

Metro North Hospitals ACEM Fellowship Trial Examination

2017.2

Short Answer Questions

SAQ Paper

Model Answers

Booklet one

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SAQ 1 (9 Minutes)
(Total 18 marks)

Passmark = 11/18

A 20 year old male patient starts talking to you about anaphylaxis, whilst he waits for the result of an x-ray for a twisted ankle. He is surprised when you tell him that people can actually die from anaphylaxis.

I. What are 4 recognised possible risk factors for a fatal anaphylactic reaction?
(4 Marks)

Underlying asthma
Other atopic disease
Delay to, or no use of adrenaline
Upright posture during shock
Cardiorespiratory disease in general (irrespective of age, and including COPD / IHD etc)
Misdiagnosis
Carelessness with deliberate exposure / ingestion (of a known allergen)
Carelessness with iatrogenic drug exposure (to a known drug allergy)
[<https://www.uptodate.com/contents/fatal-anaphylaxis>. Table 1]

Now his curiosity is piqued, as he is allergic to pecan nuts. He says he can often first tell from his skin that he is getting an anaphylactic reaction.

II. List 3 skin manifestations consistent with an underlying anaphylactic reaction.
(3 marks)

Itch (pruritus)
Erythema (flushing)
Urticaria (hives / wheals)
Angioedema (swelling)
Pallor (in shock)
[<https://www.uptodate.com/contents/anaphylaxis-symptoms-and-diagnosis-beyond-the-basics>]

You then ask him if he carries an EpiPen, and he says he used to, but has now forgotten how to use it. You decide to tell him exactly how to use it

III. Describe five (5) steps on exactly how a patient uses an EpiPen.
(5 Marks)

Store the EpiPen at room temperature
Use the EpiPen as soon as you recognise you are having an anaphylactic reaction
Flip open the yellow cap (green if EpiPen Junior) carrier tube

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Grip in your hand with orange tip (needle end) pointing downward (ready to inject)
Remove / pull off the blue safety cap on the other end of the EpiPen
Place EpiPen orange tip against your upper, outer thigh (must say thigh, not arm)
Push the EpiPen inwards firmly, until you hear a 'click'
Hold in place for 3 seconds after adrenaline delivery (needle pops out with the click)
Remove EpiPen and massage injection area for 10 seconds
Make certain someone else (or you if alone) has called an Ambulance at the same time ie. 'call for help'
[<https://www.epipen.com/en/prescribing-information#Patient>]

Undeterred, he says he has heard that "*adrenaline is a really dangerous drug*", and should only ever be used by an expert. You correct him by saying that it is life-saving and absolutely essential in anaphylaxis, but agree there are some side effects and dangers, particularly if used incorrectly.

IV. List Three (3) recognised 'normal' side effects of being given adrenaline. (3 Marks)

Nausea
Tremor
Palpitations
Anxiety
Headache

V. List three (3) serious / potentially lethal side effects of being given adrenaline too fast, too concentrated or too much? (3 Marks)

Acute hypertension / hypertensive crisis (one mark)
Myocardial ischaemia / myocardial infarction (one mark)
Ventricular tachycardia / VF (one mark)
Intracranial haemorrhage
Acute pulmonary oedema
Peripheral ischaemia / gangrene (one mark)

SAQ 2 (6 Minutes)
(Total 12 Marks)

Passmark: 8/12

An 11 month old boy is brought in by ambulance following a brief 1-2min generalised tonic clonic seizure. He was well prior to the onset of seizure and has no previous history of seizures.

I. List six (6) possible causes for the seizure other than a febrile convulsion:
(6 Marks)

- Meningitis/encephalitis
- Hypoglycaemia
- Trauma including NAI
- Electrolyte disturbance
- Cardiac arrhythmia (Prolonged QT)
- Inborn error of metabolism
- New onset epilepsy/epilepsy syndrome including infantile spasms

On further assessment the child has a temperature of 38.5 and evidence of a viral upper respiratory tract infection.

The child is GCS 15 with no focal neurology. You are comfortable that the child has had a febrile convulsion.

