



Model Answers — NSW Practice SAQ Trial 2024.1

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Question 1 (12 marks)

A 50-year-old male is brought in by ambulance. Paramedics were called out of concern for his welfare. On assessment he is agitated, disoriented to time, sweaty and tremulous.

Part a (4 marks)

You suspect alcohol withdrawal. Please provide four additional differential diagnoses for the above presentation.

Model Answer

Drugs	• CMA intoxication • Sympathomimetic poisoning • Toxic alcohol poisoning • Withdrawal - GHB, benzos, opiates
Infection	• CNS infection • Encephalitis • Any sepsis really
Metabolic	• Severe hypoglycaemia • Severe hyponatraemia • Thyroid storm • Wernicke's encephelopathy
Environmental	• Hypo/hyperthermia • Potential envenomation
Structural	• TBI - SAH/EDH/SDH • Cerebral mass • Basal ganglia stroke

For full marks, candidates must include a differential from 4 different systems.

Part b (4 marks)

List the four (4) diagnostic criteria for Wernicke's Encephalopathy.

Model Answer

(Caine's criteria)

- Ataxia
- Ophthalmoplegia
- Altered mental state or new memory impairment
- Nutritional deficiency

Part c (4 marks)

Prior to your assessment, he has a brief self-terminating tonic-clonic seizure secondary to alcohol withdrawal. You are now told that he has Child-Pugh C liver cirrhosis. His current observations are:

HR 140 bpm
BP 140/90 mmHg
GCS 14/15
Afebrile

List four (4) steps in managing this patient:

Model Answer

Benzodiazepine loading to prevent further seizures and manage symptoms of withdrawal	Oxazepam 60mg x3 up to 180mg over 6 hours then fixed weaning regimen eg or 20mg Diazepam 2 hourly to 60mg/ sedate, then fixed weaning regimen eg 10mg QID initially Can use diazepam or lorazepam– but will not score full marks
Thiamine	IV 300-500mg initially
Supportive care	IV fluids Electrolyte management Lactulose 20ml PO Social work review
Disposition	Admission given likely withdrawal seizure D&A review

Question 2 (12 marks)

You are the FACEM in charge of a tertiary hospital ED. You are informed that a major incident has been declared at a nearby train station.

Part a (3 marks)

List the three (3) components used to sort patients in disaster triage.

Model Answer

- Respiratory rate
- Systolic BP
- GCS

Part b (4 marks)

An updated report becomes available from the scene commander:

- Estimated casualties – 50 combined adult & paediatric patients
- Type of incident – suspected chemical warfare agent release
- Clinical features at scene – consistent with cholinergic toxidrome

You will be receiving 20 patients via ambulance in the next 15-30 minutes.

List two (2) key medications and two key equipment items that you will need to source in large supply for the incoming patients.

Model Answer

Medications	• Atropine • Pralidoxime • Adrenaline • Salbutamol
Equipment	• PPE • Suction / portable suction • Decontamination equipment e.g. soap and water • Ventilators (+ adult/ paediatric tubing) • NIV machines • High flow O2 • Adult & paed BVMs with PEEP valves • Laryngoscopes (DL, VL) + adult/ paed blades • ET tubes • Adjuncts – OPAs, NPAs, LMAs

At least one bolded answer

Part c (5 marks)

List five (5) steps in preparing your department for the anticipated influx of patients.

Model Answer

Action	Detail
Declare major incident/ code Brown/ external disaster	Via switchboard
Activate hospital disaster plan	Notification to: • Executives • Bed managers • OT • ICU • Lab • Radiology • Pharmacy Stop all elective OT
Create capacity in the ED	• Disaster triage for all patients • Decontamination area • Red, yellow, green zones • Discharge lounge • Forensic mortuary under security/ police guard • Decant ED patients to ICU/ ward/ OT • Discharge SSU/FT/WR (delegate to senior) • Ambulance divert
Deploy staff	• Call in/ send home – roster for prolonged event • Assemble teams and medical commander • Delegate senior to clear spaces • Assemble allied health – SW, physio (splints, plasters), pastoral care
Brief team	• Roles assigned • Clear chain of command • Communication through medical commander • Preserve chain of evidence • Likely clinical priorities (atropine, O2, RSI) • Documentation & debrief

Question 3 (18 marks)

A 59-year-old male has a witnessed collapse at the airport. CPR was immediately commenced. The ambulance will arrive to your ECMO-capable hospital ED in five minutes.

Part a (6 marks)

List six (6) positive prognostic factors predicting return of spontaneous circulation.

Model Answer

- Shockable rhythm
- Witnessed cardiac arrest
- High-quality CPR
- Younger age
- Shorter low flow times
- Kinetic activity on USS
- etCO₂ > 20mmHg
- Early defibrillation
- Cause (eg toxicological arrest)
- Lactate <18

Part b (3 marks)

Other than cardiac arrest, list three (3) indications for VA ECMO.

Model Answer

- Severe cardiogenic shock- eg fulminant myocarditis
- Massive PE
- Toxicological overdose
- Severe hypo/Hyperthermia

Part c (4 marks)

List four (4) contraindications for ECMO CPR.

Model Answer

- Prolonged asystole or other poor prognostic factors
- Pre-existing advanced care directive
- Contraindication for anticoagulation (eg life threatening bleeding)
- Aortic dissection
- Severe aortic insufficiency

Part d (5 marks)

List five (5) potential complications of ECMO.

Model Answer

- Thrombosis: 1-22%
- Bleeding and coagulopathy, including haemolysis: 5-79%
- Limb ischemia: 13-25%
- Infection: 17-49%
- Neurologic events: 10-33%

Question 4 (12 marks)

A 38-year-old male presents to your ED with a painful left wrist after a fall on outstretched hand.

Radiographs are shown below:



Part a (4 marks)

List four (4) abnormalities visible in the above radiographs.

Model Answer

- Transverse, comminuted fracture through distal radius
- Dorsal angulation and displacement of the distal radius
- Ulnar styloid fracture
- Impaction/ shortening
- Intra-articular extension (or should at least comment on this)
- Marked soft tissue swelling
- Loss of radial inclination

Part b (4 marks)

You decide to perform a haematoma block in the emergency department. Written consent is obtained, suitable IV opioid analgesia is administered, the patient is appropriately positioned and the skin is cleaned.

Outline four (4) steps in performing a haematoma block.

Model Answer

- Palpate the fracture ('bony step off') on the dorsum of the wrist
- Insert the needle at the fracture site (dorsal aspect), aspirating the needle as it advances
- Confirm placement in the fracture haematoma with flashback of blood
- Inject 10-15ml 1% lignocaine (and aspirated blood) into the fracture site

(Alternative USS-guided technique):

- Trace the radius longitudinally with the US, noting the break in the cortex
- Insert the needle using ultrasound in plane technique through the break in cortex into the fracture space
- Confirm placement in the fracture haematoma with flashback of blood
- Inject 10ml of lignocaine

Part c (4 marks)

List two (2) early and two late complications of this fracture.

Model Answer

EARLY	Median nerve compression • 5-10% • More common with displacement, comminution, repeated reduction attempts, splinting in excessive flexion.
	Ulnar nerve neuropathy
LATE	Shoulder/wrist stiffness (30%)
	Malunion/ Delayed union/ Non union
	Complex regional pain syndrome
	Compartment syndrome (uncommon)
	Arthrosis
	EPL tendon rupture • 3% • Due to interruption of vascular supply to tendon sheath • Usually 4-8 weeks post fracture

Question 5 (12 marks)

An 18 year-old male presents with atraumatic, right-sided chest pain for 24-hours. He has no medical history and is otherwise well. A radiograph reveals a right-sided pneumothorax.

His observations are:

HR 70 bpm
BP 124/75 mmHg
SpO₂ 98 % RA
RR 14 /min
Afebrile

Part a (3 marks)

List three (3) sonographic findings of a pneumothorax.

Model Answer

- No lung sliding
- Absence of B lines
- Presence of a lung point
- Barcode/Stratosphere sign
- Loss of lung pulse

Part b (6 marks)

Complete the following table outlining management options for a primary spontaneous pneumothorax.

