**Kev's Physical Examination Guide**

### MEDICAL

#### Cardiovascular

**General observations:**
- General description – age, gender, well/unwell, comfort level
- Features – cachexia, cyanosis, dyspnoea, sweating, gross oedema, environment
- Dysmorphic features – Marfan (aortic dilatation), Down (VSD) and Turner (coarctation) syndromes

#### Upper limb:

- Hands and nails:
  - Clubbing – congenital cyanotic heart disease, infectious endocarditis
  - Infectious endocarditis – splinter haemorrhages, Osler’s nodes (red, raised tender nodules on puls or thenar/hyperthenar eminences), Janeway lesions (red, flat non-tender palmar macules)
  - Peripheral circulation – capillary refill (<2s normal), cyanosis, palmar creases (pallor of anaemia)
  - Others – nicotine stains, Dupuytren’s contracture (alcoholic cardiomyopathy), xanthomata (tendon = type II, palmar/tuberoeruptive = type III hyperlipidaemia)

- Radial pulse:
  - Rate (over 20-30 seconds) – 60-100bpm (<60 = bradycardia, >100 = tachycardia)
  - Rhythm – regular or irregular (regularly = sinus arrhythmia, Wenckebach or irregularly = AF)
  - Special pulses – Waterhammer (AR – lift arm), pulsus alternans (LV failure – hold breath)
  - Radioradial delay – coarctation or stenosis of other cause
  - Radiofemoral delay – coarctation

- Blood pressure – ideally both arms, lying and standing (postural hypotension – fall of >15/10 mmHg)
  - Use appropriate cuff size – bigger if obese (otherwise overestimates), 2/3 length of arm in kids
  - Centre bladder over brachial artery (1/3 the way across arm from medial epicondyle)
  - Palpate radial pulse, inflate cuff fully and deflate slowly until pulse returns (predicts systolic)
  - Inflate to 10-200mmHg above predicted and listen over brachial artery (beware auscultatory gap)
  - K1 = sharp thudding, K2 = blowing, K3 = softer thudding, K4 = softer blowing, K5 = silence
  - Note pulsus paradoxus (>10mmHg between expiration>inspiration 2° to ↓LV filling) – tamponade

#### Face and neck:

- Observation:
  - Facies – mitral (rosy cheeks, bluish tinged), syndromes, systemic diseases
  - Eyes – xanthelasma, arcus senilis, scleral icterus, conjunctival pallor
  - Mouth – central/peripheral cyanosis, arched palate (Marfan), dentition (infectious endocarditis)

- Carotids – medial to sternocleidomastoid
  - Volume
    - Small volume – pericardial effusion, cardiac failure, shock, vascular/valvular disease
    - Large volume – high cardiac output, bradycardia + high stroke volume, AR, rigid aorta
  - Jerky – hypertrophic cardiomyopathy
  - Character
    - Collapsing (sharp drop) – AR, hyperdynamic circulation, PDA, AV fistula, sclerotic aorta
    - Anacrotic (slow and notched upstroke, small volume) – AS
    - Plateau (slow upstroke, sustained) – AS
    - Pulsus bifurcens (double peak) – hypertrophic obstructive cardiomyopathy, AR+AS
    - Pulsus bigeminus (double pulse) – premature ectopics after each sinus beat

- JVP – use internal jugular (medial to sternocleidomastoid)
  - Height above sternal angle – RVF, TS/TR, pericardial effusion or constrictive pericarditis, SVC obstruction, fluid overload, hyperdynamic circulation
  - Character – A (atrial contraction), C (carotid pulsation), X (atrial relaxation), V (atrial filling), Y (tricuspid valve opening with rapid ventricular filling)
    - Cannon A waves – complete heart block, retrograde atrial conduction or AV dissociation
    - Giant A waves – TS, PS, pulmonary hypertension
    - X descent – absent (AF), exaggerated (cardiac tamponade, constrictive pericarditis)
    - Large V waves – TR
    - Y descent – slow (TS, RA myxoma), sharp (severe TR, constrictive pericarditis)

#### Chest:

- Observation:
  - Deformity – pectus carinatum, pectus excavatum, kyphoscoliosis
  - Scars – median sternotomy, lateral thoracotomy, mitral valvotomy (left breast), pacemaker
  - Apex beat, other pulsations

- Palpation:
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- Apex beat (due to recoil of apex during systole) – position, character
  - Impalpable – usually thick chest wall (emphysema, pericardial effusion) or dextrocardia
  - Tapping – palpable first heart sound (MS or TS)
  - Pressure loaded – high pressure (AS, hypertension) or high output (moderate AR/MR)
  - Volume loaded – left ventricular dysfunction
  - Double impulse – hypertrophic cardiomyopathy
- Parasternal heave – RV hypertrophy or severe LA enlargement
- Thrills – apex, left sternal edge, base of heart (left and right 2nd IC spaces; may feel P2)

- Auscultation – palpate carotid at the same time to determine phase of heart
  - Mitral area – 4th intercostal space, left midclavicular line
  - Tricuspid area – 5th intercostal space, left sternal edge
  - Pulmonary area – 2nd intercostal space, left sternal edge
  - Aortic area – 2nd intercostal space, right sternal edge
  - Carotid bruits

Others:

- Back:
  - Percuss bases
  - Auscultate for late or pan-inspiratory crackles (heart failure with pulmonary oedema)
  - Feel for pitting oedema of sacrum
- Abdomen:
  - Palpate liver – hepatomegaly, may or may not be pulsatile
  - Palpate spleen – congenital cyanotic heart disease, endocarditis
  - Check for ascites, feel for AAA (can’t hurt)
- Lower limbs:
  - Observe for peripheral vascular disease, varicose veins, comment on toe nails
  - Pitting oedema – 15 seconds at distal shaft of tibia gently
  - Pulses – femoral, popliteal, posterior tibial and dorsalis pedis on both sides

Auscultation reference:

