



Model Answers — NSW Practice SAQ Trial 2023.2

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SAQ 1 O&G Neonatal Resus (18 marks)

You are the consultant working in a regional emergency department.

A 26-year-old woman presents in labour, with the baby's head clearly crowning.

You determine you will need to deliver the baby in the emergency department.

Part a (3 marks)

List three (3) potential intra-partum and three potential post-partum complications associated with delivery.

Model answer:

Intrapartum complications:

- Shoulder dystocia
- Breech position
- Nuchal cord

Post-partum complications

- Post-partum haemorrhage
- Retained placenta
- Cervical, vaginal, perineal lacerations
- Foetal compromise

Part b (6 marks)

After a precipitous delivery the newborn has poor respiratory effort.

Despite appropriate resuscitation there is ongoing breathing difficulty, and you decide to intubate the baby.

They have an estimated weight of 3 kg.

Complete the following table

Model answer:

Laryngoscope blade size	0- 1
ETT size	3.5-4 uncuffed
ETT depth	8-10 cm
LMA size	1
Ventilator tidal volume	6-8ml/kg = 18-24ml
Cardiac arrest adrenaline dose	30 mcg (10 mcg/kg)

Part c (6 marks)

Due to ongoing difficulties in obtaining intravenous access you opt for umbilical line insertion.

Describe the steps in umbilical line insertion

Model answer:

- Clean the cord site/stump site and abdomen with chlorhexidine
- Flush umbilical line with normal saline and apply 3-way stopcock

- Tie umbilical tape loosely around the base of the umbilicus
- Use a scalpel to cut perpendicularly through the umbilicus below the clamp (leave at least 2cm of cord)
- Identify the umbilical vein (larger, thin walled)
- **Choose appropriate size eg 5F and depth of insertion –umbilicus to xiph in cm+stump length** /Depth is calculated by the formula: $(\text{birth weight [kg]} \times 3) + 9 \div 2$
- Advance the catheter into the vein. In an emergency only advance the minimum depth required to get free flowing blood (or approximately 5cm)
- Ensure line aspirating, then flush line
- Secure the umbilical line e.g., using tape bridge

Bold to pass

SAQ 2 Agitated Peri-Arrest Post-Tonsillectomy Haemorrhage (18 marks)

You are a junior FACEM working in a regional emergency department that does not have ENT services on site.

An 18-year-old male is brought in by ambulance with several episodes of large volume haemoptysis 10-days post tonsillectomy. He is unable to provide any further history.

On arrival, he is severely agitated, combative, and confused with ongoing expectoration of large volumes of blood with clots. He has dislodged his IV access.

His observations are as follows:

GCS 14 (E4, V4, M6)

BP 78/40 mmHg

HR 160 bpm

RR 24 /min

SpO₂ 85 % RA

Temp 37.9 °C

You decide to sedate the patient to facilitate ongoing assessment and management.

Part a (4 marks)

Describe your approach to chemically restraining this patient.

Model answer:

Answer must include pharmacological agent + 3 other considerations

- Manage in standard contact precautions / PPE
- Minimise physical restraint
- Attempt to keep patient upright
- Apply high flow oxygen to face
- Continue physiological monitoring
- Prepare rescue airway management equipment including 2x suction
- IMI Droperidol 10mg or IMI Ketamine 4mg/kg targeting RASS -1 to +1
- Avoid agents which will result in significant CNS and respiratory depression or further compromise hypotension e.g., Midazolam

References:

- Cameron Adult Emergency Medicine – Psychiatric Emergencies – The violent patient
- NSW Health Policy (2015) – Management of patients with acute severe behavioural disturbance

Part b (4 marks)

He has been adequately sedated and moved to the resuscitation bay. Your resuscitation team have been assembled and large bore IV access has been obtained.

His VBG shows; pH 7.20, PCO₂ 45 mmHg, HCO₃ 16 mmol/L, Lactate 6.0 mmol/L and Hb 60 g/dL.

Outline your priorities for haemostatic resuscitation in this patient.

Model answer:

- Restore circulating blood volume
 - o Balanced blood product administration (2:1:1 or 1:1:1)
- Avoid hypothermia and acidosis
 - o Warm blood products, environment, patient
 - o Minimise crystalloid administration
- Correct coagulopathy
 - o IV Tranexamic acid 1g
 - o Targeted factor replacement e.g., ROTEM/TEG, biochemical end points e.g., Plt, Fibrinogen, INR
- Stem bleeding
 - o Direct pressure with Adrenaline 1:10 000 + Tranexamic acid soaked gauze
 - o Definitive treatment (Chemical / electrical cauterisation or IR)

References:

- Cameron Adult Emergency Medicine – Haematology – Blood transfusion
- RCH Clinical Practice Guidelines – Post tonsillectomy haemorrhage and vWF deficiency

Part c (4 marks)

His parents arrive who state he has von Willebrand factor deficiency. He takes no regular medications and has no known drug allergies.

What *other* medications would you consider in managing this patient's bleeding?

Model answer:

If answer includes same agent as b but different route, 0.5 mark.

- IV / SC Desmopressin / DDAVP 0.3 mcg/kg
- IV Biostat (rVIIIa and vWF) 25U/kg (= 50U/kg vWF) if bleeding refractory to Desmopressin
- TOP Lignocaine 5% + Phenylephrine 0.5% (Co-phenylcaine Forte)
- IV / Neb / TOP Tranexamic acid 0.5-1g
- TOP / Nebulised Adrenaline 1:10 000 5ml
- IV Ceftriaxone 1g or IV Benzylpenicillin 1.2 – 2.4g
- IV Calcium gluconate 10% 10ml
- H₂O₂ contraindicated due to sedation

References:

- Dunn's – Other ENT Disorders – Post tonsillectomy haemorrhage
- Robert's & Hedge's – ENT procedures – Post tonsillectomy haemorrhage

Part d (6 marks)

The patient's respiratory distress worsens despite high flow oxygen and he has clinical and radiographic features of aspiration pneumonitis. You decide to intubate him in preparation for transfer.

Outline modifications to your standard RSI approach in this patient.

Model answer:

- Anatomical difficulty anticipated
 - o Verbalise airway plan
 - o Mark out CTM / Prepare double set-up
 - o Have difficult airway trolley in room / Site difficult airway equipment
- Optimise oxygenation
 - o Perform in semi recumbent / upright position to avoid further aspiration
 - o Apnoeic oxygenation e.g., high flow NP O2
 - o BVM / NIV will increase risk of aspiration if bleeding ongoing / packing present
- Optimise haemodynamics
 - o Insert radial arterial line
 - o Adjust induction doses anticipating hypotension e.g., IV Ketamine 0.5 mg/kg and IV Rocuronium 2mg/kg
 - o Prepare inopressors / blood products on pump set
- Optimise view / first pass success
 - o Consider early NGT insertion given high aspiration risk i.e., distended stomach filled with blood
 - o Prepare double large bore suction
 - o Perform SALAD / laryngoscopic facilitated oropharyngeal decontamination
 - o Assistant to apply direct pressure to tonsillar fossa with adrenaline-soaked gauze to stem bleeding / Pack tonsillar fossa with adrenaline-soaked gauze and tape to face
 - o Video laryngoscopy with airway adjunct e.g., bougie, stylet

SAQ 3 (12 marks)

A 25 year old woman presents with headache, neck stiffness and fever. A lumbar puncture (LP) is performed. The result is below.

Glucose	3.7 mmol/L
Protein	0.48 g/L (0.15-0.45)
WCC	330 X10 ⁶ /L
RBC	6 X10 ⁶ /L
Monos	98 %
Polymorphs	2 %

Part a (1 mark)

What is the most likely diagnosis based on her CSF result?

Model answer:

Viral meningitis

Part b (1 mark)

List two (2) possible organisms

Model answer:

Herpes 1&2, enterovirus, varicella, adenovirus

Part c (4 marks)

List four (4) causes of decreased CSF glucose seen on a LP

Model answer:

- Bacterial meningitis
- TB meningitis
- Fungal meningitis
- Mumps and herpetic meningitis* (other viral meningitis have normal CSF Glucose)
- Sarcoidosis
- CNS tumours
- SLE, rheumatoid meningitis

Part d (4 marks)

She is appropriately managed for her illness and discharged several days later but returns with a headache. You believe she has a post dural puncture headache.