Model Answer

Treatment	Advantages (1 mark each)	Disadvantages (1 mark each)
Conservative management	High rate of resolution (95%) Avoids procedural complications Lower rate of recurrence Non-inferior to intercostal catheter in certain circumstances Non-invasive Facilitates early discharge	Theoretical risk of tension May not be definitive (5-10% failure rate) Slower resolution
Needle aspiration	High success rate in young patients with small pneumothoraces Less painful than ICC Shorter LOS than ICC	Time consuming Failure requires repeat intervention

	Decreased risk of recurrence vs ICC Similar success to catheter drainage Fewer complications than catheter insertion	
Intercostal catheter (e.g. pigtail)	Highest efficacy Faster resolution	Requires admission to hospital Risk of complications – pain, bleeding, infection, scarring, injury to structures

Part c (3 marks)

The patient prefers conservative management.

List three (3) clinical features on history and examination that support conservative management.

Model Answer

- Asymptomatic or mildly symptomatic
- Haemodynamically stable
- Not hypoxic
- Reliable and able to return if worsening symptoms
- No planned air travel

(No points awarded for anything referenced in the question stem, no points awarded for features on CXR)

Question 6 (12 marks)

A six-year-old boy presents with right elbow pain after falling from monkey bars. He is distressed and non-cooperative with the examination. The skin around the elbow is tented. You suspect an isolated supracondylar fracture. Paracetamol and ibuprofen were given pre-hospital. He weighs 25kg.

Part a (4 marks)

List two (2) pharmacological and two non-pharmacological options for managing this patient's pain.

Model Answer

Must include routes and doses

Pharmacological	Fentanyl 1.5mcg/kg intranasal (37.5mcg divided into both nostrils)
	Oxycodone PO 0.1mg/kg (2.5mg)
	NO/ methoxyfluorane
Non-pharmacological	Immobilisation in position of comfort eg backslab/ splint
	Distraction/ play therapy
	Ice application
	Elevation

Part b (3 marks)

List three (3) acute complications of this injury.

Model Answer

- Need to be specific in details to get full marks such as type of nerve / artery:
- Brachial artery injury
- Compartment syndrome
- Neurological injuries can result from the fracture itself or the treatment. Radial, ulnar, median, and specifically anterior interosseous nerve.

Part c (3 marks)

Complete the table below.

Model Answer

Fracture grade	Description
Gartland Grade 1	Non- or minimally displaced fractures (<2 mm).
Gartland Grade 2	Moderately displaced (>2 mm). The anterior periosteum is not intact. Angulated to varying degrees, but the posterior cortex of the humerus is intact
Gartland Grade 3	Completely displaced with no cortical contact

Part d (2 marks)

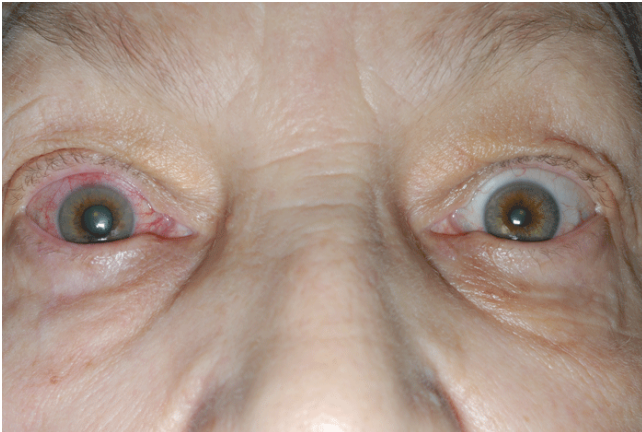
Aside from threatened skin integrity, list two (2) additional indications for urgent reduction in the ED.

Model Answer

- Neurological impairment
- Vascular impairment

Question 7 (12 Marks)

A 70 year-old male presents with severe right-sided headache, nausea and blurred vision. You suspect acute angle-closure glaucoma.



Part a (3 marks)

List three (3) abnormalities in the photo shown above.

Model Answer

- Corneal haze/clouding or loss of iris detail
- Semi-dilated pupil
- Scleral injection/ redness

Part b (3 marks)

List three (3) additional findings on clinical assessment in acute angle-closure glaucoma.

Model Answer

- Tense, tender globe to palpation
- Shallow anterior chamber on slitlamp
- Markedly increased intraocular pressure (> 30 mmHg)

Part c (2 marks)

List two (2) precipitating factors for this condition.

Model Answer

- Low-light conditions eg cinema
- Topical mydriatics
- Anticholinergic drugs
- Sympathomimetic drugs
- Emotional stimuli
- Accommodation eg. Reading

Part d (4 marks)

You have contacted the ophthalmology registrar, who will urgently review.

Complete the following table outlining the mechanism of action for your pharmacological management options.

Model Answer

Generic (Common Brand)	Mechanism of action
Apraclonidine (Iopidine) 0.5%	↓ production ↑ outflow Onset = 1 hr Duration = 3.5 hrs Stat or tds
Brimonidine (Alphagan) 0.2%	↓ production ↑ ↑ outflow Onset = 2 hrs Duration = 12 hrs bd
Timolol 0.25%, 0.5%	↓ production Onset = 20 min Duration = 24 hrs bd or daily
Betaxolol (Betoptic) 0.25%, 0.5%	↓ production ↑ outflow Onset = 30 min Duration = 12 hrs bd
Pilocarpine 0.5%, 1%, 2%, 3%, 4%, 6%	↑ outflow qid
Acetazolamide (Diamox) Oral tabs 250mg Injection 500mg	↓ production Variable dosage (diuretic)
Dorzolamide (Trusopt) Brinzolamide (Azopt 1%)	↓ production bd/tds
Latanoprost (Xalatan) 0.05% Bimatoprost (Lumigan) 0.03% Travaprost Travatan 0.004%	↑ episcleral outflow daily or nocte

- Acetazolamide 500 mg IV stat (then 250 mg orally three times daily)
 - Or mannitol 1 g/kg IV
 - Reduced IOP through carbonic anhydrase inhibitor
- Pilocarpine 2% every 5 minutes for 1 hour
- Timolol 0.5% 1 drop every 30-60 minutes
- Latanoprost can be used as an additional agent 1 drop topically

Question 8 (12 marks)

A 23 year old male has been brought in by friends having been involved in a fire-related incident. He was trapped in a store room at work for an unknown period of time. They managed to pull him out of the fire.

His observations are:

GCS	13
HR	110 bpm
BP	100/60 mmHg
RR	28 /min
Sats	90 % RA

Part a (4 marks)

List four (4) criteria for this patient to be referred to a Burns Centre.

Model Answer

- Mid-dermal, deep dermal or full thickness in adults >10% TBSA.
- Any priority areas are involved, i.e. face/neck, hands, feet, perineum, genitalia and major joints.
- Caused by chemical or electricity, including lightning.
- Any circumferential burn.
- Burns with concomitant trauma or pre-existing medical condition.
- Burns with associated inhalation injury.

Ref: ACI and ANZBA

Part b (4 marks)

This patient has 20% TBSA full thickness burns. He weighs 70 kg. Calculate your fluid resuscitation for the first 24 hours.

Model Answer

Parkland formula

[Calculated from the time of injury]
 $4\text{ml} \times \text{kg body weight} \times \% \text{TBSA}$
 $= 4 \times 70 \times 20\text{mls}$
 $= 5600\text{mls}$
2800mls in 1st 8 hrs, 2800mls over following 16hrs

Modified Parkland formula

[Calculated from the time of injury]
 $3\text{ml} \times \text{kg body weight} \times \% \text{TBSA}$
 $= 3 \times 70 \times 20\text{mls}$
 $= 4200\text{mls}$
2100mls in the first 8 hrs, 2100mls in the following 16 hrs

Brooke formula

[Calculated from the time of injury]
 $2\text{ml} \times \text{kg body weight} \times \% \text{TBSA}$
 $= 2 \times 70 \times 20$
 $= 2800\text{mls}$
1400mls given in the first 8 hrs, 1400mls given in the following 16 hrs

Key points:

- Guide only
- Adjust according to endpoints such as urine output >0.5mls/kg

Part c (2 marks)

Outline two (2) indications for urgent intubation.

