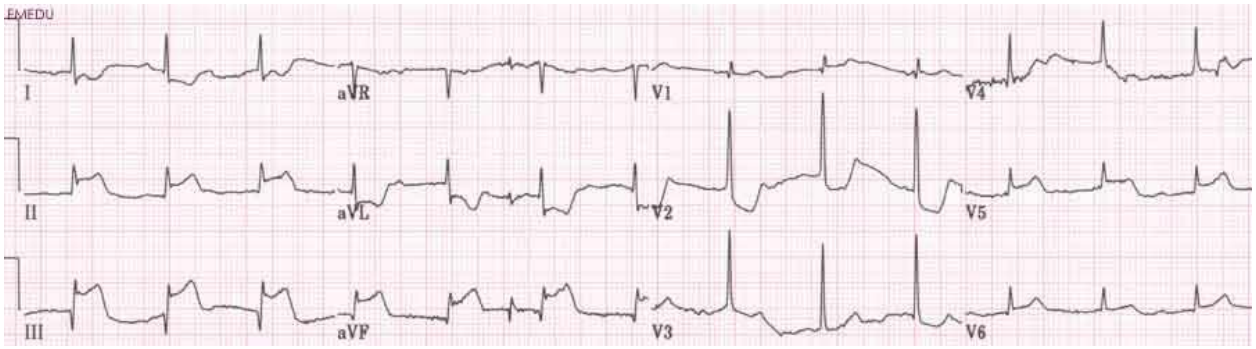
- Arrange for an inward 12 lead ECG and inward CXR if suspecting cardiac failure
- Interpret the ECG
  ST elevations – STEMI
  No ST elevations but ST depressions and T inversions – Unstable angina or NSTEMI

What are the ECG changes associated with a STEMI?

Time	Changes
Hyperacute (0-20 min)	Tall peaking T waves and progressive ST elevations
Acute (min – hours)	ST elevations
Early (hours – days)	ST elevations disappear and Q waves appear
Indeterminate (days – weeks)	Q waves and T inversions
Old	Persistence of ST elevations

Discuss the management of a STEMI

- Commence drug therapy – Aspirin 300mg oral (chewed), clopidogrel 300mg, morphine 2.5-5mg IV and metaclopramide 10mg IV. Consider administering nitrates after exclusion of hypotension.
- Commence strategies to limit infarct size
    - Beta blockers (CI in patients with HR<60, SBP <100, conduction defects and history of asthma
    - ACEI
    - Statin
    - Reperfusion
    - Heparin (LMWH)
- Reperfusion is available as 2 options. One is drug based thrombolysis and the other is percutaneous coronary intervention (PCI). However PCI is not routinely available in the government sector in SL.
- The decision for thrombolysis is made based on the clinical history and the ECG findings.



What are the indications for thrombolysis?

- Within 12 hours of onset of pain
- ECG evidence of ST elevation
- New onset LBBB

If the decision is made to use thrombolysis the CI should be excluded

Absolute contraindications for thrombolysis

- Past history of a hemorrhagic stroke
- Past history of an ischaemic stroke within the last 6 months
- Intracranial tumor
- Aortic dissection
- Active internal bleeding within the last 2 weeks

Compare thrombolysis to primary PCI in the management of acute STEMI

- In Sri Lanka primary PCI facilities are extremely limited and most patients will receive thrombolysis

- However PCI should be considered in patients who have contraindications for thrombolysis or have STEMI complicated with cardiogenic shock

How would you assess the response to thrombolysis?

- Relief of pain
- Restoration of hemodynamic stability
- Reduction of ST elevations by 50% in 60-90 minutes following administration (Remember that persistent ST elevations could indicate a left ventricular aneurysm)

As a house officer how would you manage this patient in the ward?

- Ask how the patient feels and establish the symptoms
- Examine the patient to look for complications (see below)
- Order the necessary investigations
- Look in to the management – look at the drugs the patient is receiving
  Antiplatelet drugs – Aspirin and clopidogrel (now on maintenance doses)
  Nitrates - ISDN
  Beta blockers
  ACEI
  Statins
- Initiate or modify the management of co morbidities – DM, hypertension
- Look into the risk factors and start a program of cardiac rehabilitation and risk factor modification

What are the complications of an acute STEMI? State the principles of management

Timing	Complication	Management
Early	Arrhythmias	VF – Immediate cardioversion Manage other arrhythmias
	Heart block	Use atropine Consider temporary cardiac pacing
	Heart failure and cardiogenic shock	Manage heart failure Use inotropes in the management of cardiogenic shock
	Post infarction angina	Increase the dose of the anti anginal drugs. Consider coronary angiography
	Acute pericarditis	Usually no treatment required
	Acute MR	Refer for surgical repair
Intermediate and late	VSD	
	Dressler's syndrome	

What are the principles of management of the patient prior to discharge?

- Counsel the patient regarding lifestyle modifications
- Discuss the management of stress
- Perform a risk stratification and plan for further investigations
  Echocardiography to assess the left ventricular function
  Plan stress testing if required by the consultant
  Coronary angiography
- Discharge medications
- Cardiac rehabilitation and reintegration to the patient's day to day activities

Further topics of discussion

Discuss the principles of management of a patient with UA/NSTEMI

- The initial management of the patient should take place as described above
- Diagnosis is based on the ECG and cardiac biomarkers
  Patients with unstable angina/NSTEMI present with acute chest pain
  ECG may show ST depressions and T inversions
  Cardiac biomarkers are positive in NSTEMI and negative in UA
- Heparin should be administered in these patients – LMWH
- There is no place for the use of thrombolytics in patients with UA/NSTEMI
- Other principles of management are the same as in STEMI

Discuss the principles of management of a patient with stable angina

- Lifestyle modifications
- Medication
  Anti anginal drugs

Class and mechanism of action	Drugs	Side effects
Nitrates Relaxation of vascular smooth muscle causing venodilation, arteriolar dilation and coronary artery dilation	GTN (Sub lingual) ISDN (oral)	Headache, flushing and postural hypotension
Beta blockers Reduction of heart rate and myocardial contractility	Atenolol Bisoprolol Metoprolol	Bradycardia, conduction abnormalities, bronchoconstriction, worsening of peripheral vascular disease, impotence
Calcium channel blockers Vasodilatation, conduction block, reduced myocardial contractility	Dihydropyridine Nifedipine Non dihydropyridine Verapamil, diltiazem	**Non dihydropyridine** Edema, bradycardia, constipation (verapamil) **Dihydropyridine** Edema, tachycardia

- Nitrates and beta blockers are the 1st line drugs used. If there is poor response add on therapy with a beta blocker is recommended
- Other drugs – start the patient on low dose aspirin if not contraindicated
- Perform risk stratification – Stress testing
- Consider coronary angiography in high risk patients and in patients with angina not responding to optimal medical management
- Manage other co morbidities

Hypertension

History

Presenting complaint

- Remember that hypertension is usually a secondary problem in another long case

History of the presenting complaint

When and how was the diagnosis made?

- Describe when the diagnosis was made and how – The initial presentation, investigations and other special features

Evidence of a secondary cause for the hypertension

Category	Disease	Specific questions
Renal	Renal disease	Past history of renal disease Childhood history suggestive of glomerulonephritis – hematuria with associated edema
Endocrine and metabolic	Phaeochromocytoma	Episodic headache, sweating and palpitations
	Primary hyperaldosteronism (Conn syndrome)	Associated proximal muscle weakness (difficulty in walking stairs, getting up from the seated position)
	Cushing syndrome	(Mostly from the examination)
	Thyroid disease	Ask a few questions for hyper and hypothyroidism
Cardiovascular	Coarctation of the aorta	(Mostly on examination but some patients present with intermittent claudication)
Drugs		Ask for history of OCP use

Establish associated cardiovascular comorbidities

- Ask for associated diabetes mellitus, hyperlipidaemia, smoking, family history of hypertension and other cardiovascular disease

Complications of hypertension

Category	Disease	Specific questions
Cardiovascular	IHD	Ask for past history of ischaemic heart disease
	Heart failure	Ask for exertional dyspnoea,

	Peripheral vascular disease	orthopnoea and paroxysmal nocturnal dyspnoea and oedema Intermittent claudication, rest pain, ulcers
Nervous system	Stroke	Ask for past history of stoke
Renal disease		History of recent onset symptoms of uremia
Hypertensive emergencies		Previous hospital admissions with elevated blood pressure

Management and follow up

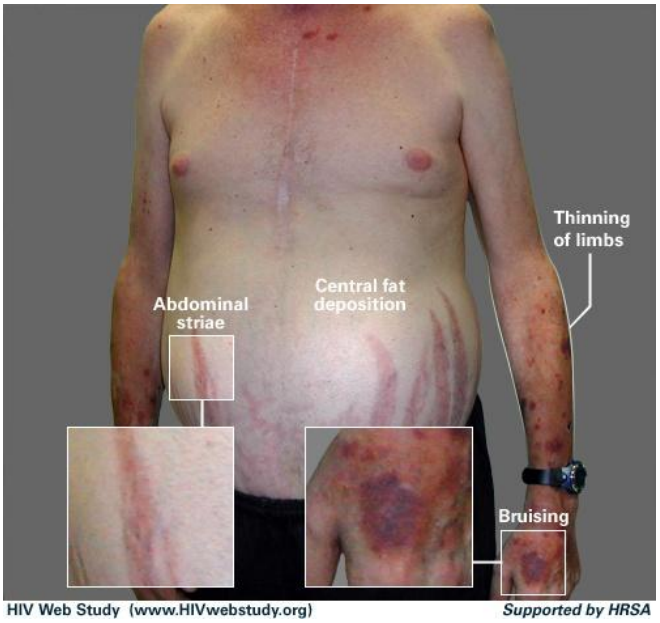
- Give a detailed chronological description of how the disease has progressed up to now. Include the following
- Education and lifestyle modifications
- Drugs and side effects
- Compliance to the medication
- Follow up – Does the patient attend the follow up?

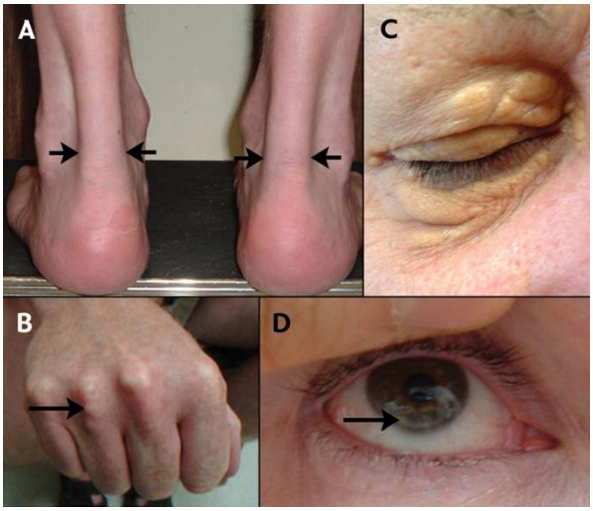
Examination

Objective is to measure blood pressure, look for evidence suggesting secondary causes of hypertension and assess the complications

General examination

- Measure the BMI and waist circumference of the patient
- Look for features suggestive of Cushing syndrome
- Look for peripheral stigmata of hyperlipidaemia
- Ankle edema





Cardiovascular system

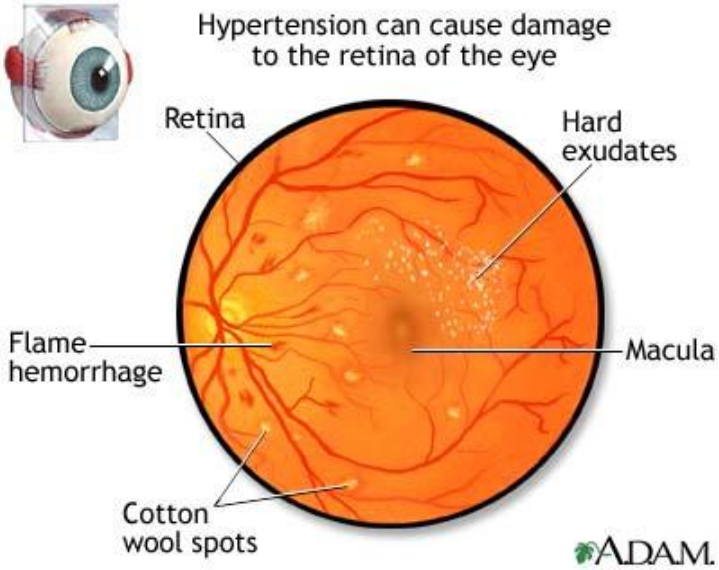
- Measure the blood pressure
- Examine the pulse for any abnormalities of rhythm
- Look for radio-radial or radio- femoral delay (Coarctation of the aorta)
- Look for evidence suggestive of heart failure – Dilated heart, added heart sounds, bibasal crepitations

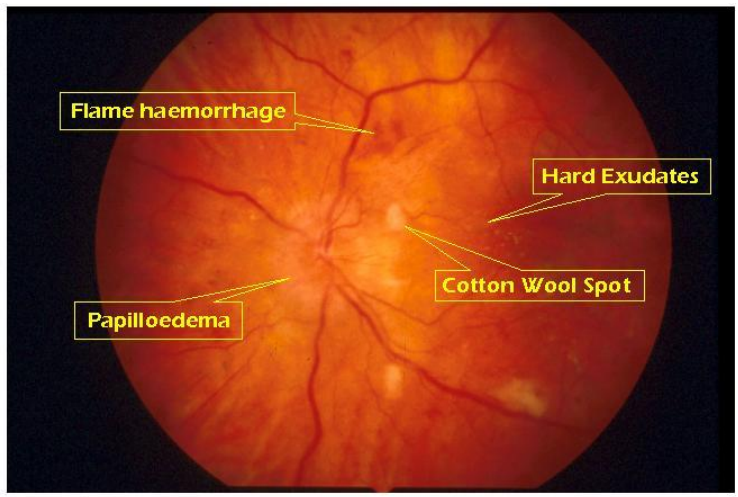
Abdomen

- Palpate for renal masses
- Auscultate for renal bruits

Nervous system

- Examine the fundus for features of hypertensive retinopathy





- Look for focal neurological signs

Discussion

How would you classify the level of hypertension in this patient?

Remember that the diagnostic levels of hypertension may change according to the guidelines or clinical recommendation

Category	Systolic	Diastolic
Normal	<120	<80
Pre – hypertension	120 – 139	80-89
Grade 1 hypertension (mild)	140 – 159	90 – 99
Grade 2 hypertension (moderate)	160 – 179	100 – 109
Grade 3 hypertension (severe)	More than or equal to 180	More than or equal to 110
Isolated systolic hypertension	More than or equal to 140	<90

What are the investigations you would perform in this patient?

Investigations should be performed to

- Assess co morbidities that increase the cardiovascular risk
- Assess complications of hypertension (target organ damage)
- Look for a secondary cause for hypertension (this should be guided on the history and examination)

Co morbidities

- Fasting blood sugar
- Lipid profile

Target organ damage

System	Investigation
Cardiovascular	ECG – Evidence of left ventricular hypertrophy, atrial fibrillation Echocardiogram if necessary
Renal	Blood urea, serum electrolytes, UFR USS of the abdomen

Secondary causes of hypertension

Category	Disease	Investigations
Renal	Renal disease	USS of the abdomen, renal function tests Renal angiogram if there is suspicion of renal artery stenosis
Endocrine and metabolic	Phaeochromocytoma	Urinary VMA levels, CT scan abdomen
	Primary hyperaldosteronism (Conn syndrome)	Serum electrolytes – Hypokalemia Plasma renin activity - decreased
	Cushing syndrome	Dexamethasone suppression test
	Thyroid disease	Thyroid function tests
Cardiovascular	Coarctation of the aorta	Echocardiogram

What are the basic aspects of management in a patient with hypertension?

