Long cases in medicine
Content overview

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  - Management of infective endocarditis
  - An introduction to hematological malignancies
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- Hypertension
- Chest pain
  - Management of Ischaemic heart disease
- Shortness of breath
  - Management of heart failure
  - Management of COPD and bronchial asthma
  - An introduction to diffuse parenchymal lung disease (DPLD)
  - Approach to a patient with anaemia
- Fever with respiratory symptoms
  - Management of LRTI
- Chronic cough and hemoptysis
  - Management of tuberculosis
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  - Management of nephritic syndrome
  - Management of chronic kidney disease
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  - Management of chronic liver disease
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- Bleeding and bruising
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- Lower limb weakness
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  - Management of spinal cord disease — compressive and non compressive
  - Approach to the diagnosis and management of peripheral neuropathies
- Hemiparesis
  - Management of stroke
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

<table>
<thead>
<tr>
<th>Disease</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dengue fever</td>
<td>Headache, retro–orbital pain, arthralgia and myalgia, anorexia, nausea and vomiting</td>
</tr>
<tr>
<td></td>
<td><strong>Warning signs</strong></td>
</tr>
<tr>
<td></td>
<td>Abdominal pain, mucosal bleeding and other bleeding manifestations, lethargy and restlessness</td>
</tr>
<tr>
<td>Respiratory tract infection</td>
<td>Ask for</td>
</tr>
<tr>
<td></td>
<td>Cough, sputum (if sputum is associated state the color and amount), rhinorrhoea, chest pain associated with breathing and difficulty in breathing</td>
</tr>
<tr>
<td>Ear infection</td>
<td>Ear pain and discharge</td>
</tr>
<tr>
<td>Pharyngitis</td>
<td>Ask for sore throat, pain on swallowing</td>
</tr>
<tr>
<td>CNS infection (Meningitis and encephalitis)</td>
<td>Headache, photophobia, altered behavior and loss of consciousness, seizures</td>
</tr>
<tr>
<td>GI infection</td>
<td>Ask for passage of loose stools</td>
</tr>
<tr>
<td>Hepatitis</td>
<td>Yellowish discoloration of the eyes, darkening of</td>
</tr>
<tr>
<td>Medical Condition</td>
<td>Clinical Presentation</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>--------------------------------------------</td>
</tr>
<tr>
<td>Leptospirosis</td>
<td>Exposure to muddy water/ possible contaminated water</td>
</tr>
<tr>
<td>Septic arthritis and osteomyelitis</td>
<td>Bone pain, joint pain and swelling</td>
</tr>
<tr>
<td>Urinary tract infection</td>
<td>Crying on passage of urine, frequency, hematuria</td>
</tr>
</tbody>
</table>

**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

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

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
<table>
<thead>
<tr>
<th>Category</th>
<th>Diseases</th>
<th>Specific points in the history</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Infective</strong></td>
<td><strong>Localized</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Respiratory tract infections</td>
<td>Cough, sputum, nasal or ear discharge, sore throat</td>
</tr>
<tr>
<td></td>
<td>Gastrointestinal infections and localized intra abdominal abscesses</td>
<td>Ask for alteration of bowel habits, recurrent episodes of abdominal pain</td>
</tr>
<tr>
<td></td>
<td>Urinary tract infections</td>
<td>Dysuria, frequency, hematuria and other urinary tract symptoms</td>
</tr>
<tr>
<td></td>
<td>Infections of the bones and joints</td>
<td>Ask for joint pain and swelling, limping,</td>
</tr>
<tr>
<td><strong>Generalized</strong></td>
<td>Infective endocarditis</td>
<td>Past history of heart disease, rheumatic fever with evidence of a predisposing event for bacteraemia</td>
</tr>
<tr>
<td></td>
<td>IMN</td>
<td>Associated sore throat</td>
</tr>
<tr>
<td></td>
<td>TB</td>
<td>Contact history of TB, chronic cough, hemoptysis</td>
</tr>
<tr>
<td></td>
<td>Typhoid fever</td>
<td>Ask for possible exposure to unhygienic food</td>
</tr>
<tr>
<td></td>
<td></td>
<td>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</td>
</tr>
<tr>
<td></td>
<td>Malaria</td>
<td>Visit to a malarial endemic area</td>
</tr>
<tr>
<td></td>
<td>Other zoonotic infections</td>
<td>Contact history with animals</td>
</tr>
<tr>
<td></td>
<td>HIV</td>
<td>Multiple sexual partners, unprotected sexual intercourse, contact with blood or blood products</td>
</tr>
<tr>
<td><strong>Inflammatory</strong></td>
<td>Still’s disease</td>
<td>Ask for a evanescent salmon pink maculopapular rash, associated joint pain and early morning joint stiffness</td>
</tr>
<tr>
<td></td>
<td>SLE</td>
<td>History of facial rashes and joint pain</td>
</tr>
<tr>
<td><strong>Neoplastic</strong></td>
<td>Hematological malignancy</td>
<td>Evidence of bleeding, ask for the features of anaemia, history of bone pain, past history of recurrent infections</td>
</tr>
<tr>
<td></td>
<td>Other malignancies</td>
<td></td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>Drugs</td>
<td>Drug history</td>
</tr>
<tr>
<td></td>
<td>Factitious fever</td>
<td></td>
</tr>
</tbody>
</table>
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 after 1 week of rational inpatient investigations or 3 outpatient visits

**What is your 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

<table>
<thead>
<tr>
<th>History</th>
<th>Examination</th>
<th>Differential diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUO</td>
<td>Peripheral stigmata of IE (rare)</td>
<td>Infective endocarditis</td>
</tr>
<tr>
<td>Past history of rheumatic fever/ congenital heart disease</td>
<td>Cardiac murmur (MR, AR)</td>
<td></td>
</tr>
<tr>
<td>PUO</td>
<td>Pleural effusion</td>
<td>TB</td>
</tr>
<tr>
<td>Chronic cough, hemoptysis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+/- Contact history of TB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PUO</td>
<td>Pallor</td>
<td>Leukaemia</td>
</tr>
<tr>
<td>+/- symptoms of bone marrow suppression</td>
<td>Lymphadenopathy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hepatosplenomegaly</td>
<td>Lymphoma</td>
</tr>
</tbody>
</table>
What are the initial investigations you would like to perform in this patient?

