OSCE Knowledge

Death

Verification

• Rule out hypothermia, overdose, drowning, hypoglycaemia, encephalopathy, myxoedema
• Attempt to rouse patient - sternal / supraorbital rub
• Inspect for body cooling, lividity (hypostasis, after 30mins), rigor mortis (after 3hrs)
• Auscultate the chest for breath and heart sounds while palpating central pulse for > 5mins
• Inspect eyes for fixed dilated pupils, absent corneal reflex, ‘boxcars’ on fundoscopy

Certification

• By a doctor who (a) provided care in last illness and (b) saw patient within 14 days of death
• Refer to coroner if death violent / suspicious, suicide, industrial, neglect, within 24hrs of admission, intra-operative, before full recovery from anaesthetic, in prison

Developmental milestones

• Gross motor:
  • 2 months - holds head up when prone; 4 months - holds head up when sitting
  • 6 months - some weight bearing; no head lag on pull-to-sit
  • 9 months - crawls; sits unsupported; pulls to stand
  • 1 year - stands unsupported; walks with support; 18 months - walks unsupported
  • 2 years - runs, kicks a ball; 3 years - jumps; stands on one leg; walks on tip-toes
  • 4 years - hops; 5 years - skips

• Fine motor:
  • 4 months - reaches for objects; 6 months - moves objects between hands
  • 9 months - deliberately drops objects
  • 1 year - pincer grip
  • 18 months - scribbles; 3-cube tower
  • 2 years - overhand throw; 6-cube tower
  • 3 years - self dresses; 8-cube tower; draws a circle
  • 4 years - draws a cross; 6 years - draws a diamond

• Speech and language:
  • 2 months - vocalises; 1 year - some words; 2 years - simple sentences

• Social and behavioural:
  • 1 month - looks at faces; responds to noise; 2 months - smiles
  • 9 months - stranger anxiety; 18 months - recognises familiar images
ECGs

- **12-lead** placement:
  - V1 / V2 - 4th IC space, parasternal (right / left)
  - V4 / V6 - 5th IC space, mid-clavicular line / mid-axillary line
  - V3 / V5 - midway between V2-V4 / V4-V6
  - R (red) / L (yellow) - palmar wrists
  - N (black) / F (green) - lateral malleoli (right / left)
- **Calibration** - horizontally 25mm / 1s, vertically 1mV / 1cm
- **Interpretation** - check patient details, time / place, symptoms, calibration
  - rate, rhythm, axis; P wave, PR, QRS complex, ST, T waves; conduction, compare
- **Axis** - leads I / aVF normally positive deflection
  - positive lead I, negative aVF / lead II - *left axis deviation* e.g. LAHB, LVH, ASD, DCM
  - negative lead I, positive aVF - *right axis deviation* e.g. PE, RVH, infancy, Fallot’s

Heart sounds and murmurs

- **Heart sounds** - S2 normally louder; on *inspiration* - HR increases, BP / JVP falls, S2 splits
  - S1 (closure of mitral / tricuspid valves) - best at apex
  - S2 (closure of aortic / pulmonary valves) - best at left sternal edge, splits on inspiration
  - S3 (diastolic ventricular filling) - low pitch, post-S2; normal in children / pregnancy
  - S4 (atrial contraction against stiff ventricle) - low pitch, pre-S1; always abnormal
- **Abnormal findings:**
  - loud S1 (> S2) - mitral stenosis
  - fixed split S2 - ASD
  - S3 aged > 40 - **LVF** (‘gallop rhythm’) mitral regurgitation
  - S4 - LVH secondary to HTN / **aortic stenosis** / HOCM
  - inspiratory *rise* in JVP - Kussmaul’s sign, **constrictive pericarditis**
- **Murmurs** - grade 1 (soft), 2 (easily heard), 3 (clear), 4 (thrill), 6 (audible from end of bed)
  - *rheumatic heart disease* can cause any valve disorder
  - systolic murmurs - AS, MR, ASD (+ fixed split S2), VSD, severe anaemia (flow murmur)
- **Aortic stenosis** - due to sclerosis (degenerative), congenital bicuspid valve
  - low pulse volume, slow-rising pulse, narrow pulse pressure; heaving apex
- **Mitral regurgitation** - due to prolapsed valve (e.g. post-MI), infective endocarditis
  - may be AF, heaving apex, *pan systolic murmur* with axillary radiation, midsystolic click
- **Aortic regurgitation** - due to infective endocarditis, Marfan’s, Turner’s, SLE
  - collapsing pulse, wide pulse pressure, Corrigan’s / De Musset’s, *early diastolic murmur*
- **Mitral stenosis** - AF, *malar flush*, opening snap, *mid-diastolic murmur*
Immediate life support (ILS)