- Heart sounds:
  - 1st – beginning of systole; closure of mitral and tricuspid valves (loudest over apex)
    - Loud if valves shut abruptly e.g. stenosis, reduced diastolic filling time (e.g. tachycardia)
    - Soft if filling prolonged e.g. 1° heart block, delayed ventricular systole (LBBB), MR
    - Splitting – usually not clinically detectable, due to RBBB
  - 2nd – end of systole; closure of aortic and pulmonary valves (loudest in 2nd left intercostal space)
    - Loud – aortic (systemic hypertension, congenital AS) or pulmonary (hypertension)
    - Soft – aortic calcification (reduced leaflet movement), AR
    - Splitting – delayed RV emptying (RBBB, PS, VSD) or MR (early aortic closure), reversed in delayed LV depolarisation (LBBB), emptying (AS, coarctation) or ↑volume (PDA)
  - 3rd – after 2nd (‘Tennessee’ – S1S2S3); tautening of mitral/tricuspid papillary muscles – normal in children, pathological in decreased ventricular compliance (LVF, MR, AR, VSD, PDA, RVF)
  - 4th – before 1st (‘Kentucky’ – S4S1S2); high pressure atrial wave reflected from poorly compliant ventricle – decreased LV compliance (IHD, MR, AS) or RV compliance (pulmonary hypertension)

- Additional sounds:
  - Opening snap – high pitched, follows S2; sudden opening of non-compliant valve (MS, TS)
  - Systolic ejection click – early systolic, high pitched; congenital AS or PS where valve is mobile
  - Non-ejection systolic click – systolic; due to prolapse, redundant mitral leaflets or ASDs
  - Others: tumour plop (systolic; atrial myxoma), pericardial knock (diastolic; constrictive pericardial disease), prosthetic valves (variety, look for a scar); pacemaker (late diastolic high-pitched click)

- Murmurs (1/6 barely audible, 2/6 soft but audible to most, 3/6 moderate no thrill, 4/6 loud with thrill just palpable, 5/6 loud with thrill palpable and heard with stethoscope lightly, 6/6 audible without stethoscope)
  - Systolic:
    - Pansystolic (ventricle leaking to lower pressure chamber):
      - MR/LVF – soft/absent S1, LV S3; pansystolic murmur at apex → axilla (L lateral)
      - TR/RVF – pansystolic murmur at lower end of sternum increasing on inspiration
      - VSD – harsh pansystolic murmur at lower left sternum ±S3/S4, ↑ on expiration
    - Ejection systolic (crescendo-decrescendo; turbulent or increased flow)
      - AS – split/reversed S2 ± click; harsh murmur at aortic area → carotids (sit up)
      - PS – ±S3; ejection click; harsh murmur in the pulmonary area ↑ on inspiration
      - Hypertrophic cardiomyopathy – S4; murmur at lower left sternum/apex ± MR
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- ASD – fixed split S2; pulmonary (systolic) or tricuspid (diastolic) flow murmur

- Late systolic (regurgitation in mid-systole):
  - MVP – systolic click; high-pitched murmur extending through the rest of systole
  - Papillary muscle dysfunction 2° to ischaemia or hypertrophic cardiomyopathy

  o Diastolic:
    - Early diastolic (high pitch, decrescendo; regurgitation through aortic/pulmonary valves)
    - AR – soft A2; murmur just after S2 loudest at 3rd/4th left IC spaces ± flow murmur
    - PR – harsh murmur at the left sternal edge ↑ on inspiration (Graham-Steell)

    - Mid-diastolic (low pitch, ↓ filling) and pre-systolic (↑flow on atrial systole) murmurs
      - MS – loud S1 and P2; opening snap; low-pitched rumbling murmur ↑ by exercise
      - TS – low pitched murmur similar to MS but at left sternal edge, ↑ by inspiration

      - Others – atrial myxoma, Austin-Flint murmur (AR murmur at apex due to high-velocity jet), Carey-Coombs murmur (blubbering apical murmur of acute RF)

    o Continuous:
      - PDA – reverse split S2; machinery murmur at 1st left IC space, L-side flow murmurs
      - Others – AV fistula, aorto-pulmonary connection, venous hum (right supraclavicular fossa, stop with internal jugular compression), ruptured Valsalva sinus, mammary soufflé

- Dynamic manoeuvres
  - Right sided murmurs louder on inspiration (increases venous return and blow flow to the right side of the heart); left sided murmurs louder on expiration (vice versa)
  - Must roll the patient to left lateral position when listening to the mitral region (and have them breathe in), and sit them forward if aortic stenosis is suspected (and have them breathe out)
  - Useful for most murmurs – squatting increases venous return and peripheral resistance, with ↑SV and BP; isometric exercise increases systemic arterial resistance, BP and heart size

- Respiratory

  General observations:
  - General description – age, gender, well/unwell, comfort level, on air/O2
  - Features – accessory muscles, cachexia, cyanosis, dyspnoea, sputum (describe), environment
  - Ask to state their name, and ask to cough – listen for wheeze, stridor, quality of voice, quality of cough

  Upper limb:
  - Hands:
    - Clubbing – lung cancer, empyema, bronchiectasis, lung abscess, interstitial fibrosis, CF
    - Peripheral circulation – capillary refill (<2s normal), cyanosis, palmar creases (pallor of anaemia)
    - Nicotine stains
    - Test for interosseous wasting (Pancoast tumour, COPD wasting), HPOA and hypercapnic flap

  - Radial pulse and respiratory rate (do these at the same time) and blood pressure:
    - Respiratory rate is normally 12-15
    - Pulsus paradoxus (>10mmHg difference between expiration>inspiration 2° to ↓LV filling) – air flow limitation e.g. severe asthma (negative intrathoracic pressure on inspiration → lung pooling)

  Face and neck:
  - Observation:
    - Facies – mouth breathing, pursed lips, Horner’s syndrome (ptosis, miosis, anhidrosis)
    - Eyes – scleral icterus, conjunctival pallor
    - Nose – percuss over sinuses, assess nostril patency/discharge, look for deviation or polyps
    - Mouth – central/peripheral cyanosis, tonsil size/exudate, post-nasal drip, dentition (→ abscess)

    - Trachea – midline (towards collapse, away from tension PTX or massive effusion), tug (overexpansion)
    - Lymphadenopathy – cervical, submental, submandibular, pre/post auricular, occipital, supraclavicular

  Chest:
  - Posterior:
    - Observe – AP diameter (hyperinflation), kyphoscoliosis, symmetry, scars, skin changes
    - Palpate:
      - Chest expansion – superior and inferior
      - Tactile fremitus – place palms on chest wall, ask patient to say ‘99’ (↑ with consolidation)
    - Percuss – ask patient to hug shoulders, at least three areas each side plus axillae
      - Dull – pneumonia, effusion, tumour
      - Resonant – pneumothorax
      - Liver dullness should be at 6th rib in the right mid-clavicular line; lower if hyperinflated
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Anterior:
- Auscultate – see below
  - Observe – pectus excavatum, Harrison’s sulcus, symmetry, scars, skin changes
  - Palpate:
    - Chest expansion – superior (apices) and inferior
    - Apex beat – should be 5th IC space along mid-clavicular line, may be displaced
    - Parasternal heave – cor pulmonale (RHF 2° to pulmonary hypertension – check JVP)
  - Percuss – directly on clavicles and three areas each side plus axillae, note cardiac dullness
  - Auscultate – see below