List four (4) ways you can modify how you would perform the LP to decrease the incidence of post LP headache in future

Model answer:

- Needle size-smaller the better
- Needle design- pencil point or non-cutting needle eg Whitacre or Sprotte needle better than Quincke needle
- Replace stylet prior to removal of needle
- Ensure bevel of needle parallel to dural fibres (rather than perpendicular) if using a cutting needle

No evidence for lying flat post procedure, hydration prior, no difference if done in lateral decubitus or upright position, no evidence number attempts related to post LP headache. No evidence amount fluid removed

Part e (2 marks)

She has a persistent headache despite simple oral analgesia.

List two (2) therapies for managing her post LP headache in the ED. Include drug doses and route

Model answer:

- Epidural blood patch done by anaesthetics team
- Caffeine -300-500mg po BD
- IV fluids
- Pregabalin and gabapentin
- Greater occipital nerve block or sphenopalantine ganglion block

Reference:

- Post lumbar puncture headache: diagnosis and management. SV Ahmed et al. *Postgrad Med J* 2006 Nov;82(973):713-716
- www.rebelem.com
- www.sahealth.sa.gov.au Post dural puncture headache
- Perils and Pitfall of lumbar puncture in the emergency department. Holdgate A, Cuthbert K. *Emergency Medicine* (2001) 13,351-358

SAQ 4 Sickle cell crisis (12 marks)

A 38 year old man, who recently migrated from Ghana, presents very distressed with severe chest pain.

His observations are:

HR	110 /min
BP	110/60 mmHg
RR	22 /min
SaO ₂	93 % RA
Temp	38.5 °C

Your registrar has ordered routine blood tests and Chest xray for him.

Results attached

Hb	92g/L	Normal range 130-170
MCV	82 fl	Normal range 80-100
HCT	42%	Normal range 40-54%
WCC	20	

A chest x-ray is also performed;



Part a (2 marks)

What is the most likely unifying diagnosis?

Model answer:

Sickle cell disease/crisis with acute chest syndrome

Must state –acute chest syndrome

Part b (8 marks)

Complete the following table listing the immediate management priorities for this patient as well as details for each priority

Model answer:

	Mx Priorities (1 mark each)	Details (1 mark each)
1	Analgesia	IV Opioids with details (drug/dose/route) titrated to pain
2	Rehydration	IV fluids with details
3	Correct Hypoxia	High Flow Oxygen 15L/min aim sats >95%
4	treat possible infection/RLZ pneumonia	IV Abx details Cef+ Azithro

No marks if states only simple (non opioid analgesia)

Must give details of the drug/dose/route/endo point to score 1 mark

Part c (2 marks)

List four (4) complication of this condition

Model answer:

- CNS -Ischaemic stroke/ICH/Seizure
- Splenic sequestration/aplastic crisis
- Vaso occlusive crisis
- Renal failure
- Retinopathy
- Sepsis

References:

- https://www.emergencymedicinemanual.com/Content/v6/TEMM%206%20single%20volume/Responsive%20HTML5/index.html#t=TEMM_6_single_volume%2FAnaemia%2FHbS_-_Sickle_cell_disease.htm&rhsearch=sickle%20cell&rhhlterm=sickle%20cell&rhsyns=%20
- https://www.uptodate.com.acs.hcn.com.au/contents/search?search=sickle%20cell%20crisis&sp=0&searchType=PLAIN_TEXT&source=USER_INPUT&searchControl=TOP_PULLDOWN&searchOffset=1&autoComplete=true&language=&max=0&index=0~10&autoCompleteTerm=sickle%20c&rawSentence=

SAQ 5 Drowning (12 marks)

You are the Emergency Consultant in an urban district hospital. A 2 year old boy (12kg) is brought in by ambulance having been found at the bottom of a backyard swimming pool in cardiac arrest. His parents provided initial basic life support until paramedics arrived. Return of spontaneous circulation was obtained after 10 minutes of further resuscitation.

On arrival to the resus room he is intubated and manually ventilated on 100% oxygen. He has bilateral air entry with coarse crepitations on auscultation. He remains unconscious.

His vital signs are:

GCS	3/15
SpO ₂	72%
HR	180 bpm
BP	82/40mmHg
CRT	6-7 secs

Part a (5 marks)

List five (5) immediate management priorities for this patient

Model answer:

- Optimise oxygenation
 - a. 100% O₂
 - b. Add PEEP valve (5-10cmH₂O)
 - c. Gastric decompression
- Optimise haemodynamics
 - a. Cautious fluid bolus (10mL/kg crystalloid)
 - b. End-points: cap-refill <3sec, improved HR
- Neuroprotection and avoidance of secondary brain injury
 - a. SpO₂ > 92%
 - b. CO₂ ~35-40mmHg
 - c. Head up 30°
 - d. ETT taped, not tied
 - e. Sedation eg Morphine + midazolam infusion or other appropriate
- Detect & correct hypoglycaemia
- Temperature control
 - a. Active warming to normothermia
- Disposition:
 - a. Needs PICU & requires suitable retrieval to tertiary Paeds centre

Part b (3 marks, 0.5 marks each)

Complete the following table with the initial ventilator settings that would you prescribe for this child.

Model answer:

	Settings
FiO₂	100% (titrate to SpO ₂ >94%)
PEEP	5-10 cmH ₂ O
Peak inspiratory pressure	15-30 cmH ₂ O
Tidal volume	5-8mL/kg
Respiratory rate	~25/min
I:E ratio	1:2

Part c (4 marks)

You manage to achieve an SpO₂ of 92% on the current ventilator settings however despite increasing the minute ventilation the patients' end-tidal CO₂ reading remains high.

His venous blood gas reveals a pCO₂ of 72 mmHg with a pH of 7.14.

List four (4) interventions to improve CO₂ clearance in this child

Model answer:

- Remove excessive ventilator dead-space (flex-tubes / filters)
- Ensure adequate sedation &/or muscle relaxation
- Ensure ETT has not migrated (both lungs ventilating)
- Exclude pneumothorax (ultrasound or repeat CXR)
- Decompress stomach (OGT / NGT)
- Sit up 30*
- Vent settings Increased RR or TV

SAQ 6 Pericardiocentesis (12-marks)

You are a junior FACEM working in a regional emergency department that does not have cardiology or cardiothoracic services on site.

A 67-year-old female with metastatic breast adenocarcinoma presents with 3-weeks of exertional dyspnoea. She has no infective symptoms and you do not suspect she has a PE.

At triage her observations are as follows:

GCS	15
SpO ₂	85 % RA
RR	28 brpm
BP	90/60 mmHg
HR	120 bpm
Temp	37.4C

She is placed in a resuscitation bay, attached to physiological monitoring and IV access is obtained. Her ECG is shown below.



Part a (3 marks)

Other than pericardial effusion, list three (3) causes for this patient's ECG findings.

Model answer:

DDx – Low voltage QRS complexes

- Fat – Morbid obesity
- Fluid – Massive pleural effusion
- Air – Emphysema, Pneumothorax
- Infiltrative / Connective tissue disorders – Myxoedema, Amyloidosis, Sarcoidosis, Haemochromatosis, Constrictive pericarditis, Scleroderma

Reference:

- Tintinalli's Emergency Medicine 9E: Ch 55 – Cardiomyopathies and Pericardial Disease

Part b (3 marks)

You are concerned she has a pericardial tamponade and you decide to perform a point-of-care ultrasound scan.

Other than pericardial effusion, what sonographic findings would confirm this diagnosis?

Model answer:

- RA collapse in systole
- RV collapse in diastole
- Swinging heart
- Abnormal respiratory variation in tricuspid and mitral flow velocities
- Dilated IVC (>1.5cm) with <50% inspiratory collapse

Reference:

- Tintinalli's Emergency Medicine 9E: Ch 55 – Cardiomyopathies and Pericardial Disease

Part c (6 marks)

You diagnose a pericardial tamponade, and despite fluid resuscitation, her haemodynamics deteriorate and you decide to perform pericardiocentesis.

Informed consent has been obtained, your procedural equipment has been prepared and adequate staff are available to assist.

Describe how you would perform pericardiocentesis in this patient.

