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Question 1

A 34 year old female presents to the ED via ambulance and proceeds to emergently deliver a term baby in a resuscitation cubicle. Immediately after the second stage of labour you notice heavy vaginal bleeding.

Part a

What is the definition of primary postpartum haemorrhage?

Model Answer

Haemorrhage >500mls in the first 24 hours

Part b

List four (4) risk factors for primary postpartum haemorrhage.

Model Answer

- Overdistension of uterus (multiple gestations, polyhydramnios)
- Prolonged labour
- Infection – chorioamnionitis
- Tocolytic use in labour
- Birth trauma – uncontrolled delivery, macrosomia, malpresentation
- Placental abnormalities accreta, increta, percreta – (risk factors being multigravidity, prior c section, placenta previa) previous curettage,
- retained placenta
- Previous PPH
- Preeclampsia
- Episiotomy

Part c

List six (6) immediate interventions you would undertake in the emergency department in this patient to control her postpartum haemorrhage.

Model Answer

- **Deliver the placenta** (10% of PPH) controlled cord traction
- **Uterine massage/bimanual compression** (atony accounts for 75-90% of PPH)
- **Uterotonic agent AFTER ENSURING NO TWIN** oxytocin (preferred in the presence of hypertension and when placenta in-situ), ergometrine, prostaglandins
- Empty the bladder – insert urinary catheter
- Examination of perineum, vagina and cervix for site of bleeding and control of haemorrhage – wound repair or packing (20% of PPH)
- Intrauterine tamponade balloon (Bakri balloon)
- Tranexamic acid 1g

Note: Below are not IN the ED so not accepted.

- Radiological embolisation
- Iliac artery ligation/hysterectomy in theatre or theatre for removal of placenta

Part d

The patient continues to deteriorate and has a pulseless electrical activity (PEA) cardiac arrest. In addition to uncontrolled postpartum haemorrhage, list four (4) most likely causes of PEA in this patient.

Model Answer

- **amniotic fluid embolism**
- thromboembolism
- cardiac causes – aortic dissection/pericardial tamponade
- CNS – subarachnoid haemorrhage
- Sepsis

Part e

With regards to management of pulseless electrical activity cardiac arrest in neonates and adults, complete the following table.

Model Answer

Intervention	Neonate (3 kg)	Mother (70kg)
compression to ventilation ratio	3:1	15:2
FiO2 (%)	1.0	1.0
Adrenaline bolus (mcg)	30 - 90	1000

Question 2

A 45 year old man presents to your emergency department with chest pain. He is assessed by a junior doctor who identifies ST elevation in the inferior leads on the ECG. The HMO believes the patient has acute pericarditis.

Part a

List four (4) ECG features you would look for that would be more suggestive of a STEMI rather than acute pericarditis.

Model Answer

- Anatomically contiguous ST and J point elevation
- ST depression in aVL
- ST elevation in III>II
- Absent PR depression (although can occur in STEMI)
- Reciprocal ST depression
- Prolonged QT may be present
- Dynamic ECG changes that alter rapidly with pain
- ST elevation that is convex up or horizontal

Part b

You assess the patient and review the ECG. You agree with the junior doctor's provisional diagnosis of acute pericarditis.

List five (5) non-infectious causes of acute pericarditis.

Model Answer

- Idiopathic
- Malignancy
- Drug induced (procainamide, hydralazine)
- Systemic rheumatic diseases (SLE, RA, scleroderma, polyarteritis nodosa, dermatomyositis)
- Radiation Induced
- Postmyocardial infarction (Dressler's syndrome)
- Uraemia
- Myxoedema

Part c

The patient has a blood pressure of 90/70mmHg with heart rate 115 bpm. You perform a bedside echocardiogram and detect a large pericardial effusion.

Other than the presence of a pericardial effusion, list three (3) echocardiographic features that would be consistent with cardiac tamponade.

Model Answer

- Right atrial compression – occurs at end of diastole
- Right ventricular collapse – occurs during early diastole
- Left atrial collapse – occurs in 25%, highly specific
- Abnormal respiratory variation in tricuspid and mitral flow velocities
- Dilated inferior vena cava with a lack of inspiratory collapse

Question 3

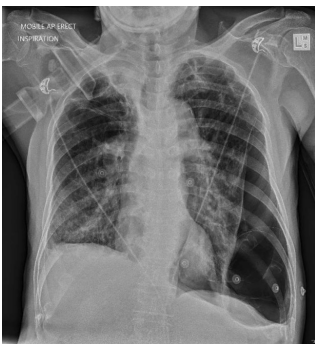
An 80 year old gentleman presents with acute dyspnoea, onset 2 hours ago. His past history is unclear. On arrival he is placed on non-invasive ventilation.

His vital signs are:

HR	107
BP	110/70
SaO ₂	95% on 50% FiO ₂
Temp	36.4 oC
RR	24

Part a

A portable CXR is taken soon after his arrival. List three (3) abnormal findings in this CXR image.



Model Answer

- Left sided pulmonary bulla
- Left sided loculated pneumothorax – ½ mark only if does not specify “loculated”
- Hyperinflated left hemithorax
- Emphysematous changes or scarring to background lungs
- Non-invasive ventilation circuit

?bullae R side too, upper zone?

Part b

State the immediate change in your initial management required after these CXR findings.

Model Answer

Stop non-invasive ventilation / change to other form of supplemental O₂ (eg NRBM).

Part c

In general, List six (6) causes for the most important finding on this CXR.

Model Answer

- Chronic lung disease, eg COPD, interstitial lung disease

- Infection, eg necrotising pneumonia, PJP, TB
- Malignancy, eg lung Ca, sarcoma
- Connective tissue disease, eg marfan's syndrome,
- Valsalva, eg cannabinoid use
- Trauma
- Iatrogenic

Part d

Your resident asks about the utilisation of point of care ultrasound in this patient. Complete the table below listing different lung ultrasound findings you would expect in the right and left chest for this patient.

Model Answer

Right Lung findings on ultrasound	Left lung findings on ultrasound
lung sliding present	absence of lung sliding
A-lines	lung point barcode sign

Question 4

A 60 year old woman presents to your Emergency Department with two days of increasing abdominal pain and vomiting. She has no significant medical history, with no prior surgeries. You suspect a small bowel obstruction (SBO).

Part a

List five (5) potential causes of SBO in this patient.