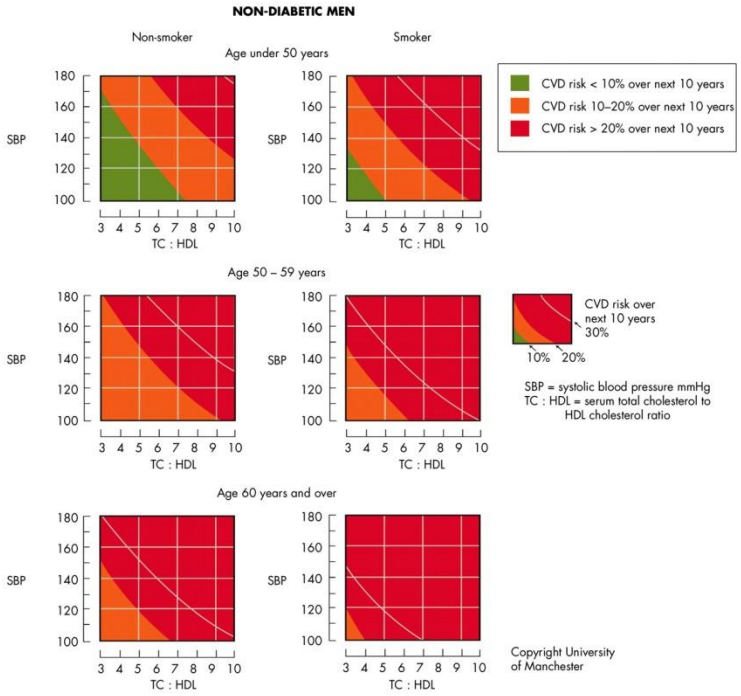
The basic aspects of management in a patient with hypertension are,

- Lifestyle modifications
- Antihypertensive therapy

- Management of associated co morbidities

Discuss the initial management of a patient with hypertension

- Confirm the elevated blood pressure and do the initial investigations
- Assess the cardiovascular risk using a chart



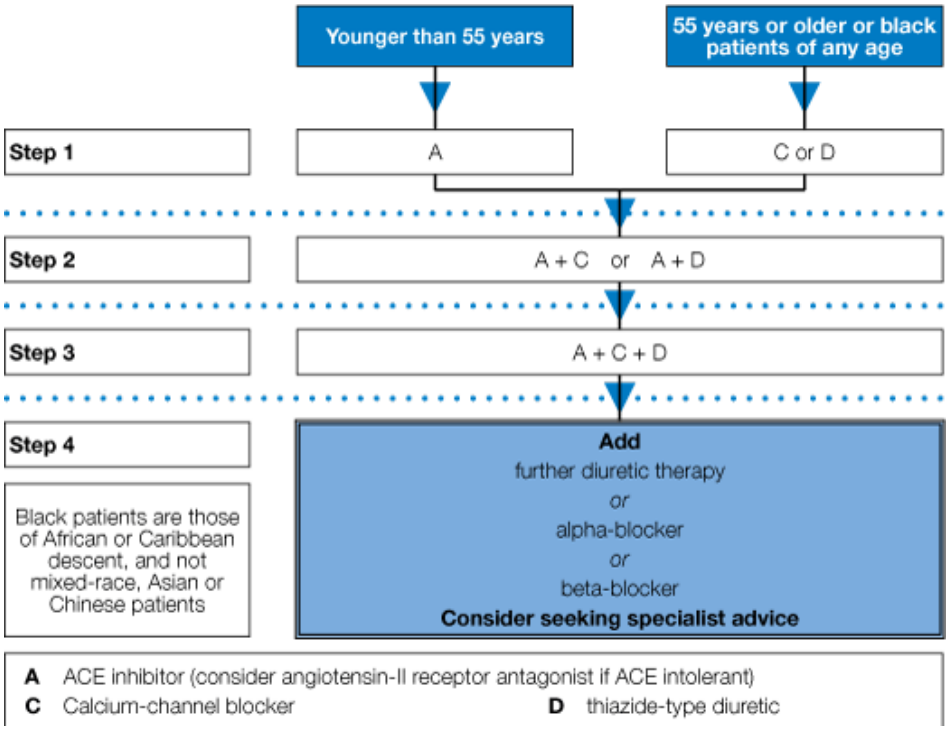
- Decide on the mode of management
- Commence lifestyle modifications
  Cessation of smoking
  Weight reduction
  Increase physical activity
  Dietary modifications – Reduction of salt intake, reduce intake of cholesterol and saturated fat

What are the indications to start anti hypertensives in this patient?

Antihypertensives should be started in patients with

- **BP > 160/100**
- **Isolated systolic BP > 160**
- **BP > 140/90 and 10 year cardiovascular risk of at least 20% or existing cardiovascular disease or target organ damage**

What antihypertensives would you select in this patient?



Discuss the characteristics of the various classes of antihypertensives

Note that even though drugs may be selected based on the above guideline there are some drugs which may have compelling indications. This means that the drug may be preferred in the presence of other diseases

Class of drug	Compelling indications	Side effects	Contraindications
ACE inhibitors	• Heart failure • Post MI • Left ventricular dysfunction • Diabetic nephropathy • Secondary prevention of stroke	• Dry cough • 1st dose hypotension • Postural hypotension • Electrolyte imbalances – hyperkalemia • Angioedema	• Pregnancy • Renovascular disease
Angiotensin II receptor blockers	• ACE inhibitor intolerance • Similar to the above	• Postural hypotension	• Pregnancy
Beta blockers	• MI, angina		• Asthma • COPD • Heart block • Use with caution in patients with DM and peripheral vascular disease
Calcium channel blockers	• Angina • Older patients	• **Non dihydropyridine** Edema, bradycardia, constipation (verapamil) • **Dihydropyridine** Edema, tachycardia	• Be cautious when using CCB (non dihydropridine) in patients with heart block
Diuretics	• Older patients		• Gout
Alpha blockers	• Benign prostatic hyperplasia	• 1st dose hypotension	• Urinary incontinence

How would you follow up this patient?

- Follow up the patient in the clinic
- Recommended blood pressure target is a blood pressure <140/90. However in patients with diabetes the target is lower – 130/80

- Assess causes for poor control – non compliance of the patient, overlooked secondary hypertension

The patient presents to the medical casualty ward with a blood pressure of 200/120 mmHg. Discuss the subsequent management

- Admit the patient
- Assess for evidence of target organ damage using the history, examination and investigations
  Assess for
  Disk oedema
  Aortic dissection
  Acute left ventricular failure
  Acute renal failure
  ICH

- Classify the patient in to the following categories

Category	Definition	Management
Hypertensive emergency	Severe hypertension with evidence of new or progressive target organ damage	**Reduction of MAP by 25% or DBP to 100 -110 mmHg within 1-2 hours** **IV antihypertensives** Sodium nitroprusside GTN Labetalol
Hypertensive urgency	Severe hypertension without evidence of new or progressive target organ damage	**Reduction in MAP by 25% within hours to a day** **Oral antihypertensives**

- Identify the cause for the event

Diabetes mellitus

History

Presenting complaint

- Remember that diabetes mellitus is usually a secondary problem in another long case

History of the presenting complaint

When and how was the diagnosis made?

- Describe when the diagnosis was made and how it was confirmed. Describe if the patient had any presenting symptoms – polyuria, nocturia, polydipsia
- However the patient will usually be asymptomatic at the time of diagnosis
- State the investigations which were done at the time of diagnosis

Describe the initial management

- Describe the advice given to the patient at the time of diagnosis – regarding the disease, complications and follow up
- Describe the initial pharmacological management

Description of the chronological order of events

- Describe the chronological order of events up to the present state. Use a time line to summarize
- Include the following

Treatment and medication

- Describe the change in the treatment of diabetes over time
- Include the side effects of the medication
- Describe the compliance to medication
- Special points should be stated regarding the use of insulin if the patient is on insulin
  Where does the patient get his/her insulin?
  Question the patient regarding the injection method of insulin. Describe this and state any inadequacies
  What is the type of insulin injection device that the patient uses?
  Describe the storage of insulin
  Does the patient know how to identify expired insulin?

Follow up of the patient

- Describe the place and frequency of follow up of the patient
- State when the following screening investigations have been done

Category	Investigations
Diabetes control	FBS, PPBS, HbA1C
Macrovascular complications and risk factors	Lipid profile

Microvascular complications	UFR, Microalbuminuria Eye referral

Complications of diabetes

Category	Complication	Specific questions in the history
Macrovascular complications	**CVS**	
	Coronary artery disease	Ask for past history of MI, IHD Present symptoms of angina
	Peripheral vascular disease	History of intermittent claudication, rest pain
	CNS	
	Stroke and TIA	Ask for past history of stroke/ TIA
Microvascular complications	**Diabetic nephropathy**	Ask for passage of frothy urine, recent onset uremic symptoms Previous diagnosis of renal impairment
	Diabetic retinopathy	Ask for history of visual impairment
	Diabetic neuropathy	**Sensory polyneuropathy** Ask for parasthesia in the feet, lower limb pain aggravated during the night, burning sensation of the lower limbs and associated numbness **Diabetic amyotrophy** Ask for pain in the anterior aspect of the thigh **Mononeuropathy** Past history of diplopia and ptosis **Autonomic neuropathy** Postural dizziness, nocturnal diarrhoea, LUTS, erectile dysfunction, gustatory sweating
Other	**Foot complications**	Ask for history of foot ulcers, amputations
	Recurrent infections	Ask for history of recurrent infections
Acute complications	**Hypoglycaemic and hyperglycaemic emergencies**	Ask for history of previous hospital admissions with diabetic emergencies State the episodes of hypoglycaemia and the symptoms experienced by the patient

Present state of the patient and involvement of the patient in the management

- Describe the present state of the patient's disease. The following aspects are important
  Present state of glycaemic control
  Complications
  Adherence of the patient to the recommended lifestyle modifications

Associated co morbidities and cardiovascular risk factors

- Hypertension
- Smoking
- Family history of cardiovascular disease

Examination

The following gives a description of the important examination points in a diabetic patient

General examination

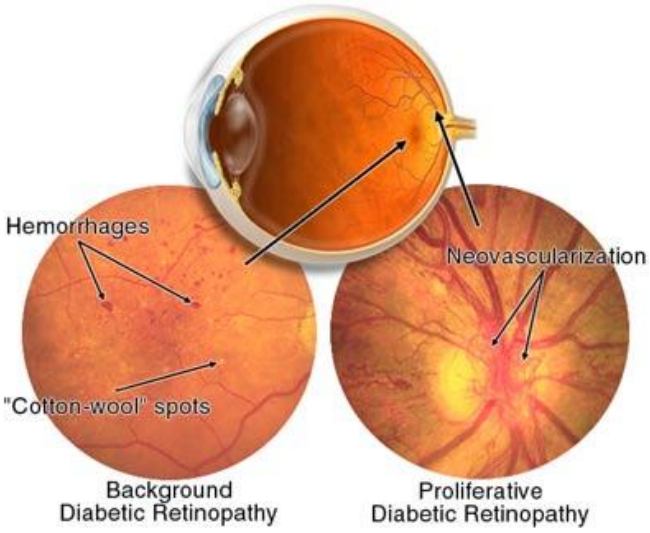
Perform a head to toe examination

Measure the BMI and waist circumference of the patient

Blood pressure

Eyes

- Examine the visual acuity
- Look for opacification of the ocular lens – use the ophthalmoscope to examine the red reflex
- Examine the fundus to look for evidence of diabetic retinopathy



Hands

- Look for muscle wasting
- Carpal tunnel syndrome
- Trigger finger
- Diabetic cheiroarthropathy – limited joint mobility causing painless stiffness in the hands. Elicit the prayer sign

Examine insulin injection sites

Feet

Inspection

- Ulcers
- Callus formation
- Skin lesions – Necrobiosis lipoidica

- Charcot's joints

Circulation

Sensation

Reflexes

Discussion

What are the features of differentiation between type 1 and type 2 diabetes?

	Type 1	Type 2
Age of onset	Childhood and adolescence	Above 50 years
Presentation	Classical symptoms of diabetes Diabetic ketoacidosis	Usually an incidental finding
Complications at diagnosis	No	Present in 25%
Family history of diabetes	Uncommon	Common
Other associated autoimmune diseases	Common	Uncommon

How would you diagnose diabetes mellitus?

The current recommendations for diagnosis is based on the WHO diagnostic criteria

- Fasting plasma glucose > 7mmol/l (126mg/dl)
- Random plasma glucose > 11.1mmol/l (200mg/dl)
- One laboratory value is diagnostic in symptomatic individuals; two values are needed in asymptomatic individuals
- The glucose tolerance test is required in borderline individuals

What are the principles of management in a patient with type 2 diabetes mellitus?

- Patient education
- Dietary modifications
- Other lifestyle modifications
- Drug therapy
  Oral hypoglycaemic drugs

Insulin

- Follow up
- Screening for complications
- Management of complications

What are the important aspects of patient education in a patient with diabetes?

- Educate about the disease – pathophysiology in extremely simple terms
- Discuss the dietary and life style modifications
- Educate on the complications of diabetes and their prevention – especially on proper foot care
- Discuss the important aspects of the management and the importance of compliance to treatment
- Discuss with the patient on insulin therapy
- Follow up

Discuss the important dietary recommendations and lifestyle modifications in a patient with type 2 diabetes?

General recommendations

- Take regular meals to avoid drug related hypoglycaemia
- Reduce the portion size of the meal

Carbohydrates

- Should account for 45%-60% of the total caloric requirement
- Avoid taking refined sugar based products – sweets, ice cream
- Avoid adding sugar to drinks (i.e. tea) as much as possible
- Try to take more complex carbohydrates – with a high fiber content
- Eat a lot of fruits and vegetables

Fat

- Should account for less than 35% of the total caloric intake
- Reduce saturated fat (mostly in red meat) as much as possible
- Avoid trans fat – mostly in fast foods
- Try to consume unsaturated fat, especially monounsaturated – vegetable oil and oily fish

Normal protein diet

Lifestyle

Exercise

- Ask the patient to commence an exercise regimen involving 30-60 minutes of moderately strenuous physical activity at least on 5 days of the week

Manage stress

Discuss the initial pharmacological management of a patient with diabetes

- The latest recommendations state that after diagnosis of a patient with diabetes the patient should be started on an oral hypoglcaemic drug (preferably metformin) concurrently with the above dietary and lifestyle modifications
- If the patient does not respond to the initial therapy combination therapy can be started (see below)

Discuss the characteristics of the commonly used oral hypoglycaemic drugs

Drug class and mechanism	Examples	Adverse effects
Biguanides Increases peripheral sensitivity to insulin	Metformin	Risk of lactic acidosis Contraindicated in patients with major organ failure
Sulphonylureas Stimulates the release of insulin from the pancreas	Tolbutamide (short acting) Glicazide Glipizide Glibenclamide Glimipiride(long acting)	Weight gain Hypoglycaemia (risk high with glibenclamide)
Thiazolidinediones Enhance the peripheral action of insulin	Pioglitazone Rosiglitazone	Hepatotoxicity Water retention and aggravation of cardiac failure
Alpha glucosidase inhibitors Delay absorption of carbohydrates in the gut	Acarbose	Flatulence, bloating and diarrhoea

What are the other aspects of initial assessment of the patient?

- The other important aspect is to assess the patient for complications. The following should be done

Category	Investigations
Diabetes control	FBS, PPBS, HbA1C
Macrovascular complications and risk factors	Lipid profile
Microvascular complications	UFR, Microalbuminuria Eye referral
Foot complications	Examine the feet

How will you follow up this patient?