Other:
- Palpate the liver for ptosis 2° to hyperexpansion
- Pemberton’s sign (SVC obstruction) – lift hands above head → facial plethora, cyanosis, inspiratory stridor, non-pulsatile elevation of JVP

Breath sounds reference:
- Anatomy:
  - Posterior:
    - L – upper (above 3rd-4th rib), lower lobe (above medial aspect of 10th rib)
    - R – upper (above 4th rib), middle (lateral to 4th-5th ribs), lower lobe (below 4th rib)
  - Anterior:
    - L – upper (above 5th rib), lower lobe (below 5th rib)
    - R – upper (above 3rd rib), middle (3rd-5th ribs), lower lobe (below 5th rib)
- Breath sounds – quality and intensity
  - Vesicular – inspiration longer and louder than expiration, no gap between
  - Bronchial – louder, harsher, heard over consolidation (transmitted from big airways), may be gap
  - Amphoric – exaggerated bronchial sounds over a large cavity
  - Intensity - decreased in emphysema, effusion, pneumothorax, pneumonia, cancer, lung collapse
- Added sounds:
  - Wheeze – continuous musical sounds, louder on expiration; low (large bronchi) or high (small bronchi) pitch; may be localised/monophonic if tumour, absent if airflow obstruction is severe
  - Stridor – rasping or croaking noise louder on inspiration 2° to upper airways obstruction
  - Crackles – interrupted non-musical sounds occurring on inspiration, thought to be due to abrupt opening of collapsed distal airways (smaller, most compliant areas first)
    - Early inspiratory – small airways, medium coarseness
    - Late inspiratory – alveoli, may be fine, medium or coarse
      - Fine – pulmonary fibrosis (‘Velcro®’)
      - Medium – left ventricular failure
      - Coarse (gurgling) – pools of retained secretions, changes with coughing
  - Pleural rub – continuous or intermittent grating sound (creaking like a door that needs oiling)
- Vocal resonance – speech is clearer over areas of consolidation as high frequencies are not attenuated (aegophony – ‘e’ as in ‘bee’ sounds like ‘a’ as in ‘bay’); can do whispering pectoriloquy (less sensitive)

Abdominal

General observation:
- General description – age, gender, well/unwell, comfort level (position and activity), alertness
- Features – body habitus, cachexia, jaundice, pigmentation, gross oedema, environment

Upper limb:
- Hands:
  - Nails – clubbing (chronic liver disease, IBD, coeliac disease), leukonychia or Muehrke’s lines, (hypoalbuminaemia), koilonychia (iron deficiency), Terry’s nails (half/half; cirrhosis, CRF)
  - Palms – palmar erythema (chronic liver disease), pallor of palmar creases, Dupuytren’s (EtOH)
  - Test for hypertrophic osteoarthropathy, asterixis (hepatic flap), tremor (Wilson’s, EtOH)
- Arms – wasting, bruises, petechiae, scratch marks (chronic cholestasis), spider naevi (>2 abnormal)

Face and neck:
- Observation:
  - Eyes: scleral icterus, conjunctival pallor, xanthelasma, iritis (IBD), Kayser-Fleisher rings (Wilson)
  - Mouth – breath (fetor hepaticus, EtOH), oral lesions:
    - Lips – angular stomatitis, ulceration, pigmentation, telangiectasia, aphthous ulcers
    - Gums – gingivitis, bleeding, hypertrophy, pigmentation, monilia
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• Tongue – coating, atrophic glossitis (B₁₂ deficiency), macroglossia, leukoplakia (sore teeth, smoking, spirits, sepsis, syphilis), geographical tongue (B₂ deficiency)
  o Palpate parotids for bilateral enlargement in alcoholic liver disease (fatty infiltration)
• Lymphadenopathy – cervical, submental, submandibular, pre/post auricular, occipital, supraclavicular
  o Virchow’s node (Troisier’s sign) – left supraclavicular fossa; stomach cancer

Abdomen:
• Observe – gynaecomastia, spider naevi, scars, distension, veins, striae, bruising, masses/peristalsis
• Palpate – ask if they have any pain, check for tenderness, rigidity, guarding, masses, nodes
  o Superficial palpation, then deep palpation in nine areas; other tests as necessary e.g. Murphy/
  o Palpate liver edge and percuss out liver span (normal is 12-15 cm along mid-clavicular line)
  o Palpate spleen – splint ribs
  o Ballot kidneys
  o Check for a AAA
• Percuss:
  o Play the drums.
  o Check for shifting dullness (note that you need 30 seconds for fluid to redistribute)
• Auscultate:
  o Bowel sounds
  o Friction rubs – inflammation of parietal and visceral peritoneum
  o Venous hums – portal hypertension (between xiphisternum and umbilicus)
  o Liver, spleen or renal bruits

Lower limb:
• Must check for hernias (standing), examine external genitalia and do a PR exam (plus a PV exam)
• Check for sacral and pedal oedema

Surgical signs:
• Distension – fat, flatus, foetus, fluid, faeces, fucking big tumour, fantom pregnancy
• Bleeding:
  o Cullen’s sign – periumbilical ecchymosis (retroperitoneal bleeding)
  o Grey Turner’s sign – local discoloration of loins (haemorrhagic pancreatitis)
  o Fox’s sign – ecchymosis of inguinal ligament (haemorrhagic peritonitis)
• McBurney’s sign (appendicitis) – tenderness at McBurney’s point
  o Rovsing’s sign – RLQ pain with left-sided pressure, RLQ pain on withdrawal
  o Dunphy’s sign – increased pain with coughing (appendicitis)
• Murphy’s sign (cholecystitis) – sharp increase in tenderness with a sudden stop in inspiratory effort
  o Boas’s sign – right subscapular pain in cholelithiasis
  o Charcot’s triad (ascending cholangitis) – RUQ pain, jaundice, fever in 70% of patients (Reynold’s
tendet adds altered mental status and shock)
  o Courvoisier’s law – tumours that obstruct the common bile duct result in an enlarged bladder,
    obstructing stones do not (scars)
Cranial Nerves