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

<table>
<thead>
<tr>
<th>Clinical diagnosis</th>
<th>Investigations</th>
<th>What to look for</th>
</tr>
</thead>
<tbody>
<tr>
<td>IE</td>
<td>Blood culture, Echo</td>
<td>These are required for the confirmation of the diagnosis</td>
</tr>
<tr>
<td>TB</td>
<td>CXR, Mantoux test</td>
<td></td>
</tr>
<tr>
<td>Hematological malignancy</td>
<td>FBC, Blood picture, USS of the abdomen, Bone marrow biopsy</td>
<td>Look for pancytopenia, Look for abnormal cells (blasts), Confirm the organomegaly, Look for para aortic lymph nodes</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Major criteria</th>
<th>Minor criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive blood culture</td>
<td>Predisposing valvular or cardiac anomaly</td>
</tr>
<tr>
<td>Typical organism from two cultures</td>
<td>IV drug use</td>
</tr>
<tr>
<td>Persistent positive blood cultures taken &gt; 12 hours apart</td>
<td>Pyrexia &gt; 38 Celsius</td>
</tr>
<tr>
<td>Three or more positive cultures taken over &gt; 1h</td>
<td>Embolic phenomenon</td>
</tr>
<tr>
<td>Positive echocardiogram</td>
<td>Vasculitic phenomenon</td>
</tr>
<tr>
<td>Vegetations</td>
<td>Positive cultures not achieving major criteria</td>
</tr>
<tr>
<td>New valvular regurgitation</td>
<td>Positive echo not achieving major criteria</td>
</tr>
</tbody>
</table>

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

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


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)

<table>
<thead>
<tr>
<th>System</th>
<th>Diseases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular</td>
<td>MI, unstable angina, aortic dissection, acute pericarditis</td>
</tr>
<tr>
<td>Respiratory</td>
<td>Spontaneous pneumothorax, pulmonary embolism</td>
</tr>
<tr>
<td>Gastrointestinal</td>
<td>Oesophageal spasm, peptic ulcer disease, acute pancreatitis</td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th>Time</th>
<th>Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hyperacute (0-20 min)</td>
<td>Tall peaking T waves and progressive ST elevations</td>
</tr>
<tr>
<td>Acute (min – hours)</td>
<td>ST elevations</td>
</tr>
<tr>
<td>Early (hours – days)</td>
<td>ST elevations disappear and Q waves appear</td>
</tr>
<tr>
<td>Indeterminate (days – weeks)</td>
<td>Q waves and T inversions</td>
</tr>
<tr>
<td>Old</td>
<td>Persistence of ST elevations</td>
</tr>
</tbody>
</table>

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.

![ECG Image]

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

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

<table>
<thead>
<tr>
<th>Class and mechanism of action</th>
<th>Drugs</th>
<th>Side effects</th>
</tr>
</thead>
</table>
| **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

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

Establish associated cardiovascular comorbidities

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

Complications of hypertension

<table>
<thead>
<tr>
<th>Category</th>
<th>Disease</th>
<th>Specific questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular</td>
<td>IHD</td>
<td>Ask for past history of ischaemic heart disease</td>
</tr>
<tr>
<td></td>
<td>Heart failure</td>
<td>Ask for exertional dyspnoea,</td>
</tr>
</tbody>
</table>
Peripheral vascular disease
- orthopnoea and paroxysmal nocturnal dyspnoea and oedema
- Intermittent claudication, rest pain, ulcers

<table>
<thead>
<tr>
<th>Nervous system</th>
<th>Stroke</th>
<th>Ask for past history of stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renal disease</td>
<td></td>
<td>History of recent onset</td>
</tr>
<tr>
<td></td>
<td></td>
<td>symptoms of uremia</td>
</tr>
<tr>
<td>Hypertensive emergencies</td>
<td></td>
<td>Previous hospital admissions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>with elevated blood pressure</td>
</tr>
</tbody>
</table>

**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

![Peripheral vascular disease symptoms](image)

**Cardiovascular system**

![Cardiovascular system](image)
- 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

**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

<table>
<thead>
<tr>
<th>Category</th>
<th>Systolic</th>
<th>Diastolic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&lt;120</td>
<td>&lt;80</td>
</tr>
<tr>
<td>Pre – hypertension</td>
<td>120 – 139</td>
<td>80-89</td>
</tr>
<tr>
<td>Grade 1 hypertension (mild)</td>
<td>140 – 159</td>
<td>90 – 99</td>
</tr>
<tr>
<td>Grade 2 hypertension (moderate)</td>
<td>160 – 179</td>
<td>100 – 109</td>
</tr>
<tr>
<td>Grade 3 hypertension (severe)</td>
<td>More than or equal to 180</td>
<td>More than or equal to 110</td>
</tr>
<tr>
<td>Isolated systolic hypertension</td>
<td>More than or equal to 140</td>
<td>&lt;90</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>System</th>
<th>Investigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular</td>
<td>ECG – Evidence of left ventricular hypertrophy, atrial fibrillation</td>
</tr>
<tr>
<td></td>
<td>Echocardiogram if necessary</td>
</tr>
<tr>
<td>Renal</td>
<td>Blood urea, serum electrolytes, UFR</td>
</tr>
<tr>
<td></td>
<td>USS of the abdomen</td>
</tr>
</tbody>
</table>

Secondary causes of hypertension

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

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 antihypertensives 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?**

![Antihypertensives Algorithm](image)

- **Step 1**: A
- **Step 2**: A + C or A + D
- **Step 3**: A + C + D
- **Step 4**: 
  - Add further diuretic therapy
  - or alpha-blocker
  - or beta-blocker

  **Consider seeking specialist advice**

- A: ACE inhibitor (consider angiotensin-II receptor antagonist if ACE intolerant)
- C: Calcium-channel blocker
- D: thiazide-type diuretic
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.