- DR ABCDE: danger (ensure personal safety), response (shake and shout)
- If responsive - consider MET call; ABCDE assessment
  - airway - check if patent, suction if appropriate, sit patient up, consider OPA / NPA
  - breathing - assess RR, respiratory efficacy, sats.; give oxygen, brief respiratory exam
    - if depth / rate of breathing inadequate - lie patient down, bag-and-mask ventilation
  - circulation - assess pulse, BP, perfusion, brief cardiovascular exam, ECG
    - gain IV access, take relevant bloods, fluid bolus (250ml if CCF / 500-1000 as per BP)
  - disability - assess GCS / AVPU, check BM (consider 50ml 10% glucose IV stat)
  - exposure - check thoroughly for injuries, bleeding, signs of infection etc.
- If unresponsive - call for help
  - airway - head tilt, chin lift, look for any obvious airway obstruction
  - breathing - 10s: feel for breath on cheek, observe chest movement, feel carotid pulse
    - if breathing (unless agonal) / pulse - place in recovery position, reassess
    - otherwise - confirmed cardiac arrest, call crash team (2222) / 999
  - circulation - begin CPR (30:2) at 100-120 compressions / min, 5cm depth
    - bag-and-mask; consider OPA, LMA, ETT; rescue breaths for no longer than 5s
    - once airway secure (e.g. ETT, possibly LMA) give continuous chest compressions
  - defibrillation - apply pads below right clavicle / at V6 left mid-axillary line
    - momentary pause of CPR to assess heart rhythm every 2mins (5-6 iterations of 30:2)
    - if shockable (VF, VT) - shock (150-200 initially), resume CPR for further 2mins
      - after 3rd shock - 1mg adrenaline (10ml of 1 in 10,000), 300mg amiodarone
    - if unshockable (PEA, asystole) - 1mg adrenaline immediately, resume CPR
    - repeat adrenaline after alternate 2min CPR cycles (every 3-5mins)
    - 20ml saline flush and limb elevation after each drug bolus administration
- At return of spontaneous circulation (RSOC) - ABCDE, consider therapeutic hypothermia
- Reversible causes - 4Hs and 4Ts
  - hypoxia, hypovolaemia, hypothermia, hyperkalaemia or other disordered metabolite
    - consider calcium chloride if hyperkalaemia, hypocalcaemia, CCB overdose
  - tension pneumothorax, tamponade, toxins, thromboembolism
    - consider thrombolysis if suspected VTE

Mental health act (MHA 2007) assessment

- Where the patient is deemed to have ‘any disorder or disability of mind’ - not addiction alone
  - hospitalisation is required for either assessment or treatment
  - detention is required to protect patient’s or others’ health / safety
- Approved mental health professional (AMHP) e.g. social worker, nurse, OT, psychologist
  - undergone specialist training, approved by local social services authority; not a doctor
• Responsible clinician (RC) has overall responsibility for patient, may be doctor or as above
  • GP to liaise with AMHP to arrange compulsory hospitalisation (‘sectioning’)
    • 2 medical recommendations usually required by consultant psychiatrist and regular GP
• Section 2 (assessment) - up to 28 days, non-renewable, 14 days to appeal
• Section 3 (treatment) - up to 6 months, renewable, exact diagnosis must be specified
• Section 4 (emergency treatment) - up to 72hrs, only requires 1 medical recommendation
• Section 5(2) (doctor’s holding) - up to 72hrs, inpatients only
• Section 5(4) (nurse’s holding) - up to 6hrs, by psychiatric nurse
• Section 7 (guardianship) - ‘compulsory community care’ usually under social worker
• Section 17a (CTO) - where hospital detention not required
• Section 135 (removal) - if suspected neglect / ill treatment, police search warrant
• Section 136 (police) - up to 72hrs, convey from public place to ‘place of safety’ e.g. A&E