- See the patient in the clinic
- Weight and BMI
- Assess the glycaemic control of the patient
- The options for this are
  Self monitoring of blood glucose
  FBS - gives only a point estimation of the blood glucose
  HbA1c – Gives an estimation of the glycaemic control over the preceding 6-8 weeks
- Assess for complications
  History and examination (see history and examination above)
  Investigations
  Lipid profile, UFR, microalbuminuria
- Assess the drug therapy and compliance
- Assess for the complications of medication
- Compare with the following management targets

Parameter	Target
Blood pressure	<130/80
FBS	Between 90 and 130 (Ideal around 100)
HbA1c	< 7%
Total cholesterol (mmol/l)	< 4
LDL cholesterol (mmol/l)	< 2

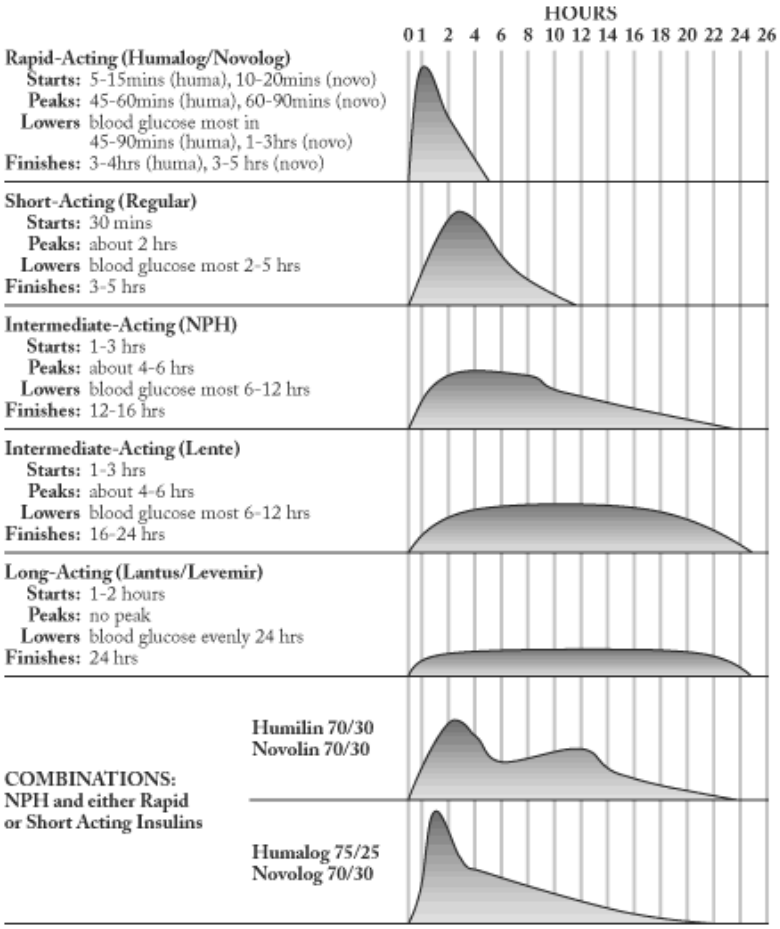
When will you consider the addition/ modification of therapy in patients with diabetes mellitus?

- The recommendations vary but generally the patient should be considered when there is failure to achieve good glycaemic control (HbA1c < 7%) after about 3 months of therapy
- Remember that before adding or altering medications always assess the compliance of the patient with the drugs and the adherence to the dietary and lifestyle modifications
- The options are to add a second oral hypoglycaemic drug (sulphonylurea)
- Insulin therapy should be considered if the HbA1c is extremely high or is there is poor response to treatment with combination therapy of oral hypoglycaemic drugs

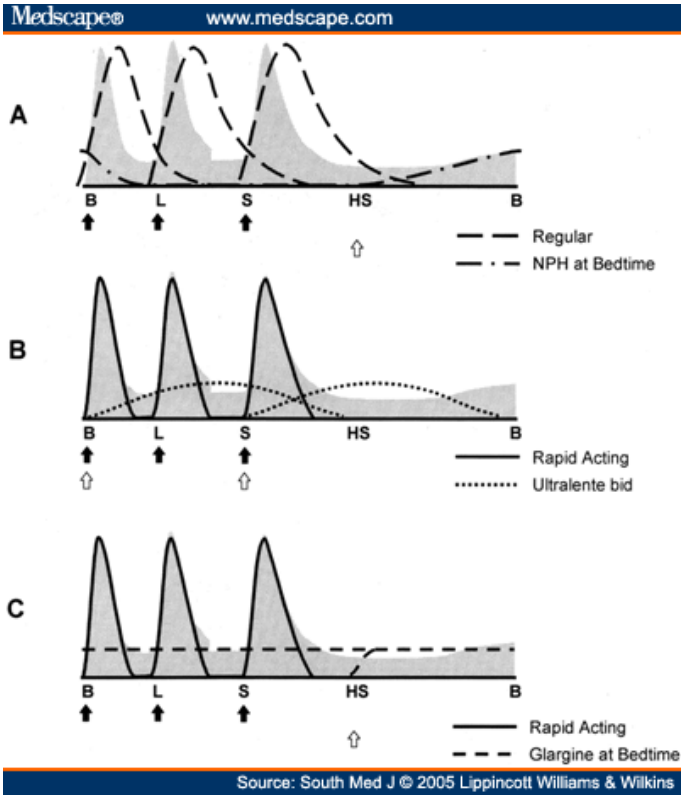
How would you start insulin therapy in patient with type 2 diabetes?

- This should be initiated following consultation with a senior physician
- Start at a low dose and adjust the insulin dose based on the FBS and PPBS values
- Insulin can be started as concurrent therapy with oral hypoglycaemic drugs

Describe the various types of insulin available and their basic properties



Insulin regimens



What is the advice you would give a patient on insulin therapy?

- Reinforce the previous education
- Tell the patient the reason for starting insulin
- Advise on where to obtain insulin and the insulin injection devices
- The most commonly used device will be a plain syringe – this has a 29G needle and should be calibrated up to 100U of insulin
- Storage of insulin – in the refrigerator (middle compartment)
- Before injection have a wash. Check the injection bottle (regular insulin is colourless and all other preparations are turbid)
- Gently roll the bottle on your palms
- Do not use surgical spirit to clean the area
- Demonstrate the technique of injection
- Tell the patient to inject on slightly different places in the same site and rotation of the sites
- Syringes can be reused if the same person is using it. Dispose sharps into a sharps bin
- Have your meals to avoid hypoglycaemia
- Educate the patient on the complications of insulin therapy

What are the principles of management of complications of diabetes?

- **Prevention is better than cure**
- **Microvascular complications can be prevented by strict glycaemic control**
- **Glycaemic control as well as control of other risk factors is important in the prevention of macrovascular complications**

Complication	Principles of management
Retinopathy	**Screening** Arrange for an eye referral annually **Non proliferative retinopathy** Glycaemic control and risk factor modification Regular screening **Maculopathy** Refer to a specialist as can be sight threatening

	Proliferative retinopathy Retinal photocoagulation
Nephropathy	**Screening** UFR and microalbuminuria at least once a year **Established disease** Aggressive reduction of blood pressure Commence therapy with ACE inhibitors Improve glycaemic control
Neuropathy	**Management of painful neuropathy** Strict glycaemic control Anticonvulsants – Gabapentin, cabamezapine TCA Opioids **Postural hypotension** Fludrocortisone **GI** **Gastroparesis** Dopamine antagonists Loperamide for diarrhoea **Erectile dysfunction** Sildenafil

Discuss the management of the diabetic foot

Patient education

Prevention is better than cure

- Avoid walking barefoot
- Use proper well fitting shoes
- Inspect the feet every day
- Wash your feet every day and moisturize the skin if it is dry
- Cut toenails regularly

Discuss the principles of management of DKA

Diagnosis

- The patient will present with poyuria, poydipsia and abdominal pain
- Kussmaul's breathing is characteristic
- Perform a CBS, urinanalysis for ketones and ABG which will show a metabolic acidosis
- Screen for an infection

Initial management

- Admit the patient
- Establish IV access
- Start resuscitation with IV fluids – initially 0.9% saline
  Should be changed to 5% dextrose when the blood glucose drops below 250mg/dl
  Add potassium to subsequent fluid bags
- Insulin therapy – via infusion pump at a rate of 0.1u/kg/h with regular monitoring of CBS
- Titrate the dose of insulin based on the CBS
- Look for a cause and treat

Shortness of breath

History

Presenting complaint

- The patient will present with shortness of breath which is progressing over time
- State the duration of the symptoms

History of the presenting complaint

- Describe the onset and progression of the symptom
- Classify the degree of dyspnoea based on the NYHA classification of dyspnoea
- Think of the differential diagnosis and ask specific questions
- Describe what has happened to the patient over time

Disease category	Disease	Specific points in the history
Cardiovascular disease	Heart failure	Ask for associated orthopnoea and paroxysmal nocturnal dyspnoea Abdominal swelling and ankle swelling **Non specific systemic symptoms** loss of appetite and loss of weight, malaise and easy fatigue **Ask for a possible aetiology** Past history of ischaemic heart disease, MI Past history of valvular or congenital heart disease Family history of cardiomyopathy
Respiratory disease	COPD	Ask for a history of smoking, chronic cough with sputum, history of recurrent exacerbations
	Bronchial asthma	Intermittent symptoms with diurnal variation, triggering factors Family history of atopy and asthma
	Diffuse parenchymal lung disease	Ask for occupational exposures Drugs known to cause lung disease (amiodarone, chemotherapeutic agents) Ask for history suggestive of connective tissue diseases (SLE, rheumatoid arthritis, scleroderma) – joint pain, skin rashes, low grade fever, dry eyes

	Pleural effusion (secondary to TB or bronchial carcinoma)	Ask for history of chronic cough and hemoptysis, past history of TB, contact history of TB
Hematological disease	Anaemia and pancytopenia	Malaise, easy fatigue, site of bleeding (See the long case on anaemia)

Complete the other components of the history

Social history

- Get a detailed account of the household and occupational environment if you suspect bronchial asthma

Examination

General examination

- Get a general impression of the patient
- Cachexia (chronic heart failure, malignancy)
- Examine the skin for any vasculitic rashes (SLE)
- Look for pallor (anaemia)
- Icterus (cardiac cirrhosis in long standing heart failure)
- Cyanosis
- Examine the hands for features of rheumatoid arthritis or scleroderma
- Clubbing (diffuse parenchymal lung disease)
- Ankle oedema

Cardiovascular system

- Pulse examination
  Look for pulsus alternans in severe heart failure
  Arrhythmias
- JVP – elevated in congestive cardiac failure
- Blood pressure
- Palpate for a shifted apex (cardiac failure), palpable P2 in cor pulmonale
- Auscultate for murmurs
- Look for fine basal crepts in the lower zones of the lungs (cardiac failure)

Respiratory system

- Examine for the following
- COPD – features of hyperinflation
- Pleural effusion
- Pulmonary fibrosis

Abdomen

- Look for a tender pulsatile liver (cardiac failure)
- Ascites (cardiac failure)

Nervous system

- Do a quick examination

Discussion

What is your diagnosis?

Use the following table to discuss this question

History	Examination	Diagnosis
SOB Orthopnoea, PND, edema Possible aetiology present	Cachexia Edema (Arrhythmias) Displaced apex Functional MR/TR Fine basal crepts in the lung Tender pulsatile liver Ascites	Congestive cardiac failure
SOB Strong history of cigarette smoking, chronic cough with productive sputum	Cyanosis Hyperinflated chest Diffuse crepts and ronchi **Features of cor pulmonale** Loud P2 Ankle edema	Chronic obstructive airway disease
SOB Connective tissue disease Occupational exposure	Clubbing Features of localized fibrosis Bilateral fine basal crepts	Diffuse parenchymal lung disease

What are the initial investigations you would like to perform in this patient?

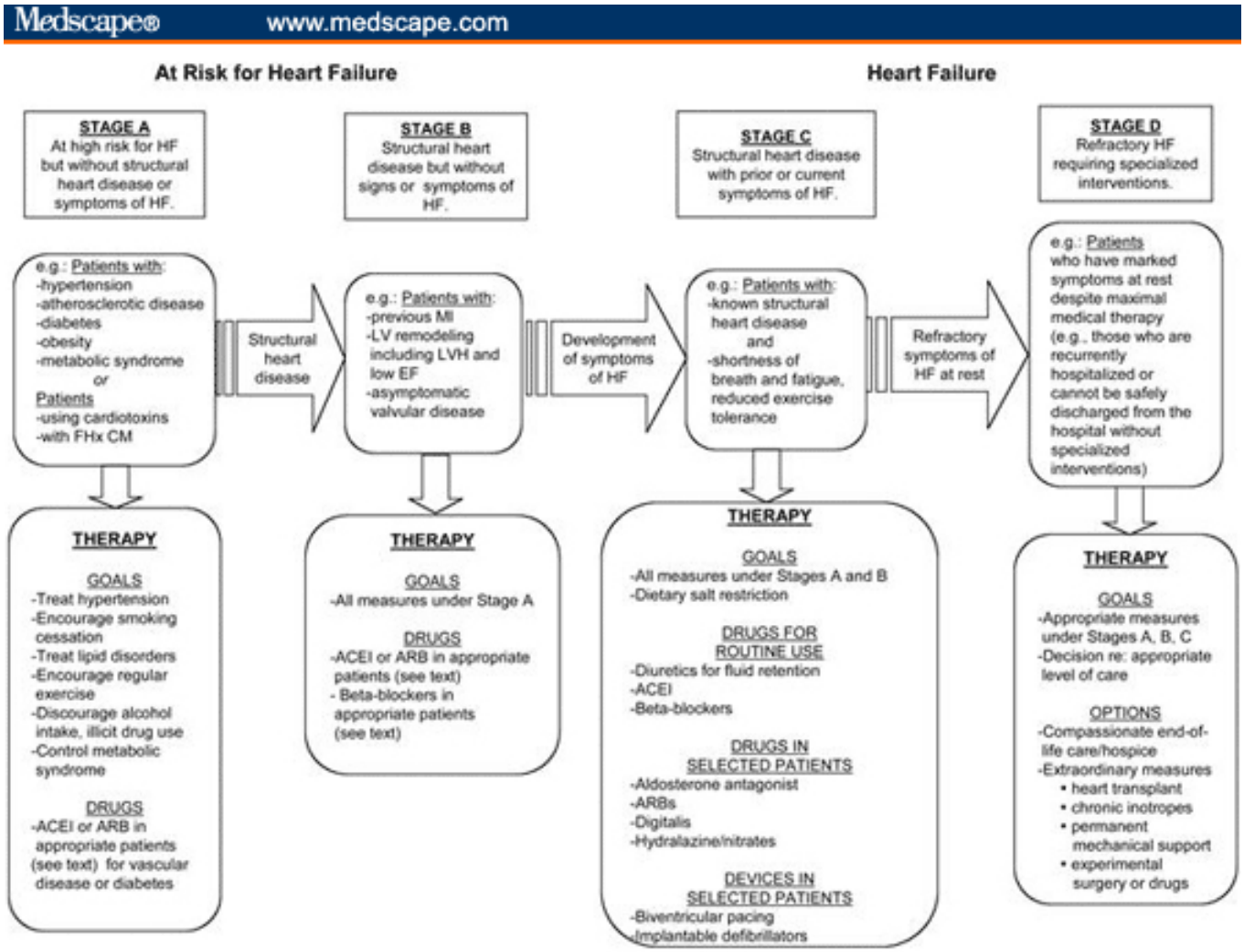
- FBC – to look for anaemia
- CXR
  Look for a respiratory pathology
  Look for evidence of cardiac failure
- ECG
  Several arrhythmias are known to be associated with heart failure
- Echocardiogram
  Assess the ejection fraction
  End systolic and end diastolic diameter
  Associated valvular abnormalities
- Lung function tests if the diagnosis is unclear to look for obstructive or restrictive pulmonary disease
- Other blood investigations

Renal functions
Serum electrolytes
BNP

Heart failure

What are the principles of management in a patient with heart failure?

The principles of management of heart failure can be summarized as follows



Discuss the pharmacological management of cardiac failure

The following drugs are used in the management

Class	Drugs	Side effects	Special points
Diuretics	Frusemide	Postural hypotension **Metabolic disturbances** Hyperglycaemia Hyperuricaemia Hypokalemia Hyponatremia **Other** Urinary retention	Check renal function and electrolyte imbalances prior to commencement of therapy Start at a low dose and monitor the weight
ACEI	Captopril Enalapril	Dry cough 1st dose hypotension Postural hypotension Electrolyte imbalances – hyperkalemia Angioedema	Are 1st line drugs in the management of heart failure 1st dose should be given as a low dose before the patient sleeps Do renal functions and SE before commencing **Contraindications** Significant renal dysfunction Hyperkalemia Bilateral renal artery stenosis Severe aortic stenosis
Angiotensin II receptor blockers	Losartan		Are used when the patient cannot tolerate ACEI
Beta blockers	Bisoprolol Metoprolol	Bradycardia, conduction abnormalities, bronchoconstriction, worsening of peripheral vascular disease, impotence	Is contraindicated in patients with asthma, significant heart block
Aldosterone antagonists	Spiranolactone	Painful gynaecomastia Hyperkalemia	Take care when using as combination therapy
Cardiac glycosides	Digoxin	Heart block Pre excitation syndromes	May be considered as second line therapy in heart failure

What are the options available for advanced heart failure?

- Pacemakers
- Implantable defibrillators
- Cardiac transplantation

How would you manage a patient with acute heart failure who presents to the casualty ward?