I – Olfactory (not usually tested)
- Ask patient, look for external rash/deformity
- Test nostrils separately with familiar scents (note pungent/painful stimuli detected by CNV)

II – Optic
- Visual acuity
  - Snellen chart at 6m (or hand-held chart at 30cm)
  - If < 6/60 bring closer, count fingers, hand movements, perception of light
- Visual fields
  - “Look at my nose – are any parts of my face missing?” (macular degeneration)
  - Screen with finger wiggle in four quadrants (left, right, both)
  - Define with white pin: abnormal to normal, horizontally and vertically (red for scotomata)
  - Colour vision not routine (red desaturation in optic neuritis)
- Fundoscopy
  - Optic atrophy – pallor of the nerve head
  - Swelling of the optic disc (papilloedema/papillitis)
  - Haemorrhages:
    - Linear/flame or ecchymoses (hypertensive/diabetic retinopathy)
    - Petechiae (diabetes)
    - Subhyaloid (crescent) haemorrhage (subarachnoid haemorrhage)

III – Oculomotor, IV – Trochlear, VI – Abducens
- Pupils
  - Shape, relative size, symmetry, ptosis
  - Direct and consensual reaction
  - Swinging flashlight – keep on each pupil just long enough to maintain constriction, abnormal \( \rightarrow \) dilation (relative afferent pupillary defect)
- Eye movements – (SO₄, LR₆)₃
  - Both eyes, cardinal directions + corners
  - Ask about diplopia, look for nystagmus
  - Beware internuclear palsy from lesion in medial longitudinal fasciculus between VI (crosses over) and III (doesn’t)

V – Trigeminal
- Look for wasting of temporal fossa
- Muscles of mastication (open mouth, clench and palpate)
- Light touch and pinprick in \( V₁, V₂, V₃ \)
- Jaw jerk (↑ in UMN lesions)

VII – Facial
- Forehead wrinkling and power (bilateral cortical representation – normal in UMN)
- Close eyes tightly and power
- Smile, blow out cheeks (check nasolabial grooves)
- Taste (anterior 2/3 of tongue) not usually tested
- Corneal reflex (V afferent, VII motor)

VIII – Auditory/Vestibulocochlear
- Whisper numbers at arm’s length, rub fingers in other ear
- Rinne’s test (tuning fork on mastoid):
  - Normal – air conduction > bone conduction
  - Sensorineural loss – air > bone
  - Conductive loss – air < bone
- Weber’s test (tuning fork on forehead):
  - Normal – L = R
  - Sensorineural – best in normal
  - Conductive – best in abnormal

IX – Glossopharyngeal, X – Vagus
- Palata/uvula at rest and saying “Ah”
- Swallow saliva/sip of water
- Ask patient to say “Eee” (recurrent laryngeal nerve)
- Gag reflex (both sides)

XI – Spinal Accessory
- Trapezius (also C2-4) – shrug shoulders, test power
- SCM – turn head to side, test power

XII – Hypoglossal
- Look at tongue for wasting/fasciculation
- Poke out tongue (deviates to weak side), test power
- Coordination – ask to say “la la la”
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Upper Limb
• Observe
  o Wasting, fasciculations
  o Abnormal movements (tremor, choreiform, athetosis, myoclonic jerks)
  o Outstretch arms, look for drift – UMN down, cerebellar up, proprioception any
• Tone
  o Elbow flexion and extension
  o Pronation and supination
  o Wrist flexion and extension
• Power
  o Shoulder abduction (C5-C6), adduction (C6-C8)
  o Elbow flexion (C5-C6), extension (C7-C8)
  o Pronation and supination (C5-C6)
  o Wrist flexion (C6-C7), extension (C7-C8)
  o Finger flexion (C7-C8), extension (C7-C8; radial)
  o Finger abduction (C8-T1; ulnar), thumb adduction (median)
• Reflexes
  o Biceps (C5-C6)
  o Triceps (C7-C8)
  o Brachioradialis (C5-C6)
  o Finger jerks (C8)
• Coordination
  o Finger-nose-finger test (intention tremor)
  o Rapid alternating movements (slow and clumsy if cerebellar, slows down if EPS)

Lower Limb
• Observe
  o Wasting, fasciculations
  o Posture, gait including turning and heel-toe, toe walking (L5-S1), heel walking (L4-L5)
  o Romberg test – stand feet together, eyes closed (proprioception)
• Tone
  o Roll legs side to side
  o Knee flexion and extension, lift from below
  o Rapidly dorsiflex foot and maintain (clonus)
• Power
  o Hip flexion (L1-L3), extension (L5)
  o Hip abduction (L4-S1), adduction (L2-L4)
  o Knee flexion (L5-S1; sciatic), extension (L3-L4; femoral)
  o Ankle plantar flexion (S1-S2; sciatic), dorsiflexion (L4-L5; common peroneal)
  o Ankle inversion (L4-L5), eversion (L5-S1)
• Reflexes
  o Knee jerk (L3-L4)
  o Ankle jerk (S1-S2)
  o Plantar reflex (L5-S2)
• Coordination
  o Heel-shin-heel test
  o Rapid alternating movements

Sensation (see dermatome reference next page):
• Light touch (ipsilateral dorsal column + contralateral spinothalamic)
• Pinprick (spinothalamic tract)
• Proprioception using middle finger DIP or great toe (dorsal column)
• Vibration (128Hz fork, test sternum as reference):
  o Upper limb – pulp of middle finger, distal radius, olecranon, clavicle
  o Lower limb – pulp of great toe, medial malleolus, tibial tuberosity, ASIS

Notes:
• Power:
  o 0 – no contraction
  o 1 – flicker/trace
  o 2 – active movement
  o 3 – active movement against gravity
  o 4 – active movement against resistance
  o 5 – normal power
• Reflexes:
  o 0 – absent
  o ± – just present
  o + – normal
  o ++ – brisk normal
  o +++ – very brisk

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Peripheral nerves:

- **Upper limb** (beware brachial plexus):
  - Axillary nerve (C5-C8; deltoid, teres minor)
    - Test shoulder abduction
    - Sensation at regiment badge area
  - Radial nerve (C5-C8; triceps, brachioradialis and hand extensors)
    - Look for wrist drop, test extension (wrist/elbow)
    - Sensation at anatomical snuff box
  - Median nerve (C6-T1; palmar forearm muscles except FCU and ulnar half of FDP; lateral two lumbricals, opponens pollicis, abductor pollicis brevis and flexor pollicis brevis)
    - Test APB if lesion at wrist, flexor digitorum if at cubital fossa (Ochsner’s claspig test)
    - Sensation at pulp of index finger (digital), radial heel of hand (palmar)
  - Ulnar nerve (C8-T1; other small muscles of the hand, FCU and ulnar half of FDP)
    - Look for claw hand (note loss of FDP → less flexion), test little finger abduction or thumb adduction (Froment’s sign)
    - Sensation at pulp of little finger (digital), ulnar heel of hand (palmar)

- **Lower limb**
  - Lateral cutaneous nerve of the thigh (L2-L3)
    - Sensation at lateral thigh
  - Femoral nerve (L2-L4; anterior thigh muscles)
    - Test knee extension (reflex lost), hip flexion
    - Sensation at medial thigh
  - Sciatic nerve (L4-S2; all muscles below knee, some hamstrings)
    - Look for foot drop, test knee flexion (reflex intact, none below)
    - Sensation at posterior thigh, lateral/posterior calf, foot
  - Common peroneal nerve (L4-S1; anterior/lateral compartment muscles of leg)
    - Look for foot drop, test dorsiflexion/eversion (reflexes intact)
    - Sensation at lateral aspect of dorsal foot
Kev’s Physical Examination Guide

SURGICAL
• “She’s lump, she’s lump, she’s in my head…”

Observe:
• Site, Size, Shape
• Surface – smooth vs. rough vs. indurated; skin, scars
• Edge – well defined vs. poorly defined
• Transillumination – whether a torch behind the lump will allow light to shine through
• Associated features – including motor and neurological deficits

Palpate:
• Temperature, tenderness, consistency (soft, spongy, firm)
• Mobility and attachment – move in two directions at 90°, repeat with muscle contracted; bone: immobile, muscle: contraction reduces mobility, subcutaneous: skin moves over lump, skin: lump moves with skin
• Pulsation – assess with two fingers on mass (transmitted same direction, expansile divergent)
• Fluctuation – place 2 fingers on either side of lump, then tap lump centre with other index finger
• Reducibility – compressible (reappears without pressure), reducible (reappears on cough)
• Regional lymph nodes

Percussion and Auscultation:
• Percussion – dullness, resonance
• Auscultation – bruit, bowel sounds

Thyroid

General observation:
• General description – age, gender, well/unwell, comfort level, level of alertness
• Features – body habitus, clothing, abnormal movements, facial appearance (anxious), hirsutism
• Ask to state their name, and ask to cough – listen for stridor, quality of voice, quality of cough

Upper limb:
• Hands:
  o Nails – thyroid acropachy, onycholysis (Plummer’s nail)
  o Palms – temperature, moisture, palmar erythema (hyper), yellow (hypo), thenar wasting (hypo)
  o Check for tremor; use Tinnel’s sign to test for myxoedema of flexor retinaculum (hypo)
• Pulse – rate and rhythm (may have wide pulse pressure, rapid pulse and/or AF in hyper)
• BP – elevated in both hypo and hyper
• Shoulder abduction – proximal myopathy (hyper)
• Pemberton’s sign (SVC obstruction) – lift hands above head → facial plethora, cyanosis, inspiratory stridor, non-pulsatile elevation of JVP

Face and neck:
• Eyes – lid retraction (sclera above iris), exophthalmos (sclera below iris), proptosis (protruding globes), lid lag and ophthalmoplegia, complications (chemosis, conjunctivitis, corneal ulceration, optic atrophy)
  o Queen Anne’s sign (hypo) – lateral 1/3 of brows sparse (apparently a fashion at the time)
  o Stellwag’s sign (hyper) – incomplete and frequent blinking
  o Joffrey’s sign (hyper) – absence of forehead wrinkling with upward gaze
• Mouth – lingual thyroid, thyroglossal duct cyst (rises if tongue poked out), enlarged tongue (hypo)
• Neck:
  o Observe front, back and sides – determine local/generalised swelling
    • Ask patient to swallow some water – only goitre or thyroglossal cyst will rise
    • Note prominent veins may suggest thoracic outlet obstruction from retrosternal mass
  o Palpate:
    ▪ Trachea – midline/deviated
    ▪ Thyroid – examine from the back, dip patient’s head
      • Start with the isthmus of the thyroid, then one lobe at a time
      • Ascertain the nature of any masses and try to get above/below them
      • Describe any lumps (see above)
      • Ask patient to swallow and feel if the swelling rises
    ▪ Lymph nodes – cervical, submental, submandibular, pre/post auricular, occipital, supraclavicular; also sublingual, submandibular and parotid glands
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- Percuss – manubrium for retrosternal masses
- Auscultate – carotid and thyroid bruits (note Riesman’s sign – bruit over closed eyes in hyper)

**Lower limb:**
- Check shins for pretibial myxoedema (hypo)
- Ankle reflexes – slow relaxing in hypo, brisk in hyper

I would also do a full neurological examination; check for local (scalp, chest, skin, mouth) and distant spread (chest, bone, liver) and do some investigations – TFTs, CXR, USS, FNA and thyroid scan.

### Breast
**Observe:**
- Breast – size, symmetry, contours, masses, distortion
- Nipple – retraction, symmetry, Paget’s, discharge, areolar colour
- Skin – masses, distortions, veins, dimpling, peau d’Orange, tethering
- Movements – raise arms in front, lower to the sides, hands on hips, squeeze hips
- Also look at arms, axillae, supraclavicular fossae

**Palpate:**
- Lie patient down with their hand under head
- Use the first three fingers flat on the breast, examining the normal side first
- 4 quadrants, nipple area, axillary tail (note that 50% of cancers are in the UOQ)
- Axilla – sit patient up and ‘shake hands’ at the elbow; feel front, back, medial, lateral and superior

**Other:**
- Describe any lumps as per the lump exam
- Check for metastases – local, bones, chest, liver, brain

Further assessment – blood tests (FBC, LFTs, CXR), triple assessment (clinical examination, mammography and/or ultrasound, FNA), core or open biopsy for any lump in patients >35 years old or any suspicious lumps.

