

Context for the session

The aims for this session are:

- To discuss either how anaemia, bleeding disorders or blood clots present in practice
- Practice consulting with a patient including eliciting information about their social context & lifestyle
- Describe the steps involved in the cardiovascular systems examination
- Describe the key components of an ECG

Students will have covered the following in the two-week ABC block:

In **Case-Based Learning** they will have discussed a 65-year-old man (who smokes) with pain and swelling of his right lower leg and a positive D dimer. He is diagnosed by duplex ultrasound with a deep vein thrombosis and treated with apixaban. He subsequently reports shoulder pain, a hoarse voice and unintentional weight loss. On examination of his chest, he is noted to have reduced breath sounds at the left apex. He is subsequently diagnosed (via a CT and biopsy) with a non-small cell Pancoast's tumour.

In **Lectures, workshops and practical:**

- Introduction to haematology and blood tests including clotting
- Anaemias and polycythaemia
- Transfusion and consent
- Venous thrombosis
- Drugs that affect haemostasis
- Abnormal bleeding
- Arterial disease
- Too many/too few blood cells
- Introduction to haemato-oncology
- Blood histology and histopathology

In their **effective consulting labs** they will:

- Consult with a patient who has had a recent DVT
- Consider a patient's social and lifestyle history
- Talk to a patient whose smoking habit is impacting their health
- Consider the range of potentially helpful interventions including lifestyle measures
- Consider how to work with patient resistance to change

Specifics for ABC in GP clinical contact

Introduction

As part of the “Anaemia, bleeding and clotting” theme this fortnight, we would like you to discuss with your group how anaemia, bleeding disorders or blood clots present in practice. What you focus on depends on the patient that you have invited to attend.

As with the previous sessions:

- refer to the [Year 2 GP handbook](#), which covers the information common to all sessions.
- use the attached “session plan” as a guide on how to use your time with your group

Allow time for:

- introductions (reflecting on any learning/action points from session three, Pharmacology)
- student-led interaction with patient(s), and
- summing up at the end/planning for next time (Chest pain), which isn't until the end of January.

(Expert) patients

Suitable patients for the block are someone who has:

- been diagnosed/treated for anaemia
- had a previous DVT or PE and/or is on an anticoagulant

Tasks

What you discuss before/after seeing your patient will depend on what their relevant problem is, but questions to common to patients with **anaemia, bleeding and clotting problems** are:

- What do students know about anaemia/bleeding/clotting disorders, and their causes? (A suggested mind map for anaemia is given on the next page)
- How do patients with these problems present?
- What are the risk factors?
- How do you assess a patient who you suspect has anaemia/bleeding/clotting disorder?