Model Answer

- Hypoxia on 60% O₂
- Voice change
- Oral erythema or blistering

Part d (2 marks)

Outline two (2) indications for immediate intubation.

Model Answer

- Impending complete airway obstruction (stridor, oligophonia)
- Significant hypoventilation
- Hypoxia on maximal O₂ via face mask

Question 9 (18 marks)

A 22 year old female presents to your urban district hospital with confusion. She is 34/40 gestation. She has a previous history of pre-eclampsia.

Part a (4 marks)

State the diagnostic criteria for pre-eclampsia.

Model Answer

Pregnancy	> 20/40 gestation
Hypertension	>140/90 mmHg on 2 measurements 4 hours apart OR -one reading > 160/110 mmHg OR -rise from baseline of-> 20 mmHg systolic
Proteinuria	> 300 mg in 24 hours, not from other cause
Multisystem involvement	At least one of the following • rapid onset generalised oedema • renal insufficiency (Cr > 0.90 micromol/L or oliguria) • liver disease (abnormal transaminases, RUQ pain, subcapsular haematoma) • neurological abnormalities • hyperreflexia with clonus • headache • visual scotoma • haematological abnormalities • thrombocytopenia • DIC • haemolysis

Part b (4 marks)

List two (2) obstetric risk factors and two non-obstetric risk factors for pre-eclampsia.

Model Answer

Obstetric	Non obstetric
• Primigravida • Positive family History • Multiple pregnancy • Multigravida with new partner • Hydatidiform mole	• Obesity • Renal disease • Hypertension • Diabetes Mellitus • Autoimmune disease • Thrombophilia

Part c (8 marks)

During your assessment the patient has a generalised tonic-clonic seizure.

Complete the table below, outlining your specific management of this patient.

Model Answer

Management	Management Detail
Resuscitation	Something sensible • Ensure airway patent • Oxygen via non rebreath mask • Left lateral position to take pressure off IVC
Seizure Control	Loading dose Magnesium Sulphate • 4 g IV over 20 minutes via controlled infusion device If seizures occur/ongoing while preparing magnesium sulphate • Diazepam 5–10 mg IV at a rate of 2–5 mg/ minute (maximum dose of 10 mg) OR • Clonazepam 1–2 mg IV over 2–5 minutes OR • Midazolam 5–10 mg IV over 2–5 minutes or IM
Blood Pressure Control	Aim to reduce sBP to 130–150 mmHg and dBP to 80–90 mmHg • Avoid maternal hypotension • Monitor FHR with continuous ^CTG Hydralazine • 5–10 mg IV over 3–10 minutes • Repeated doses 5 mg IV every 20 minutes if required • Maximum dose 30 mg • Infusion may be required • May require plasma expansion # Labetalol • Initially 10-20 mg IV bolus over 2 minutes • Repeated doses 40–80 mg IV every 10 minutes to maximum of 300 mg if required • Infusion may be required
Deliver baby	Plan birth as soon as feasible using a multidisciplinary approach • Obstetric code blue/ urgent obstetric attendance • Mode of delivery based on maternal and foetal wellbeing • Continue close foetal monitoring • Stabilise the woman prior to birth • Actively manage third stage • Ergometrine should NOT be used in severe preeclampsia or eclampsia

Part d (2 marks)

What are two (2) foetal complications of pre-eclampsia?

Model Answer

- Growth restriction
- Preterm delivery
- Placental abruption
- Respiratory distress
- Cerebral palsy
- Retinopathy of prematurity
- Necrotising enterocolitis
- Sepsis
- Stillbirth

Question 10 (12 marks)

A 19 year old female presents with intermittent facial twitching on a background of worsening generalised weakness and fatigue over several weeks. She appears cachectic.

A venous gas is taken, revealing the following:

pH	7.64
pCO ₂	66 mmHg
pO ₂	28 mmHg
Na ⁺	135 mmol/L
K ⁺	2.7 mmol/L
Cl ⁻	72 mmol/L
Ca ⁺⁺	0.86 mmol/L
Glu	6.6 mmol/L
Lac	2.4 mmol/L
HCO ₃	74 mmol/L
BE	43.3 mmol/L

Part a (3 marks)

Summarise the major acid-base disturbance on this venous blood gas.

Model Answer

Moderate-severe metabolic alkalosis (1 mark)

- pH elevation
- HCO₃ elevation
- BE elevation

Appropriate respiratory compensation suggesting chronicity

- $e\text{CO}_2 \text{ (chronic)} = 40 + [(74 - 24)/10 \times 5] = 65$ (2 marks)

Part b (4 marks)

List four (4) causes of this presentation.

Model Answer

Severe metabolic alkalosis:

Eating disorder (induced vomiting/ diuretic misuse/ laxative misuse) (1 mark)

Hyperemesis gravidarum (1 mark)

Two other causes of metabolic alkalosis from:

GI HCl loss (1 mark)

- chronic vomiting/ diarrhoea e.g. cannabinoid hyperemesis, malignancy
- Prior GIT surgery e.g. ureterostomy/ ileostomy

Renal acid loss (1 mark)

- Diuretics

- Gitelman/ Bartter syndromes

Exogenous bicarbonate (1 mark)

- Laxative misuse
- PPI

Endocrine (1 mark)

- Cushings/ Conns/ steroids (less likely given normal Na⁺)

Part c (3 marks)

List three (3) ECG features of hypokalaemia.

Model Answer

Hypokalaemia features (1 mark)

- Increased P wave amplitude
- Prolonged PR interval
- ST depression
- T wave inversion
- U waves
- SVT / AF
- VT/ VF/ TdP

Part d (2 marks)

List two (2) ECG features of hypocalcaemia.

Model Answer

Hypocalcaemia features (1 mark)

- QT prolongation
- ST segment prolongation
- TdP

Question 11 (12 marks)

You are developing a new clinical pathway for patients presenting with acute chest pain to your emergency department in liaison with the inpatient cardiology service. Your aims include:

- To establish criteria for activation of urgent reperfusion therapy ('cath lab')
- To determine consensus on troponin assay use and interpretation

Part a (3 marks)

Describe three (3) strategies used to rule out cardiac ischaemia with troponin assays.

Model Answer

- Single undetectable hsTrop >3 hours post pain
- Repeat hsTrop at 1 hour
- Repeat 4th generation troponin at 2hrs + clinical score (ADAPT)
- Repeat 4th generation troponin at 3hrs + HEART score
- Repeat 4th generation troponin at 6-12 hours

Part b (5 marks)

List five (5) ECG patterns that meet ST elevation myocardial infarction (STEMI) criteria or equivalency.

Model Answer

- New ST elevation in 2 or more contiguous leads
- New LBBB with haemodynamic instability
- New LBBB with positive Sgarbossa criteria
- De Winter pattern
- Posterior MI

Part c (4 marks)

You wish to include a prompt for clinicians to consider alternative diagnoses to cardiac ischaemia.

List four (4) non-ischaemic causes of ST elevation that could be included.

Model Answer

Early repolarisation
LBBB/RBBB
Electrolyte disturbance – hypercalcaemia, hypokalaemia (st depression)
Ventricular hypertrophy (LVH)
Aneurism (LV)
Toxicology – Lithium, digoxin, cocaine
Inflammation (perimyocarditis)
Osborne waves (hypothermia)
Neurological (raised ICP/ SAH)
Sodium channelopathy (Brugada)

Other sensible answers considered e.g. massive PE

Question 12 (12 marks)

A 5 day old male baby brought by his mother for decreased breast feeding.

On examination the child is:

Flat and hypoactive

RR 66 /min

HR 162 bpm

Temp 38.5 °C

No skin rash

Part a (5 marks)

List five (5) causes for a collapsed neonate.