### Vascular
**Observe:**
- General description – age, gender, well/unwell, comfort level, level of alertness (e.g. post-TIA)
- Features – body habitus (amputations, obvious neurological problems, BMI), colour, environment
- Pressure areas – thickening of skin, discoloration, blistering, ulceration, gangrene, hair/nails
  - Hands – cyanosis, refill, temperature, arthritis (vasculitis), pallor, xanthomata, gout
  - Head/neck – xanthelasma, corneal arcus, malar flush (polycythaemia vera), cyanosis
  - Chest – apex, heaves, thrills, auscultate 4 areas (central problem → peripheral signs)
  - Legs – scars, thinness/shininess of skin, oedema, lymphangitis, varicosities, venous gutters
  - Foot – eczema, infection, nail changes, ulcers, Achilles xanthomata

**Palpate:**
- Temperature – use backs of fingers after 5 minutes ambient exposure
- Capillary refill – press pulp/nail tip for 2s, then observe for crude measurement of perfusion
- Pulses – rate, rhythm, character, volume (0 absent, 1 barely, 2 weak, 3 normal, 4 bounding)
  - Radial, brachial, subclavian (if radial not felt), superficial temporal (surrogate for carotid)
  - Radio-radial and radio-femoral delay
  - Abdominal aorta (slightly left of midline, roll to R if obese)
  - Femoral (between symphysis and ASIS), popliteal, posterior tibial, dorsalis pedis

**Auscultate:**
- Bruits – carotids (listen superiorly to distinguish transmitted bruit), aorta, renal, iliacs, femoral
- BP sitting and standing both arms (>20mmHg reduction in one arm suggests steal syndrome)

**Other tests:**
- Beurerger’s angle (PVD) – lift leg off bed and assess the angle it turns white (normally pink up to 90°),
  - Dependent rubor – drop leg off bed to 90° (cyanosis if poor arterial supply)
- Homan’s sign (DVT) – pain on compression of calf muscles or foot dorsiflexion
- Ankle brachial index – >0.9 OK, 0.6-0.9 mild, 0.3-0.6 moderate, <0.3 severe obstruction
I would also do a full neurological exam including fundoscopy (muscles/nerves may be affected by ischaemia), and arrange for Doppler flow assessment and/or angiography.

**Hernia**

**Observe:**
- General description – age, gender, well/unwell, comfort level, scars, abdominal swellings
- Compare both sides, doing a cough test and looking for protrusions (slow rising and falling)
- Compare with the patient supine, coughing and standing.

**Palpate:**
- Define your anatomy – ASIS and pubic tubercle (3cm lateral to pubic symphysis); inguinal ligament runs between these with a slight curve inferiorly; the internal ring is at the midpoint
- Detect and define a hernia:
  - Describe any obvious masses as per lump (beware non-groin hernias e.g. incisional, umbilical)
  - Ask the patient to cough with your fingers over the internal ring if there isn’t a visible mass
  - Reduce the hernia and ask the patient to cough – pressure on the tip of your finger is an inguinal hernia, pressure from under your finger is a femoral hernia (not that reliable, mind you)
  - Note that a femoral hernia tends to smooth out the groin crease, while an inguinal hernia will tend to accentuate the groin crease.
- Scrotum – inspect and compare both sides; define any swellings

**Varicose Veins**

**Observe:**
- Expose entire lower limp from groin to toes, standing the patient up
- Describe the distribution of veins
- Inspect suprapubic and lower abdominal areas for venous collaterals signifying past DVT
- Inspect for vulval varicosities from the vulva down the medial side of the upper thigh

**Palpate:**
- Feel for venous dilation in the groin (saphena varix), check for a cough impulse
- Turn the patient around and palpate the upper end of the short saphenous:
  - Must stand on the contralateral limb, relaxing muscles bounding the popliteal fossa by slightly flexing the knee on the affected side
  - If normal or impalpable, it is not incompetent; otherwise mark on the surface with a pen.

**Banding:**
- Lie the patient on the bed, with the affected leg slightly elevated.
- Stroke the blood out of the veins, then secure a rubber ligature around the top of the thighs (must be tight enough to move the skin deeper than the diameter of the saphenous vein – up to 2cm)
- Stand the patient up
  - If veins still empty for 15 seconds, the problem is at the tourniquet level; if not controlled the problem is below the tourniquet level – apply the tourniquet just above the knee
  - If veins controlled by tourniquet above knee, the thigh perforating vein is incompetent; if not controlled put tourniquets on the thigh and just below the upper end of the short saphenous
  - Compress the upper end of the short saphenous vein, then release the lower tourniquet – if the thumb controls the varicosity, the short saphenous vein is incompetent
  - If you fail to control the varicosity, the calf perforators are incompetent.
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<table>
<thead>
<tr>
<th>ORTHOPAEDIC</th>
<th>GALS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ask:</strong></td>
<td><strong>Arms (sit down):</strong></td>
</tr>
<tr>
<td>• Do you have any pain/stiffness in any joints?</td>
<td>• Shoulders – normal/symmetrical muscle bulk, hyperalgesic response of fibromyalgia, hands behind head (full abduction and external rotation)</td>
</tr>
<tr>
<td>• Do you have any difficulty dressing yourself?</td>
<td>• Elbows – check for nodules, flex and extend</td>
</tr>
<tr>
<td>• Do you have any trouble climbing stairs?</td>
<td>• Hands – inspect palms/palpate/pulps/nails, squeeze MCP joints, pronate/supinate, tight fist, pincer grip, prayer sign</td>
</tr>
<tr>
<td><strong>Gait:</strong></td>
<td><strong>Legs (lie down):</strong></td>
</tr>
<tr>
<td>• Straight line – smoothness, symmetry, stride length</td>
<td>• Hips – internal rotation at 90° flexion</td>
</tr>
<tr>
<td>• Mobility to U-turn quickly</td>
<td>• Knees – wipe test, flex/extend (palpate for crepitus)</td>
</tr>
<tr>
<td><strong>Spine:</strong></td>
<td>• Feet – inspect soles/toes/palps/nails, squeeze MTP joints</td>
</tr>
<tr>
<td>• Look – scoliosis or kyphosis (from side), lumbar lordosis, level iliac crests, normal/symmetrical muscle bulk (paraspinal and pelvic girdle muscles)</td>
<td></td>
</tr>
<tr>
<td>• Move – lumbar spine and hip flexion, lateral cervical flexion</td>
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| • **Hand** |
| Introduce yourself, ask patient to expose to elbow and ask them if they are experiencing any wrist/hand pain. |