Mental capacity act (MCA 2005) assessment
• 5 principles apply to aged 16 and over:
  • presumption of capacity - until proven otherwise
  • right to support - all appropriate assistance in making own decisions must be provided
  • right to eccentric or unwise decisions
  • protection of best interests
  • least restriction - interventions should not unnecessarily impinge basic rights / freedoms
• Capacity - ability to understand, retain, weigh-up information and communicate decision
• Consent may be given by one with parental responsibility on child’s behalf up to age 18
  • only one parent’s consent is required but full involvement is preferable
  • mother always has responsibility; father only if married when born, jointly registered birth
  • emergency life-saving treatment may be provided to children without consent
  • children aged 16-18 cannot refuse treatment in best interests consented to by parents
• Gillick competency - sufficient understanding and maturity to exercise capacity

Informed consent
• A clinician should only attempt to gain consent to a procedure they themselves can perform
• In order to give informed consent the patient with capacity must understand:
  • what the proposed treatment is, what it involves, its purpose and justification
  • the benefits, risks, alternatives and consequences of non-treatment

Independent mental capacity advocate (IMCA)
• Appointed to support / represent a patient who lacks capacity with no-one to speak for them
  • used where serious / long-term treatment proposed or change to accommodation
Advance decisions

- Defines treatments a patient wishes to avoid should they lack capacity
  - must be aged 18 or over
  - may be verbal unless life-saving treatment involved, then must be signed inc. by witness

Lasting power of attorney

- Appoints someone to act on patient’s behalf should they lack capacity
  - must be registered with Office of the Public Guardian
  - attorney may make decisions about health, welfare, financial, property

Neurology

- MRC power - 5 (normal), 4 (weak), 3 (against gravity), 2 (without gravity), 1 (flicker), 0 (nil)
- Reflexes - ++ (normal), +++ (brisk), ++++ (clonus), + (reduced), - (none)

Dermatomes

- trunk - nipple line T4, xiphisternum T6, umbilicus T10, above hips T12
- upper limbs - thumb C6, index / middle C7, ring / little C8, inner forearm T1
- lower limbs - pockets L1/2, knee L3/4, foot L5/S1 (little toe), malleoli - medial L4, lateral S1

Myotomes

- shoulder abduction (supraspinatus / deltoid) - C5
- elbow flexion (biceps) - C5/6; elbow extension (triceps) - C7
- wrist flexion (carpi radialis / ulnaris) - median / ulnar nerve; extension - radial nerve
- finger flexion - C8/T1; finger extension - radial nerve/C8
- finger abduction / adduction (dorsal / palmar interossei) - ulnar nerve/T1
- thumb abduction (abductor pollicis brevis) - median nerve
- hip flexion (iliopsoas) - L1/2; hip extension (gluteals) - L4/5
- knee flexion (hamstrings) - L5/S1; knee extension (quadriiceps) - L3/4
- ankle dorsiflexion (tibialis anterior) - L4/5; ankle plantar flexion (gastrocnemius) - S1
- great toe extension (extensor hallucis longus) - L5

Safeguarding

- GMC expects doctors to act on any concerns about safety / welfare of children
  - parents should be told about professional duty to raise concerns about children at risk
  - seek consent to share information where possible, but consider public interest / law
- NICE assessment - information gathering, explanation seeking, record keeping
  - if maltreatment possible - discuss with experienced colleague / paediatrician / CAMHS
  - if maltreatment suspected - refer to child social services via local safeguarding policies
SBAR

- **Situation** - introduce self, check who speaking to, identify patient / location, problem, needs
- **Background** - patient details, relevant PMH, reason for admission, relevant developments
- **Assessment** - ABCDE, relevant obs. / EWS, relevant results
- **Recommendation** - plan / intentions, explicit request for assistance