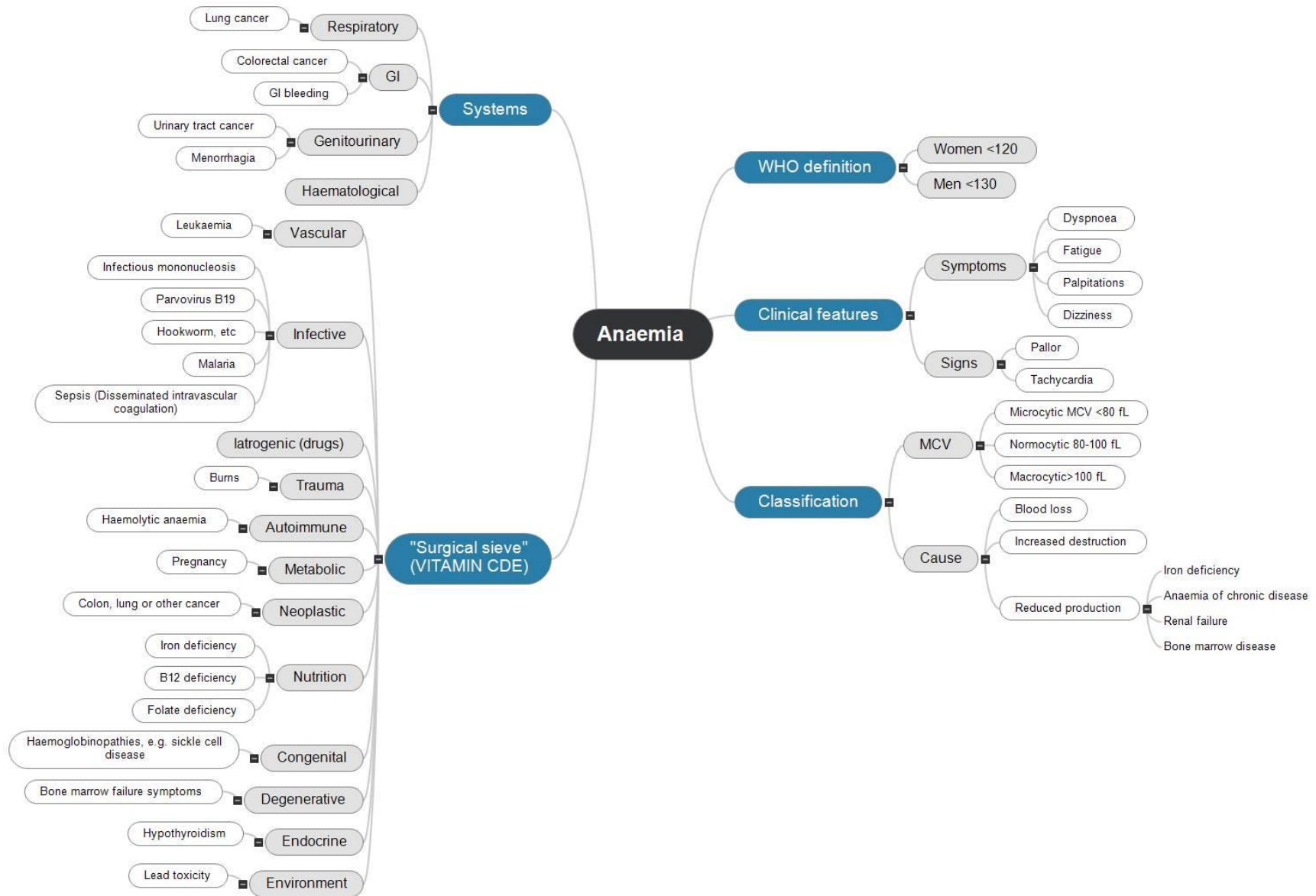
Take the group through cardiovascular examination, ideally on volunteer patient; and look at the basics of a (normal) ECG.

Towards the end the session, get them to recap on what you've covered today, and ask them to each identify one or two learning points/things to look-up for next time.

If possible, allow some time to reflect on the sessions so far.

- How are the students finding the sessions? Anything they would like to do differently?
- Give feedback to the group – how are they getting on from your perspective?

Below is the information given to students via OneNote, before they attend the session.