- **Exclude an alternate diagnosis**
  Acute severe asthma
  Pneumothorax
  Pulmonary embolism
  Metabolic acidosis
- Admit the patient and give a bed near the nurses' station
- **ABC**
- Administer oxygen
- Insert an IV cannula and collect blood for investigations
- Start the patient on IV frusemide 40-80mg slow bolus injection at a rate of 4mg/min. (High rates of infusion can cause ototoxicity)
- IV morphine 2-4mg with an antiemetic
- Order an urgent inward ECG and CXR (ECG is extremely important as heart failure may be due to underlying acute coronary syndrome)
- Start an ACEI

COPD

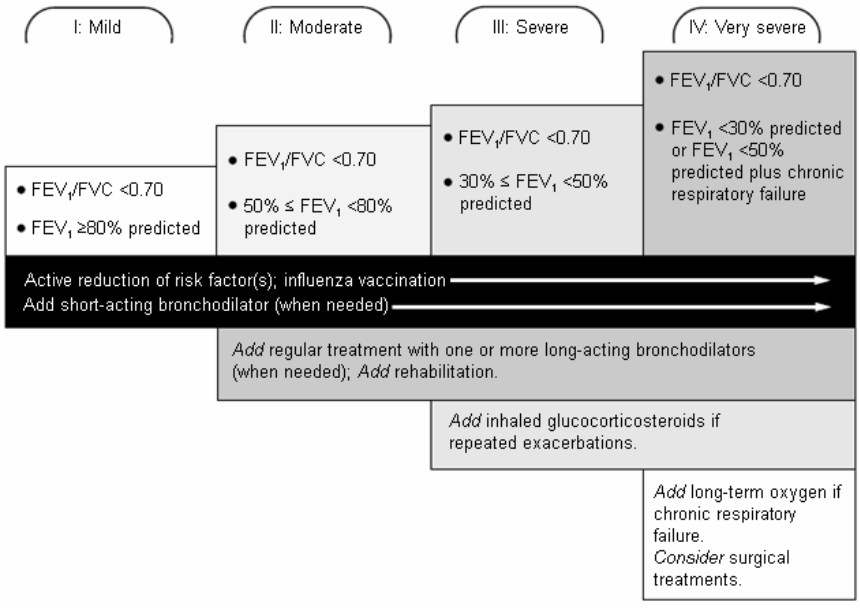
How would you diagnose COPD?

- This has already been discussed in the section on diagnosis
- Further investigations may be performed – pulmonary function testing shows a obstructive airways disease with an FEV1/FVC ratio of less than 0.7 with minimal reversibility (< 15%) to bronchodilators

What are the principles of management in a patient with COPD?

The main principles of management are as follows

- Cessation of smoking
- Pulmonary rehabilitation – physical exercise
- Proper nutrition
- Drug therapy
  Bronchodilators
  Corticosteroids
  Low dose oral theophylline – only in refractory disease



Short acting	Long acting
Beta 2 agonists Salbutamol	**Beta 2 agonists** Salmeterol Formeterol **Anticholinergics** Ipratropium Tiotropium

- Other
  Long term oxygen therapy
  Secretion clearance
  Vaccination – pneumococcal and influenza (not usually practiced in Sri Lanka)
- Surgical options – lung volume reduction surgery

How would you manage and acute exacerbation of COPD in the casualty ward?

- Admit the patient
- Give a bed near the nurses' station
- Administer oxygen – **Remember that in COPD the patient should receive 24-28% oxygen. This can be achieved by using a venturi mask**
- Nebulize with salbutamol and ipratropium bromide
- Give oral prednisolone
- Administer antibiotics
- If the patient is getting worse consider ICU admission and ventilation

Bronchial asthma

State the principles of management in a patient with bronchial asthma

Grade the severity of asthma

Category	Days with symptoms	Nights with symptoms
Mild intermittent	2 or less per week	Less than 2 per month
Mild persistent	> 2 per week but < 1 per day	> 2 per month
Moderate persistent	Daily	> 1 per week
Severe persistent	Continual	Frequent

Patient education and lifestyle modifications

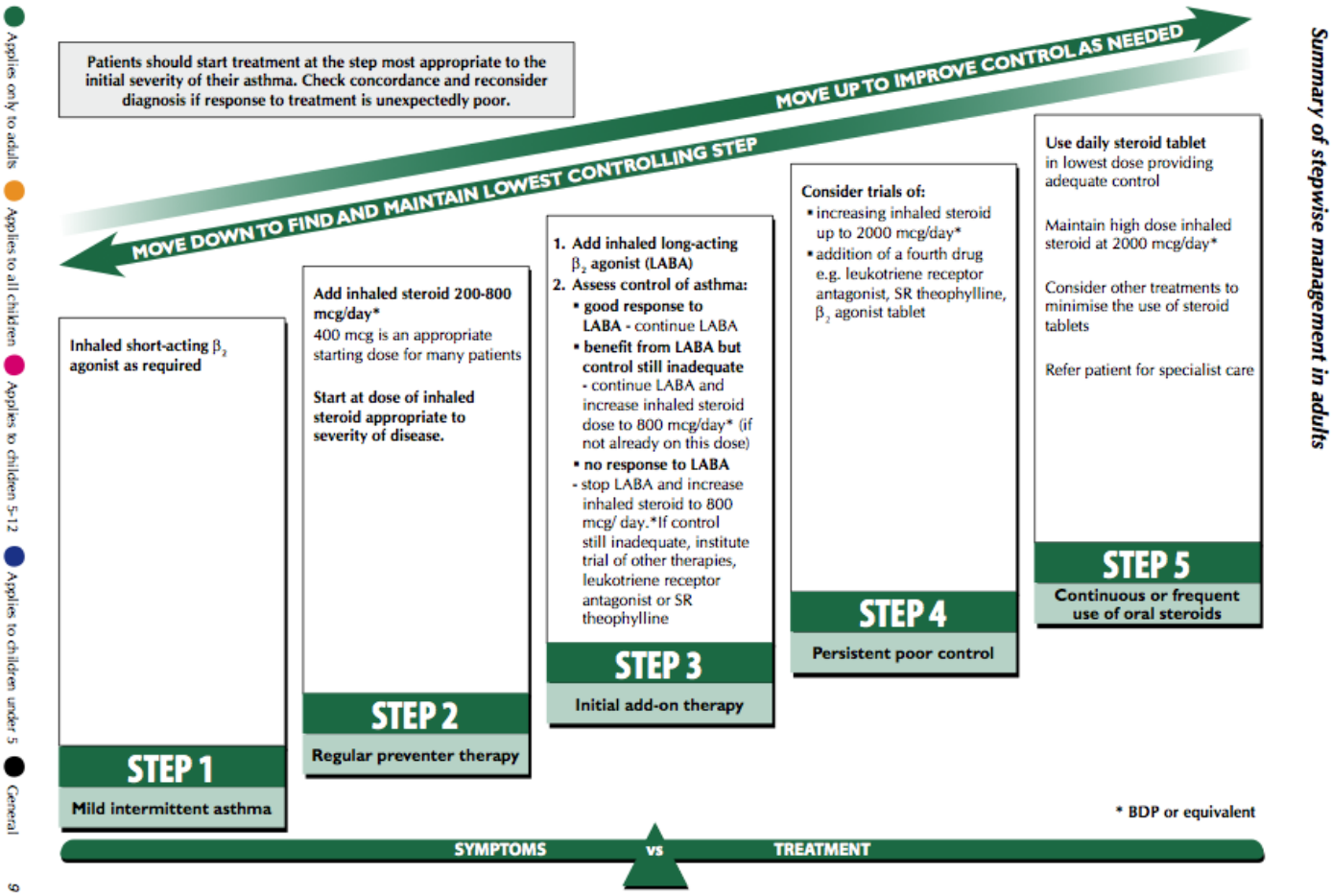
- Basic facts about asthma
- Importance of compliance to the medication and roles of the various medication
- Skills development in the use of the various devices and their care (revise the technique of use of these devices as it will be asked in the exam)
- Monitoring response by the use of a symptom diary
- Environmental modifications of asthma

- How to recognize an acute exacerbation of asthma and when to seek treatment

Modifications in the household environment

Asthma pharmacotherapy

- This has 2 aspects. These are
  Long term management
  Management of exacerbations of asthma
- The goals of pharmacotherapy are as follows
  Minimal or no chronic symptoms at day or night
  Minimal or no exacerbations
  No limitations on activities
  Minimal adverse effects of medication
- There are two categories of drugs which are used in the management of asthma. These are preventer medication and reliever medication



Indications for reliever medications in bronchial asthma

- Chronic persistent asthma
- After an episode of life threatening asthma
- Recent increase in the severity or frequency of acute exacerbations
- Nocturnal asthma which disturbs the child from sleep
- Frequent episodic asthma which interferes with normal life
- Severe exercise induced asthma
- Inaccessibility of medical care

Regular assessment and follow up

The following should be assessed at a routine asthma follow up

- Signs and symptoms of asthma
- Pulmonary function
- Quality of life and functional status
- Acute exacerbations during this period

- Adequacy of the management
  Pharmacotherapy
  Consider step up or step down every 3 months
  Environmental modifications
- Assess for the side effects of the medication – especially steroids
  Assessment of the weight and height
  Measure the blood pressure
  Encourage exercise
  Adequate dietary calcium supplementation
  Ophthalmological assessment

How would you manage a patient admitted to the casualty ward with an acute exacerbation of bronchial asthma?

- Admit the patient and give a bed
- Assess the severity of the episode

Acute severe asthma	Life threatening asthma
Inability to complete a single sentence in one breath	Exhausted, confused or comatose
RR > 30/min	Poor respiratory effort
Heart rate > 120/min	Bradycardia and hypotension
	Cyanosis Silent chest
PEFR between 50 and 33% of best or predicted	PEFR <33% of expected or predicted

- Connect to a monitor, measure the oxygen saturation
- Administer high flow oxygen
- Give oxygen driven nebulization with salbutamol 5mg every 15 -30 minutes
- Add ipratropium bromide 500 micrograms nebulized every 6 hours
- Monitor the response
- Give hydrocortisone 200mg IV

If the patient is not responding to the initial treatment consider adding

- Aminophylline IV bolus dose of 250mg over 20 minutes and continue with an infusion. Omit the bolus dose if the patient is already on oral theophyllines
- Other
  Exclude a pneumothorax
  IV salbutamol
  IV magnesium sulphate
- At this point perform an arterial blood gas and try to obtain ICU care for the patient

Diffuse parenchymal lung disease

Category	Further classification and causes
DPLD of known cause or associations	**Connective tissue diseases** SLE, rheumatoid arthritis, scleroderma **Drugs** Amiodarone Chemotherapeutic agents Antirheumatic agents – gold, penicillamine **Environmental exposures**
Idiopathic interstitial pneumonias	Idiopathic pulmonary fibrosis (formerly known as fibrosing alveolitis) Other
Granulomatous DPLD	Sarcoidosis
Other rare forms of DPLD	Histiocytosis X

What are the investigations you would like to perform in a patient with suspected DPLD?

- CXR – Look for reticular, reticulonodular shadowing and honeycomb appearance
- HRCT
- Perform lung function testing including diffusing capacity of CO (DLCO)
- Bronchoalveolar lavage and lung biopsy in selected cases
- Hematological investigations for autoantibodies associated with autoimmune disease

Anaemia

History

Presenting complaint

- The patient will usually present with shortness of breath, malaise and poor exercise tolerance
- State the duration

History of the presenting complaint

Describe the symptoms

- Describe the onset and progression of the symptoms
- Quickly exclude other causes of shortness of breath – see case on shortness of breath

The next step is to categorize the anaemia in to the following clinical categories using the history

- **Part of a pancytopenia –** Ask for associated bleeding manifestations, recurrent infections or prolonged fever
- **Hemolytic anaemia –** Ask for associated yellowish discolouration of the eyes, darkening of urine
- **Isolated anaemia**

Isolated anaemia

Look for a cause

Cause	Specific points in the history
Nutritional anaemia	
Iron deficiency anaemia	Ask for chronic blood loss **Uterine** Detailed menstrual history in females **GI** Dyspeptic symptoms, abdominal pain in relation to meals, episodes of hematemesis and malaena **(peptic ulcer disease)** LOA and LOW, bleeding PR **(GI malignancy)** Lumps at anus Passage of worms **Detailed dietary history** **Malabsorption** Chronic diarrhoea
B12 deficiency	Ask for symptoms of dementia, alteration of behavior, lower limb weakness and numbness (B12 deficiency)

Anaemia of chronic disease	Ask for past history of any chronic disease
Exclude a hematological malignancy	Neck lumps Bone pain Backache and renal impairment Hyperviscosity syndrome – vertigo, nausea, headache, visual disturbances (multiple myeloma)

Pancytopenia

Cause	Specific points in the history
Aplastic anaemia	**Drug history** Cytotoxic drugs Chloramphenicol Gold Sulphonamides NSAID **Exposure to chemicals** **Infective disease** As a complication of hepatitis HIV – Sexual promiscuity, IV drug use, blood transfusions
Hematological malignancies	**Leukaemias** No specific symptoms except, LOA, LOW, bone pain, fever and night sweating **Lymphoma** Neck lumps **Paraproteinaemias (MM)** Backache, features of uremia Hyperviscosity syndrome – vertigo, nausea, headache, visual disturbances
Secondary malignant infiltration of bone marrow	**Features of primary malignancy** Breast, thyroid, prostate, GI malignancy
Other infiltration	Past history of TB, contact history of TB

Other rare diseases

- Myelodysplastic syndrome
- Paroxysmal nocturnal hemoglobinuria

Describe what has happened to the patient over time – the chronological order of events up to the present

Other components of the history

- Take a detailed dietary history from the patient
- Social history is also important especially in suspected nutritional anaemias

Examination

General examination

- Pallor
- Icterus (hemolytic anaemia)
- Lymphadenopathy (Hematological malignancy)
- Features of iron deficiency – glossitis, angular stomatitis, koilonychia
- Ankle oedema

Abdomen

- Hepatosplenomegaly

Cardiovascular system

- Pulse – tachycardia
- Blood pressure
- Auscultate for flow murmurs
- Look for evidence of cardiac failure as a complication of anaemia

Discussion

How would you investigate a patient with anaemia?

- **The most important initial investigations are a full blood count with red cell indices and a blood picture**

Microcytic hypochromic	Normocytic normochromic	Macrocytic anaemia
Iron deficiency anaemia	Anaemia of chronic disease	B12 deficiency
Beta Thalassemia	Hemolytic anaemia	Folate deficiency
Anaemia of chronic disease		
Sideroblastic anaemia		

What are the further investigations of microcytic hypochromic anaemia?