Model answer:

- Patient preparation
 - o Position supine
 - o **ASNTT, drape and anaesthetise skin at needle insertion site**
- Seldinger method
 - o **US guided needle insertion over superior margin of rib into largest pocket of fluid for apical / parasternal or subcostal**
 - Apical - 5th intercostal space
 - Parasternal – 3-5cm from sternal edge
 - o Confirm needle placement with agitated saline
 - o Aspirate 30-50ml of pericardial fluid for sampling (cell count, gram stain / culture, cytology, pH, albumin, glucose, LDH)
 - o **Place guidewire through needle then perform stab incision at insertion site**
 - o **Remove needle and dilate over guidewire**
 - o **Insert drain over guidewire then remove guidewire confirming that it is intact**
- Post procedure care
 - o **Clamp drain, connect to drainage bag and secure drain to skin**
 - o CXR to confirm position
 - o Monitor for improvement in haemodynamics and aspirate fluid q4-6hr as required
 - o Liaise with cardiology / cardiothoracics at referral centre regarding ongoing management

References:

- Tintinalli's Emergency Medicine 9E: Ch 55 – Cardiomyopathies and Pericardial Disease
- Tintinalli's Emergency Medicine 9E: Ch 34 – Pericardiocentesis
- Robert's & Hedge's – Cardiac procedures - Pericardiocentesis
- ECI Procedures App – Pericardiocentesis

SAQ 7 Eczema Herpeticum (12 marks)

A 27 yo female presents to ED with lethargy and new pruritic, painful rash which has been present for two days. Her dermatologist commenced her on methotrexate for severe eczema months ago. Her pain is now severe despite oral antibiotics prescribed by her GP.

Her vital signs are:

Temp	37.9 °C
HR	105 bpm
RR	18 /min
SpO ₂	98 % on RA

Her photo is shown below:



Part a (3 marks)

List three (3) features of the rash

Model answer:

- Erythematous monomorphic blisters with areas of confluence/coalescence (1)
- Central/dimples/punched out appearance (1)
- Evidence of weeping/bloodstaining/crusting (1)
- Widespread over left half of the face and neck (1)

DermzNET Ref:

- The blisters are monomorphic, that is, they all appear similar to each other.
- They may be filled with clear yellow fluid or thick purulent material.
- They are often blood-stained i.e., red, purple or black.
- New blisters have central dimples (umbilication)/punched out
- They may weep or bleed.
- Older blisters crust over and form sores (erosions)

Part b (1 mark)

What is the most likely diagnosis?

Model answer:

Eczema herpeticum

Part c (4 marks)

List four (4) patient risk factors for severe disease and 4 potential complications

Model answer:

- Risk factors for severe disease include-
 - o HIV infection (0.5)
 - o Malignancy (0.5)
 - o Organ transplantation/Immunosuppression (0.5)
 - o Malnutrition (0.5)
 - o Burn and skin disorders (0.5)
 - o Pregnancy (0.5)
- HSV-1 dissemination/complications-
 - o Encephalitis (0.5)
 - o Meningitis (0.5)
 - o Hepatitis (0.5)
 - o Herpetic keratitis (0.5)
 - o Respiratory tract infections/Pneumonia (0.5)
 - o Oesophagitis (0.5)
 - o Severe scarring (0.5)

Part d (4 marks)

List your management priorities for this patient

Model answer:

Must have bold

- **IV Antivirals for immunocompromised patient: Acyclovir 10mg/kg IV TDS (1)**
- Analgesia: Paracetamol 1g QID PO/ Endone 5mg PO QID/ Pregabalin 75mg PO BD (1)
- Antibiotics for suspected secondary infection e.g. Flucloxacillin 2g IV QID, accept topical antiseptics to prevent secondary infection (1)
- Urgent referral to dermatology/+/- cease methotrexate (1)
- Admission for systemic therapy as immunocompromised patient (1)

*Ophthalmology referral if eyelid or eye involvement is suspected

*Topical steroids are not routinely recommended

SAQ 8 Refugee health (12 marks)

A 29 year old man has been referred to your ED by the detention centre medical officer for investigation and management of his chronic abdominal pain, anorexia weight loss and fatigue.

He is currently haemodynamically stable.

He has been in detention centre for past 3 months He was in Indonesia for 4 years after leaving his country of birth, Iraq. He does not speak English.

Part a (6 marks)

List six (6) infectious conditions that this patient is at risk of.

Model answer:

- TB
- HIV
- Hep A/B/C
- STI
- Strongyloidiasis
- Schistosomiasis
- Malaria
- Chagas
- Amoebiasis/amoebic abscess
- Filariasis
- Hydatid cyst

Part b (6 marks)

You attempt to assess this patient accompanied by an interpreter, however he appears withdrawn and refusing to engage.

Other than a language barrier, list six (6) factors that might prevent forming a therapeutic relationship between this patient and treating doctor.

Model answer:

- 1 Traumatic or poor experience with medical professionals previously
- 2 lack of trust in authority figures
- Cultural difference in health care behaviours
- Underlying mental health issue-depression/psychosis
- Acute medical illness
- Fear of financial burden of care
- Detention fatigue
- Isolation /lack of social support
- Substance dependence
- Cultural bereavement
- Culturally insensitive behaviour
- Clinical racism

- Clinician lack of awareness of regarding refugee mental health
- Clinician compassion fatigue/burn out

Reference:

- https://www.uptodate.com.acs.hcn.com.au/contents/medical-care-of-adult-immigrants-and-refugees?search=refugee%20health&source=search_result&selectedTitle=1~150&usage_type=default&display_rank=1#H27777173

SAQ 9 (12 marks)

You are the consultant in the emergency department of a regional hospital with no Urology service.

A 38 year old man presents with a painful penile erection for the past 4 hours. His past medical history includes intravenous drug use. His observations are normal.

Part a (6 marks)

List two (2) types of priapism with their underlying pathology, and give two (2) causes for each type

Model answer:

Type	Pathology	Examples
Ischaemic/low flow	Decreased venous outflow causing increased cavernosal pressure and subsequent ischaemia and structural damage to erectile tissues	1: Drugs – Sildenafil /intracavernosal papaverine/recreational drug use eg. cocaine 2: Haematological – Sick cell disease, lymphoma, leukaemia
Non Ischaemic/High flow	Disruption of arterial blood supply to the cavernous tissue	1: Penile or perineal trauma 2: congenital penile arterial malformation 3: Spinal cord injury?

Part b 6 marks)

Outline your stepwise management for this patient (including dose and route where necessary) (

Model answer:

- Non-invasive – Exercise, Ice
- Pseudoephedrine immediate release 30mg orally
- Systemic Analgesia - IV Opioid/Non opioids- anything sensible with details
- Regional Analgesia - Dorsal Penile nerve block with 1% Lignocaine 3-5ml
- Cavernosal blood aspiration- 20-30ml followed by irrigation with Normal Saline 10-20ml
- Administration of intracorporal vasoactive – Phenylephrine 0.1mg-0.5mg/ml q5min until detumescence OR Adrenaline 1-2ml 1:100 000 q5min
- Transfer to tertiary centre for urgent Urology review for surgical management if fails ED treatment

SAQ 10 Morbid obese RSI (18 marks)

A 53 female is brought in by ambulance from home after being found unresponsive with a suspected overdose. She is morbidly obese and weighs 210 kg.

On initial assessment her GCS is 9 (E2, M5, V2).

Part a (4 marks)

List four (4) toxicological causes of a patient with reduced GCS. Provide an exam finding or investigation finding for each which would support your diagnosis

Model answer:

Toxicological Cause 0.5 each	Feature on examination or investigation
Opiates	Miosis, respiratory depression
TCA	Na channel blockade patterns on ECG
Alcohol	Ethanol level. Smell of alcohol
Toxic alcohol	HAGMA
Anti-cholinergic syndrome	Mydriasis, Dry mucous membranes,
Insulin, Sulfonylurea	Hypoglycaemia
Anticonvulsant e.g. carbamazepine	Elevated carbamazepine drug level

Any other sensible suggestion

Part b (2 marks)

The patient's GCS drops to 3 and the decision is made to intubate the patient to facilitate getting a CT scan. Whilst you are setting up for intubation a nurse asks you what landmarks are used to size an oropharyngeal and nasopharyngeal airway

Describe the landmarks used to appropriately size each airway device:

Model answer:

- | | |
|-----------------------------------|---|
| a. Oropharyngeal airway (1 mark) | Incisor (or corner of mouth) to angle of mandible |
| b. Nasopharyngeal airway (1 mark) | Nare of nostril to tragus |

Part c (4 marks)

List four (4) physiological or anatomical changes that occur in morbid obesity that can make performing an RSI more challenging

Model answer:

- Increased thoracic fat means ramping needs to occur to achieve an appropriate airway position
- Large breast tissue can make laryngoscope blade insertion more challenging
- Reduced intra-oral space makes laryngoscopy more difficult
- Increase subcutaneous fat in neck make palpation of the cricothyroid membrane more challenging for a surgical airway
- Raised intra-abdominal pressure leads to a higher aspiration risk

- Facial fat makes BVM more challenging
- Atelectasis due to reduced FRC
- Higher minute ventilation leads to faster desaturation
- Increased subcutaneous tissue leads to difficult IV access
- Increased arm fat leads to less reliable NIBP readings
- Any other sensible answer

Part d (8 marks)

The patient is successfully intubated and started on a fentanyl and midazolam infusion. She is transferred for a CT scan.