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

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

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

- 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

<table>
<thead>
<tr>
<th>Category</th>
<th>Investigations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes control</td>
<td>FBS, PPBS, HbA1C</td>
</tr>
<tr>
<td>Macrovascular complications and risk factors</td>
<td>Lipid profile</td>
</tr>
<tr>
<td>Category</td>
<td>Complication</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>-------------------------------------------</td>
</tr>
<tr>
<td>Macrovascular complications</td>
<td>CVS</td>
</tr>
<tr>
<td></td>
<td>Coronary artery disease</td>
</tr>
<tr>
<td></td>
<td>Peripheral vascular disease</td>
</tr>
<tr>
<td></td>
<td>CNS</td>
</tr>
<tr>
<td>Microvascular complications</td>
<td>Diabetic nephropathy</td>
</tr>
<tr>
<td></td>
<td>Diabetic retinopathy</td>
</tr>
<tr>
<td></td>
<td>Diabetic neuropathy</td>
</tr>
<tr>
<td></td>
<td>Sensory polyneuropathy</td>
</tr>
<tr>
<td></td>
<td>Diabetic amyotrophy</td>
</tr>
<tr>
<td></td>
<td>Mononeuropathy</td>
</tr>
<tr>
<td></td>
<td>Autonomic neuropathy</td>
</tr>
<tr>
<td>Other</td>
<td>Foot complications</td>
</tr>
<tr>
<td></td>
<td>Recurrent infections</td>
</tr>
<tr>
<td>Acute complications</td>
<td>Hypoglycaemic and hyperglycaemic emergencies</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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?

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

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 lifestyle 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
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 hypoglycaemic 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

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

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

<table>
<thead>
<tr>
<th>Category</th>
<th>Investigations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes control</td>
<td>FBS, PPBS, HbA1C</td>
</tr>
<tr>
<td>Macrovascular complications and risk factors</td>
<td>Lipid profile</td>
</tr>
<tr>
<td>Microvascular complications</td>
<td>UFR, Microalbuminuria, Eye referral</td>
</tr>
<tr>
<td>Foot complications</td>
<td>Examine the feet</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood pressure</td>
<td>&lt;130/80</td>
</tr>
<tr>
<td>FBS</td>
<td>Between 90 and 130 (Ideal around 100)</td>
</tr>
<tr>
<td>HbA1c</td>
<td>&lt; 7%</td>
</tr>
<tr>
<td>Total cholesterol (mmol/l)</td>
<td>&lt; 4</td>
</tr>
<tr>
<td>LDL cholesterol (mmol/l)</td>
<td>&lt; 2</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Type</th>
<th>Starts</th>
<th>Peaks</th>
<th>Lowers</th>
<th>Finishes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rapid-Acting (Humalog/Novolog)</td>
<td>0-15 mins (huma), 10-20 mins (novo)</td>
<td>45-60 mins (huma), 60-90 mins (novo)</td>
<td>blood glucose most in 45-90 mins (huma), 1-2 hrs (novo)</td>
<td>3-4 hrs (huma), 3-5 hrs (novo)</td>
</tr>
<tr>
<td>Short-Acting (Regular)</td>
<td>0 mins</td>
<td>about 2 hrs</td>
<td>blood glucose most 2-5 hrs</td>
<td>3-5 hrs</td>
</tr>
<tr>
<td>Intermediate-Acting (NPH)</td>
<td>1-3 hrs</td>
<td>about 4-6 hrs</td>
<td>blood glucose most 6-12 hrs</td>
<td>12-16 hrs</td>
</tr>
<tr>
<td>Intermediate-Acting (Lente)</td>
<td>1-3 hrs</td>
<td>about 4-6 hrs</td>
<td>blood glucose most 6-12 hrs</td>
<td>10-24 hrs</td>
</tr>
<tr>
<td>Long-Acting (Lantus/Levemir)</td>
<td>1-2 hours</td>
<td>no peak</td>
<td>blood glucose evenly 24 hrs</td>
<td>24 hrs</td>
</tr>
</tbody>
</table>

**COMBINATIONS:**
NPH and either Rapid or Short Acting Insulins

**Insulin regimens**

![Insulin regimens diagram](www.medscape.com)

Source: South Med J © 2006 Lippincott Williams & Wilkins
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

<table>
<thead>
<tr>
<th>Complication</th>
<th>Principles of management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retinopathy</td>
<td>Screening</td>
</tr>
<tr>
<td></td>
<td>Arrange for an eye referral annually</td>
</tr>
<tr>
<td>Non proliferative retinopathy</td>
<td>Glycaemic control and risk factor modification</td>
</tr>
<tr>
<td>Maculopathy</td>
<td>Regular screening</td>
</tr>
<tr>
<td></td>
<td>Refer to a specialist as can be sight threatening</td>
</tr>
<tr>
<td><strong>Nephropathy</strong></td>
<td><strong>Screening</strong></td>
</tr>
<tr>
<td>-----------------</td>
<td>--------------</td>
</tr>
<tr>
<td></td>
<td>UFR and microalbuminuria at least once a year</td>
</tr>
<tr>
<td></td>
<td><strong>Established disease</strong></td>
</tr>
<tr>
<td></td>
<td>Aggressive reduction of blood pressure</td>
</tr>
<tr>
<td></td>
<td>Commence therapy with ACE inhibitors</td>
</tr>
<tr>
<td></td>
<td>Improve glycaemic control</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Neuropathy</strong></th>
<th><strong>Management of painful neuropathy</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strict glycaemic control</td>
</tr>
<tr>
<td></td>
<td>Anticonvulsants – Gabapentin, carambazepine</td>
</tr>
<tr>
<td></td>
<td>TCA</td>
</tr>
<tr>
<td></td>
<td>Opioids</td>
</tr>
<tr>
<td></td>
<td><strong>Postural hypotension</strong></td>
</tr>
<tr>
<td></td>
<td>Fludrocortisone</td>
</tr>
<tr>
<td></td>
<td><strong>GI</strong></td>
</tr>
<tr>
<td></td>
<td>Gastroparesis</td>
</tr>
<tr>
<td></td>
<td>Dopamine antagonists</td>
</tr>
<tr>
<td></td>
<td>Loperamide for diarrhoea</td>
</tr>
<tr>
<td></td>
<td><strong>Erectile dysfunction</strong></td>
</tr>
<tr>
<td></td>
<td>Sildenafil</td>
</tr>
</tbody>
</table>