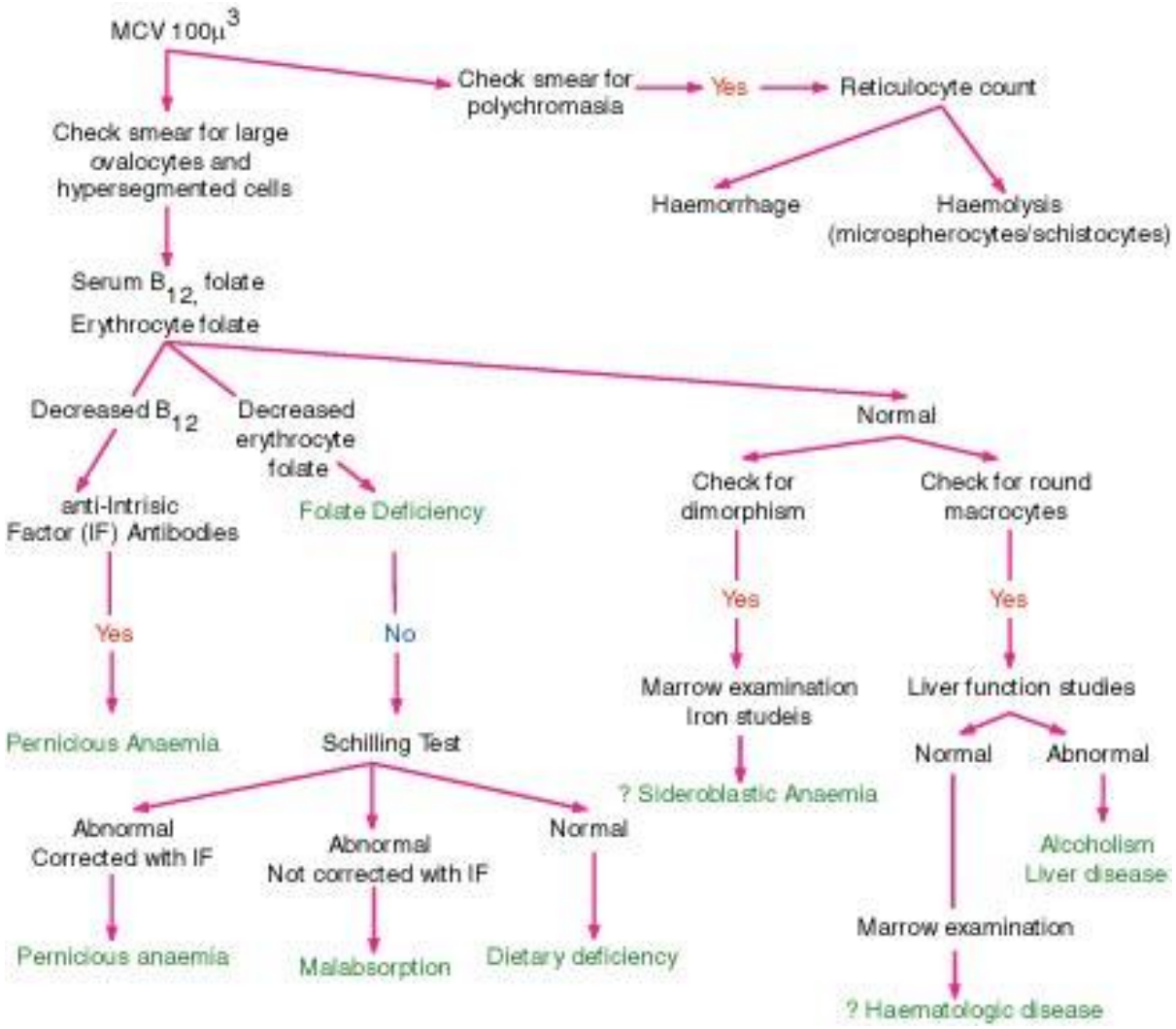
The first step is serum iron studies

	Fe deficiency	Thalassemia	Chronic disease	Sideroblastic
Serum iron	Reduced	Normal	Normal	Raised
Serum ferritin	Reduced	Normal	Normal or raised	Raised
TIBC	Raised	Normal	Reduced	Normal

Blood picture and other special investigations

	Fe deficiency	Thalassemia	Sideroblastic anaemia
Blood picture	Microcytic hypochromic cells, tear drop cells, pencil cells and occasional target cells	Microcytic hypochromic cells, abundant target cells, nucleated RBCs, basophilic stippling	Can have a dimorphic blood picture
Special investigations		Hb electrophoresis Reduced HbA and increased HbF and HbA2	Ring sideroblasts

Discuss the further assessment of a macrocytic anaemia



Chronic cough and hemoptysis

History

Presenting complaint

- Chronic cough and hemoptysis
- State the duration of symptoms
- (Remember that hemoptysis can be mimicked by bleeding from the throat and the upper GI tract. However true hemoptysis is usually associated with cough and sputum)

History of the presenting complaint

- Describe the onset, duration and progression of the symptom
- Describe the amount and nature of the sputum
- Think of a differential diagnosis and ask specific questions

Disease	Specific points in the history
Pulmonary TB	Ask for long standing fever, night sweats, anorexia and malaise Past history or contact history of TB
Bronchial carcinoma	Ask for associated loss of appetite and loss of weight Ask for recurrent LRTI Progressive shortness of breath Past history of malignancy (i.e. breast)- secondary deposits **Features of local spread** Hoarseness of the voice (Recurrent laryngeal nerve) Drooping of the eyelid (Horner's syndrome) Puffiness of the face and prominent veins in the neck (SVC obstruction) **Distant spread** **LN** Neck lumps noticed by the patient **Liver** Right hypochondrial pain and yellowish discolouration of the eyes **Bone** Bone pain, history of fractures following trivial trauma, difficulty in walking **Brain** Early morning headache with associated vomiting, adult onset seizures

	Paraneoplastic syndromes Seizures Imbalance when walking (cerebellar degeneration) Progressive difficulty in climbing steps (proximal myopathy) Weakness and numbness of the limbs (peripheral neuropathy) Confusion and constipation (hypercalcaemia)
COPD	Usually does not produce hemoptysis
Bronchiectasis	Characterized by copius sputum production
Vasculitis Wegener's granulomatosis Goodpasture syndrome	Ask for features of multisystem involvement, especially joint manifestations and hematuria suggestive of glomerulonephritis
Coagulopathy	Other bleeding manifestations

Past medical history

Past surgical history

Social history

- Get a detailed history of smoking
- Occupational history may also be extremely important
- Discuss how the disease affects the patients day to day life

Examination

General examination

- Look for cachexia
- Pallor and Icterus in the eyes
- Horner's syndrome
- SVC syndrome
- Examine for cervical lymphadenopathy
- Examine the hands for clubbing and hypertrophic pulmonary osteoarthropathy (Bronchial carcinoma)
- Look for wasting of the small muscles of the hand(Pancoast's tumor)
- Look for ankle oedema

Respiratory system

- Examine for evidence of a pleural effusion (malignancy, TB)
- Localized consolidation
- Lung collapse

Abdomen

- Hepatomegaly
- Ascites

Neurological

- Look for evidence of a paraneoplastic neurological syndrome
- LL weakness – bone metastasis

Tuberculosis

What are the investigations you would perform on a patient with suspected tuberculosis?

Mantoux test

- Has extremely limited use in the diagnosis of tuberculosis
- 0.1ml(10 units) of a PPD solution is injected intradermally into the flexor aspect of the forearm
- Induration is read after 48-72 hours
- Induration > 10mm is considered positive
- However this test can be negative in patients with TB who also have HIV infection due to impaired cell mediated immunity

Imaging investigations

- CXR is a first line investigation- Look for upper lobe disease
- CT scan may be required in some cases

Microbiological investigations

- **Sputum**
  Early morning expectorated samples of sputum on 3 consecutive days for acid fast bacilli stain and culture in the Lowenstein- Jensen medium

Special investigations

- Bronchial washings are used as microbiological samples in patients who cannot expectorate sputum
- Pleural effusion aspirate – AFB and adenosine deaminase levels
- Pleural biopsy in selected patients

How would you manage this patient?

- Isolate the patient
- Educate the patient on the disease, proper disposal of sputum
- Educate the patient on the importance of compliance to drug therapy and on the side effects of the medication
- Do the baseline investigations prior to the commencement of therapy. Liver function tests are the most important
- Start the medical management
  Intensive phase – Isoniazid, Rifampicin, Pyrizinamide and Ethambutol daily for 2 months
  Continuation phase – Isoniazid and rifampicin for 4 months

Drug and mechanism of action	Dose	Side effects
Isoniazid Bactericidal and bacteriostatic effect	5mg/kg	Liver toxicity Peripheral neuropathy Mental disturbances Incoordination Drug interaction – enzyme inhibitor
Rifampicin Bactericidal effect	10mg/kg	Liver toxicity Orange discolouration of body secretions Skin rashes, thrombocytopenia Oral contraceptive failure
Pyrizinamide Kills intracellular persisters	25mg/kg	Liver toxicity Hyperuricaemia
Ethambutol Bacteriostatic effect	15mg/kg	Optic neuritis

How would you follow up this patient following the initial treatment?

- Regular follow up during the 1st 2 months. In ward treatment at Welisara chest hospital is an option
- DOTS may be employed in the community
- See the patient after 2 months
  Assess the symptoms
  Examine the patient
  Assess the adverse effects of drug therapy
  Repeat the chest x ray
  Sputum samples
  Liver function tests
- If the sputum smear is positive at 2 months repeat another smear at 3 months. If this is positive perform drug susceptibility testing

What are the other aspects of management in a patient with tuberculosis?

Contact tracing and prophylaxis

- Perform mantoux test and CXR in close contacts

Indications for treatment

- Adults with symptoms of TB
- Adults with CXR changes suggestive of TB
- Children with a positive mantoux test

How would you treat multi drug resistant TB?

- Complex treatment regimens
- Second line anti TB drugs

Bronchial carcinoma

What are the investigations you would like to perform in a patient with suspected bronchial carcinoma?

- **CXR**
  This is the first line investigation – look for a solitary lesion appearing on the chest x ray, pleural effusion and hilar lymphadenopathy
- CT scan of the chest and abdomen for staging the disease
- Lung biopsy for histological classification of the tumor

What are the principles of management of bronchial carcinoma?

- The management of bronchial carcinoma depends on the stage of the tumor and the histological classification

Squamous cell carcinoma of the lung

- Early stage lesions are managed with surgical resection
- Locally advanced disease is managed with chemoradiotherapy
- Palliative treatment is preferred for patients with advanced disease

Non squamous cell carcinoma of the lung

- Early stage lesions are managed with surgical resection but most of these tumors are widely disseminated at the time of presentation
- Chemotherapy is the mainstay of management

Pneumonia

Classification of pneumonia

- Community acquired pneumonia
- Hospital acquired pneumonia
- Ventilator associated pneumonia
- Pneumonia in the immunocompromised patient

Describe the management of a patient with community acquired pneumonia

Confirmation of the diagnosis and initial investigations

- The patient will present with fever and respiratory tract symptoms
- Examination may reveal the following
  Febrile patient
  Features of respiratory distress
  Finding of a consolidation or pleural effusion on physical examination

Initial investigations for the diagnosis

- **FBC –** Look for a neutrophil leucocytosis
- **CXR**
  Look for evidence of a consolidation or pleural effusion. The chest x ray may also give clues as to the organism causing the infection
- **Microbiological studies**
  Sputum for gram stain and culture
  Blood culture

Aetiological agent

- A possible aetiological agent causing the symptoms may be thought of based on the history and other co morbidities
- CXR features
- Special investigations for atypical organisms

CXR pattern	Possible pathogen
Cavitation	TB, *Staphylococcus aureus*, *Klebsiella,* fungal pneumonia
Miliary pattern	TB, fungal pneumonia
Multifocal infiltrates	*Legionella, Staphylococcus aureus*
Interstitial pattern	Atypical organisms (*Mycoplasma, Chlamydia*)

Grade the severity of the pneumonia

- This is done based on the CURB 65 criteria and some other markers
  Confusion
  Urea > 7mmol/l

Respiratory rate more than or equals 30
Blood pressure (systolic <90 or diastolic <60)
Age > 65 years of age

Start empirical treatment

- The initial empirical antibiotic therapy should be started after the collection of blood for culture
- The usual choice is a 3rd generation cephalosporin such as IV cefotaxime
- However if an atypical organism is suspected a macrolide antibiotic (erythromycin, clarithromycin) is preferred as empirical treatment
- A cephalosporin and a macrolide can be used as combination therapy

Describe your continuing management of this patient in the ward

- Assess the symptoms of the patient and ask how he/she is feeling
- Look at the fever chart and the response to antibiotic treatment – Usually the temperature should begin to subside 2-3 days after initiation of antibiotic therapy
- Examine the respiratory system of the patient
- Order the necessary investigations – FBC, BU/SE, CRP
- Continue antibiotic therapy for 5-7 days

What would you consider if the pneumonia fails to respond to antibiotic therapy?

- Reconsider the diagnosis
- Inappropriate dose
- Inappropriate antibiotic
- Additional diagnosis – underlying bronchial carcinoma, obstruction, foreign body, immunosuppressed patient

Discuss how you would manage this patient if there is progressive deterioration

- The most likely diagnosis in this situation would be sepsis +/- ARDS
- In this situation it is extremely important to reserve an ICU bed for the patient

Investigations

- FBC
- CRP
- CXR – look for the bilateral fluffy infiltrates suggestive of ARDS
- Perform an arterial blood gas
- Renal function tests
- Liver profile and coagulation studies

Management

- ICU care
- ABC

- Consider ventilation
- Early aggressive fluid therapy and carful input output monitoring
- Consider inotropes if in shock

- Antibiotic therapy

What are the complications of pneumonia? State the basic principles of management

Complications	Principles of management
Local	
Parapneumonic effusion	Usually no specific treatment is required
Empyema	Aspiration to dryness with adequate antibiotic cover IC tube insertion
Systemic	**See discussion above**
ARDS	
Severe sepsis and septic shock	
Metastatic infection	

Generalized oedema

History

Presenting complaint

- The patient will complain of swelling of the body
- State the duration

History of the presenting complaint

- Describe the onset and progression of the symptoms over time
- Carefully describe the distribution of the oedema. This is extremely important in the differential diagnosis
- Now ask specific questions to reach a possible diagnosis

Cause	Specific points in the history
CVS Heart failure	Ask for associated progressive exertional dyspnoea, orthopnoea and paroxysmal nocturnal dyspnoea Loss of appetite and weight Look for a possible aetiology in the history
RS Cor pulmonale	Ask for a past history of chronic cough and sputum production
GIT Chronic liver disease	This usually presents with generalized oedema **Ask for the other complications associated** **Do this in a chronological order** Previous episodes of hematemesis and malaena and treatment Fever and abdominal distension (**SBP**) Episodes of confusion, behavioural change, day night reversal (**hepatic encephalopathy**) Uremic symptoms (**Hepatorenal syndrome**) **Ask questions for a probable aetiology** Alcohol intake Sexual promiscuity, intravenous drug use (Hep B) Ayurvedic or long term drug use Joint pain, skin rashes, history of autoimmune disease (Autoimmune hepatitis) Movement disorders (Wilson's disease)

	Biliary disease
Renal disease Glomerulonephritis	Frothy urine, hematuria **If the diagnosis is likely to be nephrotic syndrome ask the following questions** **Probable aetiology** Ask for evidence of an autoimmune disease Skin rashes, joint pain, fever and other evidence of systemic involvement Hep B Lymphoma Malaria Drugs DM **Complications** **DVT**
Renal failure	**Features of uremia** **(See separate case on CRF)**
Endocrine disease	Ask for symptoms of hypothyroidism

Complete the other components of the history

Examination

General examination

- General condition of the patient
- Pallor
- Icterus (Liver disease)
- Peripheral stigmata of chronic liver disease – parotid swelling, palmar erythema, dupuytren contractures, gynaecomastia, spider naevi
- Clubbing
- Flapping tremors
- Vasculitic rashes
- Lack of axillary and pubic hair
- Testicular atrophy
- Injection sites
- Oedema

Abdominal examination

- Palpate the liver

- Splenomegaly – Portal hypertension
- Examine for ascites

Respiratory system

- Pleural effusion

Cardiovascular system

- Look for evidence of cardiac failure
- Cor pulmonale

Discussion

Chronic liver disease

How would you investigate a patient with chronic liver disease?

The objectives of investigation are as follows

- Confirmation of the diagnosis
- Investigation for a probable aetiology
- Assess the complications of the disease
- Estimate the prognosis of the disease

Imaging studies

- USS of the abdomen is a very important investigation. It visualizes the architecture of the liver
- Also looks for splenomegaly (portal hypertension) and ascites

Hematological investigations

- Most of these investigations are valuable in assessing the severity and prognosis of the disease
- Liver function tests
  Transaminases and alkaline phosphatase
  Serum bilirubin
- Serum albumin and PT/INR are indicators of liver function
- Renal function tests – Hepatorenal syndrome

Aetiology

Category	Cause	Investigations
Infective	Viral hepatitis	Hepatitis B and C serology
Autoimmune	Autoimmune hepatitis	ANA, anti smooth muscle antibodies
Metabolic	Wilson's disease	Serum ceruloplasmin, 24 hour urinary copper excretion
	Hemochromatosis	Serum iron studies
Biliary cirrhosis	Primary biliary cirrhosis	Anti mitochondrial antibodies

- Consider liver biopsy

How would you estimate the severity of cirrhosis?

Medscape® www.medscape.com

Points	1	2	3
Encephalopathy	None	Minimal	Advanced (coma)
Ascites	Absent	Controlled	Refractory
Bilirubin (µmol/L)	<34	34–51	>51
Albumin (g/L)	>35	28–35	<28
Prothrombin (sec)*	<4	4–6	>6

*Difference between the patient and the control. Differences of 4 to 6 seconds correspond approximately to a prothrombin ratio of ~50 to 40% of normal.