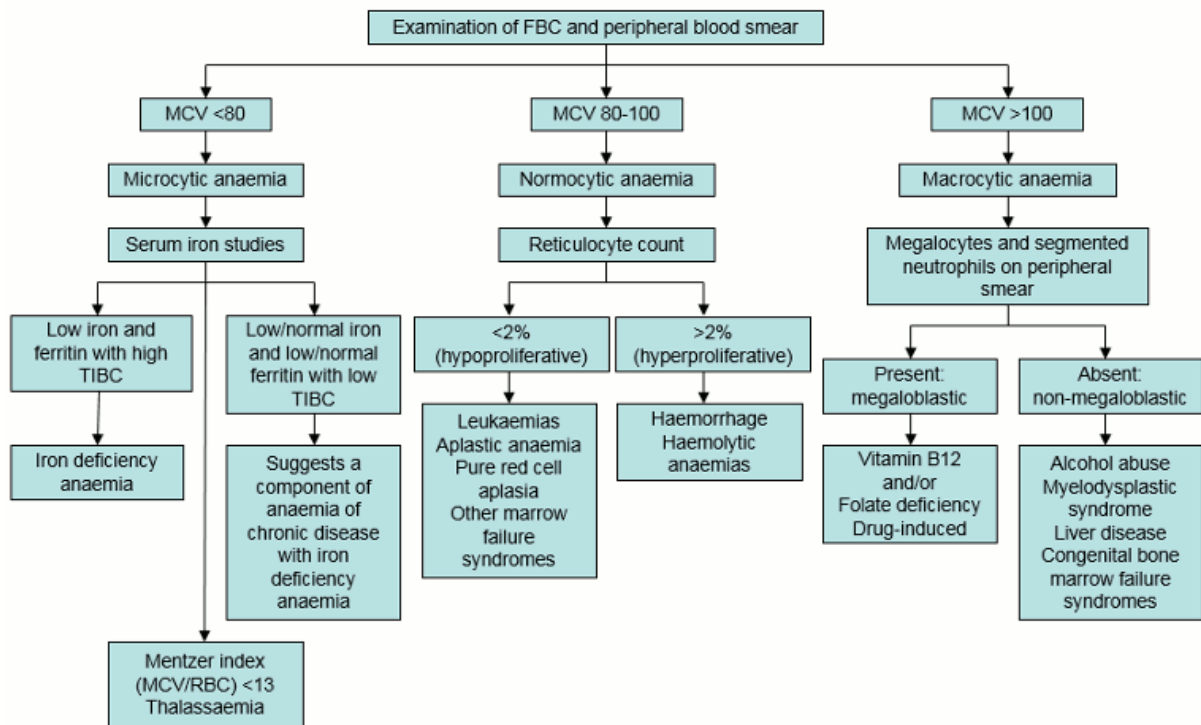


Student information

Anaemia

- the most common haematological disorder seen in general medical practice
- often the presenting sign of a more serious underlying condition
- risk factors include
 - extremes of age
 - female sex
 - pregnancy and lactation
- most common cause internationally is iron deficiency.

Based on a full blood count, anaemia can be classed as microcytic, normocytic or macrocytic:



(From BMJ Knowledge Centre)

Symptoms

Symptoms of anaemia may include:

- fatigue
- weakness
- decreased exercise tolerance
- shortness of breath with exercise
- palpitations
- dizziness
- irritability
- impaired concentration.

Symptoms suggestive of a haematological malignancy or aplastic anaemia:

- bleeding

- easy bruising
- night sweats
- weight loss

The list of differential diagnoses is long but common causes are genitourinary, dietary, gastrointestinal and respiratory.

- Genitourinary: Menorrhagia
- Dietary: Diets low in red meat may produce iron deficiency. Generalised malnutrition often produces combined vitamin B12 and/or folate deficiency, in which case the resulting anaemia is normocytic.
- Gastrointestinal: Abdominal or rectal pain, coffee ground vomit, haematemesis, fresh red rectal bleeding (haematochezia), melaena and/or haematemesis. Prior episodes of gastrointestinal bleeding?
 - Colorectal cancer
 - Gastritis
 - Peptic ulcers
 - Inflammatory bowel disease
 - Alcohol misuse and liver cirrhosis (coagulation disorders and oesophageal varices)
- Respiratory: dyspnoea, haemoptysis (lung cancer)

Relevant drugs to ask about include:

- GI bleeds, from non-steroidal anti-inflammatory drug (NSAID) or corticosteroid use
- Haemolysis, penicillin, methyldopa, levodopa, quinidines, cephalosporins, and some NSAIDs
- Macrocytosis: methotrexate, trimethoprim, anticonvulsants, oral contraceptives, cycloserine, metformin, colchicine, hydroxyurea.