**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

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

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

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
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:

<table>
<thead>
<tr>
<th>Class</th>
<th>Drugs</th>
<th>Side effects</th>
<th>Special points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diuretics</td>
<td>Frusemide</td>
<td>Postural hypotension, Metabolic disturbances, Hyperglycaemia, Hyperuricaemia, Hypokalemia, Hyponatremia, Other Urinary retention</td>
<td>Check renal function and electrolyte imbalances prior to commencement of therapy. Start at a low dose and monitor the weight.</td>
</tr>
<tr>
<td>ACEI</td>
<td>Captopril, Enalapril</td>
<td>Dry cough, 1st dose hypotension, Postural hypotension, Electrolyte imbalances – hyperkalemia, Angioedema</td>
<td>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. <strong>Contraindications</strong> Significant renal dysfunction, Hyperkalemia, Bilateral renal artery stenosis, Severe aortic stenosis.</td>
</tr>
<tr>
<td>Angiotensin II receptor blockers</td>
<td>Losartan</td>
<td>None</td>
<td>Are used when the patient cannot tolerate ACEI.</td>
</tr>
<tr>
<td>Beta blockers</td>
<td>Bisoprolol, Metoprolol</td>
<td>Bradycardia, conduction abnormalities, bronchoconstriction, worsening of peripheral vascular disease, impotence</td>
<td>Is contraindicated in patients with asthma, significant heart block.</td>
</tr>
<tr>
<td>Aldosterone antagonists</td>
<td>Spiranolactone</td>
<td>Painful gynaecomastia, Hyperkalemia</td>
<td>Take care when using as combination therapy.</td>
</tr>
<tr>
<td>Cardiac glycosides</td>
<td>Digoxin</td>
<td>Heart block, Pre excitation syndromes</td>
<td>May be considered as second line therapy in heart failure.</td>
</tr>
</tbody>
</table>

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 an 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
<table>
<thead>
<tr>
<th>Short acting</th>
<th>Long acting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Beta 2 agonists</strong></td>
<td><strong>Beta 2 agonists</strong></td>
</tr>
<tr>
<td>Salbutamol</td>
<td>Salmeterol</td>
</tr>
<tr>
<td></td>
<td>Formeterol</td>
</tr>
<tr>
<td><strong>Anticholinergics</strong></td>
<td></td>
</tr>
<tr>
<td>Ipratropium</td>
<td>Tiotropium</td>
</tr>
</tbody>
</table>

- 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 an 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**

<table>
<thead>
<tr>
<th>Category</th>
<th>Days with symptoms</th>
<th>Nights with symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild intermittent</td>
<td>2 or less per week</td>
<td>Less than 2 per month</td>
</tr>
<tr>
<td>Mild persistent</td>
<td>&gt; 2 per week but &lt; 1 per day</td>
<td>&gt; 2 per month</td>
</tr>
<tr>
<td>Moderate persistent</td>
<td>Daily</td>
<td>&gt; 1 per week</td>
</tr>
<tr>
<td>Severe persistent</td>
<td>Continual</td>
<td>Frequent</td>
</tr>
</tbody>
</table>

**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

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

• 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

<table>
<thead>
<tr>
<th>Category</th>
<th>Further classification and causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPLD of known cause or associations</td>
<td><strong>Connective tissue diseases</strong>&lt;br&gt;SLE, rheumatoid arthritis, scleroderma&lt;br&gt;<strong>Drugs</strong>&lt;br&gt;Amiodarone&lt;br&gt;Chemotherapeutic agents&lt;br&gt;Antirheumatic agents – gold, penicillamine&lt;br&gt;<strong>Environmental exposures</strong>&lt;br&gt;</td>
</tr>
<tr>
<td>Idiopathic interstitial pneumonias</td>
<td>Idiopathic pulmonary fibrosis (formerly known as fibrosing alveolitis)&lt;br&gt;Other&lt;br&gt;</td>
</tr>
<tr>
<td>Granulomatous DPLD</td>
<td>Sarcoidosis&lt;br&gt;</td>
</tr>
<tr>
<td>Other rare forms of DPLD</td>
<td>Histiocytosis X</td>
</tr>
</tbody>
</table>

#### 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 into 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

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

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

### 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

<table>
<thead>
<tr>
<th>Microcytic hypochromic</th>
<th>Normocytic normochromic</th>
<th>Macrocytic anaemia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron deficiency anaemia</td>
<td>Anaemia of chronic disease</td>
<td>B12 deficiency</td>
</tr>
<tr>
<td>Beta Thalassemia</td>
<td>Hemolytic anaemia</td>
<td>Folate deficiency</td>
</tr>
<tr>
<td>Anaemia of chronic disease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sideroblastic anaemia</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

What are the further investigations of microcytic hypochromic anaemia?