When the patient returns from CT and the nurse informs you that the ventilator is alarming for “high airway pressure”.

List four (4) potential causes of a high airway pressure alarm on the ventilator and describe an action you would take to manage each of the causes you have listed

Model answer:

Potential causes	Action
Tension pneumothorax	Chest decompression (finger / needle / chest tube)
Endobronchial intubation	Re-position ETT
Bronchospasm	Bronchodilators for asthma / Adrenaline for anaphylaxis
Dynamic hyperinflation	Disconnect ventilator. Allow full expiration. Adjust vent settings
Mucus plugging	Suction down ETT with suction catheter
Ventilator patient asynchrony	Paralyse patient
Gastric distension/ abdominal girth	Insert NG tube sit patient up (semifowlers)
Inappropriate ventilator settings (low alarm limit, high TV , high pressures settings)	Change ventilator settings

SAQ 11 Anaphylaxis (18 marks)

A 10 year old boy has been brought to your emergency department with anaphylaxis.

Part a (4 marks)

Other than Adrenaline and intravenous fluids, list four (4) other treatment options (with doses) for Life threatening symptoms of refractory anaphylaxis.

Model answer:

1. Glucagon
2. Refractory Bronchospasm- Mag /ketamine
3. Nebulised Salbutamol
4. Steroids
5. other inotrope-Norad/vasopressin
6. Vasoplegia-Mythelyne blue
7. ECMO

Part b (4 marks)

In the table below list two (2) different types of anaphylaxis and their respective pathophysiological mechanism.

Model answer:

	Type of Anaphylaxis	Pathophysiology
1	Immunological	IgE mediated mediator release Type I HS
2	Non immunological	Direct stimulation of mast cell /basophils leading to degranulation (non IgE mediated)

Part c (4 marks)

List four (4) indications for discharge from ED

Model answer:

1. exposure to antigen terminated -e. g. ingested agent with short T1/2
2. no airway compromise or bronchospasm
3. > 4 hours since initial reaction
4. symptoms improving without therapy in previous 2 hours
5. steroid cover provided
6. adequate social situation

Part d (2 marks)

List two (2) indications for allergy specialist referral following discharge from the Emergency Department

Model answer:

1. if prescribed EpiPen
2. anaphylaxis secondary to wasp or bee stings and suitable for immunotherapy
3. suspected food, drug or exercise induced anaphylaxis
4. severe reaction without any obvious trigger

Part e (4 marks)

Explain how to use EpiPen to his mother

Model answer:

- Lie flat
- Pull off blue safety cover
- Hold leg still place orange part on outer mid thigh
- Push down hard until click, hold for 3 secs (previously 10s) then remove EpiPen
- Call 000 if no improvement

References:

- Anaphylaxis: Emergency treatment - UpToDate (hcn.com.au)
- How to give EpiPen - Australasian Society of Clinical Immunology and Allergy (ASCIA)
- Pathophysiology of anaphylaxis - UpToDate (hcn.com.au)

SAQ 12 Thyroid storm (12 marks)

A 34 year old woman presents to the Emergency Department with confusion, vomiting and fever. Her history includes thyroid issues. Her wife is unsure if she has been taking her regular medication.

Her vital signs are:

Temp 39.9 °C
HR 168 bpm
BP 157/95 mmHg
RR 25 /min
Sats 96 % RA
GCS 13/15 (E3, V4, M6)
BSL 12

Her thyroid function tests return with the following results:

TSH <0.01 (0.5 – 5 mIU/L)
T4 57 (12 – 22 pmol/L)
T3 24 (3 - 6 pmol/L)

Part a (12 marks) 1 mark per box

Complete the table listing agent, dose/route and action for the treatment of this condition.

Model answer:

Agent	Dose/route	Action
Propylthiouracil (PTU)	600-1000mg PO/PR then 200-250mg Q4H	Blocks synthesis of thyroid hormone, & peripheral conversion of T4 to T3
Lugol's iodine	8 drops PO/NG/PR Q6H	Blocks release of thyroid hormone, **give at least 1 hour after PTU
Hydrocortisone (steroid)	100mg IV Q8H	Blocks conversion of T4 to T3
Propanolol	60-80mg PO Q4H (1mg IV)	B-blocker to treat systemic effects (of tachycardia, tremor, agitation, fever, psychosis), also inhibits peripheral conversion
Cholestyramine	4g PO Q6H	Blocks entero-hepatic circulation of thyroid hormone

Reference:

- Dunn

SAQ 13 Paeds HI (12 marks)

You are working in a mixed ED

You review a 2 month old baby boy who was at home in his Dad's arm. Dad slipped while carrying the baby. Baby hit his head on the floor.

Part a (4 marks)

List four (4) important features in history that would suggest a clinically significant brain injury.

Model answer:

- Fall of ≥ 1 metre in a < 2 year old
- History of LOC for ≥ 5 seconds
- The parent notes the baby is behaving abnormally.
- Post traumatic seizure
- Vomiting >3
- Bleeding disorder or on anticoagulation

Part b (4 marks)

What examination findings may suggest a clinically significant brain injury?

- GCS 14 or other signs of altered mental status
- Non frontal scalp haematoma ie parietal, temporal or occipital scalp haematoma
- Palpable skull fracture
- Signs of BOS #
- Abnormal neuro exam

Part c (1 mark)

What is the approximate cancer risk associated with a CT scan in a child?

Model answer:

- 1:1000 to 1:10,000 risk of cancer – range reflecting the greater risk younger children face
- 1 excess leukemia and brain tumour occurs for every 10,000 CT scans in children less than 10 years old. This is higher in children less than 5 years.

Accept sensible answers which reflect the above.

Part d (3 marks)

You decide the baby needs a CT Brain what simple options are available to you to ensure the baby keeps still for the scan?

Model answer:

- Ensuring the baby has a feed before the scan
- Swaddling/wrapping them up ensuring they are snug and comfortable
- Giving them their pacifier if they use this
- Simple analgesia: paracetamol 15mg/kg PO, oral sucrose - 0.5mls increments up to 2mls
- Music playing in the CT e.g. lullaby

References:

- <https://www.predict.org.au/head-injury-guideline/>
- The Emergency Medicine Manual – Robert Dunne
- <https://dontforgetthebubbles.com/how-safe-are-ct-scans-in-children/>
- <https://www.arpansa.gov.au/understanding-radiation/radiation-sources/more-radiation-sources/ct-imaging-and-children-referrers>
- <https://www.safetyandquality.gov.au/sites/default/files/migrated/CT-scans-for-children-information-for-referrers.pdf>

SAQ 14 Lateral Medullary Syndrome (12 marks)

A 69 yo man has been sent into the emergency department by his GP after outpatient CT scan.

His CT brain showed an ischemic stroke due to a right sided posterior inferior cerebellar artery occlusion leading to a lateral medullary syndrome (Wallenberg's syndrome).