**Transfusion reactions**

- Early reactions are *less common* and tend to be *more severe*
- **Acute haemolysis** - caused by ABO incompatibility (IgM / complement mediated)
  - symptoms (within minutes of transfusion) - fever, anxiety, flushing, chest pain, dyspnoea
  - management - stop transfusion, re-crossmatch, IVT
  - complications - hypotension, renal failure, DIC
- **Delayed haemolysis** - caused by alloimmunisation e.g. RhD (IgG mediated, extravascular)
  - symptoms (1wk post-transfusion) - jaundice, fever, symptomatic anaemia
  - management - direct Coomb’s test, monitor Hb, consider further transfusion
- **Febrile non-haemolytic** - recipient anti-leucocyte antibodies attack donor leucocytes
  - symptoms (end of infusion) - fever, rigors, flushing, tachycardia
  - management - slow transfusion, paracetamol; stop transfusion if severe
- **Urticaria** - autoantibodies against donor plasma proteins
  - symptoms (during transfusion of platelets / plasma) - rash, itch
  - management - slow transfusion, 10mg IV chloramphenamine
- **Anaphylaxis** - if recipient lacks IgA, anti-IgA antibodies react against donor IgA
  - management - stop transfusion, consider intubation, IM adrenaline, antihistamines
- **TRALI** - donor anti-leucocyte antibodies attack recipient leucocytes
  - symptoms (within 6hrs of transfusion) - fever, dyspnoea, cough
  - management - maintain airway, treat as ARDS

**HIV screening and counselling**

- Universal screening in GUM clinics, antenatal / TOP services, drug dependency services
  - routine testing in STDs, MSM, IVDU, sexual contact abroad in high-risk area
- First-line testing - 4th generation (HIV antibody / p24 antigen) - positive after *1 month*
  - 3rd generation (HIV antibody only) - positive after *7 weeks*
  - *all* should have second confirmatory assays (antibody, antigen, RNA) before diagnosis
- Initial counselling - benefits of testing, how result will be given, lifestyle issues
  - if negative - advise re. STIs / PEP, consider repeat test at 3 months post-exposure
  - if positive - refer to HIV specialist within 48hrs to discuss staging, treatment etc.
Falls

- **Risk assessment** (STRATIFY) - recent fall, agitation, visual impairment, frequent toilets, transfer / mobility dependence
  - also - cognitive impairments, osteoporosis, continence, home hazards
  - medication review
- **Acute fall** - ABCDE assessment; ascertain whether mechanical or medical aetiology
  - ‘top to toe’ examination, document fully in the notes
  - after suspected head injury - neurological obs. (at least every 2hrs)

Emergency contraception counselling

- Initial history - timing of intercourse, confirm unprotected, with new / regular partner
- Gynaecology - LMP, normal cycle, previous pregnancy / EC, current contraception
  - any other unprotected intercourse since LMP - could they already be pregnant?
- PMH - general health, medications, ‘funny rashes that come and go’ (porphyria)
- Options (none completely effective):
  - ‘morning after pill’ - within 72hrs, up to 85% effective
  - SPRM (another single pill) - within 120hrs, up to 98% effective
  - copper IUD - within 5 days, up to 99% effective (recommend)
- Next period may be early or late; perform pregnancy test if delayed by > 1wk
  - consult doctor immediately if abdominal pain / irregular or excessive bleeding
- Recommend STI screen (consider prophylactic antibiotics if IUD - risk of PID)
- Discuss long-term contraception options - offer leaflet, another appointment

Controlled drugs

- Five **schedules** according to misuse potential
  - 1 (no medicinal use) - cannabis, LSD etc.
  - 2 (registered) - diamorphine, morphine, pethidine, cocaine; must be locked away
  - 3 (unregistered) - barbiturates, buprenorphine, midazolam, temazepam
  - 4 (no safe custody) - benzodiazepines, testosterone, hCG
  - 5 (invoiced only) - codeine
- Schedule 2-4 prescriptions - valid for 28 days, maximum prescribed quantity up to 30 days
- Must include patient’s name / address; form / strength of preparation; total quantity or dosage units in words and figures to be supplied; dose; prescriber’s signature / address
Medication counselling

