

Cardiovascular examination

Intro (WIIPPPPE)

- **W**ash your hands
- **I**ntroduce yourself
- **I**dentify of patient – confirm
- **P**ermission (consent and explain examination)
- **P**ain?
- **P**osition at 45°
- **P**rivacy
- **E**xpose chest to waist

General Inspection

- Surroundings
 - Monitoring:
 - pulse oximeter
 - ECG monitoring
 - Daily weights/ fluid restriction chart
 - Treatments:
 - oxygen therapy (method of delivery, rate, SATs, humidified, venturi)
 - GTN spray
 - Warfarin INR card
 - Insulin pen
 - IV infusions
 - Paraphernalia:
 - Wheelchair
 - food and drink
 - Cigarettes/ nicotine patches/ gum
- Patient
 - Well or unwell?
 - Short of breath?
 - Alert and orientated or drowsy and confused?
 - Comfortable at rest or in pain?
 - Body habitus: cachectic or obese? Marfanoid?
 - Colour
 - Cyanotic
 - Malar flush (mitral stenosis)
 - Pale (anaemia)
 - Chest
 - Scars
 - Pacemaker/ AED
 - Deformity
 - Visible pulsations
 - Ticking of metallic heart valve?
 - Syndromic features?

Systemic examination

- **H**ands
 - Inspect
 - Temperature
 - Capillary refill (at level of heart)
 - Colour (peripheral cyanosis)

- Clubbing – perform Shamroth’s window test and consider cardiac causes
 - Congenital cyanotic heart disease; endocarditis; atrial myxoma
 - Cigarette tar staining (not nicotine!)
 - Blood glucose testing on fingertips
 - Tendon xanthomata (hyperlipidaemia)
 - Janeway lesions (endocarditis)
 - Osler nodes (endocarditis)
 - Splinter haemorrhages
 - trauma, vasculitis, endocarditis
 - Pale palmar creases (anaemia)
 - Palmar erythema
 - Hyperthyroidism; pregnancy, polycythaemia
 - Arachnodactyly (Marfan’s syndrome)
 - Quincke’s sign (aortic regurgitation)
 - Palpate:
 - Radial pulse (rate, rhythm)
 - Weak left pulse post-Fontan procedure
 - Radio-radial delay
 - Aortic dissection
 - Aortic coarctation (delayed on left depending on level of coarctation)
 - Subclavian artery stenosis
 - Radio-femoral delay
 - Aortic coarctation
 - Collapsing pulse (aortic regurgitation)
 - Ask about pain in shoulder first
- **Arms**
 - Inspect
 - Scars from forearm vein harvesting
 - IV access
 - Track marks (IV drug use is an endocarditis risk factor)
 - Bruising
 - Anticoagulation therapy
 - Palpate
 - Offer to measure BP
 - Pulse pressure
 - Narrow (aortic stenosis)
 - Wide (aortic regurgitation)
 - Unequal arm BPs
 - Aortic dissection
 - Subclavian artery stenosis: BP reduced on side of stenosis
- **Neck**
 - Inspect and palpate
 - Carotid pulse (character and volume)
 - Collapsing: aortic regurgitation
 - Slow-rising: aortic stenosis
 - Thready: shock
 - Bounding: CO2 retention
 - JVP
 - JVP can be differentiated from carotid by:
 - Hepatojugular reflux; occludable; not pulsatile; double waveform

- JVP is raised if vertical height is >3cm above sternal notch
 - See questions below for more information on the JVP
- Auscultate
 - Carotid bruits
- **Face**
 - Inspect
 - Malar flush (mitral stenosis)
 - Eyes:
 - Corneal arcus (elderly, hyperlipidaemia in young)
 - Conjunctival pallor (anaemia)
 - Petechial haemorrhages (endocarditis)
 - Xanthelasma (hyperlipidaemia)
 - Mouth
 - Hydration status
 - Dentition (risk of endocarditis)
 - Central cyanosis (under tongue)
 - High-arched palate (Marfan's syndrome)
- **Chest**
 - Inspect
 - Scars
 - Lateral thoracotomy (mitral valve)
 - Midline sternotomy (CABG or valve)
 - Left subclavicular (pacemaker, AED)
 - Back (coarctation or ballistic-torso shunt)
 - Pacemaker or AED
 - Deformity (e.g. pectus excavatum in Marfan's syndrome)
 - Visible apex beat
 - Palpate
 - Apex beat
 - Normal: 5th intercostal space, mid-clavicular line
 - Forceful: LVH, aortic stenosis
 - Heaving/thrusting: aortic regurgitation, mitral regurgitation
 - Tapping: mitral stenosis
 - Double: HOCM
 - LV and RV heave (ventricular hypertrophy)
 - Thrills (palpable murmur)
 - Auscultate
 - Listen to heart sounds in four areas with diaphragm whilst feeling carotid pulse
 - If a systolic murmur is heard:
 - Listen in the axilla for radiation (mitral regurgitation)
 - Listen over the carotids for radiation (aortic stenosis)
 - Always perform the reinforcement manoeuvres to detect diastolic murmurs:
 - Bell on apex, roll on left side, hold breath in expiration (mitral stenosis)
 - Sit forwards, left lower sternal edge with diaphragm, hold breath in expiration (aortic regurgitation)
 - With patient sat forward, auscultate lung bases
 - Reduced air entry, bilateral crepitations (pulmonary oedema)
- **Sacrum**
 - Sacral oedema (heart failure, fluid overload)
- **Legs**
 - Scars (medial calf for saphenous vein harvesting)
 - Peripheral oedema (heart failure, fluid overload)

- Check for pain in ankles first
- If present find upper limit of peripheral oedema and feel for pulsatile liver (tricuspid regurgitation)

Closure

- Thank patient
- Patient comfortable?
- Help getting dressed?
- Wash hands

Turn to examiner, hands behind back, holding stethoscope (try not to fidget!) before saying:

- **“To complete my examination, I would like to...”**
- Further examinations:
 - Perform a peripheral arterial examination
 - Perform fundoscopy (hypertensive retinopathy, Roth spots in endocarditis)
- Bedside investigations:
 - Obs: resp rate, pulse, BP, O2 sats, temperature
 - Measure lying and standing BP
 - 12-lead ECG
 - Urine dip
 - Blood glucose
- Further investigations
 - Bloods: consider BNP (heart failure) and troponin (ischaemia or myocarditis)
 - Echo

Questions about the cardiovascular exam

- Tell me about the JVP?
- How can you differentiate the JVP from the carotid pulse?
 - The JVP rises with pressure on the liver (hepatojugular reflux)
 - The JVP is easily occludable
 - The JVP is not strongly pulsatile
 - The JVP has a double waveform, the carotid pulse is single
- What are the signs of endocarditis?
- What are the signs of aortic regurgitation?
- What are the causes of mitral regurgitation?
- What are the causes of aortic stenosis?
- How would you grade the severity of aortic stenosis?
- When is a valve replacement indicated in aortic stenosis?
- What are the indications for a pacemaker?
- What are the different types of pacemaker?
- How do you treat heart failure?