Part a (3 marks)

List three (3) stroke mimics which may be seen in the ED

Model answer:

- Todd's paralysis
- Hypoglycaemia
- Hemiplegic migraine
- MS
- Brain tumour
- Brain abscess
- Bell's palsy
- Subdural haematoma
- Hypertensive encephalopathy
- Hyponatraemia

Part b (3 marks)

List three (3) features of horner's syndrome on clinical examination

Model answer:

Ipsilateral:

- Miosis
 - Ptosis
 - Anhidrosis
 - *Enophthalmos*
 - *Vasodilation*
- } minimum 2 of

Part c (3 marks)

List three (3) possible causes of the patient's horner's syndrome (other than lateral medullary syndrome)

Model answer:

- Basilar artery stroke
- Carotid artery dissection
- Spinal fracture involving sympathetic trunk (C7-T2)
- Pancoast tumor
- Mediastinal mass

Part d (3 marks)

List three (3) other features (excluding the features of horner's syndrome) you would expect to find on clinical examination in this patient with a right sided lateral medullary syndrome (Wallenberg's syndrome)

Model answer:

- Nystagmus
- Ataxia
- Ipsilateral loss of pain & temperature in the face
- Contralateral loss of pain & temperature in body
- Dysphagia
- Dysphonia

SAQ 15 Pneumothorax (12 marks)

A 27 year old male has presented with acute onset of R sided pleuritic chest pain. He is hemodynamically stable with normal observations and no oxygen requirement.

He is found to have a spontaneous pneumothorax on Chest X-ray.

Part a (12 marks)

Complete the table below listing four treatment modalities with indication, advantages and disadvantages for each modality.

Model answer:

Treatment modality (1 mark)	Indication (1 mark)	Advantages (0.5 marks)	Disadvantages (0.5 marks)
Conservative management - discharge	Primary PTx BTS guidelines < 2cm hilum and no SOB, ACCP < 3cm Cupola/apex no SOB	Can be discharged. Avoids procedure with risks assoc.	FU needs to be organised in OP clinic or back to ED. May progress, need to take into consideration geographical location for FU
Oxygen therapy	Secondary PTx but < 1cm BTS	Avoids procedure with risks assoc. short LOS (24hours)	may fail and delay definitive management, risk T2RF COPD patient.
Needle aspiration	Primary PTX > 2cm at hilum/ breathless	Quick and reduced complication vs ICC. Can avoid chest drain, reduced LOS, equivalent Success ICC,	May fail and require ICC. delay to definitive management, complications- lung lac, injury to NV bundle
Small bore chest drain	Failed aspiration primary PTx, Secondary PTx > 2cm at hilum /SOB/tension	Definitive management	Painful, higher complication rate than other treatment modalities – infection, scarring, and as above

Do not use same advantage/disadvantage for different treatment modalities. Candidates are expected to know about treatment options!! High Yield topic!

SAQ 16 Wide complex tachycardia (12 marks)

A patient presents with a one hour history of palpitations. His ECG shows a regular broad complex tachycardia.

Part a (4 marks)

List four (4) patient factors that would make a diagnosis of VT more likely than SVT with aberrancy

Model answer:

- Age >35
- Underlying structural heart disease
- Underlying ischaemic heart disease
- Previous history of VT
- Family history of sudden death

Part b (5 marks)

List five (5) ECG features you would look for that make a diagnosis of VT more likely than SVT (Eponyms must be accompanied by a description of the named sign).

Model answer:

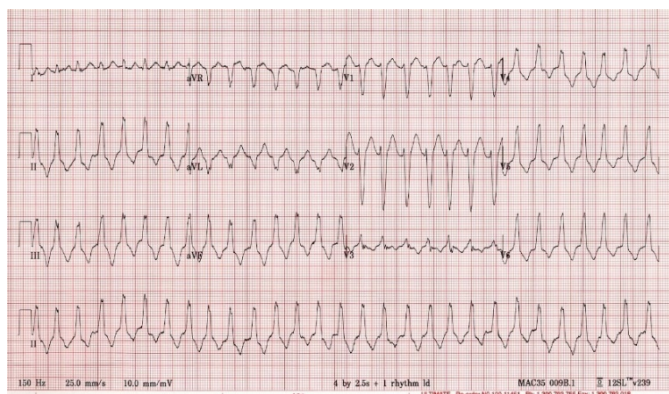
- Extreme axis deviation ('northwest' axis)
- QRS >160ms
- Absence of typical RBBB or LBBB morphology
- Capture beats
- Fusion beats
- AV dissociation – P waves at different rate to QRS
- Concordance in the precordial leads (equivalent to absence of RS complex in all precordial leads)
- RSR' with taller L rabbit ear
- Brugada sign - >100ms from onset of R wave to nadir of S wave in any precordial lead
- Josephson's sign: Notching near nadir of S wave

Part c (3 marks)

The patient is a 37 yo man with no medical history. He is on no medications. He has no chest pain or dyspnoea. He is alert with normal peripheral perfusion

His observations are HR 180/min, BP 125/70, O2 sats 99 % RA

This is his ECG



List three (3) treatment options for this patient tachyarrhythmia

Model answer:

- Vagal manoeuvre – syringe blow or other breath hold.
- Trial of Adenosine 6 +12mg
- Amiodarone 5mg/kg over one hour (Sotalol acceptable)
- Synchronised cardioversion 50-200J with procedural sedation

SAQ 17 Lis franc (12 marks)

A 20-year-old female is brought in by ambulance after a dirt bike accident. She has a painful and swollen right foot with a deep wound to the dorsum of her midfoot.

An x-ray is performed.



Part a (4 marks)

List three (3) findings and state the diagnosis

Model answer:

Findings:

- Lateral dislocation of all metatarsal bones
- Widening of the interval between the 1st and 2nd ray
- Dorsal displacement of proximal base of the 1st and 2nd metatarsals

Diagnosis: Lis franc injury

Part b (1 mark)

What is the mechanism that usually causes this injury?

Model answer:

Rotational forces AND axial load through hyper-plantarflexed forefoot
(causing injury to the tarso-metatarsal ligament +/- fracture)

Part c (4 marks)

List four (4) complications associated with this injury

Model answer:

- Compartment syndrome
- Dorsalis pedis artery injury – ischaemic injury
- Deep peroneal nerve injury
- Post-traumatic arthritis
- Malunion / Non-union
- Planovalgus (flat foot) deformity - in non-operative management

Part d (3 marks)

Outline the management for this patient

Model answer:

- Analgesia e.g., PO Endone 5-10mg Q3h, IV Fentanyl 25-50mcg titrate to pain Q1-2h
- Irrigate and dress wound
- Provide ADT
- IV antibiotics – Cephazolin 1g IV TDS + Metronidazole 500mg IV BD
- Immobilisation in backslab
- Urgent referral to orthopaedics for washout + reduction in theatre

SAQ 18 Malaria (12 marks)

A 32 year old male presented with fever with chills, night sweats headache and cough for past 3 days. He returned from Cambodia 2 weeks ago.

Temp 39 °C
HR 134 bpm
BP 90/60 mmHg
RR 20 /min
Sats 98 % RA

You notice maculopapular rash throughout his body.

You suspect he has malaria.

Part a (3 marks)

Other than Malaria list three (3) differential diagnosis for his presentation.

Model answer:

1. Dengue fever
2. Pneumonia
3. Meningitis
4. Chikungunya
5. TB
6. Sepsis

Part b (4 marks)

List and justify four investigations that are required

Model answer:

	Investigation	Justification
1	Full blood count	For anaemia thrombocytopenia evidence haemolysis -
2	Thick and thin blood film	Malaria parasite identification and count
3	Malaria Antigen	Diagnostic test
4	LFT	Elevated bili transaminases /end organ dysfunction
5	Renal function	ARF
6	Coagulation profile/extended coags	Deranged synthetic function of liver/DIC

Part c (3 marks)

Other than bitten by an infected vector mosquito, list three other modes of transmission of malaria

Model answer:

- 1- Contaminated needles
- 2- Transmission from infected organ transplant
- 3- Perinatal (maternofoetal) transmission
- 4- Infected blood transfusion

Part d (2 marks)

In the table below list two (2) malarial parasites with one unique clinical hallmark for each

Model answer:

	Name malaria Parasite	Clinical hallmark
1	P Falciparum	Severe multi organ failure
2	P Ovale /P vivax	Remains dormant in hepatocytes and recrudescence of infection in months or years later