Signs

Pallor, tachycardia.

Iron deficiency: koilonychia, angular cheilosis, glossitis, and thinning hair.

Folate deficiency: glossitis; angular stomatitis; patchy hyperpigmentation of the skin and mucous membranes.

Investigations

Tests are guided by the history, examination, and suspected aetiology, and include the following:

- Other blood tests, including ferritin, B12, folate; coeliac disease screen
- Faecal immunochemical tests (FITs)
- Stool microscopy
- Endoscopy (upper and lower)
- Transvaginal ultrasound (menorrhagia) including hyperplasia, dysplasia, fibroids, polyps or malignancy
- Other imaging, e.g. chest X-ray, CT abdomen/pelvis

DVT

Venous thromboembolism includes deep vein thrombosis (DVT) and pulmonary embolism (PE).

DVT = development of a blood clot in a major deep vein

- usually in the leg, thigh, pelvis, or abdomen
- less commonly, arm veins; the portal, mesenteric, ovarian, or retinal veins; or the veins and venous sinuses of the brain.

DVT → ↓ venous blood flow

- rarely life-threatening on its own
- can cause PE, which can be fatal.

Clinical features

- calf swelling: measuring circumference 10 cm below the tibial tuberosity; a difference (>3 cm) in circumference, makes a DVT is more likely
- localised pain along deep venous system
- asymmetrical oedema
- prominent superficial veins

Risk factors

- Recently immobility, e.g. bedridden, major surgery, hospitalisation, plaster
- Active cancer
- Previous venous thromboembolic event
- Recent trauma or fracture
- Increasing age
- Pregnancy and the postnatal period
- Hereditary thrombophilia (e.g. factor V Leiden, protein C or protein S deficiency)
- Medical comorbidities
- Certain drugs (e.g. oestrogen-containing oral contraceptives).

Investigations

- Wells score (likely ≥ 2 or unlikely < 2)*
- D-dimer*
- Venous ultrasonography
- Blood tests: FBC, renal, liver, clotting screen
- Thrombophilia screening: Consider testing for hereditary thrombophilia in patients who don't have an identifiable risk factor and have a first-degree relative who has had a VTE. Tests for hereditary thrombophilia and antiphospholipid antibodies can be affected by anticoagulation.

* Do not use in pregnancy

D-dimer

- non-specific

- often abnormal in patients without DVT who are older, are acutely ill, have underlying hepatic disease, have an infection, or are pregnant.

In any patient diagnosed with unprovoked DVT who is not known to have cancer:

- Review medical history and baseline blood tests including full blood count, renal and hepatic function, prothrombin time (PT), and activated partial thromboplastin time (aPTT)
- Offer a physical examination

Do not offer further investigations for cancer for patients with an unprovoked DVT unless they have relevant clinical symptoms or signs.

Disorders of haemostasis

Haemostasis depends on a closely linked interaction between vessel wall, platelets, and coagulation factor, hence defects in any of these can cause problems:

- Vessel wall disorders
 - Inherited, e.g. hereditary haemorrhagic telangiectasia, connective tissue disorders
 - Acquired, e.g. normal ageing, corticosteroid therapy, vitamin C deficiency
- Thrombocytopenia or disordered platelet function
- Disorders of coagulation
 - Inherited: haemophilia A (factor VIII deficiency), haemophilia B (factor IX deficiency), other (rare)
 - Acquired: liver disease, disseminated intravascular coagulation, drugs, vitamin K deficiency

Clinical features



- excessive bruising/haematoma
- recurrent or severe bleeding
- bleeding into joints or muscles
- fatigue
- menorrhagia and bleeding following surgical procedures or childbirth (females)




First-line blood tests: FBC and coagulation screen.

Cardiovascular examination

You should have an opportunity on clinical contact to either perform or observe and feedback on a colleague performing a cardiovascular examination.