II. List three (3) criteria for the diagnosis of a simple febrile convulsion.
(3 Marks)

- <15mins
- Generalised
- Full recovery <1 hr
- No recurrence within 24hrs

III. It is deemed safe for discharge. State three (3) criteria that suggest this patient is safe to be discharged home.
(3 Marks)

- Good social supports/parent willing and able
- Reasonable proximity to hospital
- Full neurological recovery
- Normal Obs (Except Temp)
- GP follow up arranged
- Counselling/safety netting + advise leaflet provided
- Well hydrated with ongoing good fluid intake
- Source of fever identified with appropriate advice given

SAQ 3 (6 Minutes)
(Total 12 marks)

Passmark: 8/12

A 67 year old lady has been brought to your emergency department with spontaneous bilateral epistaxis. This started about 2 hours ago while she was in her backyard gardening. She is complaining of nausea and difficulty breathing. There is no history of trauma. She has a background of atrial fibrillation, ischaemic heart disease and hypertension.

The ambulance officers have estimated about 500 mls of blood loss.

Her medications include:

Rivaroxaban 20 mg PO OD
Digoxin 125 mcg PO OD
Metoprolol 50 mg PO BD
Perindopril 5mg PO OD

Her observations are:

Temp	36.0 degrees
BP	150/100 mmHg
Pulse	120 bpm
O2 Sats.	91% RA
RR	25 breaths/min
GCS	15/15

Your registrar has identified that she has ongoing active bleeding and is becoming more distressed.

I. List five (5) immediate management options you would perform for this patient.

(5 marks)

1. Commence appropriate first aid - Sit upright, Ice, Local pressure
2. Resuscitation
 - a. Fluids/Blood
 - b. Oxygen with end-points
3. Assess and institute specific management - Anterior vs Posterior, Escalating approach to haemorrhage control
4. Blood pressure lowering - Diastolic <90 mmHg
5. Consider reversing anticoagulation - Tranexamic acid/Prothrombin complex concentrate/Idarucixumab/Haemodialysis

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II. List and justify 3 important investigations that would assist you in the resuscitation of this patient. (4 marks)

1. Blood gas for pH, Haemoglobin, Lactate
2. Group and Hold - Likely need for blood transfusion
3. ECG - Significant tachycardia in context of known atrial fibrillation and ischaemic heart disease
4. Chest XRAY - Dyspnoea, Low O2 Saturations, Possible Aspiration

You have been unsuccessful in your approach to haemostasis. You suspect a posterior source for the bleeding.

III. List three (3) options for specific management of posterior epistaxis. (3 marks)

1. Posterior cauterisation under general anaesthesia
2. Arterial ligation
3. Embolisation via femoral approach by interventional radiology
4. Local injection with lignocaine/adrenaline around sphenopalatine artery

SAQ 4 (6 Minutes)
(Total 12 Marks)

Passmark = 9/12

A 16 year old male patient presents to your ED with a laceration to the plantar surface of the heel of his L foot sustained whilst walking in a freshwater creek bed. The wound was heavily soiled with mud and has been superficially cleaned on arrival to ED. There is no visible foreign body on X-ray.

He has no known allergies and is unvaccinated.

Your junior doctor has attempted to infiltrate with local anaesthetic but the skin is very thick and this has been unsuccessful.

You decide to perform regional anaesthesia to allow washout and laceration repair.

I. List the type of block and the landmarks you would use to perform a regional nerve block for this patient? (4 marks)

Posterior tibial nerve block

Landmarks:

Posterior to medial malleolus & anterior to Achilles tendon

Superior by 0.5-1cm from posterior tibial artery

Also accept Ankle Block if all nerves and landmarks at listed below.

* Posterior Tibial Nerve Block

- Palpate the posterior tibial artery behind the medial malleolus. Inject 3-5-mL of anesthetic 1-cm in depth 1-cm superior to this point.

* Sural Nerve Block

- Inject 3-5-mL of anesthetic subcutaneously in a band between the Achilles tendon and 1-cm above lateral malleolus.

* Superficial Peroneal Nerve Block

- Inject 4-10-mL of anesthetic subcutaneously in a band between the lateral malleolus and the extensor hallucis longus tendon.

* Deep Peroneal Nerve Block

- Have the patient dorsiflex their foot and insert the needle 1-cm above the medial malleolus aiming underneath the extensor hallucis longus tendon and advance until you hit the tibia. Then inject 3-5-mL of anesthetic.

* Saphenous Nerve Block

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- Inject 2-5-mL subcutaneously between the medial malleolus and the anterior tibial tendon.