Source: Semin Liver Dis © 2008 Thieme Medical Publishers

How would you manage a patient with cirrhosis?

The management should be discussed on the following themes

- Lifestyle modification and abstinence from alcohol
- Management of hematemesis due to variceal bleeding
- Ascites and spontaneous bacterial peritonitis
- Hepatic encephalopathy
- Liver transplantation

How would you manage an episode of hematemesis in the casualty ward?

- Initial resuscitation
- Place the patient in the left lateral position to prevent aspiration of blood
- Insert 2 wide bore IV cannulae
- Collect blood for investigations especially full blood count and grouping and DT
- Give IV 0.9% saline bolus as initial volume resuscitation – 20ml/kg
- Consider giving FFP and packed cells
- IV omeprazole
- IV vasopressin or IV octreotide
- Urgent endoscopic treatment is the treatment of choice but it is not readily available in Sri Lanka

Other options of management

- Balloon tamponade with a Sengstaken- Blakemore tube

Further management

- Give drugs used in the management of hepatic encephalopathy
- Consider prophylaxis with oral propranolol
- Follow up endoscopy

How would you manage ascites in a patient with cirrhosis?

- Start an input output chart and daily weight chart
- Dietary modifications – no added salt
- Diuretic therapy
  Oral spiranolactone 100mg and frusemide 40mg (maximum 400mg spiranolactone and 160mg frusemide)
  Adjust the doses of diuretics once in every 3-5 days
  Target a daily weight loss 0.5kg/d
- Carefully monitor the electrolytes and renal functions

- Therapeutic paracentesis can be performed in patients with tense ascites or in patients not responding to diuretics

How would you manage spontaneous bacterial peritonitis?

Confirmation

- Perform a diagnostic peritoneal tap. SBP is diagnosed in the presence of >250 polymorphs/mm^3
- Send samples for culture
- Start empirical antibiotics – IV cefotaxime
- Prophylaxis should be considered with norfloxacin or co trimoxazole

Discuss the management of hepatic encephalopathy in a patient with cirrhosis

Grade	Description
Minimal	Normal standard clinical exam; abnormal responses to detailed psychometric tests
1	Euphoria or anxiety; shortened attention span; mild lack of awareness
2	Lethargy or apathy; mild distortion of place or time; mild personality changes; impaired performance on addition/subtraction
3	Confusion, disorientation, or somnolence to semistupor but responsive to verbal stimuli
4	Coma

Think of precipitating factors

- Gastrointestinal – hemorrhage, constipation, high protein load
- Infection – SBP, pneumonia, UTI
- Electrolyte abnormalities – hypokalemia, dehydration, uremia
- Drugs – benzodiazepines

Initial management

- **Grade**
- Elevate the head end of the bed
- Input output chart and proper fluid balance
- **Nutrition**
  Protein can be withdrawn in the first 2-3 days. Then 25-35kcal/kg/d and protein intake of 0.5 – 1.2g/kg/d should be maintained
- Maintain electrolyte balance
- Treat infection
- Reduction of the nitrogen load from the gut
  Lactulose
  Metranidazole 200mg tds
- Branched chain amino acids – LOLA
- Mannitol may be considered if the patient develops cerebral oedema

Can liver transplantation be offered?

- This option is now available in Sri Lanka
- Patients are selected based on the Child Pugh score and the MELD criteria

Chronic renal failure

History

Presenting complaint

- The patient is most likely to have been admitted for regular dialysis

History of the presenting complaint

When was the diagnosis made and how?

- Describe the initial diagnosis of chronic renal failure
- Presenting symptoms of the patient, initial investigations performed and their results

Probable aetiology of the disease

- Family history of kidney disease – PCKD
- Glomerulonephritis
  Ask for preceding/ childhood history of edema, frothy urine and hematuria
  Ask for any symptoms of autoimmune disease – rashes, joint pain, malaise, low grade fever
  History of diabetes mellitus
- Vascular disease – Preceding hypertension
- Tubulointerstitial diseases – Long term use of drugs
- Obstructive uropathy – Preceding symptoms of LUTS, calculus disease

Initial management of the patient

- What was the advice given to the patient?
- What were the drugs which were prescribed?

Chronological order of events

- Describe the main events which occurred over time in a chronological order. Include the following details
- Management – initiation of dialysis
- Complications of the drugs and management
- Symptoms and complications of CKD at the present state

Complication	Specific points in the history
Uremia	Malaise, loss of energy, loss of appetite, insomnia,

	pruritus, restless legs syndrome
Cardiovascular	
Water retention and pulmonary edema	Progressive oedema, orthopnoea, Paroxysmal nocturnal dyspnoea
Acute pericarditis	Chest pain relieved on bending forward
Anaemia	Exertional dyspnoea, poor exercise tolerance
Renal bone disease	Bone pain and fractures
Nervous system	Seizures Peripheral neuropathy

Past medical history

Establish the other co morbidities and describe them

Social history

- Discuss the impact of the disease on the patient's life
- Family support for the patient
- Access to dialysis

Examination

General examination

- Pallor
- Brownish discolouration of the nails
- Arteriovenous fistula
- Flapping tremors
- Scratch marks on the skin, pigmentation, bruising
- Ankle oedema

CVS

- Measure the blood pressure
- Pericardial friction rub
- Look for signs of heart failure
- Flow murmurs

RS

- Pleural effusion

Abdomen

- Palpable renal masses (PCKD)
- Ascites

CNS

- Features of peripheral neuropathy

Discussion

What are the stages of CKD?

Stages of Chronic Kidney Disease (K/DOQI)*

Stage	Description	GFR (ml/min/1.73m^2)
1	Kindney damage with normal or ↑GFR	≥ 90
2	Kindney damage with mild ↓GFR	60 - 89
3	Moderate ↓GFR	30 - 59
4	Severe ↓GFR	15 – 29
5	Kidney failure	< 15 (or dialysis)

*National Kidney Foundation, Kidney Disease Outcome Quality Initiative (K/DOQI). Clinical practise guidelines for bone metabolism and disease in chronic kidney disease.
Am J Kid Dis. 2003; 42: S1-S201

What are the principles of management of chronic kidney disease?

- In early CKD the main principle of management is to prevent the progression of the disease
- In end stage renal failure the main principles are
  Treatment of the complications
  Renal replacement therapy

Prevention of the progression of the disease

Goals of treatment

- Management of blood pressure
- Controlling proteinuria

Treatment

- Start the patient on an ACE inhibitor
- Add an angiotensin II receptor antagonist if there is poor response to treatment

- Other
  Cessation of smoking
  Protein intake – 0.8-1g/kg/d
  Manage hyperlipidaemia
  Good glycaemic control

End stage renal failure

General management

Diet

Dietary recommendations in CKD are as follows

- Energy - >35kcal/kg/d
- Protein – 0.8 to 1g/kg of high quality protein per day
- Limit phosphate containing foods
- Limit potassium containing foods

Management of the complications of the disease

Complication	Management
General symptoms of uremia	No effective medical management available. However pruritus may be treated with emollient creams
Volume overload	Diuretic therapy with frusemide
Hypertension	ACE inhibitors and Angiotensin II receptor blockers are used as initial therapy Frusemide is preferred in end stage renal failure as the above drugs cause hyperkalemia Calcium channel blockers are also used
Anaemia	Perform FBC, blood picture and serum iron studies Erythropoietin therapy is the mainstay of the management Oral iron supplementation is indicated if there is laboratory evidence of iron deficiency
Metabolic abnormalities	
Hyperkalemia	Limitation of dietary potassium, oral potassium binding resins
Renal bone disease	Limitation of dietary phosphate Gut phosphate binders Vitamin D analogues (1 alpha calcidol) Oral calcium supplementation
Acidosis	Usually no treatment required

Manage other co morbidities

Renal replacement therapy

- **Dialysis**
  Refer the patient to a vascular surgeon for an AV fistula creation
- Renal transplantation

What are the complications of dialysis?

- Hypotension during dialysis
- Cardiac arrhythmias due to potassium and acid base imbalances
- Hemorrhage
- Air embolism
- Dialyzer hypersensitivity

What are the factors you would consider in matching a donor and a recipient for renal transplantation?

- ABO compatibility
- Matching for MHC antigens especially the HLA – DR

What are the principles of management following renal transplantation?

- Lifelong immunosupression
- Prophylaxis against infections
- Monitoring for complications – rejection, infections

A patient who has been treated for chronic renal failure is admitted to the ward with increasing confusion and decreased urine output for 1 day. Discuss the subsequent management

- The diagnosis is probably acute on chronic renal failure
- Admit the patient
- Perform the initial investigations – renal function tests, serum electrolytes, arterial blood gas if necessary
- Arrange for a 12 lead ECG

Fluid management

- Assess the volume status of the patient
- Manage fluid intake as
  Input = UOP from the previous day + insensible losses

Manage hyperkalemia

- Look for ECG changes suggestive of hyperkalemia – tall tented T waves
- Start 10% IV calcium gluconate for myocardial stability
- Start therapies for the lowering of potassium
  Nebulized salbutamol
  Insulin dextrose – 10 units soluble insulin in 50ml of 50% dextrose
  Oral potassium binding resins

Correct severe acidosis with bicarbonate

Manage pulmonary oedema

- IV frusemide and morphine

Other options

- Diet
  Potassium restriction
- IV frusemide to induce a diuresis

Consider emergency dialysis

- Persistent hyperkalemia (> 7mmol/l)
- Severe or worsening metabolic acidosis (pH < 7.2)
- Refractory pulmonary oedema
- Uraemic encephalopathy
- Uraemic pericarditis

Nephrotic syndrome

What is the definition of nephrotic syndrome?

- Generalized oedema
- Overt proteinuria > 3.5g/24h
- Hypoalbuminaemia (< 30 g/L)
- Hyperlipidaemia

Describe the principles of management of nephrotic syndrome

Find a cause/ underlying pathology

- Assess for a secondary cause based on the history and examination
- Consider performing a renal biopsy

Definitive management depends on the cause

Supportive management

- Start monitoring the patient with a daily weight chart and an input output chart
- Recommend a low salt diet for the patient
- Start diuretics for the edema. Carefully monitor the renal functions and electrolytes
- Consider starting lipid lowering drugs for the hypercholesterolemia
- Monitor for complications
  Venous thromboembolism – consider prophylactic anticoagulation if patient immobilized
  Infection

Jaundice

History

Presenting complaint

- The patient will present with yellowish discolouration of the eyes
- State the duration of the symptoms

History of the presenting complaint

- Describe the onset and progression of the symptoms in detail
- The next step is to differentiate the three main clinical syndromes of jaundice

Pre hepatic	Hepatic	Post hepatic (cholestatic)
Is usually due to hemolytic anaemia Presents with dark colour urine and dark colour stools Associated features of anaemia are present	This is usually extremely difficult to differentiate from the history	Presents with dark urine and pale stools There is usually associated pruritus

The 2 important cases of jaundice are

- **Jaundice with anaemia**
- **Cholestatic jaundice**

Jaundice with features of anaemia

- Think of a differential diagnosis and ask direct questions

Cause	Specific questions in the history
Congenital hemolytic anaemia	Ask for past history of neonatal jaundice Recurrent blood transfusions due to symptomatic anaemia Family history of hemolytic anaemia **Specific features of individual hemolytic anaemias** **Hereditary spherocytosis** History of leg ulcers Episodes of aplastic anaemia (Ask for features of pancytopenia) **Sickle cell anaemia** Leg ulcers

	Past history of episodes of sickle crisis Bone pain and pain in the extremities Aplasia Episodes of respiratory distress Neurological symptoms **G6PD deficiency** Triggering of episodes of jaundice due to drugs and certain food items **Complications** History suggestive of biliary colic (Gall stone disease) **Features of iron overload**
Acquired hemolytic anaemia **Warm autoimmune hemolytic anaemia**	Febrile illness Ask for history suggestive of autoimmune diseases **SLE** Joint pain, alopecia, oral ulcers, Skin rashes **Hematological malignancy** LOA, LOW, neck lumps **Drug history**
Cold autoimmune hemolytic anaemia	Ask for pain and bluish discolouration of the peripheries Ask for history of preceding respiratory tract infection
Non immune hemolytic anaemia	Passage of dark coloured urine in the night and early morning **(PNH)** History of prosthetic valve surgery **(Mechanical hemolysis)** Associated systemic illness and bleeding manifestations **(DIC)**

Complete the other components of the history

Social history

- Get a detailed social history if the patient has a chronic hemolytic anaemia
- Disease impact on the patient
- Disease impact on the family
- Family support

Examination

General examination

- Pallor
- Icterus
- Lymphadenopathy
- Skin rashes – especially vasculitic rashes (warm autoimmune hemolytic anaemia)
- Thalassemic facies
- Leg ulcers (sickle cell anaemia)

Abdomen

- Hepatosplenomegaly

Cardiovascular

- Look for features of heart failure due to anaemia

Discussion

Discuss how you would proceed with investigations of a suspected hemolytic anaemia?

FBC with red cell indices

Investigations showing evidence of hemolysis

- Increased unconjugated bilirubin
- Increased LDH
- Increased reticulocyte count
- Urinary haemosiderin (evidence of intravascular hemolysis)

Perform a blood film

Category	Cause	Blood film	Other investigations
Congenital	Hereditary spherocytosis	Spherocytes	
	G6PD deficiency	Bite cells, blister cells, polychromasia due to increased reticulocytes Special stain demonstrates Heinz bodies	G6PD levels
	Thalassemia	Microcytic hypochromic cells, abundant target cells, nucleated RBCs, basophilic stippling	Hb electrophoresis

	Sickle cell anaemia	Sickle cells	Hb electrophoresis
Acquired	Warm autoimmune hemolytic anemia	Spherocytes	Positive Coombs test ANA
	Cold		Cold agglutinin test

Cholestatic jaundice

Presenting complaint

- The patient will present with yellowish discoloration of the eyes, dark urine, pale stools and pruritus

History of the presenting complaint

- Describe the presenting complaint in detail regarding the onset and progression of the disease

Think of a differential diagnosis and ask direct questions

- The causes of cholestatic jaundice can be classified as intrahepatic and extrahepatic cholestasis. The history should look for both causes

Intrahepatic cholestasis

Cause	Specific points in the history
Infective	
Viral hepatitis	Ask for preceding prodromal illness – headache, arthralgia, myalgia, nausea and anorexia **Ask for risk factors** Consumption of unhygienic food and water Sexual promiscuity, use of IV drugs and past history of blood transfusions
Inflammatory	
Autoimmune hepatitis	Ask for past history of other autoimmune diseases
Primary biliary cirrhosis	Preceding history of fatigue and pruritus Associated joint pain and early morning stiffness suggestive of an inflammatory arthropathy
Metabolic	
Drugs	Obtain a detailed drug history Ask for the use of ayurvedic/ herbal preparations
Alcoholic hepatitis NASH	Ask for history of alcohol ingestion
Malignancies	
Primary and secondary liver malignancies	Ask for past history of malignancies Symptoms suggestive of primary malignancies-

	GIT, breast Ask for associated LOA and LOW

Extrahepatic cholestasis

Cause	Important points in the history
Carcinoma of the head of the pancreas	Loss of appetite and loss of weight Associated dull epigastric pain radiating to the back which may be worse at night Back pain May have associated alteration in bowel habits with steatorrhoea Recently diagnosed DM (Rare) **Ask for features of local spread** Gastric outlet obstruction (This is important in another way as gastric carcinoma can also cause obstructive jaundice due to local infiltration Profuse UGI bleeding (due to vascular invasion)
Periampullary carcinoma	Typically presents with fluctuating jaundice (has been mentioned earlier) and intermittent malaena. (Silver streaked stools)
Chronic pancreatitis	Ask for recurrent episodes of epigastric pain radiating through the back and relieved when the patient is leaning forward Associated nausea and vomiting Alteration of bowel habits (steatorrhoea)
Gallstones **Common bile duct** **Mirizzi's syndrome**	Ask for a previous history of dyspeptic symptoms **Other presenting symptoms of gallstones** History of billiary colic, acute cholecystitis Previous history of similar episodes, episodes suggestive of acute cholangitis, past history suggestive of acute pancreatitis
Bile duct strictures	Ask for past history of hepatobilliary surgery, interventions in the biliary tract
Sclerosing cholangitis	Blood and mucus diarrhea (associated with inflammatory bowel disease, constitutional symptoms such as fever, chills, night sweats
Other rare causes **Carcinoma of the biliary system** **Lymphoma with porta hepatis lymph nodes** **Parasites in the common bile duct** **HIV**	

Ask for complications associated with cholestatic jaundice

- Fat soluble vitamin deficiency
  Bleeding manifestations
- Features suggestive of cholangitis

Complete the other components of the history

Examination

General examination

- General examination is extremely important. Look for
  Icterus
  Pallor
  Features of chronic liver disease
  Xanthelasma (Primary biliary cirrhosis)
  Injection sites (Hepatitis B)
  Rashes (SLE – autoimmune hepatitis)
  Lymphadenopathy – especially for left supraclavicular lymphadenopathy
  Skin – scratch marks, bleeding manifestations
- Abdominal examination
  Do a routine abdominal examination. The most important point is to look for a palpable gall bladder
  Courvoisier's law states that if the patient with obstructive jaundice has a palpable gall bladder the cause for the jaundice is unlikely to be due to gall stones

Discussion

How would you investigate a patient with cholestatic jaundice?