Model Answer

- Hernia (most common – incarcerated groin hernia)
- Neoplasm (GI, lymphoma)
- Gallstone
- FB (including bezoar)
- Stricture
- Stenosis
- Diverticulitis
- Abscess
- SMA syndrome
- Intussusception
- IBD

Part b

As part of your assessment, you perform a bedside ultrasound to assess for SBO.

List three (3) ultrasound findings that would support the diagnosis of SBO.

Model Answer

- 'To and fro' prominent peristaltic movement
- Dilated loop of small bowel (>25mm jejunum, >15mm ileum)
- Bowel wall thickness >4mm
- Decreased/absent peristalsis
- "Tanga" Sign

Part c

As part of your management, you elect to insert a nasogastric tube (NGT).

In general, LIST four (4) contraindications to NGT insertion in any patient.

Model Answer

- Suspected basal skull fracture
- Nasal obstruction
- Oesophageal perforation
- Aorto-enteric fistula
- Patient refusal

Question 5

A 34 year old man is brought to your Rural Emergency Department, one hour after being struck by a car. He is conscious, complaining of a painful R leg. He has no other injuries.

A photo of his legs is shown below:



Part a

List two (2) important abnormal features shown in this photograph.

Model Answer

Grossly swollen shin/calf concerning for compartment syndrome

Dusky discoloration of foot

Grossly swollen knee- ? haemarthrosis

bruising medial knee and ankle

Part b

Xrays of his leg are shown below:

List three (3) abnormal features on these Xrays.



Model Answer

1. Comminuted fracture of proximal tibia

2. Fracture of proximal fibula
3. Tibial plateau fracture
4. Soft tissue swelling in calf

Part c

The patient has received adequate analgesia. List your next three (3) priorities in the management of this injury in the Emergency Department.

Model Answer

Immobilise in above knee backslab in position of comfort

Assessment of compartment pressures

fasciotomy if compartment pressures >30mmHg

Part d

List four (4) potential complications of this injury.

Model Answer

1. Disruption of the popliteal artery – transection, damage, aneurysm etc
2. Compartment Syndrome
3. Injury to common peroneal nerve

Additional responses
Non union or malunion
Complications from surgery

Question 6

A 78 year old man presents to your Emergency Department with sudden vision loss in his right eye. He initially noted a diplopia and subsequently was told by his wife that his right eye was bulging.

On examination he has proptosis. Visual acuity is light perception only.

You suspect orbital compartment syndrome.

Part a

List 4 pathological processes that can lead to orbital compartment syndrome.

Model Answer

Any 4 from below

- Retrobulbar haemorrhage
 - Trauma
 - Vascular malformations/tumors
 - Orbital Surgery
- Cellulitis/infection/Abscess
- Spontaneous from anticoagulant use or bleeding disorder.
- Extravasation of dyes/contrast/fluid (burns)
- Orbital malignancy (mass effect)

Part b

Part b

Apart from proptosis and vision loss, list three (3) further clinical examination findings that would help confirm orbital compartment syndrome.

Model Answer

Any 3 from below

- Extraocular eye movements: limited extraocular motility.
- Pupils: RAPD.
- Tonometry: increased intraocular pressure (IOP)
- External appearance: diffuse subconjunctival haemorrhage, tight eyelids (rock hard) with echymosis and chemosis.
- Fundoscopy: papilloedema from compressive optic neuropathy may be present, retinal artery or vein occlusion.

Part c

You confirm orbital compartment syndrome. The patient requires a lateral canthotomy.

List five (5) steps in performing a lateral canthotomy and cantholysis.

Model Answer

Need steps 3 to 6 (can combine consent/sedation/analgesia/prep in 1 point)

1. Informed consent.
2. Sedation if required, analgesia (appropriate drug, dose, route), Clean/Prep
3. Inject 1-2ml of 1% lignocaine with adrenaline into the lateral canthus. Stay away from the globe.
4. Devascularise the Lateral Canthus: Use a small clamp to clamp/crush the tissues for about 15-30 seconds.
5. Make an Incision into the lateral canthus- staying away from the globe.
6. Next cut the lateral canthal tendon by pulling the lower eyelid forward and inferior to expose the tendon.

Question 7

A 38 year old female presents to the Emergency Department with altered mental state, ataxia and nystagmus. She has a past history of frequent attendances due to intoxication with alcohol.

HR	110
BP	100/80
RR	12
Temp	38.8 oC
CGS	10 (E3 M3 V4)

Part a

List five (5) important aspects of her history.

Model Answer

- Social situation
- Hx of trauma
- Suicide risk assessment
- Preg test
- Co ingestions
- Allergies
- Medications
- Recent infection/ focal sx of infection
- Diet

Part b

List four (4) investigations with rationale for each.

Model Answer

- **Glucose required**
- Preg test
- LFTs
- U and e
- Se etoh
- ECG
- CXR
- Cultures blood, urine
- VBG glucose, anion gap
- Thiamine levels

Part c

Your junior registrar has reviewed the patient and believes they have Wernicke's encephalopathy.

List two (2) ocular findings associated with Wernicke's encephalopathy.

Model Answer

1. Gaze palsy with nystagmus,
conjugate gaze palsy,
6th nerve palsy, ptosis,
2. sluggish pupils,
anisocoria

Part b

Prescribe your specific treatment for Wernickes encephalopathy.

Model Answer

Intravenous thiamine 500 mg three times a day

Question 8

A 75 year old female presents from her nursing home with a one week history of worsening confusion, lethargy and hypothermia. She is now obtunded. Her TSH is markedly elevated, and you suspect myxoedema coma.

Part a

Apart from those mentioned in the stem, list five (5) physical examination features of myxoedema coma.

Model Answer

- Hypotension
- Bradycardia
- Hypoventilation
- Signs pericardial effusion
- Signs pleural effusion
- Puffiness of hands and face/thick skin/tongue enlargement
- Non-pitting peripheral oedema
- Alopecia
- Slow reflexes
- Peripheral neuropathy
- Proximal myopathy
- Psychosis
- Absence of shivering with hypothermia
- Signs urinary retention
- Carpal tunnel signs/ other nerve entrapment signs
- Signs of ileus

Part b

Apart from thyroid hormone levels, list four (4) blood test **abnormalities** you would expect to find in this patient.