- Advantages, disadvantages, complications, alternatives, implications of non-treatment

**Steroids**
- Steroids taken for more than 3 weeks should be *tapered down* - risk of **Addisonian crisis**
  - consider bisphosphonate, regular BP checks, annual DM checks, avoid NSAIDs
  - shorter courses unlikely to cause side-effects
- **Side-effects:**
  - visible - weight gain (truncal), striae, acne, thin / bruising / poor healing skin, hirsutism
  - ‘invisible’ - **osteoporosis**, **hypertension**, hyperglycaemia, proximal myopathy
  - also oligomenorrhoea, mood disturbances, recurrent infections (esp. VZ)
- Complications - **DM**, **cataracts**, **PUD**

**Warfarin**
- Avoid in pregnancy / postpartum, history of GI bleed / PUD, recent surgery / stroke
- Take at same time each day e.g. 6pm, do not take double doses if one missed
  - avoid cranberry juice, moderate alcohol only, avoid drastic dietary changes
- INR check up to every 12wks
- stop 5 days prior to elective surgery
- See doctor immediately if sudden extensive bruising, bleeding, dark urine, black stool

**SSRIs**
- Used in depression (paroxetine only if major), panic disorder, bulimia, OCD, PTSD, GAD
  - generally *not* suitable in aged < 18 years - risk of **suicidal ideation**
  - avoid in active mania, epilepsy, glaucoma, DM, NSAIDs, pregnancy
- Effects may take several weeks, review after 1-2wks, continue for > 6 months post-recovery
- Side effects - sedation, nausea, vomiting, dyspepsia, dry mouth, urinary retention, mania
  - **Serotonin syndrome** - altered mental status, hyper-autonomic, neuromuscular problems
    - initially tremor, akathisia, diarrhoea, agitation, palpitations, sweating, delirium

**Statins**
- Used in CVD / PVD, stroke / TIA, aged > 40 with 10-year CVD risk > 20%
- Side effects (less than 3%) - fatigue, headache, nausea, bowel habit change, sleep disturbance, erectile dysfunction, interstitial lung disease
  - **myopathy** (< 2 in 10,000) - muscle pain, stiffness, weakness, cramping
  - **rhabdomyolysis** (1 per 100,000 treatment years) - after 6 months of treatment
  - **hepatic toxicity** (1 in 1,000,000 treatment years)
- Risks for myopathy - multi-system disease, alcohol abuse, aged > 70, **CYP450 inhibitors**
- Check LFTs after 3 months; check **CK only** if muscle pain (discontinue statin)
MMR vaccine

- Live vaccine containing ‘diluted’ (harmless) versions of MMR viruses
  - All the MMR viruses are infectious unpleasant illnesses with serious complications:
    - measles - pneumonia, encephalitis
    - mumps - deafness, pancreatitis, infertility
    - rubella - congenital rubella syndrome
  - Vulnerable groups (pregnant women, immunocompromised) prone to more serious disease
  - “Vaccination protects your child, but it also protects other more vulnerable children / adults”
  - Contraindications - acute illness (not minor), gelatin allergy, malignancy, steroids, recent blood transfusion, pregnancy, poorly controlled epilepsy
  - Complications - fever, rash, parotid swelling; rarely febrile convolution, ITP, arthropathy
    - no evidence for risk of autism, bowel disease
  - Single vaccines not recommended by Department of Health, possible anaphylaxis risk

Inhalers

- Pressurised metered-dose inhalers (MDIs) - deliver fixed dose with manual spray
  - may be breath-actuated if co-ordination problems
- Spacers (around 750ml) - increase lung absorption but decrease oropharyngeal deposition
  - monthly washes (dry without rinse) prevents electrostatic accumulation; replace annually
- Nebulisers - indicated in severe attacks
- Dry powder inhalers (DPIs) e.g. turbohaler, accuhaler - twist base to prime (click), inhale
  - may be lack of oral sensation on dose delivery - patients may think it has not worked
- Technique (take 30s in between doses):
  - shake inhaler, remove cap, (attach to spacer), exhale, form seal around mouthpiece
  - begin slow deep inhalation, depress canister, hold breath for 10 seconds