The first step is serum iron studies

<table>
<thead>
<tr>
<th></th>
<th>Fe deficiency</th>
<th>Thalasemia</th>
<th>Chronic disease</th>
<th>Sideroblastic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum iron</td>
<td>Reduced</td>
<td>Normal</td>
<td>Normal</td>
<td>Raised</td>
</tr>
<tr>
<td>Serum ferritin</td>
<td>Reduced</td>
<td>Normal</td>
<td>Normal or raised</td>
<td>Raised</td>
</tr>
<tr>
<td>TIBC</td>
<td>Raised</td>
<td>Normal</td>
<td>Reduced</td>
<td>Normal</td>
</tr>
</tbody>
</table>

Blood picture and other special investigations
### Fe deficiency vs. Thalassemia vs. Sideroblastic anaemia

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

---

**Discuss the further assessment of a macrocytic anaemia**

![Flowchart](chart.png)
### 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

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

<table>
<thead>
<tr>
<th>COPD</th>
<th>Usually does not produce hemoptysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bronchiectasis</td>
<td>Characterized by copious sputum production</td>
</tr>
</tbody>
</table>

**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
<table>
<thead>
<tr>
<th>Drug and mechanism of action</th>
<th>Dose</th>
<th>Side effects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Isoniazid</strong>&lt;br&gt;Bactericidal and bacteriostatic effect</td>
<td>5mg/kg</td>
<td>Liver toxicity&lt;br&gt;Peripheral neuropathy&lt;br&gt;Mental disturbances&lt;br&gt;Incoordination&lt;br&gt;Drug interaction – enzyme inhibitor</td>
</tr>
<tr>
<td><strong>Rifampicin</strong>&lt;br&gt;Bactericidal effect</td>
<td>10mg/kg</td>
<td>Liver toxicity&lt;br&gt;Orange discolouration of body secretions&lt;br&gt;Skin rashes, thrombocytopenia&lt;br&gt;Oral contraceptive failure</td>
</tr>
<tr>
<td><strong>Pyrizinamide</strong>&lt;br&gt;Kills intracellular persisters</td>
<td>25mg/kg</td>
<td>Liver toxicity&lt;br&gt;Hyperuricaemia</td>
</tr>
<tr>
<td><strong>Ethambutol</strong>&lt;br&gt;Bacteriostatic effect</td>
<td>15mg/kg</td>
<td>Optic neuritis</td>
</tr>
</tbody>
</table>

**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

<table>
<thead>
<tr>
<th>CXR pattern</th>
<th>Possible pathogen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cavitation</td>
<td>TB, <em>Staphylococcus aureus, Klebsiella</em>, fungal pneumonia</td>
</tr>
<tr>
<td>Miliary pattern</td>
<td>TB, fungal pneumonia</td>
</tr>
<tr>
<td>Multifocal infiltrates</td>
<td><em>Legionella, Staphylococcus aureus</em></td>
</tr>
<tr>
<td>Interstitial pattern</td>
<td>Atypical organisms (<em>Mycoplasma, Chlamydia</em>)</td>
</tr>
</tbody>
</table>

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 careful input output monitoring
• Consider inotropes if in shock

• Antibiotic therapy

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

<table>
<thead>
<tr>
<th>Complications</th>
<th>Principles of management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Local</strong></td>
<td></td>
</tr>
<tr>
<td>Parapneumonic effusion</td>
<td>Usually no specific treatment is required</td>
</tr>
<tr>
<td>Empyema</td>
<td>Aspiration to dryness with adequate antibiotic cover</td>
</tr>
<tr>
<td></td>
<td>IC tube insertion</td>
</tr>
<tr>
<td><strong>Systemic</strong></td>
<td>See discussion above</td>
</tr>
<tr>
<td>ARDS</td>
<td></td>
</tr>
<tr>
<td>Severe sepsis and septic shock</td>
<td></td>
</tr>
<tr>
<td>Metastatic infection</td>
<td></td>
</tr>
</tbody>
</table>
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

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

<table>
<thead>
<tr>
<th>Renal disease</th>
<th>Glomerulonephritis</th>
<th>Frothy urine, hematuria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renal failure</td>
<td></td>
<td><strong>If the diagnosis is likely to be nephrotic syndrome</strong> ask the following questions</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Probable aetiology</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ask for evidence of an autoimmune disease</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Skin rashes, joint pain, fever and other evidence of systemic involvement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hep B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lymphoma</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Malaria</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Drugs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DM</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>DVT</td>
</tr>
</tbody>
</table>

| 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

<table>
<thead>
<tr>
<th>Category</th>
<th>Cause</th>
<th>Investigations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infective</td>
<td>Viral hepatitis</td>
<td>Hepatitis B and C serology</td>
</tr>
<tr>
<td>Autoimmune</td>
<td>Autoimmune hepatitis</td>
<td>ANA, anti smooth muscle antibodies</td>
</tr>
<tr>
<td>Metabolic</td>
<td>Wilson’s disease</td>
<td>Serum ceruloplasmin, 24 hour urinary copper excretion</td>
</tr>
<tr>
<td></td>
<td>Hemochromatosis</td>
<td>Serum iron studies</td>
</tr>
<tr>
<td>Biliary cirrhosis</td>
<td>Primary biliary cirrhosis</td>
<td>Anti mitochondrial antibodies</td>
</tr>
</tbody>
</table>

- Consider liver biopsy

How would you estimate the severity of cirrhosis?

<table>
<thead>
<tr>
<th>Points</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Encephalopathy</td>
<td>None</td>
<td>Minimal</td>
<td>Advanced (coma)</td>
</tr>
<tr>
<td>Ascites</td>
<td>Absent</td>
<td>Controlled</td>
<td>Refractory</td>
</tr>
<tr>
<td>Bilirubin (μmol/L)</td>
<td>&lt;34</td>
<td>34–51</td>
<td>&gt;51</td>
</tr>
<tr>
<td>Albumin (g/L)</td>
<td>&gt;35</td>
<td>28–35</td>
<td>&lt;28</td>
</tr>
<tr>
<td>Prothrombin (sec)</td>
<td>&lt;4</td>
<td>4–6</td>
<td>&gt;6</td>
</tr>
</tbody>
</table>

*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: Samin 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 spironolactone 100mg and frusemide 40mg (maximum 400mg spironolactone 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

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

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
  Metronidazole 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