Model Answer

- Hyponatraemia
- Hypoglycaemia
- Hypercapnia
- Hypoxaemia
- Renal impairment (Accept maximum one of raised creat/urea decrease eGFR)
- Low cortisol levels
- Bloods consistent with cause (e.g. raised TnI if specifically states that it is to do with cause, not just listed on its own)

Part c

Give your T3 and T4 dosing for treatment of this patient.

Model Answer

T3- 25-50mcg IV bolus then 10-20mcg tds IV

T4 300-500mcg IV bolus then 50mcg IV per day

NB Only bolus dose required for mark. Accept reasonable doses, within the ranges listed.

Part d

What other essential treatment (including dose) would you give?

Model Answer

Hydrocortisone 100mg tds/qid

Question 9

An 80 year old man has been transferred to your Emergency Department from his nursing home with an altered conscious state.

An arterial blood gas sample has been taken and the results are:

		Reference Range
FiO ₂	.21	
pH	7.09	7.35-7.45
paCO ₂	72 mmHg	35-45 mmHg
HCO ₃	27 mmol/L	22-26 mmol/L
paO ₂ -	50 mmHg	80-100 mmHg

Part a

What is your interpretation of the Arterial Blood Gas? State three (3) points in your answer.

Model Answer

Acute pure respiratory acidosis with no ventilation perfusion mismatch.

Part b

Show four (4) calculations to justify your interpretation.

Model Answer

Expected pH for pure acute respiratory acidosis = $7.35 - 0.008 \times (72-40) = 7.09$

Expected HCO₃ for acute respiratory acidosis = $24 + (72-40)/10 = 27.32$

A-a gradient = $713 \times 0.21 - (1.25 \times 72) - 50 = 10$

Expected A-a gradient for age = $80/4 + 4 = 24$

Expected pO₂ for age with this paCO₂ = $> 60 - 24 = > 36$

Part c

Give two (2) likely causes for his acid/base status and for each of those causes give one (1) intervention that is likely to quickly reduce his paCO₂. Do not list the same intervention twice.

Model Answer

- Opiates
- Benzodiazepines and other sedatives
- Stroke and other acute intracranial event
- Cervical spine injury and other causes of acute respiratory paralysis

Interventions include:

- Naloxone
- Flumazenil
- Ventilation

Part d

What is his O₂ saturation approximately?

Model Answer

O₂ sat is approximately 80. (accept 75-85)

Part e

If a patient with chronic CO₂ retention is administered excessive oxygen list two (2) important mechanisms by which the CO₂ may rise.

Model Answer

Increased V/Q mismatch due to increased blood flow to poorly ventilated alveoli.

Haldane effect causing offloading of CO₂ from red cells.

Question 10

A 78 year old woman with a past history of COAD, Type 2 diabetes, hypertension, hypothyroidism, presents with SOB in the setting of respiratory sepsis.

On arrival, she looks unwell with increased work of breathing. Her initial examination findings are:

- A patent
- B RR 32, SaO₂ 94% on room air, creps at right base, expiratory wheeze bilaterally
- C HR 125 /min , BP 105/70. mmHg
- D GCS 15/15
- E Temp 39.3 oC, BSL 18 mmol/L

She has no epidemiological risk factors for COVID-19 but precautions are taken given she has respiratory symptoms.

Early in her presentation she receives IV antibiotics, slow IV fluids, bronchodilators and corticosteroids.

While in the department her oxygenation deteriorates and she looks more unwell.

Part a

List three (3) methods for improving oxygenation in this patient with one (1) pro and one (1) con for each.

Model Answer

Method	Pros/Cons
Nasal Prongs	Pro: Comfortable for patient. Low flow available and can titrate O ₂ to try and prevent hypercapnia if a CO ₂ retainer Con: Unlikely to improve oxygenation sufficiently in this patient
Non rebreather mask	Pro: Able to deliver flow up to 15L/min without being uncomfortable Con: Potential for hyperoxygenation with disruption to respiratory drive if patient is a known CO ₂ retainer. May lead to CO ₂ narcosis
High Flow Nasal Prong Oxygen	Pro: Able to deliver higher flow rates and FiO ₂ than NRB. Due to humidified air, more comfortable for patient. May avoid intubation Con: May lead to delays in decision making regarding intubation due to "waiting for improvement". Is an aerosolising procedure sob

	requires single room/negative pressure room which can be challenging resource wise.
Non invasive ventilation	<p>Pros: Improve removal of CO₂ as well as oxygenation. May prevent need for intubation and the potential complications of that.</p> <p>Cons: May worsen hypotension. May cause claustrophobia and agitation for patient. Is an aerosolising procedure so requires single room/negative pressure room which can be challenging resource wise.</p>
Intubation/Invasive ventilation	<p>Pros: Provides oxygenation and ventilation control as well as takes over work of breathing</p> <p>Cons: May not be appropriate level of care for patient. Risks posed due to induction agents – predominantly haemodynamic instability, potential for failed procedure</p>

Part b

She continues to deteriorate with worsening hypoxia and hypotension. You feel that she requires intubation.

State five (5) steps you would do in preparation for intubation.

Model Answer

1. Establish patient's wishes/goals of care and gain consent – relies on patient's level of competence. If not able to provide this herself, check with MPOA or with prior Goals Of Care form from previous visit
2. Optimise oxygenation – keep patient sitting up till last minute, utilise most comfortable means of oxygenation that ensures compliance
3. Optimise BP in anticipation of post induction hypotension – use IV fluids judiciously along with vasopressors (can start Metaraminol peripherally as a bridge to central access and Noradrenaline). Choose more cardiac stable induction agent eg Ketamine, Fentanyl.
4. Assemble team and ensure all in full PPE for aerosol generating procedure. Most experienced team member to carry out intubation
5. Prepare equipment and medications – video laryngoscope, bougie, equipment for direct laryngoscopy, LMA, surgical airway equipment, vasopressors, induction agent, paralysing agent, ongoing sedation. Utilise checklist.

Part c

Post intubation, her BP drops to 85/50.

List two potential causes and state a management step for each.