Model Answer

- Sepsis
- Cardiac Failure
- Hypoglycaemia
- Hypothermia
- IEM

Renal Bicarbonate loses

Anaemia

THE MISFITS or other answers acceptable

Part b (2 marks)

Blood tests are taken and the following results are available:

WCC 21,000, Platelets 155, CRP 50

PH 7.21, PCO₂ 20, Bic 15, Lactate 4, BE -8, BGL 1.6 mmol/L

Outline your next immediate management step.

Model Answer

Immediately give glucose replacement with glucose 10% 2-5ml/kg, aiming for BGL > 3.3

Part c (3 marks)

List three (3) most common pathogens involved in early-onset neonatal sepsis.

Model Answer

- Group B Streptococcus (GBS)
- E Coli
- Listeria

Streptococci (Viridans and Pneumoniae)

Staph Aureus

Part d (2 marks)

What is your antibiotic regimen of choice in this neonate, include doses?

Model Answer

- Cefotaxime 50mg/kg iv/im
- Benzylpenicillin 60-90mg/kg iv/im

Question 13 (18 marks)

An 18 month girl presents to your Urban ED with fussiness, lethargy and poor feeding over the last 24hours. She weighs 10 kg.

On assessment the child has the following vital signs:

HR	220 bpm
BP	70/40 mmHg
Central CR	4 s
RR	55 /min
SpO ₂	94 % RA
Afebrile	

Part a (1 marks)

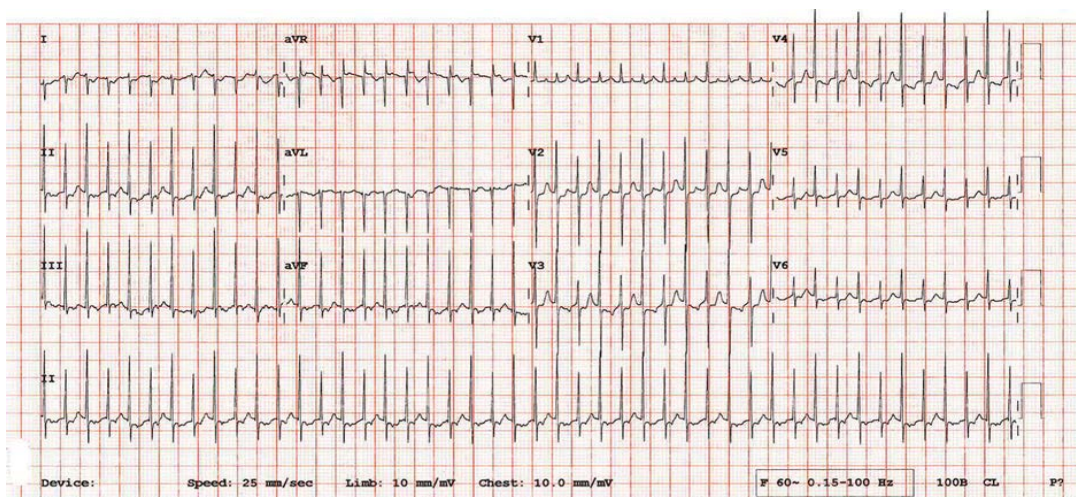
You request an ECG. What other bedside investigations would you perform?

Model Answer

BGL

Part b (4 marks)

The child's ECG is shown below.



What is the diagnosis and please give three (3) features justifying your answer.

Model Answer

Diagnosis – SVT

Three Features –

- Narrow complex tachycardia – HR 250
- Regular rhythm
- Absent p-waves, retrograde p waves, AV dissociation
- Electrical alternans

Part c (9 marks)

Please complete the table with 3 treatment options that would perform for this condition, how you would perform them including drugs and doses and their indication.

Model Answer

Method (1 mark each)	Indication (1 mark each)	Description including doses (1 mark each)
Vagal manoeuvres	Stable or Unstable (if no delay)	Neonates < 6 months – elicit diving reflex: Immersion of face in ice water for 5 seconds Older infants – Apply cold cloth or ice pack to face for 15-30 seconds
Chemical cardioversion – Adenosine	Unstable (if no delay and IV access faster than applying pads) or refractory to vagal manoeuvres	IV Adenosine 0.1mg/kg (1 mg) in proximal, large vein with rapid saline flush Can repeat with 0.2mg/kg (2mg), 0.3mg/kg (3mg) if failure to revert
Synchronised DC cardioversion	Unstable or shocked	1J/kg (10J) synchronised DC cardioversion with sedation; if fails use 2J/kg (20J)

Part d (4 marks)

Your treatment is successful and the child now has normal vital signs.

Please list two (2) investigations you would perform and their justification.

Model Answer

Investigation	Justification
CXR	Assess for signs of heart failure
ECHO	Assess for structural heart disease or cardiomyopathy

Question 14 (12 marks)

You are working in a tertiary referral hospital and are assessing a 75 year old male who was brought in with shortness of breath and fevers. He has a significant smoking history. He also takes 'some heart tablets'. You decide to use POCUS to further investigate the possible cause of his shortness of breath.

When scanning the right side of his chest you see the below image.



Part a (3 marks)

List three (3) conditions that can result in the below image on lung ultrasound.

Model Answer

- Pulmonary oedema - CCF/ ARDS
- Pneumonia/ consolidation
- Lung fibrosis

Part b (2 marks)

You commence the patient on non-invasive ventilation with some improvement in his respiratory function. However, he then becomes hypotensive.

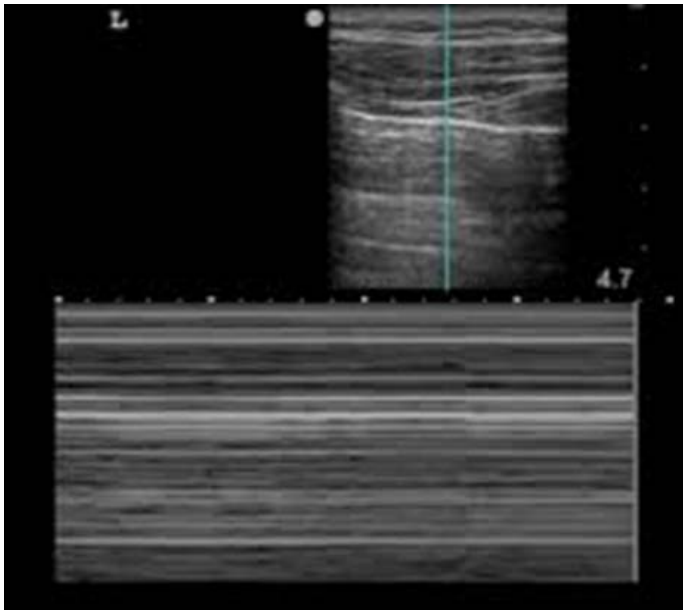
What findings on bedside ECHO would suggest cardiogenic shock?

Model Answer

- Impaired LV contraction
- Impaired mitral valve anterior leaflet excursion
- Dilated IVC with minimal collapsibility on inspiration

Part c (3 marks)

The patient is intubated for ongoing respiratory distress. You subsequently notice the high airway pressure alarm on the ventilator and repeat your bedside ultrasound. This image of the left side of his chest is obtained.



State the abnormality seen on ultrasound and give two differentials.

Model Answer

- Barcode sign
- Pneumothorax or mainstem bronchus intubation or hypoventilation

Part d (4 marks)

The director of your department has asked you to set up a formal ultrasound training and credentialing program.

List four (4) features of an ACEM accredited ultrasound training program.

Model Answer

- Defined scope of practice within the department
- Logbook/ minimum scan requirements per module
- Proctored examinations (peer-reviewed in real-time)
- Demonstration of competence/ summative assessment/ credentialing
- Assigned clinical lead in ultrasound (CLUS)
- Appropriate equipment/ machines
- Dedicated IT support
- Clinical governance - annual audit, inclusion in M&M
- Availability of Special Skills Placement for trainees

<https://acem.org.au/getmedia/0702004f-c669-4646-b5fc-4fa577117ba3/COR742-Guideline-for-the-Provision-of-ED-Focused-Ultrasound-Training-and-Governance>

https://acem.org.au/getmedia/ee68a734-7634-425d-865a-f5e17dc8b4e4/Policy_P733-Recommendations-for-Health-Service-Credentialing-%e2%80%93-EM-Ultrasonography

Question 15 (12 marks)

A 50 year old female presents to the emergency department with a two week history of worsening anxiety, palpitations and feeling generally unwell. She had no past medical history and is on no regular medications.