<table>
<thead>
<tr>
<th>Complication</th>
<th>Specific points in the history</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uremia</td>
<td>Malaise, loss of energy, loss of appetite, insomnia,</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>pruritus, restless legs syndrome</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>Water retention and pulmonary edema</td>
<td>Progressive oedema, orthopnoea, Paroxysmal nocturnal dyspnoea</td>
</tr>
<tr>
<td>Acute pericarditis</td>
<td>Chest pain relieved on bending forward</td>
</tr>
<tr>
<td>Anaemia</td>
<td>Exertional dyspnoea, poor exercise tolerance</td>
</tr>
<tr>
<td>Renal bone disease</td>
<td>Bone pain and fractures</td>
</tr>
<tr>
<td>Nervous system</td>
<td>Seizures</td>
</tr>
<tr>
<td></td>
<td>Peripheral neuropathy</td>
</tr>
</tbody>
</table>

**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?

<table>
<thead>
<tr>
<th>Stages of Chronic Kidney Disease (K/DOQI)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
</tbody>
</table>


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

<table>
<thead>
<tr>
<th>Complication</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>General symptoms of uremia</td>
<td>No effective medical management available. However pruritus may be treated with emollient creams</td>
</tr>
<tr>
<td>Volume overload</td>
<td>Diuretic therapy with frusemide</td>
</tr>
<tr>
<td>Hypertension</td>
<td>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</td>
</tr>
<tr>
<td>Anaemia</td>
<td>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</td>
</tr>
<tr>
<td>Metabolic abnormalities</td>
<td></td>
</tr>
<tr>
<td>Hyperkalemia</td>
<td>Limitation of dietary potassium, oral potassium binding resins</td>
</tr>
<tr>
<td>Renal bone disease</td>
<td>Limitation of dietary phosphate, Gut phosphate binders, Vitamin D analogues (1 alpha calcidol), Oral calcium supplementation</td>
</tr>
<tr>
<td>Acidosis</td>
<td>Usually no treatment required</td>
</tr>
</tbody>
</table>

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 immunosuppression
- 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

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

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

<table>
<thead>
<tr>
<th>Cause</th>
<th>Specific questions in the history</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congenital hemolytic anaemia</td>
<td>Ask for past history of neonatal jaundice</td>
</tr>
<tr>
<td></td>
<td>Recurrent blood transfusions due to symptomatic anaemia</td>
</tr>
<tr>
<td></td>
<td>Family history of hemolytic anaemia</td>
</tr>
</tbody>
</table>

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**

<table>
<thead>
<tr>
<th>Acquired hemolytic anaemia</th>
<th>Warm autoimmune hemolytic anaemia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Febrile illness</td>
<td>Ask for history suggestive of autoimmune diseases</td>
</tr>
<tr>
<td>Ask for history suggestive of autoimmune diseases SLE</td>
<td>Joint pain, alopecia, oral ulcers, Skin rashes</td>
</tr>
<tr>
<td>Hematological malignancy</td>
<td>LOA, LOW, neck lumps</td>
</tr>
<tr>
<td>Drug history</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cold autoimmune hemolytic anaemia</th>
<th>Non immune hemolytic anaemia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ask for pain and bluish discolouration of the peripheries</td>
<td>Passage of dark coloured urine in the night and early morning (PNH)</td>
</tr>
<tr>
<td>Ask for history of preceding respiratory tract infection</td>
<td>History of prosthetic valve surgery (Mechanical hemolysis)</td>
</tr>
<tr>
<td></td>
<td>Associated systemic illness and bleeding manifestations (DIC)</td>
</tr>
</tbody>
</table>

**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 haemoglobin (evidence of intravascular hemolysis)

Perform a blood film

<table>
<thead>
<tr>
<th>Category</th>
<th>Cause</th>
<th>Blood film</th>
<th>Other investigations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congenital</td>
<td>Hereditary spherocytosis</td>
<td>Spherocytes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>G6PD deficiency</td>
<td>Bite cells, blister cells, polychromasia due to increased reticulocytes Special stain demonstrates Heinz bodies</td>
<td>G6PD levels</td>
</tr>
<tr>
<td></td>
<td>Thalassemia</td>
<td>Microcytic hypochromic cells, abundant target cells, nucleated RBCs, basophilic stippling</td>
<td>Hb electrophoresis</td>
</tr>
</tbody>
</table>
### 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

<table>
<thead>
<tr>
<th>Cause</th>
<th>Specific points in the history</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Infective</strong></td>
<td></td>
</tr>
<tr>
<td>Viral hepatitis</td>
<td>Ask for preceding prodromal illness – headache, arthralgia, myalgia, nausea and anorexia</td>
</tr>
<tr>
<td></td>
<td><strong>Ask for risk factors</strong></td>
</tr>
<tr>
<td></td>
<td>Consumption of unhygienic food and water</td>
</tr>
<tr>
<td></td>
<td>Sexual promiscuity, use of IV drugs and past history of blood transfusions</td>
</tr>
<tr>
<td><strong>Inflammatory</strong></td>
<td></td>
</tr>
<tr>
<td>Autoimmune hepatitis</td>
<td>Ask for past history of other autoimmune diseases</td>
</tr>
<tr>
<td>Primary biliary cirrhosis</td>
<td>Preceding history of fatigue and pruritus</td>
</tr>
<tr>
<td></td>
<td>Associated joint pain and early morning stiffness suggestive of an inflammatory arthropathy</td>
</tr>
<tr>
<td><strong>Metabolic</strong></td>
<td></td>
</tr>
<tr>
<td>Drugs</td>
<td>Obtain a detailed drug history</td>
</tr>
<tr>
<td></td>
<td>Ask for the use of ayurvedic/ herbal preparations</td>
</tr>
<tr>
<td>Alcoholic hepatitis</td>
<td>Ask for history of alcohol ingestion</td>
</tr>
<tr>
<td>NASH</td>
<td></td>
</tr>
<tr>
<td><strong>Malignancies</strong></td>
<td></td>
</tr>
<tr>
<td>Primary and secondary liver malignancies</td>
<td>Ask for past history of malignancies</td>
</tr>
<tr>
<td></td>
<td>Symptoms suggestive of primary malignancies</td>
</tr>
<tr>
<td>Cause</td>
<td>Important points in the history</td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| **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**                             | Ask for a previous history of dyspeptic symptoms  
**Other presenting symptoms of gallstones**  
History of biliary colic, acute cholecystitis  
Previous history of similar episodes, episodes suggestive of acute cholangitis, past history suggestive of acute pancreatitis |
| **Common bile duct**                       |                                                                                                                                                               |
| **Mirizzi’s syndrome**                     |                                                                                                                                                               |
| **Bile duct strictures**                   | Ask for past history of hepatobiliary 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
<table>
<thead>
<tr>
<th>Dilation of both IH and EH ducts</th>
<th>Only IH duct dilation</th>
<th>No duct dilation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pancreatic head mass</td>
<td>Hilar cholangiocarcinoma</td>
<td></td>
</tr>
<tr>
<td>Stone in the common bile duct</td>
<td>Gallbladder pathology</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mirizzi’s syndrome</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Porta hepatis lymphadenopathy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medical (Intrahepatic cholestasis)</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Clinical characteristic</th>
<th>Bleeding disorder</th>
<th>Clotting factor deficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site of bleeding</td>
<td>Skin, mucous membranes (gingivae, nares, GI and genitourinary tracts)</td>
<td>Deep in soft tissues (joints, muscles)</td>
</tr>
<tr>
<td>Bleeding after minor cuts</td>
<td>Yes</td>
<td>Not usually</td>
</tr>
<tr>
<td>Petechiae</td>
<td>Present</td>
<td>Absent</td>
</tr>
<tr>
<td>Ecchymoses</td>
<td>Small, superficial</td>
<td>Large, palpable</td>
</tr>
<tr>
<td>Hemorrhages, muscle hematomas</td>
<td>Rare</td>
<td>Common</td>
</tr>
<tr>
<td>Bleeding after surgery</td>
<td>Immediate, mild</td>
<td>Delayed, severe</td>
</tr>
</tbody>
</table>