Model Answer

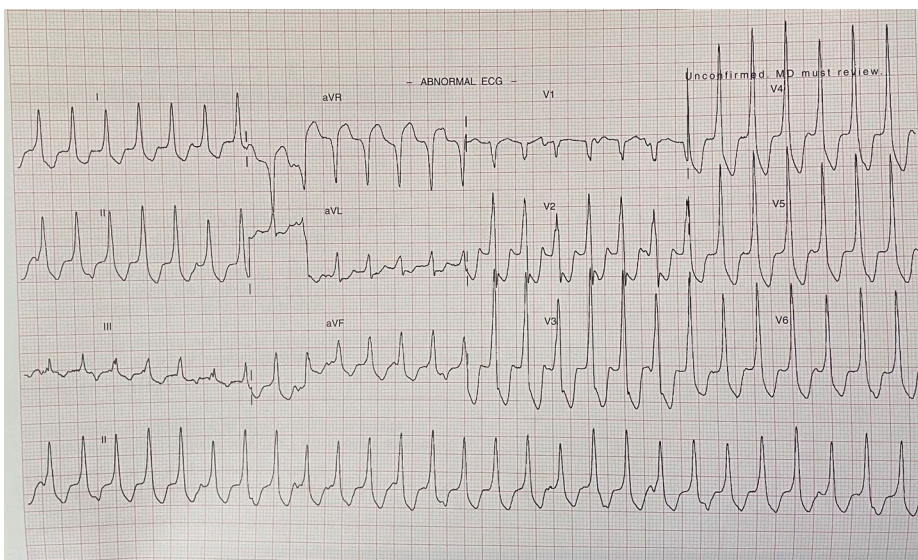
Cause for hypotension	Management
Vasodilatory shock due to sepsis	Vasopressors Judicious boluses of IV fluids, titrated to effect
Decreased Venous return due to auto PEEP	Disconnect from ventilator and manually assist patient to expire Alter ventilator settings to allow for hypercapnia and prolong I:E ratio
Tension Pneumothorax	Finger thoracostomy followed by formal ICC
Side effect of Induction agent	Vasopressors IV fluids
Anaphylaxis	Adrenaline IV fluids If due to paralyzing agent, reversal agent as appropriate

Question 11

A 55 year old male is brought in by ambulance with palpitations. He is placed into a resus bay and has intravenous access inserted. He has no chest pain and his vital signs are as follows:

HR 180 bpm
BP 120/80 mmHg
Sats 96% RA
Temp 36.5 oC

This is his ECG.



Part a

In the following table list four (4) ECG features that help distinguish VT from SVT and whether they are present on this man's ECG.

Model Answer

ECG Feature	Present or Absent
• AV dissociation	• Y
• very broad complexity >140ms	• N
• capture beats	• N
• fusion beats	• Y

ECG Feature	Present or Absent
<ul style="list-style-type: none"> • concordance 	<ul style="list-style-type: none"> • N
<ul style="list-style-type: none"> • absence of rS, RS, or Rs complexes • in chest lead 	<ul style="list-style-type: none"> • N
RS duration > 100ms in any lead	N
not typical LBBB or RBBB	Y

Part b

List, in sequence, four (4) steps you would take to achieve cardioversion.

Model Answer

Must reflect an approach to a stable patient in ED

- correct underlying cause
- pharmacological management of appropriate drug
- amiodarone or sotalol
- Cardioversion if medical management fails - with safe sedation
- Consider overdrive pacing if above not effective

Question 12

A 28-year-old female has been brought to your emergency department by concerned work colleagues. They have noticed a significant change in her behaviour over several months. Large amounts of money are missing from company accounts.

From your assessment she has normal cognition but is poorly engaged and repeatedly states there is nothing wrong.

You suspect this is a first presentation of bipolar disorder.

Part a

In addition to increased spending and/or gambling (risk taking behaviour), list four (4) **other** typical symptoms that would be highly suggestive of an acute manic episode in this patient.

Model Answer

- Easy distractibility (to unimportant or trivial things)
- Decreased sleep (or need for sleep)
- Flight of ideas/racing thoughts
- Pressured speech
- Grandiose delusions
- Increased psycho-motor activity.
- irritability

Part b

List six (6) symptoms that would indicate a major depressive episode.

Model Answer

- Depressed mood
- Markedly diminished pleasure or interest in nearly all activities
- Significant weight loss or gain or significant loss or increase in appetite
- Hypersomnia or insomnia
- Psychomotor retardation or agitation
- Loss of energy or fatigue
- Feelings of worthlessness or excessive guilt
- Decreased concentration ability or marked indecisiveness
- Preoccupation with death or suicide; patient has a plan or has attempted suicide

Part c

State two (2) non-psychiatric differential diagnoses to be considered when assessing a patient with acute manic episode.

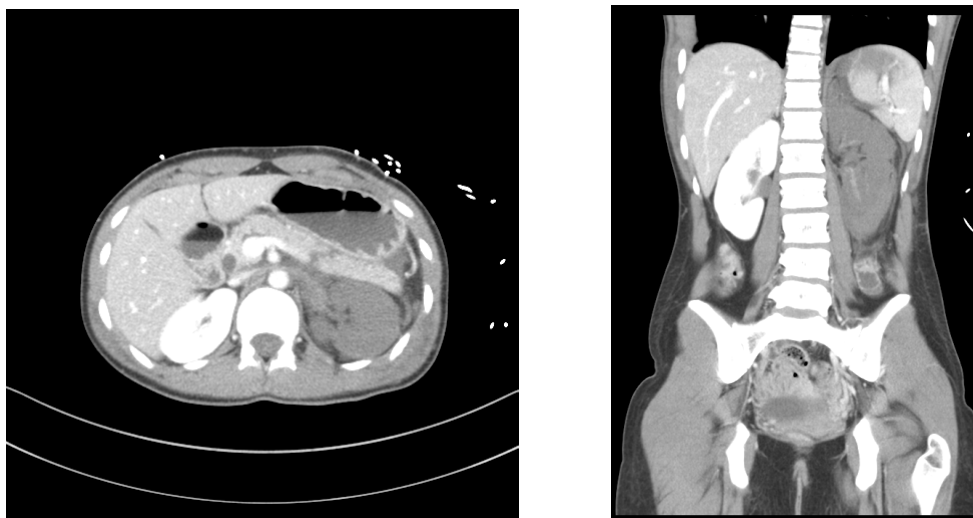
Model Answer

- Endocrine disorders (with example) (eg hyperthyroidism, Adrenal insufficiency, hyperparathyroidism)
- Stimulant Drug intoxication (substance abuse)
- Drug withdrawal state (with example)

- Encephalopathy (with a reasonable cause, including CNS infections) • Acute intermittent porphyria
- Seizure disorders

Question 13

A young unidentified patient presents to your tertiary ED after a car accident in which they were unrestrained. An urgent CT is obtained and single axial and coronal portal venous contrast phase slice of this series is shown below.