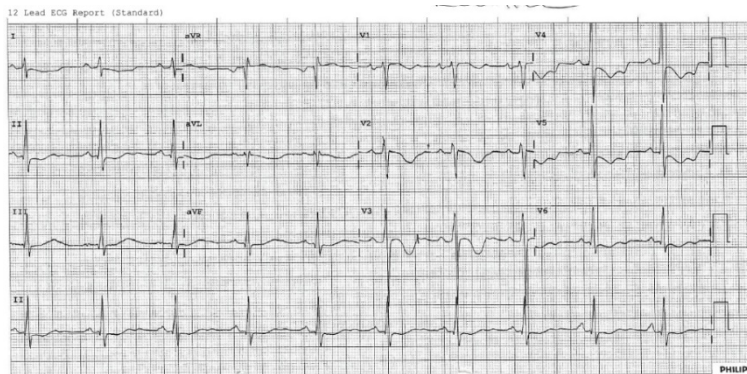
Reference:

- https://www.uptodate.com.acs.hcn.com.au/contents/malaria-epidemiology-prevention-and-control?search=malaria%20transmission&source=search_result&selectedTitle=1~30&usage_type=default&display_rank=1
- https://www.uptodate.com.acs.hcn.com.au/contents/malaria-clinical-manifestations-and-diagnosis-in-nonpregnant-adults-and-children?search=malaria%20&source=search_result&selectedTitle=1~150&usage_type=default&display_rank=1
- https://tgldcdp.tg.org.au.acs.hcn.com.au/viewTopic?etgAccess=true&guidelinePage=Antibiotic&topicfile=malaria&guidelinename=Antibiotic§ionId=toc_d1e716#toc_d1e716

SAQ 19 Tox (18 marks)

A young man presents to hospital with a history of loperamide misuse. He uses loperamide as an opioid substitution treatment and ingests 400 - 600mg per day. He feels unwell and has intermittent palpitations.

This is his ECG.



Part a (2 marks)

Describe and interpret his ECG.

Model answer:

Sinus rhythm rate is around 60

Normal axis

Bizarre T wave inversion in anterolateral leads (this patient also has a cardiomyopathy)

QT duration difficult to calculate but 600ms based on appearance in V3 / V2 and other leads

QRS duration 80ms

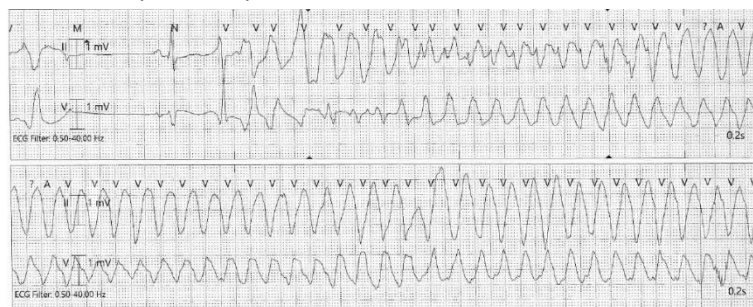
NOT BRUGADA

*** MUST SAY LONG QT***

Part b (2 marks)

While monitored he has a further episode of palpitations: This spontaneously reverts.

This is his rhythm strip.



Describe this rhythm strip and state your diagnosis

Model answer:

R on T phenomenon resulting in torsades de pointes due to QT prolongation related to loperamide misuse (1)

Part c (8 marks)

Complete the table below with four (4) toxicological (excluding agent in the stem) and four (4) non toxicological causes for this ECG findings.

Model answer:

I will only accept things that result in actual cases of torsades so things like quetiapine should not count list below of all the drugs significantly associated

Toxicological causes: long list, hydroxychloroquine, methadone, amisulpiride, sotalol, citalopram

Non toxicological: Hypokalaemia, hypomagnesaemia, hypocal congenital /genetic ischaemia
hypothermia

Table 11.2 Drugs highly associated with QT-interval prolongation and torsades de pointes

Drug class	Drug
antiarrhythmics	amiodarone disopyramide sotalol
antidepressants	citalopram, escitalopram tricyclic antidepressants [NB1]
antihistamines	dimenhydrinate, diphenhydramine loratadine
antimicrobials	ciprofloxacin clarithromycin erythromycin fluconazole moxifloxacin pentamidine voriconazole
antipsychotics	amisulpride chlorpromazine haloperidol ziprasidone
chemotherapeutic agents	arsenic
other drugs	chloroquine, hydroxychloroquine and quinine cocaine domperidone loperamide, methadone, oxycodone organophosphate and carbamate pesticides

NB1: QT-interval prolongation caused by tricyclic antidepressants is usually due to QRS widening and there is no true lengthening of the JT interval (defined as the QT interval minus the QRS width).

Part d (6 marks)

Outline your management priorities for this patient

Model answer:

- a) Needs to be in a resuscitation environment, defib pads in situ (not in cardiac arrest) with iv access
- b) Cease the offending drug if possible
- c) Electrolyte optimisation
 - a. NEED A K ideally as per eTG >5-5.5
 - b. NEED Mg at least >1 (If refractory might even aim up to 1.5) and if there is recurrent torsades one can consider a Mg infusion
 - c. Correct hypocalcaemia
- d) Chemical chronotropy needs to be commenced aiming for a HR 80-100 at least (generally aim >90) and if further episodes need to aim >100 isoprenaline or adrenaline
- e) If chemical chronotropy fails will need electrical overdrive pacing
- f) ensure substitution therapy is commenced here (buprenorphine NOT METHADONE)
- g) In the event of loss of output commence ALS with defibrillation as appropriate.
- h) In the event of loss of output commence ALS with defibrillation as appropriate.
Discuss antiarrhythmic therapy with a toxicologist. Lignocaine is the most appropriate choice, other agents including amiodarone should result in a fail.
- i) Avoid antiarrhythmics particularly that cause bradycardia or prolong the QT – this should be a fail point examples include amiodarone or use of betablockers

SAQ 20 PPH (18 marks)

A 27-year-old female is brought in by ambulance to your tertiary emergency department within 2hr of a home delivery without a midwife. The child is term and being cared for by a second medical team.

The patient reports brisk vaginal bleeding and has soaked through 2x maternity pads in 30 minutes. She had limited antenatal care.

The patient's observations are as follows:

HR	126 bpm
BP	94/52 mmHg
SpO ₂	96 % RA
RR	18 /min
Temp	38.2 °C

Part a (3 marks)

Provide a definition for primary and secondary postpartum haemorrhage (PPH)

Model answer:

- PPH = blood loss of 500ml or more
- Primary <24h post-delivery
- Secondary 24 hours to 12 weeks post-delivery

References:

- RANZCOG Management of PPH Guideline 2021. p3-4 <https://ranzcof.edu.au/wp-content/uploads/2022/05/Management-of-Postpartum-Haemorrhage-PPH.pdf>
- Cameron, Textbook of Adult Emergency Medicine 5th Edition. Obstetrics and Gynaecology Emergencies. 19.3 Bleeding after the first trimester of pregnancy

Part b (6 marks)

Other than coagulopathy, previous PPH and traumatic delivery, list six risk factors for primary PPH in the table below

Model answer:

Must have 2 correct answers for each heading to get full marks.

Maternal	Antenatal	Intrapartum
• BMI >30 • Fibroids • Advanced maternal age >35 years • Asian ethnicity	• Placenta praevia • Multiple pregnancy • Polyhydramnios • Macrosomia • Grand multiparity • Placenta accreta	• Precipitous labour • Chorioamnionitis • Placental abruption • Prolonged labour (1st, 2nd and 3rd stage) • Augmented labour • Uterine inversion

References:

- Cameron, Textbook of Adult Emergency Medicine 5th Edition. Obstetrics and Gynaecology Emergencies. 19.1 Emergency Delivery and Complications. Postpartum Haemorrhage. Table 19.1.2
- Safer Care Victoria – Postpartum haemorrhage – prevention, assessment and management <https://www.safercare.vic.gov.au/clinical-guidance/maternity/postpartum-haemorrhage-pph-prevention-assessment-and-management>

Part c (7 marks)

The obstetric team are notified and are on their way, large bore IV access has been obtained, haemostatic resuscitation with O-negative packed red cells has been commenced and the massive transfusion protocol activated.