**II. List the drug and dose you would use for the regional block for this patient.
(2 marks)**

Xylocaine 1% (Lignocaine) or Bupivocaine (0.25% or 0.5%) up to maximum of 5mg/kg without Adrenaline

**III. State the details of your preferred method of wound closure in this patient.
(2 marks)**

Primary closure with sutures with 3-0 Nylon, interrupted sutures

(Wound glue not preferred in dirty wound)

**IV. List 4 treatments you would prescribe in the ongoing management of this patient.
(4 marks)**

Ciprofloxacin 400mg bd oral (prophylaxis for freshwater exposure)

Tetanus immunoglobulin 250 IU IMI (as unimmunized)

ADT

Simple analgesia with Paracetamol 15,g/kg or Ibuprofen 10mg/kg

SAQ 5 (6 minutes)
(Total 12 Marks)

Pass mark (8/12)

An 86 year old man presents with acute pleuritic chest pain and shortness of breath.
He is a long term smoker.

His chest x-ray is shown in the props booklet

I. List three (3) radiological abnormalities on his x-ray: (3 marks)

- Marked hyperinflation
- Moderate/Large left sided pneumothorax
- Mediastinal shift to the right – possible tension PTX
- Bilateral widespread pulmonary infiltrates
- Right midzone (basal segment of upper lobe) wedge shaped cavitating lesion/consolidation
- Right apical focal consolidation
- Interposed hepatic flexure under right hemidiaphragm (Chilaiditti syndrome)

II. List three (3) possible causes for the x-ray findings (3 marks)

- Cavitating pneumonia – Klebsiella, S. Aureus, Pneumococcus, TB
- Malignancy – primary bronchogenic CA
- Interstitial pneumonitis - Influenza/viral
- Pneumothorax – rupture of large bullae

His vitals are:

HR	100 bpm
BP	150/80
RR	25/min
Sats	86% on 4L O2
Temp	38.1 degrees

III. List and justify three (3) initial interventions:

(6 marks)

Intervention	Reason
Titrate O2 therapy – Hudson/venturi to maintain sats 88-92%.	Hypoxic with likely underlying emphysema and hypercarbia
Broad spectrum antibiotics – Pip/Taz or combination abx that includes anaerobic cover	Multifocal cavitating consolidation – broad differential organisms: Klebsiella, staph, pneumococcus
Intercostal catheter/pig tail	Large pneumothorax with mediastinal shift. Poor respiratory reserve

SAQ 6 (6 Minutes)
(Total 12 Marks)

Pass mark: 8/12

Your director has asked you to take on the 'Quality Assurance' portfolio within your department.

I. Define the following terms in relation to your portfolio. (3 marks)

Quality assurance	A system to establish standards of care and to monitor how well these standards are met
Clinical indicators	Measures of clinical outcomes of care that help to point to potential problems and allow comparative data
Benchmarking	Comparing performance with others to act as a marker and goal for improvement

II. List five (5) commonly used quality measures in Emergency Departments in Australasia.

(5 marks)

- Waiting times per ATS category
- 'Did not wait' rates
- Flow measures, e.g. 4 hour ED times
- Time to analgesia
- Morbidity and mortality reviews
- X-ray follow up
- Patient satisfaction
- There are many more...

You are to lead a departmental project on a specific indicator within your department.

III. Describe the four (4) steps of the quality assurance cycle. (4 marks)

Plan – review relevant literature and data with relevant stakeholders and formulate plan.

Do – implement plan through staff engagement

Study – evaluate plan after a pre-defined period of time

Act – Adjust plan accordingly as per initial evaluation. And repeat.

References:

Textbook of Adult Emergency Medicine, Cameron et al, 4th edition, chapter 27

SAQ 7: (6 Minutes)
(Total 12 Marks)

Passmark 8/12

A 2 year old boy is brought to a suburban emergency department. The mother reports that the child has been increasingly distressed due to pain after the foreskin was retracted that morning. She has been unable to return the foreskin to its normal position.

I. List 2 abnormalities in this photograph.

(2 marks)

- Paraphimosis (Essential)
- Grossly oedematous foreskin
- Plethoric and engorged glans, suggestive of obstructed venous return. High risk of ischaemia. (Essential)

II. Describe three (3) methods for the reduction of the foreskin.

(6 marks, 2 marks for each method)

- Manual traction:
 - Circumferential pressure, to reduce swelling, and distal traction.
 - Consider use of osmotic agents (i.e. sugar) to reduce swelling.
- Aspiration of paraphimosis:
 - Requires penile block or sedation
 - Multiple needle pricks to allow drainage of oedematous foreskin.
- Surgical:
 - Dorsal slit (Cosmetically undesirable)
 - Circumcision.