- **Total bilirubin with direct fraction** – Total bilirubin will be elevated with increased direct fraction
- **Urinary urobilinogen**
- **Liver function tests** – The typical pattern will be elevation of alkaline phosphatase and GGT out of proportion to the rise in transaminases
- **Imaging studies –** Ultrasound scan of the abdomen is an extremely important investigation in the basic assessment of a patient with obstructive jaundice. Look for the dilation of the intrahepatic and extrahepatic duct system. The diameter of the normal common bile duct is less than 6mm

Dilation of both IH and EH ducts	Only IH duct dilation	No duct dilation
Pancreatic head mass **Stone in the common bile duct**	**Hilar cholangiocarcinoma** **Gallbladder pathology** **Mirizzi's syndrome** **Porta hepatis lymphadenopathy**	**Medical (Intrahepatic cholestasis)**

Further investigation of cholestasis without duct dilation

- Hepatitis serology
- ANA and serum immunoglobulin (Autoimmune hepatitis)
- Anti- smooth muscle antibodies (Primary biliary cirrhosis)

The final set of investigations are carried out to investigate for the complications of cholestatic jaundice

- **PT/INR –** To look for coagulopathy
- **Renal function tests –** To look for Hepatorenal syndrome

Approach to the diagnosis of bleeding disorders

History and examination

- Bleeding disorders can be due to defects in the vasculature, platelets or coagulation pathways
- However in clinical practice the most important causes are platelet defects and coagulation defects
- The following points are useful in differentiation

Clinical manifestations of disordered hemostasis*

Clinical characteristic	Bleeding disorder	
	Platelet defect	**Clotting factor deficiency**
Site of bleeding	Skin, mucous membranes (gingivae, nares, GI and genitourinary tracts)	Deep in soft tissues (joints, muscles)
Bleeding after minor cuts	Yes	Not usually
Petechiae	Present	Absent
Ecchymoses	Small, superficial	Large, palpable
Hemarthroses, muscle hematomas	Rare	Common
Bleeding after surgery	Immediate, mild	Delayed, severe

* These bleeding patterns are listed in their most general form, and may vary in individual patients.

Investigations

- Perform the following investigations
- FBC – to look at the platelet count
- Bleeding time – measures the platelet and vascular response
- PT – assesses the extrinsic pathway of coagulation
- APTT – assesses the intrinsic pathway of coagulation
- TT – assesses the fibrinogen to fibrin conversion

Disorder	BT	Plt	PT	aPTT	TT	Fib
Vasculopathies, connective tissue diseases, or collagen disorders affecting skin	long	normal	normal	normal	normal	normal or increased*
Thrombocytopenia	long	low	normal	normal	normal	normal
Qualitative platelet abnormalities	long	normal or low•	normal	normal	normal	normal
Hemophilia A (factor VIII deficiency)	normal	normal	normal	long	normal	normal
von Willebrand disease	long	normal	normal	longΔ	normal	normal
Disseminated intravascular coagulation	long	low	long	long	long	low

BT: bleeding time; Plt: platelet count; PT: prothrombin time; aPTT: activated partial thromboplastin time; TT: thrombin time; Fib: fibrinogen.

Hemophilia

History

Presenting complaint

- The patient will usually present due to a bleeding complication – usually joint or muscle bleeding
- State the duration of the symptoms

History of the presenting complaint

Describe the presenting symptom

- Describe the onset and progression of the present symptoms

Describe the important aspects of the disease in chronological order

- Describe the initial presentation of the patient
- Describe what was done at this point, the investigations performed and the findings of these investigations
- State the treatment given at the time
- Discuss the hospital admissions and complications of the disease in a timeline

Complication	Specific points in the history
Musculoskeletal system	Joint and muscle bleeding Progressive stiffness of the joints and associated joint deformities
Nervous system	Past history of stroke (ICH) Back pain followed by lower limb weakness (Bleeding into the vertebral canal) Peripheral weakness (peripheral nerve compression)
Life threatening bleeds	Dysphagia and dyspnoea following an episode of pharyngitis (retropharyngeal bleed) Past history of abdominal bleed presenting with abdominal pain and collapse Intracranial hemorrhage

- Describe the treatment given to the patient
- Describe the complications of treatment
  History of blood borne infections
- Follow up
- Current status of the patient

Past medical history

Past surgical history

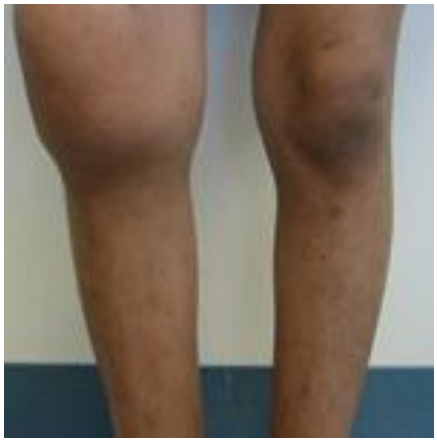
- Ask for past surgical procedures performed on this patient and their outcomes

Family history

- Draw a family tree to show the inheritance of the condition

Social history

- Describe the impact of the disease on the patient
- Education of the patient regarding the disease
- Social and family support for the patient
- Medical facilities available



Examination

General examination

- Pallor (in a large bleed)
- Icterus (hepatitis as a complication of transfusion)
- Skin – bruising
- Examine the vital signs of the patient

Musculoskeletal system

- Carefully examine the joints of the patient

Neurological examination

- Look for evidence of neurological impairment (ICH, hemorrhage into the vertebral canal)
- Compressive neuropathies

Discussion

What are the principles of management in a patient with hemophilia?

Patient education

- Educate the patient on the disease
- Advise the patient to avoid triggering factors for a bleed such as contact sports
- Advise on the management

Management of an acute bleed

- Admit the patient
- Resuscitation
- Adequate analgesia (especially in haemarthrosis) – remember to avoid NSAIDs
- Replacement of factors – pure factors are the best but cryoprecipitate can be used if factors are not available
- Other drugs like DDAVP can also increase factor levels

- Calculation of the dose
  Factor VIII dose = Body weight x Desired percentage increase x 0.5

Long term management

- Complications of the disease
  Rehabilitation in joint and neurological problems
- Complications of the treatment
  Repeated blood product transfusion – Hep B, HIV
  Development of antibodies to factors – Reduces the response to factor treatment. Other factors such as activated factor VII are used in this case
- Genetic counselling

Rheumatoid arthritis

History

Presenting complaint

- The patient is most likely to have presented for a routine clinic follow up

History of the presenting complaint

When was the diagnosis made and how?

- Describe when the diagnosis of rheumatoid arthritis was made
- Discuss the initial presenting symptoms of the patient
- Describe the articular pattern of involvement in detail
- Describe the initial investigations performed on the patient and state their results
- State the initial management of the patient

Describe in chronological order the important events up to the present

Include the following details

- Symptoms of the disease and their response to treatment
- Complications of the disease and extra articular manifestations

Complication	Specific points in the history
Soft tissue	**Subcutaneous nodules** Ask for lumps around bony points in the body **Other soft tissue problems**
RS	**DPLD** Progressive dyspnoea Long standing cough with minimal production of whitish sputum **Pleural effusion**
Cardiovascular	**Atherosclerosis** Ask for symptoms of angina, past history of MI **Pericarditis** Episodes of chest pain worsening on inspiration and relieved on bending forward **Reynaud's phenomenon** **Vasculitis** Rashes and lower limb ulcers
Nervous system	**Atlanto-axial subluxation** Weakness of the lower limbs **Peripheral neuropathies** Other focal neurological symptoms

	Entrapment neuropathies Carpal tunnel syndrome
Eyes	**Sjogren's syndrome** Dry eyes Other Red eye, associated eye pain
Renal	**Nephrotic syndrome** Ask for oedema, frothy urine
Hematological	**Anaemia of chronic disease** Ask for symptoms of anaemia **Felty's syndrome** Neck lumps

- Get a detailed history of drugs and other treatments and their side effects. Especially evidence of liver damage and bone marrow suppression due to DMARDs and gastric irritation and peptic ulceration due to NSAIDs

Get a detailed description of the functional state of the patient

Describe the following in detail

- Bathing
- Use of the toilet
- Dressing
- Personal hygiene and cleanliness
- Grooming – i.e. combing hair
- Eating
- Level of mobility
- Transferring
- Recreational activities
- General household activities – cooking, sweeping, cleaning

Describe the household environment and describe the problems the patient has. Also describe the level of mobility of the patient outside the house and the facilities available for transport

Social history

- This is extremely important in this case. Take a detailed social history based on the points given below
- Introduce the family – family members, income, social circumstances
- Assess the family support for the patient
- Ask for the nearest hospital with rehabilitation facilities available

Examination

General examination

- Pallor (anaemia of chronic disease)
- Icterus (adverse effect of medication)

- Red eye (Episcleritis, scleritis)
- Dry eyes (Sjogren's syndrome)
- Clubbing
- Look for subcutaneous nodules
- Vasculitic rashes, ulcers
- Oedema (nephrotic syndrome)

Musculoskeletal system

- Examine for the typical joint deformities associated with rheumatoid arthritis
- Look for bursitis
- Other features of soft tissue rheumatism

Cardiovascular system

- Percarditis
- Any associated murmurs

Respiratory system

- Pleural effusions
- Diffuse parenchymal lung disease

Abdomen

- Splenomegaly – Felty's syndrome

Nervous system

- Spastic quadriparesis (Atlanto-axial subluxation)
- Peripheral neuropathy
- Entrapment neuropathies – carpal tunnel syndrome

Discussion

How would you diagnose rheumatoid arthritis?

Look for four or more of the following criteria

- Arthritis of 3 or more joint areas
- Arthritis of hand joints
- Symmetrical arthritis
- Morning stiffness lasting for more than 1 hour
- Duration for more than 6 weeks
- Rheumatoid nodules
- Rheumatoid factor

- Radiological changes

What are the principles of management of a patient with newly diagnosed rheumatoid arthritis?

Patient education

The patient should be educated on the following aspects of the disease

- Nature and course of the disease
- Management options
- Drug therapy and side effects
- Prognosis
- Lifestyle modifications

Drug therapy

- Simple analgesics and NSAIDs should be used for the symptomatic relief of pain and stiffness. The main problem with the use of NSAIDs is the risk of gastric ulceration. Therefore protective acid suppression agents should be given in high risk patients
- The patient should be started on a DMARD at the outset
- The usual drug of choice is methotrexate
- Before starting methotrexate the patient should have a baseline FBC and liver function testing

Rehabilitation

- Physiotherapy
- Occupational therapy

Manage other co morbidities

- Especially those increasing the cardiovascular risk

Discuss the side effects of the common drugs used in the management of rheumatoid arthritis

Drug	Side effects
NSAIDs	Peptic ulcer disease Renal impairment
COX 2 selective inhibitors	Have less incidence of gastric irritation when compared to NSAIDs
DMARDs Methotrexate	 Gastrointestinal symptoms Hepatotoxicity Bone marrow supression

	Acute pneumonitis
Sulphasalazine	GI symptoms Liver damage
Hydroxychloroquine	Rash Retinal toxicity

How would you follow up a patient with rheumatoid arthritis?

Follow up the patient in the clinic

Assess the disease severity of the patient

History and examination

- Ask about the symptoms
- Get the patient to grade the degree of pain
- Assess the patient's functional limitations based on the activities of daily living
- Examine the joints

Investigations

- Inflammatory markers – ESR and CRP
- Extent of radiological abnormalities

Assess the side effects of the medications the patient is on

- NSAID
  Ask for evidence of gastric irritation
- DMARDs

Drug	Monitoring the side effects
Methotrexate	Assess with LFTs
Hydroxycholoroquinine	Assess the visual fields and fundi

Assess the adequacy of the management

What are the options available for the management of rheumatoid arthritis which is not responsive to your initial management?

- Combination therapy of DMARDs are used
- Newer drugs can be tried – Leflunomide, biologics
- Short courses of systemic steroids
- Intra articular steroid injections

SLE

History

Presenting complaint

- Patient will usually present due to a flare up of the disease

History of the presenting complaint

Describe the presenting symptoms

- Describe the onset and progression of the presenting symptoms

When was the diagnosis made and how?

- Describe when the diagnosis of SLE was made
- Discuss the initial presenting symptoms of the patient
- Describe the initial investigations performed on the patient and state their results
- State the initial management of the patient

Describe the various manifestations of the disease over time in a chronological order

System involved	Specific points in the history
General	Prolonged fever, malaise
Rheumatological system	Symmetrical small joint pain associated with early morning stiffness lasting for > 1h
GI	Oral ulcers
Skin	Ask for facial rashes, other rashes over the skin and alopecia
Respiratory system	Progressive dyspnoea **(pleural effusion, shrinking lung syndrome, pulmonary fibrosis)**
Cardiovascular system	**Pericarditis** Central chest pain relieved by bending forwards Past history of MI, IHD Reynaud's phenomenon
Hematological system	Ask for features of anaemia
Renal disease	Ask for history of edema, frothy urine, hematuria **(Glomerulonephritis)**
Nervous system	Alteration in behavior, depression, psychosis **(cerebral lupus),** seizures Weakness and other focal neurological signs **(stroke, peripheral neuropathy)**
Reproductive	Recurrent pregnancy losses **(APLS)**

Describe the treatment of the disease, response to medication and the side effects of medication

Get a detailed description of the functional state of the patient

Describe the following in detail

- Bathing
- Use of the toilet
- Dressing
- Personal hygiene and cleanliness
- Grooming – i.e. combing hair
- Eating
- Level of mobility
- Transferring
- Recreational activities
- General household activities – cooking, sweeping, cleaning

Describe the household environment and describe the problems the patient has. Also describe the level of mobility of the patient outside the house and the facilities available for transport

Social history

- This is extremely important in this case. Take a detailed social history based on the points given below
- Introduce the family – family members, income, social circumstances
- Assess the family support for the patient
- Assess the knowledge of the patient on the condition
- Ask for the nearest hospital with rehabilitation facilities available

Examination

General examination

- Alopecia
- Pallor (anaemia of chronic disease, hemolytic anaemia)
- Icterus (hemolytic anaemia)
- Dry eyes, red eye
- Rashes – Butterly rash, vasculitic rashes, livedo reticularis
- Edema (glomerulonephritis)

Musculoskeletal system

- Do a full joint examination

Cardiovascular system

- Look for evidence of pericarditis
- Murmurs suggestive of endocarditis

Respiratory

- Examine for pleural effusions
- Restrictive lung disease
- Features of lung fibrosis

Nervous system

- Cranial nerve lesions
- Hemiplegia
- Ataxia
- Polyneuropathy

Discussion

How would you diagnose SLE?