Outline your other immediate management priorities

Model answer:

Must determine stage of labour and address tone, thrombin, tissue and trauma for full marks

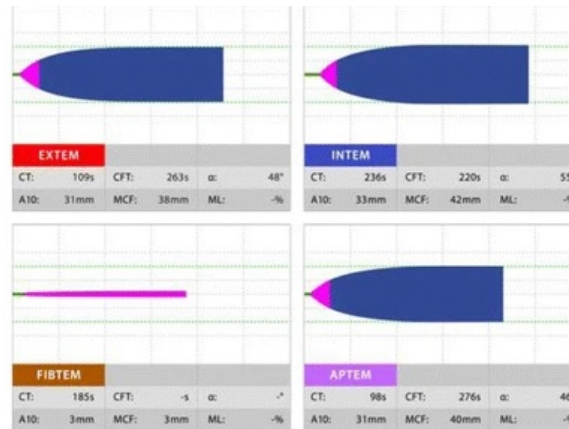
- Determine stage of labour
 - o Check for multiple pregnancy
 - o Identify whether third stage is complete and deliver placenta if necessary
- Tone
 - o IM syntocinon 10 units followed by infusion 40 units in 1L crystalloid over 1 hour
 - o In and out catheter to decompress bladder
 - o Fundal massage
 - o IM ergometrine 250mg
 - o PR misoprostol 500-1000mg
- Thrombin
 - o IV tranexamic acid 1g
- Tissue
 - o Check for retained products of conception by assessing placenta and membranes
- Trauma
 - o Look for vaginal tears and manage local bleeding with direct pressure / sutures
- IV antibiotics - benzylpenicillin 1.2g and gentamicin 5mg/kg

References:

- RANZCOG Management of PPH Guideline 2021. p7-9 <https://ranzcog.edu.au/wp-content/uploads/2022/05/Management-of-Postpartum-Haemorrhage-PPH.pdf>
- Dunkley et al. Updated Australian consensus statement on management of inherited bleeding disorders in pregnancy. Doi: 10.5694/mja2.50123

Part d (2 marks)

You perform a ROTEM and the results are shown below.



Interpret these results and describe how they will affect your ongoing management

Model answer:

- Hyperfibrinolysis
- Fibrinogen replacement with cryoprecipitate

SAQ 21 Renal (12 marks)

A 45-year-old diabetic patient presents with 2 days of bilateral flank pain and fever.

Temp	38 °C
HR	110 bpm
HB	103/74
RR	15 /min
Sats	99 % RA

She has had a CT scan performed, with an axial image shown below.



Part a (3 marks)

List two (2) significant abnormalities and state your diagnosis.

Model answer:

- Bilateral perinephric fat stranding
- Bilateral gas in renal parenchyma
- Emphysematous pyelonephritis

Part b (3 marks)

For a patient with suspected Renal calculi, list indications for advanced imaging

Model answer:

- Suspected infected renal calculi – typical renal colic loin to groin pain
- Suspected perinephric abscess – persistent high-grade fevers
- Systemically unwell – sepsis, shocked state
- Immunocompromised patient
- Severe renal impairment or anuria / oliguria
- Single kidney
- Ongoing pain

Part c (4 marks)

Outline your management of this patient in the ED

Model answer:

- IV antibiotics; Ampicillin 2g Q6h and Gentamicin 4-5mg/kg (7mg/kg if shocked)
- IV fluids 1000ml N.saline 0.9% then reassess HR and BP
- Analgesia. Titrated to response. e.g., endone 5mg Q3hr PO + paracetamol 1g QID PO
- Urgent Urology review

Part d (2 marks)

Name two (2) common causative organisms for this condition

Model answer:

- Escherichia coli
- Klebsiella pneumonia
- Proteus mirabilis

SAQ 22 POCUS (12 marks)

You have been requested to review a 75year old male who has been referred by the GP for presumed renal colic. He has worsening flank pain and is now pale.

His vitals are:

Temp	37 °C
BP	95/70 mmHg
HR	110 bpm
RR	24 /min
Sats	97 % RA

His past medical history is renal colic, hypertension, hypercholesterolaemia, and smoking.

You have performed an EFAST which is negative, and screening abdominal aorta scan has provided the following two images

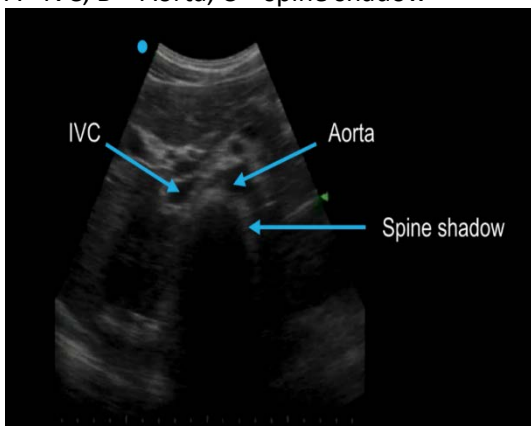
Part a (3 marks)

Please label the images A, B, C



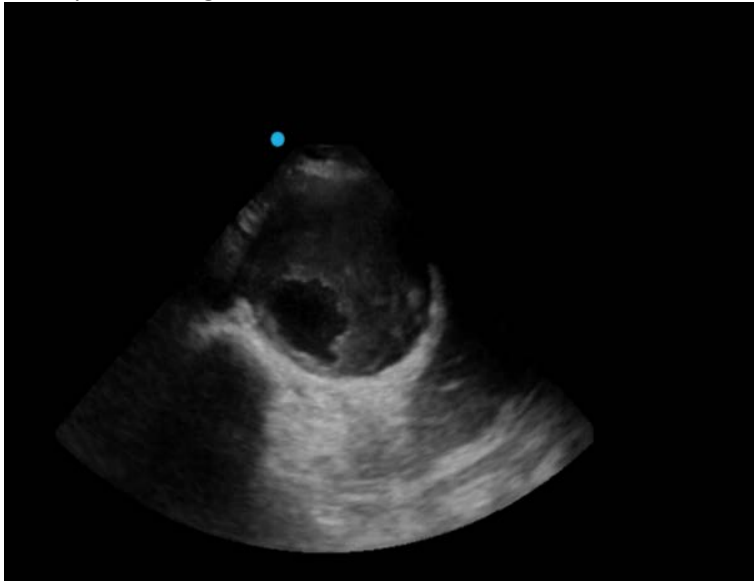
Model answer:

A= IVC, B = Aorta, C = spine shadow



Part b (2 marks)

You have scanned further down the aorta and gained the following image of the mid aorta. State your findings.

**Model answer:**

- Hypoechoic thrombus
- Small patent lumen

Part c (4 marks)

What is the likely diagnosis in this patient, and what is your immediate management of this patient:

Model answer:

Likely diagnosis is ruptured AAA.

Initial management:

- Placement of large-bore peripheral IVC for medication and fluid administration/resuscitation.
- Adequate analgesia
- If ruptured maintaining systolic blood pressure between 80-100mmHg (permissive hypotension) prior to repair to minimise further tearing of aorta and reduce blood loss.
- Consider CT for surgical planning if haemodynamically stable
- Liaison with vascular team and preparation for surgery

Part d (3 marks)

What are the treatment options for this condition

Model answer:

- surgery (open EVAR).
- Consider discussion of comfort care/palliation if deemed medically appropriate.

SAQ 23 Maxfax trauma (12 marks)

A 45 year old man presents to your Emergency Department after being assaulted with a metal bar. He was repeatedly struck around the face and head. He arrives in your department after undergoing rapid sequence intubation by a prehospital medical team. There is heavy brisk bleeding from the mouth and both nares.

Part a (3 marks)

List three (3) interventions that can be performed in the Emergency Department for maxillofacial bleeding

Model answer:

- Manual reduction of Le Forte fractures
- Catheter balloon or catheter / gauze tamponade of epistaxis
- Gauze packing of nasopharynx / oropharynx
- Dental bite blocks / dental bridge
- Rigid cervical collar to splint mandible

Part b (4 marks)

On secondary survey, you note bilateral periorbital ecchymoses.

List four (4) clinical findings that support the diagnosis of orbital compartment syndrome.

Model answer:

- Proptosis
- RAPD
- Reduced visual acuity (if awake)
- IOP > 40 or palpably firm globe
- Ophthalmoplegia
- Severe ocular pain (if awake)

Part c (5 marks)

Describe the steps to perform a lateral canthotomy and cantholysis

Model answer:

- Local anaesthetic / adrenaline infiltration of lateral canthus
- Crimp the lateral canthus for ~1 minute to devascularise
- Incise the skin of the lateral canthus towards the bony orbit with iris scissors
- Identify and incise the inferior crus of the lateral canthal ligament
- Assess for response / signs of improvement
- (Divide the superior crus of the lateral canthal ligament if no response)

SAQ 24 Neutropenic Sepsis (12 marks)

A 72 year old man presents to your ED with a 6 hour history of fevers. He has a sore throat and cough, but otherwise denies any other symptoms.