Case courtesy of Assoc. Prof Craig Hacking, Radiopaedia.org, rID: 34984

Part a

List three (3) abnormal findings seen in this CT.

Model Answer

- Left Devascularised Kidney
- Pancreatic Transection
- perinephric haematoma

Part b

Regarding the use of CT in blunt abdominal and pelvic trauma, list five (5) pathologies which may frequently be missed on the initial scan.

Model Answer

- Hollow Viscus Injury
- Pancreatic Injury
- Mesenteric Tear
- Site of bleeding with only haemoperitoneum
- Pelvic Bleeding unless large amount
- Urinary Bladder injuries
- Liver capsular injuries
- Diaphragmatic Injuries

Part c

Regarding the use of thromboelastogram (TEG) in trauma, please list a treatment response to the following TEG result.

Model Answer

1. Increased R time = FFP
2. Decreased Alpha Angle = cryoprecipitate
3. Decreased MA = platelets (consider DDAVP)
4. Fibrinolysis = tranexamic acid (aminocaproic acid)

Question 14

A junior doctor from a rural clinic has phoned you to seek advice. A 13 year old female patient has been brought in by her parents with a severe acute behavioural disturbance.

All attempts at verbal de-escalation have failed. No trigger has been identified and she has no access to any prescription or recreational drugs.

She weighs 50kg, has a past history of Autism, with no regular medications and no known allergies.

She has not received any other treatment so far.

Part a

Complete the table by listing your advice for first line sedation options.

Model Answer

Drug (any 2 of the following)

- Lorazepam 1-2mg, oral. resp depression, paradoxical effect
- Olanz 5-10mg, oral/SL. extrapyramidal, neuroleptic malignant, antiCh, hyperglycaemia, QTc prolongation
- Diazepam 0.2-4mg/kg(10mg max), oral. resp depression, paradoxical effect
- Risperidone 0.02-0.04mg/kg (2mg max)oral. extrapyramidal, neuroleptic malignant

Part b

The patient is kicking and screaming and now refusing oral medication. She is being physically restrained by parents and staff.

Complete the table by listing your advice for second line sedation options.

Model Answer

For further sedation required

- Droperidol 0.1-0.2mg/kg (10mg max) IM Extrapyramidal
- Olanzapine 10mg IM Extrapyramidal, neuroleptic, antiCh, Hyperglyc, QTc inc
- Ketamine 4mg/kg (max 200) IM or 1mg/kg (max 50) IV Vomit, Emergence, or laryngospasm if IV used
- Midaz 0.1-.2mg/kg (max 10mg) IM or IV Resp Depression/apnoea or paradoxical effect

Question 15

After taking an active interest in the prevention of adverse events for patients, your director has allocated you to the Patient Safety portfolio.

Part a

List two (2) factors shown to increase rates of adverse events for patients.

Model Answer

1. ED overcrowding / access block
2. Inadequate handover

Part b

You have discovered that your department has an unacceptably high rate of patients who “Did Not Wait” from the ED waiting room.

List four (4) factors associated with patients who “Did Not Wait”.

Model Answer

1. Prolonged waiting time
2. ED overcrowding
3. Lower socioeconomic status
4. Arrival after hours
5. Young adults
6. Parents with young children
7. Less urgent triage categories
8. Non-English speaking background

Part c

Complete the following table with respect to the prevention of patients leaving without being seen and the management of those who failed to wait to be seen. State three (3) strategies for each heading.

Model Answer

STRATEGIES TO PREVENT PATIENTS FROM LEAVING WITHOUT BEING SEEN	STRATEGIES TO MANAGE THOSE WHO LEAVE BEFORE BEING SEEN
Education: Ready access to information about the triage process and what to expect in the emergency department eg. Videos, posters	Provide alternatives to care prior to patient leaving eg. GP, urgent care centre, home visiting doctor, telehealth services
Comfort: Easy access to toilets, vending machines, TV	Liaison team dedicated to calling and follow up of patients who did not wait as soon as possible after leaving, recall those patients deemed to be at high risk
Communication: improved communication with patients regarding waiting times, clear escalation	Regular audits, implementation of Did Not Wait KPI's with frequent benchmarking to assess performance

policy for concerned patients/change in patient condition	
Assessment & Treatment: nurse-initiated analgesia and xrays at time of triage, dedicated WR staff (nurse +/- doctor) to instigate assessment and treatment in triage cubicles, frequent re-evaluation of WR patients	
Decrease overcrowding: direct admission to short stay unit, hospital-wide processes to decrease access block	

Question 16

A 40 year old male presents to your Emergency Department with worsening painful rash and a headache for 2 days.

His past medical history includes HIV and diabetes.

Part a

List 2 abnormalities seen in these photographs of his rash.



Model Answer

crops of vesicular rash, not crossing the midline, band like pattern, some crusted over, erythematous base

Part b

List two points about the most likely diagnosis & please be as specific as you can.

Model Answer

- Disseminated shingles (or Disseminated zoster) acceptable (Shingles is not enough)
- T2 C8 Dermatome

Part c

Other than blood tests, list and justify three (3) investigations you would perform in the ED.

Model Answer

1. Swab – must specify PCR of vesicle
2. CT Brain to exclude
3. LP (timing)
4. XR chest

Part d

Apart from consultation with infectious diseases, list three (3) other steps in your management of this patient.

Model Answer

- IV aciclovir
- analgesia
- single room

Part e

The triage nurse approaches you and confides that she is 20 weeks pregnant and concerned about contact with the patient. Apart from consulting with infectious diseases, list two (2) important steps in your management.

Model Answer

- Collecting baseline serology
- emotional support

Question 17

A 45 yr old male has been brought into your ED after a cardiac arrest in the community. ROSC was achieved after 2 cycles of CPR and 1 mg of Adrenaline.