Setting up for examination	Setting up - WIPPPE: <ul style="list-style-type: none"> • Wash hands • Introduce yourself and identify patient • Permission (gain from patient) • Position (45 degrees for CVS/resp) • Pain (check if patient has any pain) • Exposure (adequately expose patient)
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<p>General</p>	<p>General Appearance:</p> <ul style="list-style-type: none"> • Do they look unwell? (Pale, blue around the lips) • Are they breathless? • Do they appear to be in pain? • Do they have any obvious scars such as a midline sternotomy scar from heart surgery?
<p>Hands and nails</p>  <p>Figure 1 Finger clubbing</p>	<p>Look for: - Clubbing. Here there is loss of the angle between the nail and the nail bed.</p> <p>Causes of clubbing include cardiac (endocarditis, cyanotic congenital heart disease, atrial myxoma), respiratory (bronchial carcinoma, fibrosing alveolitis, chronic lung suppuration – empyema/abscess, bronchiectasis, cystic fibrosis), gastrointestinal (inflammatory bowel disease, cirrhosis, GI lymphoma, coeliac disease) and congenital</p>
 <p>Figure 2 Splinter haemorrhage</p>	<p>Capillary refill time: press the nail bed of a finger measure the time it takes to return to the normal colour, it should be less than 3 seconds</p> <p>Palmar erythema</p> <p>Splinter haemorrhages (these can be caused by infective endocarditis or trauma)</p> <p>Rarer signs of infective endocarditis include Osler’s nodes and Janeway lesions</p> <p>Dupuytren’s contracture: This is a localised formation of scar tissue beneath the skin of the palm of the hand.</p>
<p>Radial pulse</p>	<p>Here it is important to assess the rate and the rhythm. For the rate count for 15 seconds and multiply by 4. Is the rhythm regular, irregularly irregular or regularly irregular? If irregular, you should feel the pulse for at least 30 seconds.</p>
<p>Respiratory rate</p>	<p>Count the respiratory rate by finding the number of breaths every 15 seconds and multiply by 4.</p>
<p>Collapsing pulse</p>	<p>This is a sign of aortic regurgitation. Lift the patient’s arm into the air with the palm of your hand over the radial pulse, if the pulse is collapsing you will feel the pulse fall away under your fingers. It is important to do this for at least 30 seconds otherwise you may miss this sign.</p>
<p>Radio-radial delay and radio-femoral delay</p>	<p>Palpate the two radial pulses/radial and femoral pulses simultaneously: an appreciable delay suggests coarctation of the aorta.</p>