III. Describe the technique for a penile block.

(4 marks)

- Consent
- Sterile technique
- Local anaesthetic: Bupivacaine 0.25% 0.1ml/kg
- Injection site:
 - Dorsal nerves of penis
 - Pull penis downwards
 - Inject perpendicular to the skin at 10:30 & 01:30 0.5-1cm lateral to and caudal to the pubic symphysis.
 - Caution with regards to dorsal penile vessels

Ref: Smith's anaesthesia for infants and children

SAQ 8: (6 Minutes)
(Total 12 Marks)

Pass mark = 9/12

A 16 year old girl is brought in by her parents due to concern about her weight and mental health.

She weighs 38kg.

I. List four (4) features on history that may suggest an eating disorder .
(4 marks)

- Intense fear of gaining weight
- Preoccupation with body image / body dysmorphia
- Change in eating habits – intense dieting
- Excessive or compulsive exercise
- Significant weight fluctuations
- Obsessive food rituals
- Induced purging after meals/laxative use
- Deceptive/ secretive behaviour around food

II. List four (4) medical complications that may occur due to an eating disorder.
(4 Marks)

- Cardiac – hypotension, heart failure, arrhythmias, cardiomyopathy
- Haematological – anaemia, leukopaenia, thrombocytopaenia
- Musculoskeletal – osteopenia/osteoporosis leading to fractures
- Gastrointestinal – gastritis, PUD, oesophagitis
- Gynaecological – amenorrhoea, infertility
- Neurological – peripheral neuropathy

III. What principles of risk assessment need to be considered when deciding her treatment?
(4 marks)

- Presence of immediate life threats – arrhythmias, signs of heart failure, hypotension
- Patient's capacity to consent/refuse treatment
- Likely compliance with treatment
- Active suicide risk
- Family/social/community support

SAQ 9: (9 Minutes)
(Total 18 marks)

Pass mark 12/18

A 60 year old lady presents to ED with generalised abdominal pain. She was about to have dinner when she noticed onset of constant severe pain. This is associated with nausea without vomiting.

She denies any change in bowel motions or complaints of melaena. She has been well of late with no fevers, chills, rigors or sweats. She has no complaints of urinary symptoms. She has a past medical history of paroxysmal atrial fibrillation, insulin dependent diabetes mellitus and chronic obstructive airway disease. On clinical examination, she is generally tender with no evidence of peritonism. Bowel sounds were present and normal.

Her regular medications include:

- Aspirin 100mg PO OD
- Lantus 30 units SC NOCTE
- Novorapid 10 - 15 units SC TDS
- Salbutamol INH PRN
- Salmeterol/Fluticasone INH BD

Her observations are;

Temp	37.3 degrees
BP	160/80 mmHg
Pulse	110 bpm
O2 Sats.	92% RA
RR	22 breaths/min
GCS	15/15

I. **Based on the assessment above, what is the MOST LIKELY diagnosis?**

(1 mark)

- Mesenteric Ischaemia/Bowel Infarct

An initial abdominal XRAY was performed. Refer to prop booklet. (Image A)

II. **Based on this XRAY, list 2 relevant positive and negatives.**

(2 marks, 0.5 mark each)

- Positives - Dilated small bowel loops, Thickened bowel wall with “Thumbprint sign”
- Negatives - No portal venous gas, No pneumatosis intestinalis, No faecal loading

III. **List three (3) other differential diagnoses that should be considered?**

(3 marks)

Needs to be relevant to stem

- Ruptured Abdominal Aortic Aneurysm
- Acute bowel obstruction
- Bowel perforation
- Acute appendicitis
- Renal colic
- Biliary colic

IV. **List five (5) important aspects to the management of this patient. (5 marks)**

- Supportive care - Analgesia, Keep NBM, IV fluids, NG tube insertion
- Antibiotics - appropriate antibiotic choice
- Heparin infusion
- Early surgical input for laparotomy
- Consideration of interventional approaches - Endovascular stenting, Catheter directed thrombolysis, Intra-arterial vasodilators

A CT abdomen has been performed. Refer to prop booklet (Image B)

V. **On this axial image, what does the arrow indicate?**

(1 mark)

- Pneumatosis intestinalis

VI. List 3 other causes of this CT finding. (3 marks)

- Primary - Benign idiopathic conditions 15% of cases - Submucosal/Subserosal cysts
- Secondary - Infectious enteritis, COPD, Coeliac disease, Leukaemia, AIDs, Amyloidosis, Post-Chemotherapy enteritis, Connective tissue disorders

VII. Apart from the above CT finding, list 3 other findings on assessment which would indicate poor prognosis. (3 marks)

- Presence of bloody diarrhoea
- Lactic acidosis
- Presence of portal venous gas
- Thickened bowel wall on imaging