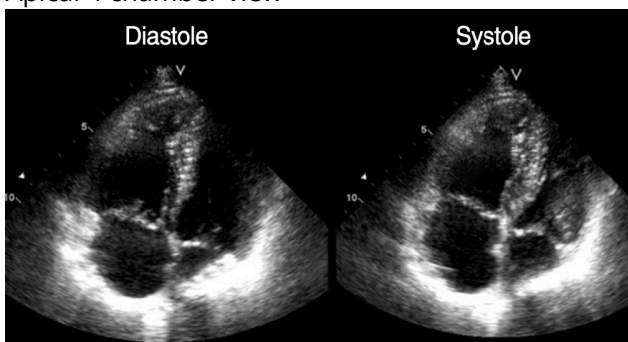
His vitals on arrival are:

Temp	36.6 °C
P	45 bpm
BP	85/50
RR	30
SaO ₂	90% on 15 L O ₂ via facemask
GCS	12/15

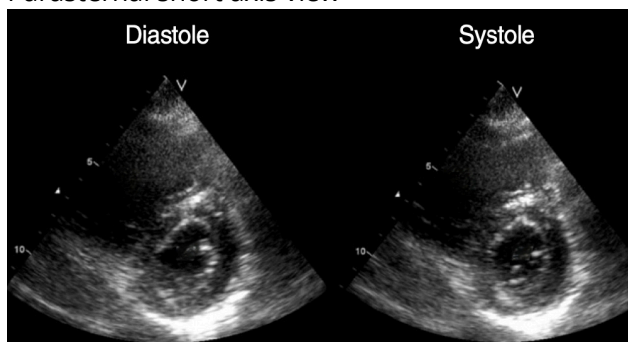
Part a

As part of his initial assessment a POCUS exam is performed with the following images obtained.

Apical 4 chamber view



Parasternal short axis view



List four (4) important abnormal findings seen.

Model Answer

1. RV dilatation: ratio of RV/LV end-diastolic area > 1.0
2. RV dilatation: septal flattening (D-sign)
3. paradoxical septal wall motion
4. RV free wall hyperkinesis and systolic dysfunction
5. small LV size

Part b

What is the most likely diagnosis?

Model Answer

Massive Pulmonary Embolism

Part c

List three (3) other POCUS findings that would support your diagnosis?

Model Answer

1. McConnell's sign
2. Proximal DVT
3. visible clot
4. Reduced TAPSE <1.6 cm
5. Dilated IVC with lack of respiratory collapse

Part d

List two (2) pro's and two (2) con's of a specific treatment you would consider for this patient.

Model Answer

Pro:

1. rapidly reduce clot burden to reduce RV strain and thereby haemodynamic
2. reduce long term pulmonary hypertension
3. appears to have mortality benefit in massive PE, inconclusive in submassive

Con:

1. ICH and other significant bleeding risk
2. Cost

Question 18

A 10 day old baby presents to your emergency department via ambulance with parents reporting episodes of being unresponsive, floppy and short of breath.

Part a

List six (6) likely differential diagnoses you would consider.

Model Answer

- Sepsis – grp B strep bacteraemia etc
- Congenital heart disease – coarctation/ etc
- Endocrine disturbance – adrenal insufficiency/ hypoglycaemia
- NAI – head injury
- Electrolyte disturbance – Na⁺,
- Also seizures/ GI emergencies acceptable

Part b

List three (3) clinical signs that would make you suspect a duct dependant cardiac lesion?

Model Answer

- Cyanosis / Hypoxia
- Hyperoxia test: failing to increase SaO₂
- No femoral pulses
- Hepatomegaly
- Murmur

Part c

The neonate has the following vital signs:

Temp	35.3 °C
HR	180 bpm
RR	65 bpm
BP	65/30 mmHg
O ₂ sats	80 % RA
Temp	37.8 °C
capill return	3 seconds
Weight	4 kg

The neonate is in a resuscitation cubicle and you have managed to site an IV line. BSL 4.2 mol/L

State five (5) initial resuscitation treatment steps including doses where applicable.

Model Answer

1. fluid bolus – 10-20mls/kg 0.9% NaCL (80MLS)
2. Antibiotics – benzylpenicillin 60mg/kg and ceftazidime 50 mg/kg
3. Resp support – oxygen via HFNC/ CPAP or BIPAP, consider intubation if altered conscious state
4. Prostaglandin infusion –
5. Inotrope vasopressor if not improvement – adrenaline 0.1mcg/kg/min

Part d

Following your resuscitation the baby has prolonged apnoea's and you decide to intubate.

Fill in the following table regarding the intubation plan.

Model Answer

Medication	ETT
Name: Ketamine/Fentanyl	Size: 3.5/4 (uncuff) or 3/3.5 (cuffed)
Dose: 2mg/kg or 1mcg/kg	Depth: oral 10cm/nasal 12 cm

Question 19

A 30 year old female is brought to your emergency department after a suspected drug overdose. She was found in an altered conscious state at her residence and was witnessed to have a tonic clonic seizure by Paramedics on their arrival. She has received 3x 5mg IV Midazolam but continues to actively seize on her arrival to the ED over 40 minutes after she was first found.

Her vitals on arrival:

HR 130 bpm
BP 160/100 mmHg
Sats 95 % 15L O₂ via NRB mask
Temp 39.5 °C

Part a

Please list four (4) specific poisons which may cause benzodiazepine resistant seizures with one specific antidote for each?

Model Answer

Poison	Antidote
Isoniazid	Pyridoxine
Tricyclic antidepressants	Sodium bicarbonate
Local anaesthetics	Intralipid
Insulin (or other toxicological cause of hypoglycaemia eg sulphonylureas)	Glucose
Some Opiates eg dextropropoxyphene	Naloxone
Cyanide	hydroxocobalamin, thiosulfate
Cholinergic agents (cause altered mental status and fasciculations but may cause seizures via hypoxia)	Atropine and pralidoxime
arsenic	Dimercaprol

Other appropriate answers may be acceptable

Nb some other causes of seizures such as serotonin syndrome and salicylates have specific treatments but the seizures will usually respond to benzodiazepines

Part b

The patient continues to have seizures and requires intubation. List four (4) significant complications of prolonged seizures that may develop in this patient.

Model Answer

- Direct CNS injury
- Rhabdomyolysis and subsequent acute renal failure
- Hyperpyrexia – causing secondary multi-organ failure
- Hyperkalaemia – cardiac arrhythmias
- Hypoglycaemia
- Cardiovascular collapse/pulmonary oedema/hypotension

Part c

The patient is stabilised and the seizure has been controlled. Complete the table below, list two (2) toxidromes which could potentially explain this presentation and for each state two (2) clinical findings that would make it more likely.