| **Look:** |
| Extensor surface |
| o Skin changes – erythema (SLE), papules (Gottron’s), pigmentation, rash, sclerodactyly, trauma |
| o Nail changes – clubbing, pitting (psoriasis), splinter haemorrhages, hyperkeratosis, hyperaemia |
| o Swellings – wrist (ganglions, tenosynovitis),PIP joints (Bouchard), DIP joints (Heberden), tophi |
| o Deformity – ulnar styloid, wrist, MCP joints, fingers (Boutonniere, Swan-neck, Z-thumb) |

| Palmar surface |
| o Skin changes – palmar erythema (RA), thick palmar fascia (Dupuytren’s) |
| o Swellings – wrist or proximal to MCP joints (tenosynovitis), palmar ganglion (RA) |
| o Deformity – wasting of thenar and hypothenar eminences |

| Lateral inspection |
| o Swellings – dorsum of wrist, flex/extend MCP joints (tenosynovitis moves, joint swelling doesn’t) |
| o Deformity – palmar subluxation at wrist (‘dinner fork’) |

| **Feel:** |
| Temperature – sweep the back of your hand from the forearm to the fingers (should get cooler) |
| Wrist – palpate while flexing/extension, sniff box (scaphoid), ulnar, radius (Colles), lateral (De Quervain) |
| MCP, DIP and PIP joints – feel for synovitis and joint-line tenderness, feel for crepitus and ROM |

| **Move:** |
| Joint stability – stabilise MCP, DIP and PIP joints and move laterally (MCP joints should be flexed) |
| Wrist – extension (prayer sign), flexion (reverse prayer), radial/ulnar deviation, pronation/supination |
| Fingers – opposition to each finger, key grip, pen grip, hammer grip, clenched fist (look at finger curling) |

| **Special tests:** |
| Piano key sign – pull wrist radially, push the ulnar styloid downwards (weak/ruptured radioulnar ligament) |
| Finkelstein’s test (De Quervain tenosynovitis) – grasp thumb, passively ulnar deviate wrist |
| Phalen’s sign (carpal tunnel) – flex wrist for sixty seconds → pins and needles |
| Tinel’s sign (carpal tunnel) – extend wrist, percuss over carpal tunnel → pins and needles |
| Assess neurology of radial, ulnar and median nerve as per wrist exam |

| **Wrist Laceration** |
| Introduce yourself, ask patient to expose to elbow; describe dimensions, check for foreign bodies/other cuts. |

| **Vascular:** |
| Look – white (arterial insufficiency), blue (venous congestion), red + no sweating (ANS deregulated) |
| Feel – temperature, capillary refill, radial pulse, ulnar pulse |
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- Allen’s test – ask patients to make fist and squeeze, occlude radial and ulnar arteries; check for patency by releasing one and checking for reperfusion (repeat from start for other artery).

Neurological:
- Ulnar nerve:
  - Sensation – pulp of little finger (digital branch), ulnar heel of hand (palmar branch)
  - Motor – abduction of little finger (abductor digiti minimi)
- Median nerve:
  - Sensation – pulp of index finger (digital branch), radial heel of hand (palmar branch)
  - Motor – abduction of thumb (abductor pollicis)
- Radial nerve:
  - Sensation – back of the base of the thumb
  - Motor – wrist extension

Tendons:
- Observe resting posture of digits, comment on cascade (present/disrupted)
- Palmaris longus – oppose thumb and little finger, flex wrist against resistance
- FCR – flex and radial deviate wrist against resistance
- FCU – flex and ulnar deviate wrist against resistance
- FDP – individually stabilise PIP joint and ask to flex DIP joint
- FDS – hold other DIP joints in extension, ask to flex finger

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- FDS – hold other DIP joints in extension, ask to flex finger

Elbow
Introduce yourself, ask patient to expose to T-shirt, ask if they have any upper limb pain.

Look:
- Wasting, asymmetry, deformities, scars, swelling, redness
- Effusion – filling out of hollows in flexed elbow above olecranon
- Carrying angle with arms extended – valgus (normal in females) or varus

Feel:
- Lateral epicondyle – localised tenderness in tennis elbow
- Medial epicondyle – localised tenderness in golfer’s elbow
- Olecranon – bursitis or fracture
- Also – palpate biceps tendon while flexing/extension, roll ulnar nerve under fingers

Move:
- Extension (0-15°)
- Flexion (0-145°) – ask to touch both shoulders
- Pronation/supination – ask to hold elbows against sides then turn palms upwards/downwards

Special tests:
- Tennis elbow:
  - Flex elbow, pronate arm then extend elbow – pain over lateral epicondyle
  - Pronate arm with elbow fully extended – pain over lateral epicondyle
  - Thomas’ test – ask patient to resist wrist flexion while holding wrist and elbow extended
- Golfer’s elbow
  - Flex elbow, supinate arm then extend elbow – pain over medial epicondyle
  - Supinate arm with elbow fully extended – pain over medial epicondyle

I would also do a detailed neurovascular exam (including reflexes, myotomes and dermatomes). I would also examine the shoulder (above) and the wrist (below).

Shoulder
Introduce yourself, ask patient to expose entire shoulder and ask if they are experiencing any shoulder pain.

Look (ideally also look from above):
- Wasting, asymmetry, deformities, scars, swelling, redness
- Manubrium → clavicle (supraclavicular fossa) → acromion → muscle bulk (deltoids, trapezius, scapular muscles)
Feel (swelling, tenderness, heat):
- SC joint → clavicle → AC joint → acromion → scapula
- Subacromial bursa → GH joint → biceps tendon (adduct)

Move:
- Range of movement (active then passive)
  - Abduction (0-150°) – pain at 60-100° = supraspinatus impingement, 100°+ = AC joint
  - Adduction (0-50°)
  - Flexion (0-90°)
  - Extension (0-60°)
  - External rotation – elbows at side
  - Internal rotation – thumbs up back
- Power (rotator cuff muscles)
  - Supraspinatus (C4-C6) – initiates abduction
  - Infraspinatus and Teres minor (C5-C6) – externally rotates
  - Teres major (C6-C7) – internally rotates
  - Subscapularis (C5-C7) – internally rotates (hands behind back)

Special Tests:
- Anterior instability – abduct to 90°, elbow flexed (stop-sign)
- Posterior instability – flex to 90° (punch)
- Inferior instability – pull down on wrist (sulcus sign)
- Supraspinatus impingement – abduct to 90°, internally rotate (beer tipping)
- Long thoracic nerve – push off against wall (winging of scapula)

I would also do a detailed neurovascular exam (including reflexes, dermatomes C3-T2, and radial, ulnar and median nerves), examine the cervical spine (above) and examine the elbow joint (below).

