

Question 1 (12 marks)

A 7 year old male with autism spectrum disorder presents with a painful arm following a fall at school. He has been given oral analgesia.

Despite placing the patient in a low stimulus environment, he is becoming more agitated, and you are unable to assess or treat him.

- a) List five (5) non-pharmacological measures that can be used to reduce his agitation. (5 marks)

1. _____
2. _____
3. _____
4. _____
5. _____

- Engage parents and caregivers
- Distraction techniques (e.g., iPad, colouring books, bubbles) - maximum one mark for distraction techniques if multiple are listed
- Engage play specialist
- Minimise interventions/only necessary interventions
- Use same staff (experienced senior staff)
- Try to make environment more familiar- own bedclothes, toys etc.
- Sensory stimulation- weighted blanket, music/headphones
- Ensure access to toilet, food, water, warmth (basic needs have been met)
- Verbal/non-verbal de-escalation, speaking calmly to child, giving them sense of control/choice

Examiner Note:

- *Low stimulus environment/quiet room / no loud noise not accepted as in stem.*
- *Splinting of limb not accepted.*

- b) Non-pharmacologic interventions have failed. List five (5) factors that will influence your choice of pharmacological agent in this child. (5 marks)

1. _____
2. _____
3. _____
4. _____
5. _____

- Current medications with relevant reasoning (including drug interactions)
- Medication that has worked well previously (Hx from notes or parents)
- Allergies
- Allocated clinical space location/safety- level of sedation in current environment (i.e. patient not currently in resus)
- Past medical history/comorbidities - with relevant reasoning (e.g., congenital long QT), including difficult airway history, URTI/laryngospasm
- Route of administration- what is more logistic & overall less distressing to patient, IV v IM v Oral v Intranasal
- Purpose - analgesia to treat pain from fracture/injury vs sedation vs both
- Hospital guidelines/local protocols/familiarity with medications
- Severity of limb injury (would influence more invasive interventions)
- Parental concern/consent/preference
- Level of agitation/aggression/anxiety

Examiner Note:

- *Would not accept weight as answer, this determines dose of medication, not your choice of agent.*
- *If no relevant reasoning in meds/PMHx - 0.5.*
- *No points for fasting status or haemodynamic instability.*

The patient is now calmer, and an X-ray has been performed. **See Prop Booklet page X.**

c) List two (2) positive findings on the elbow X-ray. (2 marks)

1. _____

2. _____

- **Medial epicondyle fracture (avulsion)**
- Raised anterior fat pad
- Soft tissue swelling
- Anterior humeral line does not intersect capitellum

Examiner Note:

- *Candidates may note that AP projection is not usual as in pronation & makes definitive findings more challenging.*
- *Medial epicondyle fracture must be identified for full marks.*
- *1 point maximum for multiple soft signs.*

Prop



Question 2 (12 marks)

A 32 year old female presents to the emergency department with a 3 hour history of severe right lower abdominal pain. Examination is unremarkable other than tenderness in the right lower abdomen.

The urine β -hCG is negative.

a) List two (2) circumstances where a false negative urine β -hCG may occur. (2 marks)

1. _____

2. _____

- Low levels of HCG (test threshold varies from 15-100 mIU/ml) / very early pregnancy
- Dilute urine (include diuretic use/ polyuria)
- Equipment fault/test error
- Very high levels e.g., in late pregnancy or hydatidiform mole, through the “hook effect”
- Abnormal HCG variants (e.g., free beta chain, nicked free beta etc.)

Examiner Note:

- *It would not be expected that candidates would be able to provide the last two answers, they are included in the marking guide for the sake of completeness.*

You are concerned about ovarian torsion.

b) List four (4) risk factors for ovarian torsion. (4 marks)

1. _____

2. _____

3. _____

4. _____

- Pregnancy, especially early pregnancy
- Large ovarian cyst or tumour (> 4cm or >5cm commonly quoted)
 - ½ mark if do not mention size > 4cm or ‘large’
- Polycystic ovaries
- Chemical induction of ovulation or Ovarian hyperstimulation syndrome
- Tubal ligation
- Adhesions (e.g., caused by previous surgery, endometriosis, PID)

You arrange a formal ultrasound.

- c) Other than absent arterial flow, list four (4) features on ultrasound that are suggestive of ovarian torsion. (4 marks)

1. _____
2. _____
3. _____
4. _____

- Reduced or asymmetric venous flow on doppler.
- Ovary >4-5cm due to oedema, cyst or tumour.
 - Full mark for ovarian oedema/ ovarian cyst/ ovarian mass
 - ½ mark if 'enlarged ovary' with no size/ other detail
- Ovarian oedema (heterogenous) or haemorrhage/haemorrhagic degeneration/venous engorgement. (1 mark total for oedema wherever it appears)
- Whirlpool sign / twisted vascular pedicle.
- Ovarian Tenderness on probe pressure.
- Unusual ovarian location e.g., anterior or posterior to the uterus, or a change in position.
- Tilted uterus (pulled by the twisted ligaments).
- Reversed diastolic flow on Doppler.

- d) List two (2) reasons why there may be preserved arterial doppler flow on ultrasound in a patient who is later confirmed to have a torted ovary. (2 marks)

1. _____
2. _____

- Dual supply for ovarian/uterine arteries.
- Intermittent/ torsion-detorsion.
- Normal arterial flow early in torsion in context of venous ischaemia/ venous occlusion.