On examination, she appears anxious and jittery. Her observations are:

Temp	37.2 °C
HR	115 bpm
RR	22 /min
BP	128/66 mmHg

She had a fine tremor and the examination was otherwise unremarkable.

Her blood tests reveal the following:

TSH	<0.02 mIU/L	(0.35-4.50mIU/L)
T3	23.3 pmol/L	(3.5-6.5 pmol/L)
T4	48.7 pmol/L	(10.0-20.0 pmol/L)

Part a (3 marks)

List the diagnostic criteria for thyroid storm.

Model Answer

- Fever (temp > 37.8)
- Tachycardia (out of proportion to fever)
- CNS disturbance/Abnormal conscious state (occurs in >90%) and may include:
 - agitation
 - delirium
 - coma

Part b (4 marks)

List four (4) potential precipitants for thyroid storm.

Model Answer

- Infection
- Myocardial infarction
- Surgery
- Vigorous palpation of thyroid
- Withdrawal of anti-thyroid drugs
- Undiagnosed Graves Disease
- Thyroxine toxicity
- Iodine administration
- DKA

Part c (5 marks)

List your medical management of thyroid storm including drugs and doses.

Model Answer

1. Inhibit TSH production

1. Propylthiouracil 800-1200mg PO loading dose

-Blocks new hormone production but has no effect on stored hormone

-Decreases T4 to T3 conversion peripherally

2. Lugol's Iodine

-BEWARE do not give before Propylthiouracil, or for 30-60 minutes following administration as it will form a substrate generation of new thyroid hormone

3. Inhibit peripheral effects

Propranolol

-Blocks cardiac and other peripheral effects

-Up to 120mg PO or 1mg/minute to 10 mg total IV

Esmolol

-can be used parenterally

4. Corticosteroids

Hydrocortisone 100mg IV 6/24

Decreases peripheral conversion of T4 to T3

Also treats possible relative adrenal insufficiency

5. Supportive measures

1. IV fluids

2. Oxygen

3. Temperature reduction: Beware NO aspirin as it displaces T4 from thyroglobulin.

5. Treat underlying cause e.g. sepsis, myocardial infarction

Question 16 (12 marks)

A 37 year old male is brought in by ambulance with agitation. He appears disheveled, is pacing and talking to himself.

His vital signs on arrival are:

Axillary temp	37.8 °C
HR	110 bpm
BP	132/79 mmHg
RR	18 /min
SaO ₂	97% on room air
GCS	14 (E4 V4 M6)

Part a (4 marks)

List four (4) differential diagnoses you will consider in this man.

Model Answer

e.g. Drug - alcohol or drug intoxication, alcohol or drug withdrawal, Infection - sepsis/meningitis, psychiatric - psychosis, metabolic - e.g. hypoglycaemia, hyponatraemia, thyroid storm, trauma - e.g. ICH, environmental although normal peripheral temp, other acceptable answers. Must include 1 from each category / system

Part b (4 marks)

Describe a four (4) step de-escalation strategy you can use when approaching this patient.

Model Answer

- verbal: reassurance, redirection, non provocative, meet basic needs e.g. food/water/blanket
- non verbal: listening, reduce number of people, calm environment
- chemical: offer oral medication first
- physical: 5 point restraint, not prone, used sparingly

Must include both non-pharmacological and pharmacological

Part c (4 marks)

The nursing staff inform you that this patient wants to leave.

List four (4) criteria that must be satisfied in order to be deemed to have capacity.

Model Answer

- maintain and communicate a choice
- understand the relevant information
- appreciate the situation and its consequences
- manipulate the information in a rational fashion

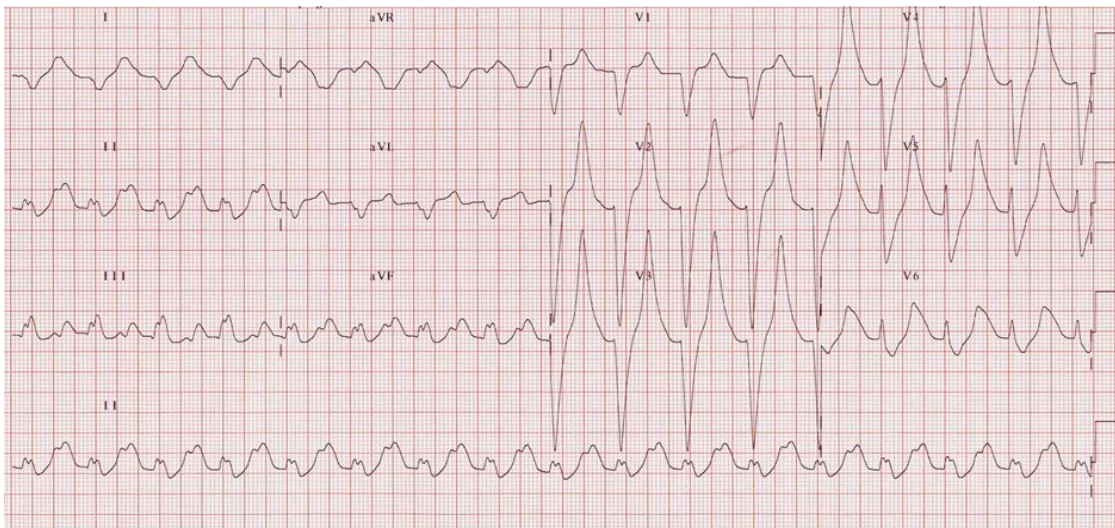
Question 17 (12 marks)

A 28-year-old male is brought in by ambulance after an accident on a construction site. An excavator tipped onto its side, trapping him by his lower limbs at the level of his thighs. Paramedics state entrapment lasted for over two hours.

His injuries are confined to his lower limbs. There are no other sites of trauma.

RR 22 /min
SpO₂ 99 % 15L NRB
BP 110/65 mmHg
HR 110 bpm

En-route to the Emergency Department, the patient became hypotensive and his ECG on arrival is shown:



Part a (4 marks)

List four (4) abnormal findings on this ECG.

Model Answer

- Wide complex tachycardia
- Absent P waves
- Bizarre widened QRS complexes
- Peaked T waves

Part b (1 mark)

What is the unifying diagnosis?

Model Answer

Hyperkalaemia secondary to rhabdomyolysis (or crush syndrome)

Part c (3 marks)

Describe three (3) other metabolic disturbances you may find on routine bloods associated with the above clinical picture.

Model Answer

- (Hyperkalaemia)
- Hypocalcaemia
- Hyperphosphataemia
- Hyperuricaemia
- Lactic acidosis (or metabolic acidosis)
- Elevated CK
- AKI

Part d (4 marks)

List two (2) pharmacological strategies for treatment of the demonstrated ECG abnormalities.

Model Answer

Agent including dose	Mechanism of action
Calcium gluconate or calcium chloride (acceptable doses) - 2.2-6.6 mmol	Stabilises myocardium
Insulin and dextrose - 50mL of 50% and 5-10 units of actrapid IV	Redistribution of potassium into cells
Furosemide 20-40mg IV	Total body excretion
Sodium bicarbonate - 1mg/kg	Redistribution
Salbutamol 2.5-5mg nebulised	Redistribution

No marks for resonium therapy as inappropriate in life threatening hyperkalaemia

10ml 10% CaGlc

NaHCO₃ - 1mmol/kg IV

Dextrose/insulin - 5-10U actrapid, 50mL of 50% glucose

Furosemide - 20-40mg IV

Salbutamol - 0.5mg IV or 20mg neb

Question 18 (12 marks)

An 82 year old female is brought to ED after a fall at home. She is complaining of hip pain. She has no other injuries.

Her observations are: HR 68 bpm, BP 128/58, RR 16, sats 94% RA, temp 36.7C

Weight - 70kgs. A pelvic x-ray is performed and is shown below.