Model Answer

Toxidrome	Clinical findings			
Serotonin syndrome	Neuromuscular excitation - Clonus (especially spontaneous), hyperreflexia, rigidity,	Altered mental status - Delirium, confusion	Autonomic instability eg diarrhoea, flushing	
Sympathomimetic	Agitation, paranoid psychosis	Siadh + Hyponatraemia secondary to cerebral oedema	Vascular emergency eg dissection, sah	cardiomyopathy, dysrhythmias APO

Question 20

An 18 month-old boy is brought to the ED with fever and reduced neck movements. Apart from a temperature of 38.3 °C he looks well and is playing happily in the ED cubicle.

On examination, he is reluctant to move his head to the left.

A lateral neck x-ray is taken and shown below.



Part a

What is the most likely diagnosis?

Model Answer

Retropharyngeal abscess

Part b

What is the justification for your conclusion (x-ray findings to support this diagnosis)?

Model Answer

Large retropharyngeal swelling (>1 vertebral body width)

Part c

List four (4) appropriate management steps.

Model Answer

- IV access
- Avoid upsetting child
- IV antibiotics (IV augmentin or IV ceftriaxone) - - required to get at least 2/4
- IV steroids (dexamethasone 0.15-0.6 mg/kg)
- Admit (under paediatrics / ENT) - required to get at least 2/4
- Analgesia (with appropriate doses for full mark)
- ENT consultation

Part d

List six (6) signs would indicate worsening airway obstruction in this child?

Model Answer

- Cough
- Stridor
- Reduced activity
- Hypoxia
- Agitation
- Use of accessory muscles (retraction / recession)
- Drooling / inability to swallow
- Change in voice

Question 21

An 18 year old presents with progressive pain, swelling and erythema of his distal phalanx. Ten days earlier he had sustained a deep abrasion to the dorsum of his left ring finger whilst playing hockey on artificial grass.

The picture of his finger is shown below:



Part a

Please state how would you describe the findings to the plastic registrar.

Model Answer

Must mention Correct anatomical location to get the full mark

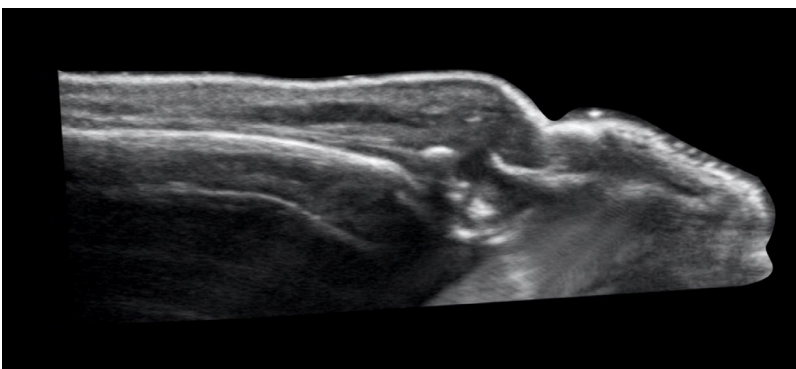
Swelling and redness over the cuticle with destruction of the proximal nail bed.

Paronychia

unusual chronicity

Part b

List Three (3) abnormal findings on the Point of care ultrasound (POCUS) shown below.



Model Answer

- Disruption of the dorsal distal phalanx
- loss of the normally smooth echogenic cortical surface
- pus

- soft tissue swelling

Part c

State one (1) important point you need to emphasize when consulting the plastic team.

Model Answer

unusual chronicity

Part d

Excluding analgesia, state three (3) important and specific management steps in this patient.

Model Answer

- OT
- IVAB with correct dose/rout + prolong AB 2[^] OM
- Tetanus immunoprophylaxis
- Splint

Part e

State one (1) POCUS technique you would utilise for patients with painful digits to increase your image quality and sensitivity.

Model Answer

Water Bath ultrasound imaging

With the patient's finger being exquisitely tender the water bath method of digit ultrasound was employed.

Method: Using a water bath can assist in obtaining good quality images in patients suffering painful digits. The finger and the imaging end of the ultrasound probe are submerged. A centimetre or two of water is allowed between the finger and probe enabling complete and accurate imaging without touching the finger.

Question 22

A 7 yr old girl presents with her mother with a straddle injury to her genital region, the injury occurred while she was at her friend's house.

Part a

List four (4) relevant factors to address in your history.

Model Answer

- Mechanism of injury
- Witnesses
- First aid applied
- Ability to pass urine + faeces
- Degree of bleeding
- Exclusion of NAI (**must be mentioned to get full marks**)

Part b

List three (3) important factors to evaluate on examination.

Model Answer

- Ability to see edges of wound
- Is there anal or rectal involvement
- Degree of bleeding

Part c

She is really anxious about the examination. List two (2) options to facilitate the examination.

Model Answer

Procedural sedation with Midazolam PO/IN or Nitrous sedation

Examination under ketamine/anaesthesia

(happy to accept distraction therapy as an option)

Part d

She is ready for discharge, but parents are very concerned about her discomfort especially with voiding. List two (2) practical tips to reduce her symptoms.

Model Answer

- salt water baths for comfort
- Barrier cream/topical anaesthetics to wound
- Simple oral analgesia

Question 23

An 80 year old female with the past medical history of hypertension, hyperlipidemia and depression is brought in to the Emergency department from home by her family. She was last seen the previous day when she seemed lethargic.

Her vital signs on arrival:

BP	70/50 mmHg
HR	40 bpm
Temp	31.0 °C
O2 Sat	80 % 40 % FiO2
GCS	10 E3V2M5

Part a

List four (4) differential diagnoses for her presentation.

Model Answer

hypothermia (environmental)

sepsis

cardiovascular (CVS/ CNS)
toxicology (OD),

Part b

State four (4) important steps in her management.

Model Answer

- establish GoC
- warming patient (endogenous, exogenous: external/core)
- seek and treat underlying causes
- seek and treat complications

Part c

In general list four (4) important points you need to consider when resuscitating a hypothermic patient.