Question 3 (12 marks)

A 3 year old female presents with brief jerking of all limbs, which self-resolved. She has no medical history and is currently well, with no recent trauma or infective symptoms.

Her examination, vital signs and blood glucose are normal.

You consider whether this event may be a first seizure.

- a) Other than seizure, list three (3) seizure mimics that could account for this presentation. (3 marks)

1. _____

2. _____

3. _____

- Syncope
- Cardiac arrhythmia
- Tics
- Hypnagogic jerks/hypnic jerks/ sleep starts /sleep myoclonus
- Self-stimulation (paediatric masturbation)
- Breath holding
- Choreoathetosis
- Sydenham Chorea
- PNEE
- Toxic cause e.g., Dopaminergic, salbutamol (*toxins causing seizures are not acceptable*)

Examiner Note:

This question is NOT “List four causes of seizures,” therefore answers e.g., trauma, SOL, electrolyte abn don’t get marks.

Differential diagnoses/seizure mimics which do not fit the stem, e.g., absence seizures, night terrors, score no marks.

Pseudo seizures are not seen in three year old – youngest age = 5-6yrs. Age group. Afebrile seizures are not seizure mimics therefore score no marks.

Nb only one type/cause of syncope gets a mark.

You ask her parents to describe in detail what they observed during the event.

- b) List six (6) features of the parents' description of the event that make a seizure the most likely cause. (6 marks)

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

- Any description of tonic clonic movements
- Aura (half point for aura, full mark for a description including ictal cry or lip smacking)
- Lateral tongue biting
- Post ictal period
- Incontinence of bladder or bowels – although can appear in syncope it is in the references as increased chance of seizure
- Cyanosis or apnoea during event
- Head or eye deviation
- Mood change or behaviour change just prior to event
- Occurring during sleep (different from jerks occurring just prior to sleep)
- Todd's paresis (or layperson description of this)
- Unresponsive during the event

Examiner Note:

- *Fever, head trauma, previous seizure excluded in stem.*

Her neurological examination and investigations are normal.

The parents ask whether she is likely to have further seizures.

- c) List three (3) risk factors that increase the risk of recurrent seizures in this patient.
(3 marks)

1. _____

2. _____

3. _____

- Family history of epilepsy
- Neurocutaneous syndrome findings e.g., café au lait spots
- Developmental delay / child not meeting milestones
- Todds Paresis (added as it is in Cochrane Review)
- Structural anomaly, CT, MRI and EEG abnormal (assuming that only ED investigations have been done)

Examiner Note:

- *Developmental delay still accepted as this may be viewed by parents as normal for their child.*
- Seizure occurring at night not accepted as not relevant to this patient

Question 4 (12 marks)

A 70 year old male is brought to your rural emergency department. He reports increasing weakness and difficulty getting out of bed this morning.

His medical history includes type 2 diabetes and chronic kidney disease.

The blood sugar level is 12.5 mmol/L.

His vital signs are:

HR	98 bpm
BP	170/100 mmHg
SaO ₂	95 % in room air
RR	24 /min
Temp	36.9 °C

The patient's ECG is provided. **See Prop Booklet page X.**

- a) State the most likely diagnosis for the ECG changes seen. (1 mark)

- Hyperkalaemia

- b) List three (3) supporting features for this diagnosis on the ECG. (3 marks)

1.

2.

3.

- Wide QRS greater than > 160 msec
- Peaked T waves
- Loss of P waves
- Extreme axis
- Long QT

- c) List four (4) important drugs (dose and route required) you would prescribe for this patient. (4 marks)

	Drug	Dose and route
1.		
2.		
3.		
4.		

	Drug	Dose and route
1.	Calcium gluconate OR Calcium chloride	10% 10mls (1g/2.2mmol) IV (titrated to effect) 10% 10mls (1g/6.8mmol) IV (titrated to effect)
2.	Short acting insulin with Dextrose	5-10 units actrapid/novorapid S/C or IV + 25 to 50ml of 50% Dextrose
3.	Salbutamol	5-20mg via nebulizer/ 6-12 puffs via MDI IV 500microg over 20min
4.	Sodium bicarbonate	8.4% 50-100 ml IV
5.	Frusemide	20-40mg IV
6.	Resonium	15g orally

Examiner Note:

Calcium required for full marks

Insulin/dextrose should be considered a combination – i.e. candidates would not be given marks for separating these answers and be given a mark for both

It would be expected that candidates would give both insulin and dextrose, as the glucose level is low enough to be concerned about possible hypoglycaemia. Suggest no marks for giving insulin only (without Dextrose) unless qualified with caveat that BSLs must be checked frequently

It would not be acceptable to give only dextrose as the patient won't generate an insulin response to this (as a non-diabetic patient would).

This presentation was found to be due to medication non-adherence.

d) List four (4) ways to reduce medication non-adherence in the elderly. (4 marks)

1. _____
2. _____
3. _____
4. _____

- Written instructions for patient/accurate list of medications
- Blister pack/pillboxes with labels
- Pharmacy education/review
- Communication of any medication changes to local pharmacy
- Engaging relative/carer to help
- Reminders on phone
- Written discharge letter to GP with any medication changes/up to date list of medications

Examiner Note:

- *Although there are many types of medication errors that do not relate to adherence (i.e. prescription errors), none of these should be given a mark, as this is not what is asked for.*
- *There may be other possible answers that could attract a mark here.*

Prop



25 mm/sec 10 mm/mV Filters 40-150Hz