Part a (1 mark)

Describe the abnormality on this x-ray.

Model Answer

Left subcapital neck of femur fracture

Part b (4 marks)

She is complaining of significant hip pain. You are considering performing a fascia iliac block. List four (4) potential contra-indications.

Model Answer

- Absolute - allergy to local anaesthetic, local site infection, patient does not consent / patient refusal
- Relative - INR >1.5, platelets <100, anticoagulated, previous femoral bypass surgery

Any 4 but must include allergy, infection +/- consent, other reasonable options allowed

Part c (1 mark)

You decide perform the block using ropivacaine. Calculate your maximum recommended dose.

Model Answer

Ropivacaine 3mg/kg

70 kg

Max recommended dose = 210 mg

Part d (3 marks)

List the three (3) nerves that are ideally blocked in a fascia iliac block.

Model Answer

- Femoral nerve
- Obturator nerve
- Lateral cutaneous nerve of the thigh

Part e (3 marks)

List three (3) early signs of local anaesthetic toxicity.

Model Answer

- Circumoral numbness (first sign)
- Tongue parasthesiae
- Dizziness
- Restlessness / agitation
- CNS depression
- Muscle twitching

Question 19 (12 marks)

A 2 year old girl is brought in by ambulance following a seizure at day care. The paramedics report a second seizure in the ambulance on route to your ED. There is no history of fever or recent illness.

AVPU	P
Temp	36.6 °C
HR	130 bpm
Cap refill	<3 secs
RR	25 /min
O ₂ sats	98 %
BSL	5.5

Part a (1 mark)

What is the definition of status epilepticus?

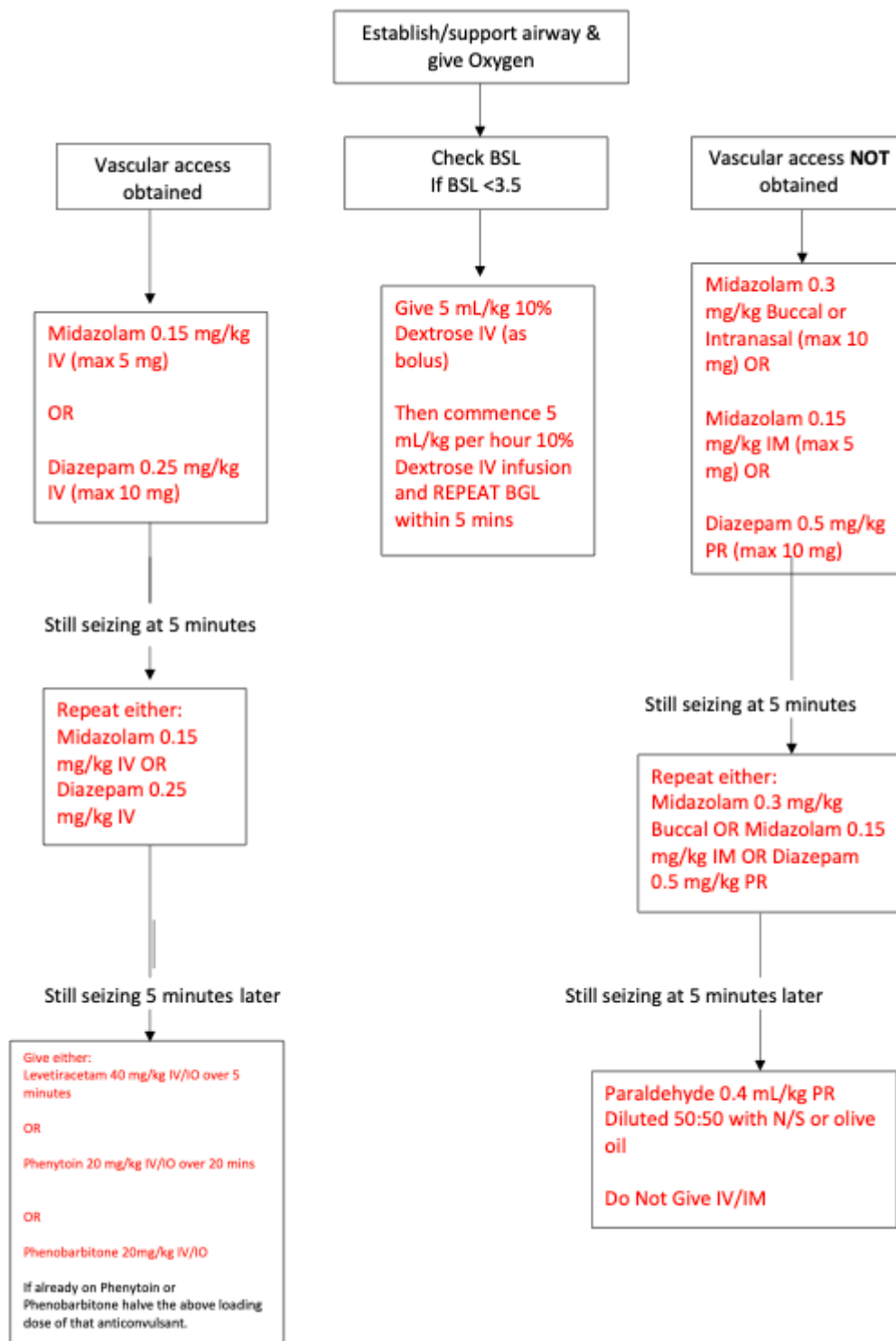
Model Answer

A seizure lasting >5 minutes or repeated seizures without full recovery to normal conscious level between episodes.

Part b (7 marks)

Complete the algorithm below for the acute management of seizures in infants and children. Include drug doses and routes of administration.

Model Answer



Part c (4 marks)

She has 2 further seizures in the ED. You decide to intubate the patient.

State four (4) key differences to be aware of when intubating a child compared to an adult.

Model Answer

- Big occiput (neonates and infants)
- Narrower airway
- Larger tongue
- Large floppy epiglottis
- Relatively larger adenoid and tonsil tissue
- Anterior larynx

Question 20 (12 marks)

A 46 year old male has presented to the emergency department with a six hour history of a painful erection.

Part a (8 marks)

Complete the following table differentiating ischaemic vs. non-ischaemic priapism.

Model Answer

	Ischaemic	Non Ischaemic
Pathophysiology	Venous obstruction and impaired arterial inflow	Unregulated cavernous arterial inflow with no venous outflow impairment
Symptoms	Painful erection	Often painless, penis not as rigid
Cavernosal Blood Gas	Hypoxic, hypercarbic, acidotic and raised lactate	Normal O ₂ , CO ₂ , pH and lactate
Risk of impotence	High risk – 50% impotence if symptoms persist for 24 hours	Lower risk

Part b (4 marks)

You suspect ischaemic priapism. Alternative methods to achieve detumescence have failed including exercise and oral pseudoephedrine.

Describe a stepwise approach to the management of ischaemic priapism. Where relevant include drugs, route and doses.

Model Answer

- Dorsal penile block – 2-5 mL of 1% lignocaine without adrenaline to either side of midline (10 o'clock and 2 o'clock position) to base of penis
- Corporal aspiration – Aspirate blood from corpora laterally using a 19 – 21 g butterfly needle up to 60 mL. Send sample for blood gas to confirm ischaemic priapism
- Irrigation with 10 – 20 mL of normal saline
- Administer intracavernosal vasoconstrictor every 5 minutes until resolution for up to 1 hour
 - 1-2 mL of 1:100,000 adrenaline to a maximum of 10 mL OR
 - 0.1 – 0.5 mg/mL phenylephrine – 1 mL every 5 minutes
- Urological referral for urgent surgical shunting if above methods fail

Question 21 (12 marks)

A 16 year old male presents feeling unwell after chemotherapy. His blood results are as follows:

Na	135	(135 - 145 mmol/L)
K	6.7	(3.5 - 5.2 mmol/L)
Bic	23	(22 - 32 mmol/L)
Urea	15	(3.0 - 8.0 mmol/L)
Creatinine	220	(60 - 110 mmol/L)
Glucose	6.5	(3.0 - 7.8 mmol/L)
Ca	1.90	(2.15 - 2.55 mmol/L)
Phos	3.00	(0.75 - 1.50 mmol/L)
Urate	0.99	(0.15 - 0.5 mmol/L)

Part a (1 mark)

State the single most likely unifying diagnosis for these abnormalities.