His past medical history includes pancreatic cancer, diabetes, IHD and asthma.

He is currently 7 days post his 2nd cycle of chemotherapy. He has no known allergies..

His observations are:

BP 90/40 mmHg
HR 120 /min
Temp 38.5 °C
RR 26 /min

Part a (4 marks)

List four (4) investigations you would order for this patient with justification for each.

Model answer:

Investigation	Justification
Blood cultures x2	Peripheral + line cultures if lines present
VBG - pH, lactate, HCO ₃ , BE	Assess for degree of shock
Swabs – Covid, Viral, Bacterial	To identify possible cause of fever
FBC	WCC to assess for raised/leukopenia – febrile neutropenia
EUC, LFT	Assess for hydration and secondary hypo-perfusion/shock/multiorgan failure in shock
CRP	Inflammatory marker for infection
UA +- MCS	Assess for infection
Sputum Culture	Assess for infection
CXR	Assess for infection

Part b (2 marks)

State medication/s if any would you prescribe (with appropriate dose/route) for this patient and in what time frame.

Model answer:

- Tazocin 4.5g IV QID +- gentamycin 5-7mg/kg IV daily +- vancomycin 1.5g IV BD
- Paracetamol +- ibuprofen
- Within 30mins if signs/symptom of shock or within 1hour if HD sta

Source: Policy - SWSLHD_GL2018_011 Immediate Management of Presumed Neutropenic Fever in Adults

Part c (4 marks)

Fill in the table below to define the SIRS criteria:

Model answer:

SIRS Criteria ≥ 2 of below:	
Temperature	>38 deg or <36 deg
HR	>90 bpm
RR	>20 /min or PaCO ₂ less than 32 mmHg
WBC	>12 or <4 or $>10\%$ bands

Part d (2 marks)

Define Febrile Neutropenia:

Model answer:

- Febrile neutropenia is defined as:
 - a single temperature measurement $\geq 38.5^\circ\text{C}$, or a sustained temperature $\geq 38^\circ\text{C}$ for more than 1 hour
 - in a patient with a decreased absolute neutrophil count (ANC) of either $<0.5 \times 10^9/\text{L}$, or $<1 \times 10^9/\text{L}$ with a predicted nadir of $<0.5 \times 10^9/\text{L}$ over the subsequent 48h

Immediate management of neutropenic fever

Patient group	Recommendation
Patients without features of systemic compromise (Beta-lactam monotherapy is recommended unless allergy to the recommended agent/s)	No penicillin allergy: Piperacillin-tazobactam (i.e. Tazocin) 4.5 g IV 6 - 8 hourly OR Cefepime 2 g IV 8 hourly <i>Other reasonable choice for monotherapy is ceftazidime 2 g IV 8 hourly</i>
	Non-life threatening penicillin allergy (rash): Cefepime 2 g IV 8 hourly <i>Other reasonable choices for monotherapy are ceftazidime 2 g IV 8 hourly or meropenem 1 g IV 8 hourly (seek advice from Infectious Diseases if meropenem is considered)</i>
	Life-threatening (immediate) penicillin allergy or beta-lactam allergy: Aztreonam 1-2 g IV 8 hourly OR ciprofloxacin 400 mg IV 12 hourly (expert opinion) + vancomycin 1.5 g IV 12 hourly (if CrCl >90 mL/min) OR 1 g IV 12 hourly (if CrCl 60-90 mL/min)†*
Patient group	Recommendation (grading and level of evidence)
Patients with systemic compromise (The combination of a beta-lactam antibiotic with an aminoglycoside is the regimen of choice)	As for patients without features of systemic compromise (expert opinion), (see above): + gentamicin 5 to 7 mg/kg ideal body weight IV once daily, adjusted to level +/- vancomycin 1.5 g IV 12 hourly (if CrCl >90 mL/min) OR 1 g IV 12 hourly (if CrCl 60-90 mL/min)†*
Patients with cellulitis, obviously infected vascular devices, or MRSA carriers with extensive skin breaks/desquamation	As for patients without features of systemic compromise, (see above): + vancomycin 1.5 g IV 12 hourly (if CrCl >90 mL/min) OR 1 g IV 12 hourly (if CrCl 60-90 mL/min)†*
Patients with features of abdominal or perineal infection	As for patients without features of systemic compromise, (see above): + metronidazole 500 mg IV/ 400mgPO 12 hourly if receiving cefepime, ceftazidime or ciprofloxacin first-line <i>Alternatively, piperacillin-tazobactam or meropenem will provide adequate anaerobic cover, if required, other than for suspected or proven Clostridium difficile-associated diarrhoea or colitis</i>

SAQ 25 Missed Fracture (12 marks)

A 13-year-old girl is brought back to the ED by her parents as she still has a very painful ankle and is unable to weight bear. She was seen 3 days earlier by one of the junior registrars and diagnosed with a sprained ankle. She was placed in a tubigrip and told to mobilise as able and take regular paracetamol for pain.

You review her initial X-rays performed 2 days prior when she was in the ED.



Part a (2 marks)

State findings of her X-rays

Model answer:

- Salter Harris type 3 # distal tibia- Tillaux fracture
- Minimal soft tissue swelling
- No splinting/ backslab present

Part b (5 marks)

State your immediate management in the ED

Model answer:

- Prioritise her care-see yourself or assign another senior colleague
- **Apologise for error ie. Missed fracture, promise to investigate**
- Initiate appropriate analgesia- list a drug/ route
- CT ankle to delineate need for OT
- Urgent ortho review
- Elevate/ below knee backslab
(*must apologise for full marks)

Part c (5 marks)

State how you would further investigate the incident once the initial clinical management has been initiated

Model answer:

- Meet with the registrar in private
- Review notes
- Notify DENT/supervisor
- Discuss aspects of care- missed fracture, poor management and discharge advice- no advice for simple STI management -ice, NASIDs, elevation, no planned follow-up- eg GP
- Explore reasons for error- poor supervision, lack of knowledge, failure to seek senior advice/ review
- Explore why radiology did not alert the ED of the fracture- 3 days earlier not formally reported or delay of ED F/U abnormal Xray reports
- Education for trainee
- Review supervision arrangement on the floor

(must address discharge advice and radiology reporting delays to get full marks)*

SAQ 26 Eye trauma (12 marks)

A 45 year old man presents to the Emergency Department following an isolated injury to his right eye.



Part a (3 marks)

Describe the main findings in this image

Model answer:

- Teardrop pupil
- Corneal defect/laceration at limbus at 8 o clock
- Protrusion of iris through defect
- Subconjunctival haemorrhage

Part b (5 marks)

List your immediate management priorities for this injury

Model answer:

- Eye shield
- Bed rest with head up 30 degrees
- Analgesia
- Antiemetics
- IV Abx (NOT topical)
- aDT
- Urgent Ophthalmology consult with admission

Part c (1 mark)

Following significant eye injuries, sympathetic ophthalmia can occur. Describe this condition

Model answer:

Delayed hypersensitivity reaction. Accept autoimmune inflammatory response.

Part d (3 marks)

Other than sympathetic ophthalmia, list three (3) complications of this injury

Model answer:

- Visual loss
- Corneal ulcers
- Endophthalmit

SAQ 27 Dog Bite (12 marks)

A 35 year old male presents to your ED 3 days after a dog bite to his right hand. He has had worsening pain and fever.



Part a (4 marks)

Other than animal bites list four (4) risk factors for wound and soft tissue infections

Model answer:

- Crush injury
- Contaminated wounds
- Diabetic patients
- Immunosuppressed patients
- Patient's with peripheral vascular disease
- Foreign body
- Failure to irrigate wound

Part b (4 marks)

You make the diagnosis of tenor synovitis.

What are the four (4) Kanavel cardinal signs of flexor tenosynovitis?

Model answer:

- Tenderness over flexor tendon
- Circumferential swelling of digit
- Pain on passive extension
- Flexed position of finger at rest

Part c (4 marks)

Describe your management of this patient

Model answer:

- Analgesia
- Elevation
- Antibiotics – Tazocin or Augmentin etc
- ADT
- Orthopaedic / Hand referral