* 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

<table>
<thead>
<tr>
<th>Disorder</th>
<th>BT</th>
<th>PIt</th>
<th>PT</th>
<th>aPTT</th>
<th>TT</th>
<th>Fib</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vasculopathies, connective tissue diseases, or collagen disorders affecting skin</td>
<td>long</td>
<td>normal</td>
<td>normal</td>
<td>normal</td>
<td>normal</td>
<td>normal or increased*</td>
</tr>
<tr>
<td>Thrombocytopenia</td>
<td>long</td>
<td>low</td>
<td>normal</td>
<td>normal</td>
<td>normal</td>
<td>normal</td>
</tr>
<tr>
<td>Qualitative platelet abnormalities</td>
<td>long</td>
<td>normal or low*</td>
<td>normal</td>
<td>normal</td>
<td>normal</td>
<td>normal</td>
</tr>
<tr>
<td>Hemophilia A (Factor VIII deficiency)</td>
<td>normal</td>
<td>normal</td>
<td>normal</td>
<td>long</td>
<td>normal</td>
<td>normal</td>
</tr>
<tr>
<td>von Willebrand disease</td>
<td>long</td>
<td>normal</td>
<td>normal</td>
<td>longA</td>
<td>normal</td>
<td>normal</td>
</tr>
<tr>
<td>Disseminated intravascular coagulation</td>
<td>long</td>
<td>low</td>
<td>long</td>
<td>long</td>
<td>long</td>
<td>low</td>
</tr>
</tbody>
</table>

**BT**: bleeding time; **PIt**: 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

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

- 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

<table>
<thead>
<tr>
<th>Complication</th>
<th>Specific points in the history</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soft tissue</td>
<td><strong>Subcutaneous nodules</strong>&lt;br&gt;Ask for lumps around bony points in the body&lt;br&gt;<strong>Other soft tissue problems</strong></td>
</tr>
<tr>
<td>RS</td>
<td><strong>DPLD</strong>&lt;br&gt;Progressive dyspnoea&lt;br&gt;Long standing cough with minimal production of whitish sputum&lt;br&gt;<strong>Pleural effusion</strong></td>
</tr>
<tr>
<td>Cardiovascular</td>
<td><strong>Atherosclerosis</strong>&lt;br&gt;Ask for symptoms of angina, past history of MI&lt;br&gt;<strong>Pericarditis</strong>&lt;br&gt;Episodes of chest pain worsening on inspiration and relieved on bending forward&lt;br&gt;<strong>Reynaud’s phenomenon</strong>&lt;br&gt;<strong>Vasculitis</strong>&lt;br&gt;Rashes and lower limb ulcers</td>
</tr>
<tr>
<td>Nervous system</td>
<td><strong>Atlanto-axial subluxation</strong>&lt;br&gt;Weakness of the lower limbs&lt;br&gt;<strong>Peripheral neuropathies</strong>&lt;br&gt;Other focal neurological symptoms</td>
</tr>
</tbody>
</table>
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
- Pericarditis
- Any associated murmurs

Respiratory system
- Pleural effusions
- Diffuse parenchymal lung disease

Abdomen
- Splenomegaly – Felty’s syndrome

Nervous system
- Spastic quadripareisis (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

<table>
<thead>
<tr>
<th>Drug</th>
<th>Side effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSAIDs</td>
<td>Peptic ulcer disease, Renal impairment</td>
</tr>
<tr>
<td>COX 2 selective inhibitors</td>
<td>Have less incidence of gastric irritation when compared to NSAIDs</td>
</tr>
<tr>
<td>DMARDs Methotrexate</td>
<td>Gastrointestinal symptoms, Hepatotoxicity, Bone marrow supression</td>
</tr>
</tbody>
</table>
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