Model Answer

Tumour lysis syndrome

Part b (2 marks)

State two (2) of the most common malignancies associated with this condition.

Model Answer

- ALL
- AML
- Hodgkins lymphoma
- non-Hodgkin lymphoma

Part c (3 marks)

List three (3) complications this patient could develop.

Model Answer

- ventricular arrhythmias/bradyarrhythmias
- cardiac arrest/asystole
- oliguria/anuria
- tetany/neuromuscular irritability
- seizures
- fluid overload
- uraemic complications

Part d (6 marks)

Outline six (6) key steps in the management of this patient.

Model Answer

2 of general measures

- appropriate monitoring (continuous ECG, BP, sats)
- resuscitation-capable bay

- early haem/onc consultation
- disposition to HDU/ICU

4 specific measures

- **fluid management:**
- maintain hydration with generous crystalloid infusions
- avoid K containing fluids
- target UO 100 ml/square m/hr (> 150 ml/hr reasonable)
- **K management:**
- avoid K containing fluids
- bicarbonate
- beta 2 agonists
- insulin-dextrose
- avoid calcium unless life threatening arrhythmia
- oral binders
- **uric acid management:**
- allopurinol 10 mg/kg/day (reasonable to omit & proceed straight to rasburicase)
- rasburicase 0.2 mg/kg
- **calcium & phosphate management**
- phosphate binders/aluminium hydroxide 15 mL bd
- correct hypocalcaemia only if symptomatic w slow Ca gluconate IV (risk of metastatic calcium phosphate precipitation)
- **renal replacement therapy**
- renal failure
- uncontrolled electrolyte derangements
- **disposition** - haem / onc, ICU/HDU for consideration of RRT
- **alkalize urine** - give sodium bicarbonate for a urinary pH > 7

1 mark for each category, reasonable answers considered.

Question 22 (12 marks)

A 65 year old male presents to your tertiary emergency department with concerns for left leg ischaemia.

Current observations are:

HR 137 bpm
BP 108/80 mmHg
Sats 92 % RA
Temp 37.6 °C
GCS 15
Pain score 7/10

Part a (4 marks)

Please complete the following table with one (1) feature on history and one (1) on examination that would help you to differentiate between embolic and thrombotic causes of acute limb ischaemia.

Model Answer

	Embolic	Thrombotic
History	• Sudden/acute onset • History of any of: AF, recent MI, large vessel aneurysmal disease, prosthetic valves, IVDU/ endocarditis	• More chronic/slow onset • History of peripheral vascular disease or symptoms of same • Less associated with cardiac disease
Examination	• Generally more severe features usually present • Cold/ mottled • Contralateral leg pulses present • Tender soft artery • AF • Leg may be profoundly pale	• Less cold, less likely to be pale due to chronicity and presence of collaterals may well have formed. commonly cyanotic • Hard calcified arteries on palpation • Commonly contralateral leg pulses also absent

Part b (4 marks)

You are unable to palpate any pulses in the foot.

List four (4) other features on assessment that would indicate that the viability of the limb is immediately threatened.

Model Answer

Rutherford classification, see table below. Needs to indicate immediately threatened/ irreversible features rather than those in viable sections

- Sensory loss (>just toes)
- Resting pain
- Weakness
- Inaudible dopplers
- Paralysis

- Slow cap/absent refill

Part c (4 marks)

The assessment determines the viability of the leg is immediately threatened and he is awaiting surgical management. It is considered likely to be embolic in nature. He is moved to a resuscitation bay and attached to full physiological monitoring.

What are your priorities in his management while he awaits theatre?

Model Answer

- **IV heparin** 5000u or infusion
- **Analgesia** must be mentioned, variety acceptable + doses and route specified
- Apply O2
- Prep for theatre: nil by mouth, supplemental IV fluids
- Seek and treat potential other causes- loads valid here. I think bedside echo important
- Nicotine replacement therapy
- Continue neurovascular observations

Question 23 (12 marks)

A 48-year-old female presents with sudden onset of left flank pain. She has a history of recurrent urinary tract infections. You suspect a diagnosis of acute renal colic.

Part a (6 marks)

Other than family history, list three (3) risk factors for kidney stone disease. For each risk factor, outline the proposed mechanism by which it increases the risk

Model Answer

Risk Factor	Mechanisms
Obesity	May promote hypercalciuria
Low urine volume	Allows solute to supersaturate
Excess dietary meat (purine)	Creates acidic urinary milieu; depletes available citrate (inhibitor); promotes hyperuricosuria
Excess dietary sodium	Promotes hypercalciuria
Insulin resistance, metabolic syndrome	Ammonia mishandling; alters pH of urine
Family history	Genetic predisposition
Gout	Promotes hyperuricosuria
Bowel surgery, inflammatory bowel disease	Promotes low urine volume; acidic urine depletes available citrate (inhibitor); hyperoxaluria
Primary hyperparathyroidism	Creates persistent hypercalciuria
Prolonged immobilization	Bone turnover creates hypercalciuria
Medications	Indinavir, ephedrine, loop diuretics, topiramate, acyclovir, triamterene

Part b (1 mark)

A CT KUB is performed, and a single coronal slice is reproduced.



List the single most significant radiological abnormality on this image.

Model Answer

Staghorn calculus

Part c (2 marks)

A urinalysis is positive for leucocytes.

List two (2) bacteria that are most likely to be responsible for this finding.

Model Answer

- Proteus, Klebsiella, Staph. species, Providencia, Corynebacterium
- NB Proteus must be mentioned for full marks.

Part d (3 marks)

List three (3) treatments that you would prescribe for this patient.

Model Answer

- Analgesia (iv opiate with sensible dose; rectal indomethacin 100mg;
 - IV antibiotics – ampicillin and gentamicin to cover urine source.
 - IV fluids sensible choice and rate
- **** other sensible treatments accepted however tamsulosin therapy likely not relevant

Question 24 (18 marks)

A 20 year male is brought to your ED after ingesting 50 tablets of verapamil SR 240mg approximately one hour ago.

His observations are as follows:

HR	85 bpm
BP	140/62 mmHg
RR	16 /min
Sats	95% RA
GCS	15

Part a (8 marks)

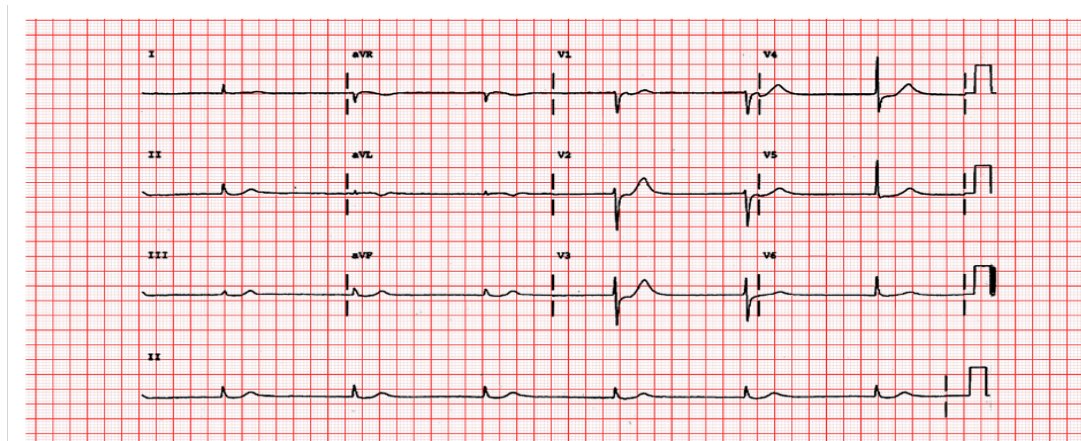
List two (2) symptoms you would expect in this patient from each of the following systems.