The following is the diagnostic criteria of SLE

Table 311-3: The 1982 Criteria for Classification of Systemic Lupus Erythematosus, Updated 1997

1. Malar rash	Fixed erythema, flat or raised, over the malar eminences
2. Discoid rash	Erythematous raised patches with adherent keratotic scaling and follicular plugging; atrophic scarring may occur
3. Photosensitivity	Exposure to UV light causes rash
4. Oral ulcers	Includes oral and nasopharyngeal, observed by physician
5. Arthritis	Nonerosive arthritis involving two or more peripheral joints, characterized by tenderness, swelling, or effusion
6. Serositis	Pleuritis or pericarditis documented by ECG or rub or evidence of pericardial effusion
7. Renal disorder	Proteinuria > 0.5 g/d or > 3+, or cellular casts
8. Neurologic disorder	Seizures without other cause or psychosis without other cause
9. Hematologic disorder	Hemolytic anemia or leukopenia (< 4000/μL) or lymphopenia (< 1500/μL) or thrombocytopenia (< 100,000/μL) in the absence of offending drugs
10. Immunologic disorder	Anti-dsDNA, anti-Sm, and/or anti-phospholipid
11. Antinuclear antibodies	An abnormal titer of ANAs by immunofluorescence or an equivalent assay at any point in time in the absence of drugs known to induce ANAs

If four of these criteria are present at any time during the course of disease, a diagnosis of systemic lupus can be made with 98% specificity and 97% sensitivity.

Criteria published by EM Tan et al, Arthritis Rheum 25:1271, 1982; updated by MC Hochberg, Arthritis Rheum 40:1725, 1997.

What are the principles of management in a patient with SLE?

General management

- Education of the patient on the disease
- Recommend lifestyle modifications and manage other co morbidities for cardiovascular disease
- Manage joint pain with simple analgesics and NSAIDs
- DMARDs may also be used – Hydroxychloroquinine

Management of acute life threatening complications

- Renal, CVS and CNS
- Administer pulses of methylprednisolone and cyclophosphamide
- After control of the acute episode the patient should be started on oral steroids, azathioprine, methotrexate or mycophenolate mofetil

Stroke

History

Presenting complaint

- The patient will have presented with a focal or global (loss of consciousness) neurological deficit
- State the duration

History of the presenting complaint

Describe the symptoms the patient experienced

- The most important point is to describe the symptoms the patient experienced in detail based on a time line

Exclude other stroke like events

- Exclude a history of trauma
- Ask for a preceding history of early morning headache with associated vomiting **(tumor)**
- Ask for a history of unilateral throbbing type headache prior to the event with preceding aura **(hemiplegic migraine)**
- Ask for abnormal movements preceding the weakness and past history of seizures **(post ictal Todd's paresis)**
- Ask for any fever and altered behavior before the event **(CNS infection)**
- Ask for symptoms of hypoglycaemia and any past history of liver or renal disease **(metabolic encephalopathy)**
- Ask for recreational drug use

Next try to establish the clinical pattern of stroke

Type of stroke	Symptoms
Anterior circulation	Face arm and leg weakness Ask for evidence of higher cortical dysfunction Language and speech Memory Calculation and making decisions
Posterior circulation	Ask for associated Diplopia Vertigo Facial numbness and weakness Dysphagia and nasal regurgitation Slurring of speech Imbalance and unsteadiness
Lacunar circulation	No specific symptoms

Ask for other associated neurological features

- Bladder and bowel incontinence

Determine the aetiology of the stroke

Ischaemic

Cause	Specific points in the history
Atherosclerosis	Ask for past history of DM, HT and ischaemic heart disease Smoking, hyperlipidaemia Ask for symptoms suggestive of atherosclerosis Chest pain – angina Intermittent claudication – PVD Past history of TIA
Cardioembolism	Past history of rheumatic fever and valvular heart disease History of MI (intramural thrombus) History of palpitations and syncope (arrhythmias) History suggestive if infective endocarditis
Vasculitis	**Infective** Sexual promiscuity, blood transfusions, use of IV drugs (syphilis and HIV) **Autoimmune disease** Ask for joint pain, skin rashes, oral ulcers, hair loss, hematuria Long standing low grade fever and malaise
Thrombophillias	Ask for family history of young stroke, recurrent pregnancy losses

Hemorrhagic stroke

Ask for use of anticoagulants

Describe any complications the patient may have had due to the stroke

- Medical – Infections such as respiratory tract infections and UTI
- Associated neurological problems - seizures
- Pressure sores
- DVT
- Describe the psychological state of the patient

Level of functioning of the patient

Finally the most important is to describe the level of functioning of the patient. Describe the following details on the patient

- Bathing
- Use of the toilet
- Dressing
- Personal hygiene and cleanliness
- Grooming – i.e. combing hair

- Eating
- Level of mobility
- Transferring
- Recreational activities
- Speech and higher functional abilities of the patient

Complete the other components of the history

Social history

- This is extremely important in this case. Take a detailed social history based on the points given below
- Introduce the family – family members, income, social circumstances
- Describe the household environment in detail especially highlighting any barriers and dangerous areas for the patient
- Assess the family support for the patient
- Ask for the nearest hospital with rehabilitation facilities available

Examination

Objectives

- Establish the neurological signs
- Look for an aetiology
- Look for complications

General examination

- Pallor/plethora (plethora could indicate polycythaemia which is a risk factor for stroke)
- Peripheral stigmata of hyperlipidaemia
- Look for features suggestive of vasculitis
- Look for peripheral stigmata of infective endocarditis
- Examine for bed sores

Neurological examination

- Examine all components of the nervous system and try to localize the lesion

Cardiovascular system

- Examine the pulse for arrhythmias
- Auscultate the heart for murmurs (MS)
- Examine the neck for carotid arterial bruits

Respiratory system

- Look for evidence of pneumonia

Abdomen

Discuss the initial management of a patient with stroke

Assess the patient

- A, B, C
- GCS
- Other vital parameters – pulse, BP, RR, temp
- Neck stiffness
- Detailed neurological examination
- Cardiovascular system – to look for a cardiogenic cause, carotid bruits, features of aortic dissection
- Take blood for investigations – FBC, SE, U, SC, Glucose, inflammatory markers, lipid profile
- Inward 12 lead ECG
- Arrange for a CT scan (non contrast)

Localization and classification of the lesion

Oxfordshire Stroke Classification

Total Anterior Circulation (TAC) – All 3 of the following criteria

- Weakness (+/- sensory deficit) of at least 2 of 3 body areas (face/arm/leg)
- Homonymous hemianopia
- Higher cerebral dysfunction (dysphasia, dyspraxia commonest)
- If drowsy with unilateral weakness, last two factors are assumed

Partial Anterior Circulation (PAC)

- 2 of 3 of TAC criteria or restricted motor/sensory deficit eg. one limb, face and hand or higher cerebral dysfunction alone
- More restricted cortical infarcts

Lacunar (LAC)

- Pure motor (most common)
  Complete or incomplete weakness of 1 side, involving the whole of 2 of 3 body areas (face/arm/leg)
  Sensory symptoms, dysarthria or dysphasia allowed
- Pure sensory
  Sensory symptoms and/or signs, same distribution
- Sensorimotor
  Combination of the above
- Ataxic hemiparesis
  Hemiparesis and ipsilateral cerebellar ataxia

Posterior Circulation (POC)

- Affecting brainstem, cerebellar or occipital lobes

Definitive management

- Aspirin 300mg oral and continue once diagnosis of ischaemic stroke has been made
- Consider for specific treatment with thrombolytics – Ateplase (Should be given within 3 hours of the event)

Rehabilitation

Assessment

- Rehabilitation should be commenced immediately with mobilization as soon as possible. Assessment of positioning, mobilization, moving and handling should be assessed.
- Detailed rehabilitation assessment should be carried out and multidisciplinary rehabilitation should take place with the involvement of the physiotherapist, occupational therapist, speech and language therapist, counselor and social worker
- The patient should also be assessed for swallowing and a NG tube should be used for feeding where ever necessary. Nutrition and hydration should be noted frequently.
- Bladder and bowel functions should be assessed
- The risk for developing pressure ulcers should also be assessed
- Capacity to understand instructions and to express needs should also be noted
- Assess the activities of daily living using Barthel's index

Carry out the plan for rehabilitation

- Perform regular physiotherapy
- Occupational therapy involves retraining of the patient's activities of daily living. The occupational therapist also performs assessment and modification of the patient's house
- Speech and language retraining is extremely important especially in patients with dysphasia

Investigate for a possible cause

- This is especially important a young patient with a stroke

Cause	Specific points in the history
Atherosclerosis	Lipid profile Investigate for diabetes Homocysteine levels Carotid duplex scan
Cardioembolism	Echocardiogram
Vasculitis	**Infective**

	VDRL and HIV testing **Autoimmune disease** ANA ANCA
Thrombophillias	Anti phospholipid antibodies Protein C and protein S levels Serum fibrinogen Factor V Leiden genetic mutation

Plan discharge

Community based rehabilitation

Secondary prevention principles

- Identify risk factors
    - Diabetes mellitus
    - Hypertension
    - Hyperlipidaemia
    - Smoking
    - Obesity
    - Cardiac disease (AF and other arrhythmias, structural cardiac disease)
    - Carotid artery
    - Other rare causes

- Provide information on stroke and risk factors to the patient and commence a personalized approach to management.

Lifestyle modifications

- Stop smoking
- Physical activities according to the patient's abilities
- Advice on proper dietary modifications should be given

Drug therapy

- **Manage hypertension**- target 130/80
- **Antiplatelet drugs**
  Aspirin and dipyridamole combination
  Aspirin alone
  Clopidogrel in patients intolerant of aspirin
- **Anticoagulation:**
  Is indicated in patients with chronic atrial fibrillation
- **Lipid lowering drugs**

Lower limb weakness

History

Presenting complaint

- The patient will present with lower limb weakness
- State the duration

History of the presenting complaint

Describe the symptoms clearly

- The first step is to clearly describe the onset and progression of the symptoms in a time line of events. This is extremely important for the differential diagnosis
- Remember that an acute onset of symptoms will indicate a vascular event or a sudden compression of the spinal cord
- Establish the pattern of weakness
- The most common case given for the exam is bilateral lower limb weakness of acute to sub acute onset

Acute	Subacute	Chronic
Acute spinal cord compression Vascular event	Spinal cord lesion – compressive or non compressive GBS Other polyneuropathies Myasthenia gravis Myopathy – periodic paralysis	Spinal cord lesion Polyneuropathy

Try to localize the lesion

Location of the lesion	Specific points in the history	Further questions
Spinal cord	Ask for associated bladder and bowel incontinence Sensory disturbances – parasthesia and sensory loss below a particular level	**Try to find the aetiology** **Compressive spinal cord disease** **Cervical spondylosis** Slow progression Neck pain and radicular arm pain **TB** Low grade fever, night sweats, LOA and LOW associated back pain aggravated at night Contact history or past history of tuberculosis **Epidural abscess**

		Similar history **Neoplastic compression** Back pain aggravated at night, increased on coughing Past history of primary site Breast – Breast lumps Kidney – Hematuria Prostate – LUTS Myeloma **Non compressive lesions** **Transverse myelitis** Preceding viral infection **B12 deficiency** Dietary history
Peripheral nerve **GBS**	Ask for preceding respiratory tract infection, diarrhoeal episode, the initial history will usually establish the diagnosis	
Other polyneuropathies		**Ask for the possible causes** **Toxins** Snake bite Exposure to chemicals – organophosphates **Autoimmune** History suggestive of autoimmune disease **Endocrine and metabolic diseases**
NMJ **Myasthenia**	Ask specifically for fatigability Past history of progressive drooping of the eyelid or diplopia Fatigability during eating Dysphagia	
Muscle disease	Ask specifically for symptoms of proximal muscle weakness. These are, difficulty in getting up from the seated position, climbing stairs	**Ask for possible causes** **Periodic paralysis** Similar episodes **Drug and toxin history**

Describe any complications

- Medical – Infections such as respiratory tract infections and UTI

- Pressure sores
- DVT
- Describe the psychological state of the patient

Level of functioning of the patient

Finally the most important is to describe the level of functioning of the patient. Describe the following details on the patient

- Bathing
- Use of the toilet
- Dressing
- Personal hygiene and cleanliness
- Grooming – i.e. combing hair
- Eating
- Level of mobility
- Transferring
- Recreational activities
- Speech and higher functional abilities of the patient

Complete the other components of the history

Social history

- This is extremely important in this case. Take a detailed social history based on the points given below
- Introduce the family – family members, income, social circumstances
- Describe the household environment in detail especially highlighting any barriers and dangerous areas for the patient
- Assess the family support for the patient
- Ask for the nearest hospital with rehabilitation facilities available

Examination and discussion

See relevant section in short cases in medicine

Discussion on spinal cord disease

A 38 year old woman presents with progressive difficulty in walking over the last few weeks. On examination she has B/L spastic paraparesis and a sensory level at T9.

Most likely localization of the lesion

UMN weakness is the conclusion which can be reached from the above clinical data. Therefore the possible sites of the lesion are

- **Cortex**
- **Brainstem**
- **Spinal cord**

Given the above details it is likely that the lesion is in the spinal cord at T9 level. The features of a lesion in the spinal cord are

- LMN signs at the level of the lesion and UMN signs below the level of the lesion
- Presence of a sensory level
- Bladder and bowel dysfunction

The next step is to determine the cause

Spinal cord disease can be compressive or non compressive.

Compressive spinal cord disease

This can be due to extramedullary or intramedullary compression

- Presentation of extramedullary compression usually is with radicular signs due to root compression which gradually proceeds into cord compression 1st affecting the sacral and lumbar regions due to lamination of the tracts.
- Intramedullary compression does not cause radicular symptoms and signs but presents with features of central cord syndrome with the sacral and lumbar regions being affected last.

Pathology	Causes
Diseases of the vertebral column	**Traumatic** – fracture dislocation **Infections** – TB spine **Neoplasms** – Secondary deposits (Breast, lung) primary vertebral tumors **Degenerative-** Disc disease
Extradural abscess	
Meningeal infiltration	Lymphoma, Leukaemia
Spinal cord tumors	Extramedullary – Meningioma, neurofibroma Intramedullary - Astrocytoma

Non compressive spinal cord disease

Pathology	Causes
Transverse myelitis	MS (Rare in SL. Can have associated optic neuropathy, cerebellar manifestations)
Vascular	Infarction (Anterior spinal artery thrombosis) Hemorrhage A-V malformation
Infective	HIV, syphilis
Degenerative	Syringomyelia, ALS, Tabes, FA
Nutritional	Vitamin B12 deficiency causing SADC

Features of non compressive spinal cord disease

Condition	Clinical features
MS	Look for associated optic neuropathy, cerebellar signs, radicular symptoms. Relapses and remissions are possible.
Anterior spinal artery thrombosis	Acute onset as this is a vascular event. Typically causes sensory loss with preservation of vibration and JPS
Syringomyelia	Look for dissociated sensory loss, central cord syndrome
FA, Tabes, SADC	Absent ankle jerks and extensor plantar response
ALS	Muscle wasting, no sensory impairment

In this patient compressive cord disease should be thought of initially. Exclusion of compressive causes should warrant the need for investigation into non compressive lesions.

A detailed and targeted history should be taken to find the cause of the suspected cord compression, especially history suggestive of malignancy and TB.

Investigations

- FBC, ESR, RFT, SE, serum calcium and phosphate levels
- Urine for BJP
- X-Ray spine, CXR
- MRI of the spine
- Other specific investigations to determine the cause

Initial management of a patient with spinal cord disease

- **ABC – Especially if the patient has a suspected cervical spine injury**
- Relieve urinary retention

- Proper nursing care, bladder, bowel, nutritional care, prevention of pressure ulcers
- DVT prophylaxis
- Rehabilitation
- Management of the specific cause

Peripheral neuropathy

Congenital	Acquired
Hereditary motor and sensory neuropathy (HMSN)	**Infection** Leprosy Diphtheria **Inflammatory** Guillain- Barre syndrome CIDP Vasculitis and connective tissue disease **Metabolic and endocrine** DM Vitamin deficiency – B1, B6, B12, E **Organ failure** Chronic renal failure **Drugs** **Toxins** Arsenic Lead Organophosphates **Malignancy**

Management of GBS

- The most important aspect of the management is the monitoring and regular assessment of the respiratory capacity of the patient. This can be done by single breath counting test or more objective assessment by FVC.
- Cardiac monitoring is also required as the patient can have autonomic instability which manifests as fluctuating BP, bradycardia and arrhythmias.
- ICU care is preferred
- Admission to the ICU should be considered for all patients with labile dysautonomia, an FVC of less than 20 mL/kg, or severe bulbar palsy
- Definitive care is provided by plasma exchange or IV immunoglobulin
- CSF analysis is not conclusive until 10 days. The typical pattern is increased protein level with no increase in the cell count. (Albuminocytologic disassociation)

- Rehabilitation