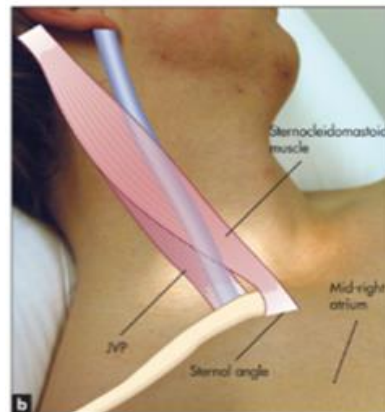
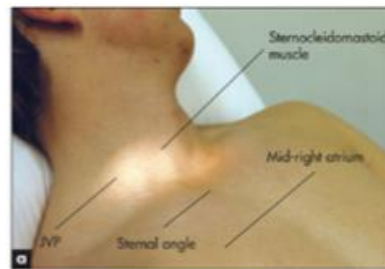
Blood pressure	Demonstrate correct method of measuring blood pressure, including applying cuff, inflating and deflating at right rate, and identifying Korotkov sounds.
Face	Assess for pallor and malar flush (this is a sign of mitral stenosis)
Eyes 	Xanthelasmata, anaemia, corneal arcus Check fundi for hypertensive or diabetic retinopathy.
Mouth	Examine tongue, for central cyanosis
Neck	Palpate the carotid pulse Assess the jugular venous pressure (JVP)
Chest 	<p>Inspection: particularly look for scars such as midline sternotomy scars (below), lateral thoracotomy scars or pacemakers. Chest wall deformity.</p> <p>Palpation Palpate the apex beat (remember that the normal position is the 5th intercostal space in the midclavicular line). If it is difficult to feel at first, you can ask the patient to lean to their left side. Feel for thrills and heaves</p> <p>Auscultation Try to identify the first and second heart sounds. Listening to the heart takes practice and is a difficult skill to master. You will need to listen to lots of 'healthy' hearts first to work out what normal heart sounds should be.</p>
Auscultation  <p>The first heart sound, or lub, S1 is produced when the tricuspid and mitral valves simultaneously close. This marks the onset of systole, or ventricular contraction.</p>	Compare heart sounds to pulse. See if you can hear the heart sounds, then if you can hear any added sounds, if so, are they systolic or diastolic? Detect clear cardiac murmur and classify as systolic or diastolic <ul style="list-style-type: none"> • Mitral: 5th ICS Mid-Clavicular Line • Aortic: 2nd ICS R parasternal border • Tricuspid: 4th ICS L parasternal border • Pulmonary: 2nd ICS L parasternal border • Carotid arteries (both sides for bruit) listen with the patient holding their breath. • Once you've listened in all areas with the diaphragm, roll patient to the left lateral position, use the bell of stethoscope at apex (for mitral stenosis)

<p>The simultaneous closing of the pulmonary and aortic valves produces S2 or dub. S2 marks the end of systole. The brief silent period between S2 and S1 represents diastole, or ventricular relaxation. During diastole the ventricles fill with blood coming from the atria.</p>	<ul style="list-style-type: none"> • Help the patient sit upright. Ask the patient to hold their breath and listen over the carotids for bruits and radiation of aortic stenosis. • Ask the patient to breathe all the way out and then hold their breath. Listen over the left sternal edge for the blowing diastolic sound of aortic regurgitation.
<p>Sacrum</p>	<p>Feel at the base of the spine for sacral oedema.</p>
<p>Lungs</p>	<p>Listen at the bases of the lungs for any crackles (this can be a sign of pulmonary oedema). Crackles are usually an inspiratory sound and may be coarse or fine.</p>
<p>Abdominal examination</p>	<p>Bruits: a bruit represents turbulent blood flow. Listen inferior to the umbilicus and to either side for renal artery bruits. Also listen for over the femoral arteries and aorta for bruits.</p>
<p>Lower limb</p>	<p>With the patient sitting back again, examine the feet and ankles for:</p> <ul style="list-style-type: none"> • Signs of ischaemia: blue toes and feet, loss of hairs on the front of the legs, ulcers. • Venous disease: brown pigmentation from haemosiderin, dilated large and small veins, ulcers. • Peripheral oedema. This can be uncomfortable so warn the patient and be gentle. Use your index +/- middle finger and press where there is swelling and see if there is an impression of the pressure when you lift your fingers up. • Palpate the dorsalis pedis and posterior tibial pulses.
<p>Closing</p>	<p>Thank the patient and help them to get dressed. As the patient if there is anything you can do for them before you leave. Remember to wash your hands.</p>

Blood pressure measurement general tips:

1. The patient must be rested for at least 5 minutes before having their blood pressure taken
2. Ensure that the arm is supported at the level of the heart
3. The bladder or the sphygmomanometer should be over the brachial artery (there is usually a marker for the artery) and it covers about 80% of the arm circumference
4. Put the *right-sized cuff* on tightly enough so it does not slip off
5. Palpate the brachial artery
6. Pump up the cuff while keeping your finger on the pulse. When you can no longer feel pulsation go up another 30 mmHg
7. Then put your stethoscope over the artery
8. Slowly lower the pressure 2-3 mm/second listening for when the first noise appears (1st Korotkoff sound)
9. This is the **systolic pressure**. Record to the nearest 2mm/Hg
10. Let the pressure drop again
11. Keep going down until the sounds disappear altogether (5th Korotkoff sound). This is the **diastolic pressure**