Model Answer

- optimal rate and technique of CPR in unknown
- inefficiency of DC cardioversion in low body temperature
- inefficiency of drugs (absorption and metabolism) in low body temperature
- risk of too much handling causing VF

Question 24

A 12-month-old previously well boy, immunised and without any allergies, is brought to your emergency department with a four-day history of fever, cough and nasal congestion and now he has developed a petechial rash on his lower back.

He is bright and alert with the following vital signs:

Temp	38.5 °C
HR	150 bpm
RR	38 /min
Sats	98 % RA
Weight	10 kg

Part a

List three (3) specific characteristics of a petechial rash.

Model Answer

Non-blanching, not palpable spot or bruise < 2mm. Point for each correct description

Part b

List four (4) potential differential diagnoses.

Model Answer

1. Sepsis- mandatory
2. ITP
3. Viral
4. Leukaemia
5. Vasculitis
6. Local trauma/ pressure

Part c

Using this table, List three (3) investigations with one (1) rationale for each.

Model Answer

1. CRP. If < 8 reassuring (along with other criteria)
2. FBC- if WCC 5-15 reassuring, check platelets for ITP, look for leukaemia
3. Blood culture. Look for bacteraemia.
4. Viral swab- ongoing fever with viral symptoms
5. VBG- check lactate/ acidotic in setting potential sepsis

Part d

His rash is spreading while in ED and he looks more unwell, so you decide to give him antibiotics. Please prescribe the antibiotics.

Model Answer

Cefotaxime 500mg IV 6 hourly/ ceftriaxone 500mg or 1000mg IV once daily

Flucloxacillin 500mg IV 6 hourly

Question 25

You are a 1st year Emergency physician at a metropolitan ED.

Your director has asked you to develop an ED guideline/protocol on recognition and diagnosis of suspected thrombosis with thrombocytopenia syndrome (TTS) following Astra-Zeneca ® COVID-19 vaccine.

Part a

State four (4) common presenting features of TTS.

Model Answer

- Headache (or other neuro sx) - cerebral venous thrombosis
- Abdominal pain - splanchnic vein thrombosis
- Chest pain, SOB, leg swelling - DVT/PE
- Bleeding, bruising etc - thrombocytopenia

Part b

State two (2) abnormalities on blood tests that would raise concern for TTS.

Model Answer

D dimer > 5 upper limit normal

Platelets < 150 x 10⁹/L

Part c

List four (4) non-ED stakeholders in your hospital you would consult to develop the guideline.

Model Answer

Haematology- clinical – will accept other relevant clinical specialty

Pathology lab – specimen collection, results

Radiology – agreed imaging

Pharmacy - NOACs, IV Ig, etc

Also will accept:

ICU

Infectious diseases (if managing vaccine issues at the hospital).

Question 26

You are assessing a 65 year old male who has presented to the ED complaining of dizziness.

Part a

Complete the table below, stating the clinical features helping in differentiating between **Peripheral** vs **Central** causes of Vertigo.

Model Answer

Clinical symptoms/signs	Peripheral	Central
Symptom characteristics	Usually sudden onset and intermittent , usually more frequent and severe nausea/vomiting	Gradual onset and persistent/constant , usually milder associated symptoms eg nausea/vomiting
Expected associated neurological findings	Absent	Often present – motor function, gait instability and reduced coordination often present

Part b

Complete the following table for a **3 step clinical decision tool** that assists with differentiating central vs peripheral vertigo and the expected findings in peripheral and central vertigo.

Model Answer

Test	Peripheral expected findings	Central expected findings
1. Head Impulse Test	presence of corrective saccade/nystagmus	absence of corrective saccade/nystagmus
2. Nystagmus	None/Unidirectional	Bidirectional
	NO vertical skew	Vertical skew

3. Test of Skew		
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1 mark for each section of table including 'tests'

½ marks for 'hearing loss'

Part c

Complete the table below listing the Sensitivity and Specificity for the above clinical decision tool.

Model Answer

Sensitivity	96-100%
Specificity	96-98%

0.5 marks for each response, accept any response in above ranges

Question 27

A 34 year old man has been brought to your RURAL ED after falling out of a tractor on his farm. He has sustained an isolated injury to his right lower limb - see clinical photo below.



Part a

Complete the following table regarding Gustilo Classification for open fractures.

Model Answer

Gustilo Classification	Specific Features
I	Skin wound < 1cm
II	Skin wound > 1cm
III	Skin wound > 10cm, extensive soft tissue injury
IIIa	Adequate soft tissue cover.
IIIb	Soft tissue loss with exposed bone and periosteal stripping.
	Massive contamination
	Associated vascular injury

Gustilo Classification	Specific Features
IIIc	

Part b

State five (5) **INITIAL TREATMENT** priorities for this patient's lower limb injuries.

Model Answer

1. Haemorrhage control - direct pressure
2. Analgesia - give example and dose
3. Appropriate antibiotics - cefipime and metronidazole (contaminated - farm)
4. Reduction of fracture dislocation under procedural sedation.
5. Immobilise & elevate / tetanus toxoid / immunoglobulin
6. Ortho referral

Part c

After your initial management, one of the nurses alerts you that the patient's foot looks more pale than it did before, with a reduced dorsals pedis pulse. Your hospital CT scanner is currently being repaired and unavailable for use. You decide to perform an arterial pressure index utilising a bedside doppler ultrasound device.

Please complete the following equation:

Model Answer

Arterial Pressure Index = Injured SBP / Uninjured brachial SBP

Part d

Please state four (4) steps in order to perform the arterial pressure index of the injured lower limb.

Model Answer

1. The ipsilateral **dorsalis pedis or posterior tibial artery** is detected with a Doppler device until the artery is clearly heard
2. The **cuff is pumped up 20 mmHg past** the point where the Doppler sound disappears. The cuff is slowly released until the Doppler device picks up the arterial sound again (the systolic pressure)
3. The pressure at which this sound occurs is recorded and the procedure is **repeated for the opposite uninjured lower extremity**
4. The blood pressure is also measured at the brachial artery in an **uninjured upper extremity**.

Part e

Your calculated arterial pressure index for the injured lower limb is **0.6**.

Please state what an arterial pressure index of 0.6 in this case may signify.

Model Answer

API <0.9 indicative of likely vascular injury

Part f

Please state and justify your disposition for this patient.

Model Answer

Immediate transfer to tertiary centre for vascular / orthopaedic management of open fracture complicated by possible vascular injury (API <0.9).