**Spine**

Introduce yourself, ask patient to expose to underwear and ask if they are experiencing any pain/weakness.

**Standing:**
- Look:
  - Front – shoulders (tilting), pelvis (wasting, asymmetry, deformities, scars, swelling, redness)
  - Side – cervical lordosis, thoracic kyphosis, lumbar lordosis; other obvious stuff as above
  - Back – muscle bulk, scoliosis, spina bifida occulta, leg length
- Move:
  - Walk – normal (gait), toes (S1-2), heels (L4-5), squat (L3-4), heel raise for ten seconds (L1-L2)
  - ROM – lumbar flexion (do Schober's test), extension and lateral flexion

**Sitting:**
- ROM – thoracic rotation (hands behind head, fix pelvis)
- Dermatomes – L1 (inguinal region), L2 (lateral thigh), L3 (anteromedial knee), L4 (medial malleolus), L5 (great toe), S1 (lateral foot), S2 (posterior thigh), threaten to do S3-S5 only if it’s a med student
- Reflexes – knee jerk (L3-L4), ankle jerk (S1-S2), Babinski (L5-S2)

**Lying:**
- Supine:
  - Peripheral pulses (neurovascular disease) – posterior tibial, dorsalis pedis
  - Move – hip flexion (L1-3) and extension (L5), knee flexion (L5-S1) and extension (L3-L4), ankle inversion (L4-5) and eversion (L5-S1), extend great toe (extensor hallucis longus – L5)
  - Special tests (beware crossover pain):
    - Lasegue sign – straight-leg raise until pain, drop back a bit then dorsiflex foot to confirm
    - Bowstring-sign – straight-leg raise until pain, drop back a bit then press in popliteal fossa
- Prone:
  - Feel – spinous processes, paraspinal muscles, SI joints, gluteal muscle bulk
  - Move – hip extension (L5)
  - Special tests – flex knee and extend hip to stretch femoral nerve (L2-L4)

I would also do an abdominal examination (masses) and assess chest expansion (ankylosing spondylitis). I would examine the rest of the spine (above), the hip joint (below) and conclude with a PR exam.
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**Hip**

Introduce yourself, ask patient to expose to underwear, ask if they are experiencing any back/hip/knee pain.

**Standing:**
- Look – wasting, asymmetry, deformities, scars, swelling, redness
- Check ASIS and iliac crests level, normal lumbar lordosis, gluteal folds equal with no buttock wasting
- Walk – watch for antalgic, Trendelenburg, short leg and fixed flexion deformity gait
- Trendelenburg test – stand on one leg for 30 seconds, positive if hip drops on unsupported side

**Lying:**
- Look – square pelvis, straighten legs; measure true and apparent leg length, thigh girth
- Feel – palpate ASIS, iliac crest, trochanters
- Move (supine) – passive, then active
  - Abduction (0-40°) – hand on ASIS to fix pelvis
  - Adduction (0-25°) – hand on ASIS to fix pelvis
  - Flexion (0-140°) – hand under back, comment on fixed-flexion deformity (Thomas test)
  - Internal and external rotation in flexion
  - FABER test – flex, abduct, externally rotate (assesses joint, capsule, SI joint)
- Move (prone) – passive, then active
  - Extension (0-10°) – hand on sacrum to fix pelvis
  - Internal and external rotation in extension
  - Also palpate SI joint while they’re still prone

I would also do a detailed neurovascular exam (including reflexes, myotomes and dermatomes), palpate the regional lymph nodes and do a PR exam. I would also examine the lumbar spine (above) and knee (below).

**Knee**

Introduce yourself, ask them to expose to shorts and ask if they have any pain in their legs.

**Look:**
- Look from front, side, back, other side – wasting, asymmetry, deformity, scars, swelling, redness
- Check alignment – valgus (knock-knee) or varus (bow-legged)
- Walk – look for obvious gait abnormality, assess quadriceps wasting

**Feel:**
- Effusion – patella tap (squeeze fluid inferiorly first), patella sweep, comment on temperature
- Start from malleoli, go up tibia and fibula and ending at the tibial tuberosity
- Feel the patella tendon, patella and retinacula, ending at the quadriceps tendon
- Feel the medial and lateral collateral ligaments and palpate the joint line around to the popliteal fossa

**Move:**
- Extension (0-10°) – lift heels
- Flexion (0-160°) – ask to bend knees, feel for locking and crepitance

**Special tests:**
- Medial and lateral collaterals – stress at 0° and 30° flexion
- Anterior and posterior cruciates – observe at 90°, anterior/posterior drawer, Lachmann (at 20-25°)
- Menisci – McMurray test (flex hip and knee, externally/internally rotate foot and extend knee)
- Patella – J-line patella movement (?), patella apprehension test (push laterally)

I would also do a detailed neurovascular examination (including reflexes, myotomes and dermatomes), examine the hip joint (above) and examine the ankle joint (below).

**Ankle**

Introduce yourself, ask them to expose to knees and ask if they have any pain in their knees or feet.

**Look:**
- Look from front, side, back, other side – wasting, asymmetry, deformity, scars, swelling, redness
- Check arches from the back, ask to stand on toes – arches accentuate, calcaneus swings to varus
- Walking – normal, toes (triceps), heels (tibialis anterior), inverted (tibialis posterior), everted (peroneals)
- Check soles of feet (callosities) and shoes (normal wear pattern)
Feel:
- Ottawa ankle rules – tibia and fibula from knee, medial and lateral malleolus, navicular, 5th metatarsal
- Other bits – medial and lateral collateral ligaments, calcaneus, other tarsals/metatarsals/phalanges
- Circulation – posterior tibial and dorsalis pedis pulses, capillary refill, temperature
- Sensation – sural (lateral), saphenous (medial), superficial peroneal (dorsal)

Move:
- Active – toe flexion/extension, foot flexion/extension and inversion/eversion
- Passive – isolate ankle joint proper, subtalar joint, midfoot rotation

Special tests:
- Anterior drawer – heel at 90°, move talus anteriorly relative to tibia/fibula (anterior talofibular ligament)
- Maximally invert foot with slight flexion, feel end point (anterior talofibular and calcaneofibular ligaments)
- Thompson test – calf squeeze → plantar flexion (tendon Achilles)

I would also do a detailed neurovascular examination (including dermatomes, myotomes and reflexes) and examine the knee joint (above).