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

<table>
<thead>
<tr>
<th>System involved</th>
<th>Specific points in the history</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>Prolonged fever, malaise</td>
</tr>
<tr>
<td>Rheumatological system</td>
<td>Symmetrical small joint pain associated with early morning stiffness lasting for &gt; 1h</td>
</tr>
<tr>
<td>GI</td>
<td>Oral ulcers</td>
</tr>
<tr>
<td>Skin</td>
<td>Ask for facial rashes, other rashes over the skin and alopecia</td>
</tr>
<tr>
<td>Respiratory system</td>
<td>Progressive dyspnoea (pleural effusion, shrinking lung syndrome, pulmonary fibrosis)</td>
</tr>
</tbody>
</table>
| 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 – Butterfly 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>
<thead>
<tr>
<th>Table 311-3: The 1982 Criteria for Classification of Systemic Lupus Erythematosus, Updated 1997</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Malar rash</td>
</tr>
<tr>
<td>2. Discoid rash</td>
</tr>
<tr>
<td>3. Photosensitivity</td>
</tr>
<tr>
<td>4. Oral ulcers</td>
</tr>
<tr>
<td>5. Arthritis</td>
</tr>
<tr>
<td>6. Serositis</td>
</tr>
<tr>
<td>7. Renal disorder</td>
</tr>
<tr>
<td>8. Neurologic disorder</td>
</tr>
<tr>
<td>9. Hematologic disorder</td>
</tr>
<tr>
<td>10. Immunologic disorder</td>
</tr>
<tr>
<td>11. Antinuclear antibodies</td>
</tr>
</tbody>
</table>

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 57% sensitivity.


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 – Hydroxychloroquine

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

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

Ask for other associated neurological features

- Bladder and bowel incontinence
### Determine the aetiology of the stroke

**Ischaemic**

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

**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

<table>
<thead>
<tr>
<th>Cause</th>
<th>Specific points in the history</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atherosclerosis</td>
<td>Lipid profile</td>
</tr>
<tr>
<td></td>
<td>Investigate for diabetes</td>
</tr>
<tr>
<td></td>
<td>Homocysteine levels</td>
</tr>
<tr>
<td></td>
<td>Carotid duplex scan</td>
</tr>
<tr>
<td>Cardioembolism</td>
<td>Echocardiogram</td>
</tr>
<tr>
<td>Vasculitis</td>
<td><strong>Infective</strong></td>
</tr>
<tr>
<td>VDRL and HIV testing</td>
<td>Autoimmune disease</td>
</tr>
<tr>
<td>----------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>ANA</td>
<td>ANCA</td>
</tr>
<tr>
<td>Thrombophilias</td>
<td>Anti phospholipid antibodies</td>
</tr>
<tr>
<td></td>
<td>Protein C and protein S levels</td>
</tr>
<tr>
<td></td>
<td>Serum fibrinogen</td>
</tr>
<tr>
<td></td>
<td>Factor V Leiden genetic mutation</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Acute</th>
<th>Subacute</th>
<th>Chronic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute spinal cord compression</td>
<td>Spinal cord lesion – compressive or non compressive GBS Other polyneuropathies Myasthenia gravis Myopathy – periodic paralysis</td>
<td>Spinal cord lesion Polyneuropathy</td>
</tr>
<tr>
<td>Vascular event</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Try to localize the lesion

<table>
<thead>
<tr>
<th>Location of the lesion</th>
<th>Specific points in the history</th>
<th>Further questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spinal cord</td>
<td>Ask for associated bladder and bowel incontinence Sensory disturbances – paraesthesia and sensory loss below a particular level</td>
<td>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</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Peripheral nerve</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GBS</strong></td>
<td>Ask for preceding respiratory tract infection, diarrhoeal episode, the initial history will usually establish the diagnosis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other polyneuropathies</th>
<th>Ask for the possible causes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Toxins</strong></td>
<td>Toxins</td>
</tr>
<tr>
<td>Snake bite</td>
<td>Snake bite</td>
</tr>
<tr>
<td>Exposure to chemicals – organophosphates</td>
<td>Exposure to chemicals – organophosphates</td>
</tr>
<tr>
<td><strong>Autoimmune</strong></td>
<td>Autoimmune</td>
</tr>
<tr>
<td>History suggestive of autoimmune disease</td>
<td>History suggestive of autoimmune disease</td>
</tr>
<tr>
<td><strong>Endocrine and metabolic diseases</strong></td>
<td>Endocrine and metabolic diseases</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NMJ Myasthenia</th>
<th>Ask specifically for fatigability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Past history of progressive drooping of the eyelid or diplopia</td>
<td>Past history of progressive drooping of the eyelid or diplopia</td>
</tr>
<tr>
<td>Fatigability during eating</td>
<td>Fatigability during eating</td>
</tr>
<tr>
<td>Dysphagia</td>
<td>Dysphagia</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Muscle disease</th>
<th>Ask for possible causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ask specifically for symptoms of proximal muscle weakness. These are, difficulty in getting up from the seated position, climbing stairs</td>
<td>Ask for possible causes</td>
</tr>
<tr>
<td><strong>Periodic paralysis</strong></td>
<td>Periodic paralysis</td>
</tr>
<tr>
<td>Similar episodes</td>
<td>Similar episodes</td>
</tr>
<tr>
<td><strong>Drug and toxin history</strong></td>
<td>Drug and toxin history</td>
</tr>
</tbody>
</table>

**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.

<table>
<thead>
<tr>
<th>Pathology</th>
<th>Causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diseases of the vertebral column</td>
<td>Traumatic – fracture dislocation</td>
</tr>
<tr>
<td></td>
<td>Infections – TB spine</td>
</tr>
<tr>
<td></td>
<td>Neoplasms – Secondary deposits (Breast, lung)</td>
</tr>
<tr>
<td></td>
<td>Primary vertebral tumors</td>
</tr>
<tr>
<td></td>
<td>Degenerative- Disc disease</td>
</tr>
<tr>
<td>Extradural abscess</td>
<td>Lymphoma, Leukaemia</td>
</tr>
<tr>
<td>Meningeal infiltration</td>
<td></td>
</tr>
<tr>
<td>Spinal cord tumors</td>
<td>Extramedullary – Meningioma, neurofibroma</td>
</tr>
<tr>
<td></td>
<td>Intramedullary - Astrocytoma</td>
</tr>
</tbody>
</table>
Non compressive spinal cord disease

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

Features of non compressive spinal cord disease

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

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

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

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