Model Answer

- Cardiovascular effects
 - sinus bradycardia, conduction disturbances (first-degree heart block, junctional and idioventricular rhythms)
 - hypotension due to a combination of bradycardia, myocardial depression and vasoplegia
 - progression to cardiogenic shock
 - pulmonary oedema
- CNS - inadequate perfusion causing drowsiness, confusion, agitation, seizures (rarely)
- GIT - nausea, vomiting, ileus
- Metabolic - hyperglycaemia, lactic acidosis.

Part b (2 marks)

Four hours later he has deteriorated. Describe his ECG below.



Model Answer

Bradycardia, nodal escape rhythm, rate ~24bpm - must include calculation of rate and that not sinus

Part c (6 marks)

His blood pressure is 75/40 and he is drowsy.

List three (3) investigations that you will perform in this patient and their rationale.

Model Answer

Investigation	Rational
TTE	Assess for vasoplegia vs. cardiogenic / negative inotropic shock
BGL	Hyperglycaemia associated with severe CCB overdose and also prior to commencing HIET
Paracetamol level	Relevant co-ingestant

TTE

VBG

BSL / lactate

paracetamol level

renal function

Must include TTE + 2 other reasonable answers

Part d (2 marks)

Following discussion with a toxicologist you decide to commence high dose insulin euglycaemic therapy (HIET).

List two (2) complications of HIET.

Model Answer

- Hypoglycaemia / hyperglycaemia
- Hypokalaemia
- Vasoplegia / hypotension
- Fluid overload

HIET is used as SECOND LINE inotropic support for non-dihydropyridine poisoning

Question 25 (12 marks)

A 55 year old male presents with his carer in acute respiratory distress. He has a tracheostomy. He is not in the terminal phase of his underlying condition.

His observations are:

Temp	37.8 °C
RR	36 /min
O ₂ sats	82 % on air
HR	130 bpm, regular
BP	150/90 mmHg

Part a (1 mark)

What is the most important historical information you require?

Model Answer

Is the upper airway patent/has he had a laryngectomy

Part b (3 marks)

What are three (3) other important pieces of history you ask his carer about?

Model Answer

- **duration of tracheostomy**
- any recent revision of tracheostomy
- devices/cannulae
- recent sputum production
- recent haemorrhage
- indication
- infective symptoms
- trauma/manipulation

Must have bold

Part c (6 marks)

He remains conscious and in respiratory distress despite high flow oxygen placed over the tracheostomy.

Describe your immediate interventions.

Model Answer

- **general** measures:
- immediate continuous monitoring CVS & O₂ sats, resuscitation bay
- urgent expert help anaesthesia & ENT team
- **oxygenation**
- high flow oxygen to tracheostomy
- if upper airway patent add face mask oxygen
- **assess tracheostomy patency**
- remove speaking valve/cap if present
- remove inner tube
- **attempt to pass suction catheter**

- **can pass** (patent trachea)- suction trachea, consider partial obstruction, ventilate via tracheostomy if needed
- **can't pass** (not patent) - deflate cuff if present, waveform capnography at stoma/look, listen, feel. Remove tracheostomy tube & reapply O2 at stoma
- **emergency oxygenation**
- stoma ventilation via paediatric face mask or LMA
- standard upper airway manoeuvres if upper airway intact
- intubate stoma with small tracheostomy tube/size 6 cuffed ETT

Part d (2 marks)

He coughs and expectorates around 250 mL of frank blood from his airway.

What is the immediate management of this?

Model Answer

intubate stoma with cuffed tube

- hyperinflate cuff
- finger pressure to root of neck in sternal notch
- urgent ENT assistance

Question 26 (12 marks)

A 23 year old female presents with breathlessness and palpitations for three days. Her GP has organised an outpatient CTPA that shows multiple pulmonary emboli.

Part a (4 marks)

List the four (4) most common clinical findings in pulmonary embolism on history and examination.

Model Answer

- Pleuritic chest pain 50%
- Tachycardia 25%
- Tachypnoea 60%
- New dyspnoea at rest or exertion 80%

Part b (3 marks)

An ECG is performed and shown below.



List the three (3) most relevant positive findings on this ECG.

Model Answer

- Sinus tachycardia
- **TWI in V2 to V5 and inferior leads suggestive of right heart strain**
- S1Q3T3

Part c (3 marks)

List three (3) other features on an ECG that may be present in a patient with a pulmonary embolism.

Model Answer

- AF
- P pulmonale
- R or rightward axis
- Dominant R in V1
- STE aVR
- Bundle branch blocks (incomplete or complete)
- TWf

- Other ST segment changes
- Low voltage QRS in limb leads
- Transition point shift.

Part d (2 marks)

The patient becomes acutely more breathless and hypoxic. Her current observations are:

Saturations 70%

Pulse 120

BP 70/40mmHg

Oxygen is applied and a fluid bolus given. The patient remains hypotensive.

List two (2) next most important treatments that you initiate.

Model Answer

TPA Bolus – sensible drug and dose

Heparin infusion – once APTT less than two times normal or other sensible protocol

Referral for IR / embolectomy / ECMO

Alteplase

65 kg or more: 10 mg intravenously as an initial dose, followed by 90 mg by intravenous infusion over 2 hours

less than 65 kg: 1.5 mg/kg total dose, given as 10 mg intravenously as an initial dose, followed by the remainder of the dose by intravenous infusion over 2 hours

high risk of bleeding (eg advanced age): 10 mg intravenously as an initial dose, followed by 40 mg by intravenous infusion over 1 hour. A further dose of alteplase may be given based on clinical response (maximum 1.5 mg/kg total dose in patients less than 65 kg)

OR

tenecteplase

less than 60 kg: 30 mg (6000 units) intravenously

60 to 69 kg: 35 mg (7000 units) intravenously

70 to 79 kg: 40 mg (8000 units) intravenously

80 to 89 kg: 45 mg (9000 units) intravenously

90 kg or more: 50 mg (10 000 units) intravenously.

Question 27 (12 marks)

You are the FACEM in charge of a tertiary ED. A nurse approaches you to request 'altered calling criteria' for a 60-year-old male with intermittent bradycardia, whose heart rate is triggering a monitoring alarm. The patient presented with syncope and is yet to be reviewed.

Part a (3 marks)

State three (3) features of a bradyarrhythmia that mandate positive chronotropic treatment.

Model Answer

- Haemodynamic instability/ hypotension
- Sinus pauses >3s
- Mobitz II AV block
- Third degree AV block
- MI + bifascicular block
- MI + alternating RBBB/LBBB

Part b (4 marks)

You decide to review the patient.

State four (4) high-risk features of cardiac syncope you are looking for on your assessment of this patient.

Model Answer

- Onset - no prodrome, whilst seated
- Age >55
- PMH of CCF or IHD
- FH of sudden cardiac death
- Significant trauma sustained from fall
- Ventricular ectopy
- Abnormal ECG

Part c (5 marks)

He appears mildly confused and diaphoretic. He denies pain or dyspnoea, but describes several episodes of 'blacking out' today. His PMH and medications are unknown.

Vital signs are as follows:

HR	38 bpm
BP	80/44 mmHg
Sats	96 % on 2L NP
RR	24 /min

ECG reveals complete heart block with a ventricular escape rhythm at 38-40 bpm.

List your immediate management options for treating his bradyarrhythmia.

Model Answer

- Cease offending agents (B-blockers, CCBs, Digoxin)
- Correct electrolyte abnormalities (eg hyperK) and aim K 4 and Mg 1
- Atropine 0.3-0.6mcg IV boluses titrated to HR >60 SBP >80
- Isoprenaline (adrenaline also acceptable with appropriate dosing and end points)
 - Bolus 20-40mcg IV

- 1-20mcg/min IVI
- 1mcg/min increments titrated to CO
- Transcutaneous pacing (+ preparatory steps, procedural sedation)
- Refer to cardiology/CCU/ICU
 - Tranvenous pacing
 - Consideration of angiogram

Accept fluid bolus eg. 500-1000ml IV crystalloid aiming MAP >65