Assessing the Jugular venous pressure (JVP)

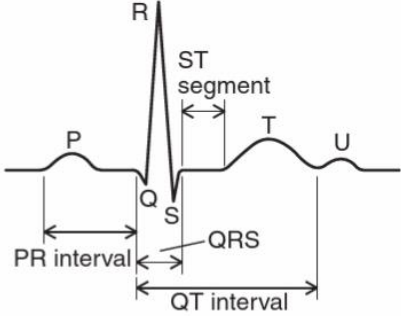
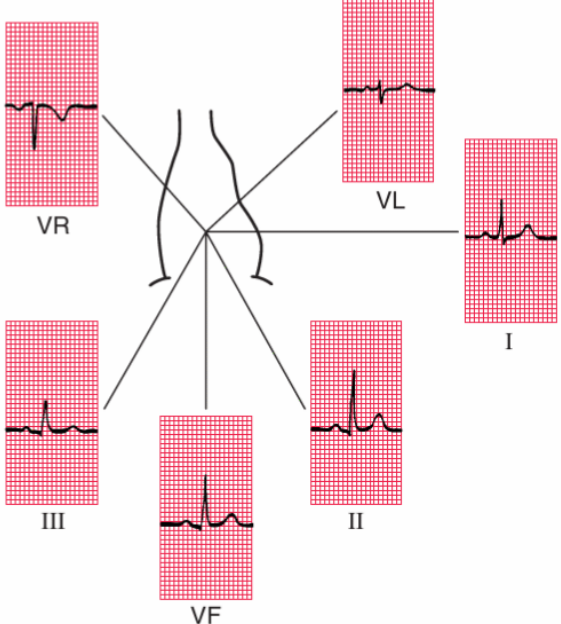


The JVP can be a difficult sign to illicit.

- Recline the patient is at an angle of 45 degrees. Ask them to relax their head back on the pillow and turn towards you and check they are comfortable.
- Look at the left side of their neck for the internal jugular which has a pulsation visible behind the sternocleidomastoid muscle.
- The JVP gives a proxy measure of right atrial pressure, and the most common cause of an elevated JVP is heart failure.
- The JVP is measured vertically from the sternal angle and should be less than 4cm high.

Reading an ECG

One large square = 0.2s; one small square = 0.04s

<p>ECG complex:</p> <ul style="list-style-type: none">• P: atria contraction• QRS: ventricular contraction• T: repolarisation• U: origin uncertain (not often seen, may be pathological if it follows a flattened T wave)	
<p>Leads "view" of the heart:</p> <ul style="list-style-type: none">• I, II and VL: left lateral surface• III aVF: inferior surface• VR: right atrium• V1-V6: horizontal plane, from front and left-hand side	

General approach to assessing:

- Rate, rhythm and axis
- P wave
- PR interval
- QRS wave
- QT interval
- ST segment
- T wave
- Escape rhythm

Source and resources:

BMJ Best Practice and Clinical Knowledge Summaries [accessed 27.11.23]:

- Anaemia: <https://bestpractice.bmj.com/topics/en-gb/93>,
<https://cks.nice.org.uk/topics/anaemia-iron-deficiency/> and
<https://cks.nice.org.uk/topics/anaemia-b12-folate-deficiency/>
- DVT: <https://cks.nice.org.uk/topics/deep-vein-thrombosis/>
- PE: <https://cks.nice.org.uk/pulmonary-embolism>

eBooks (available via www.bristol.ac.uk/library):

- A B Metha & A V Hoffbrand. Haematology at a glance. Fourth edition, John Wiley & Sons, 2014.
- J R Hampton & J Hampton. The ECG made Easy. Ninth edition, Elsevier, 2019.