The Prince Charles Hospital
The Royal Brisbane & Women Hospital
Redcliffe Hospital
Caboolture Hospital

Metro North Hospitals ACEM Fellowship Trial Examination

2017.2

Short Answer Questions

SAQ Paper

Model answers

Booklet Two

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Queensland Government

SAQ 10 (9 Minutes)
(Total 18 marks)

Passmark = 11/18

A 65 year old man cuts the lateral aspect of his right lower leg on a rusty piece of wire while gardening. He washes the area with fresh water from his garden shed kettle, and wraps the wound in an old cloth, before seeing his GP the next day.

I. List 5 types of wound that are more likely to favour the growth of tetanus (ie. are considered 'tetanus prone')

(5 Marks)

Compound fracture
Bite wound
Deep penetrating wound
Wound with extensive tissue damage (burn or contusion)
Wound containing a foreign body (espec. wood splinter)
Wound contaminated with soil, dust, manure
Wound where intervention such as surgical debridement is delayed (> 6 hr)
Wound complicated by pyogenic infection
IVDU espec. with dirty needle
Avulsed tooth
[***Australian Immunisation Handbook, 10th edition: 4.19 'Tetanus'***]

Even though the next day his GP considers the wound to be "*just a nasty scratch really*" and wipes the area down with disinfectant then changes the dressing, the GP does believe it is 'tetanus prone'. He gives the man a tetanus toxoid vaccine, but wonders if intramuscular tetanus immunoglobulin (TIG) is also needed?

II. List 3 indications for giving TIG to a patient in addition to tetanus vaccine.

(3 marks)

History of tetanus vaccination: < 3 doses or uncertain
Time since last dose: > 10 years
Type of wound: all wounds other than 'clean minor wounds'
Any individuals with humoral immunodeficiency (eg. HIV) following any tetanus prone wound, regardless of prior tetanus vaccination status
[***Australian Immunisation Handbook, 10th edition: 4.19 'Tetanus'***]

Three days later the man returns to his GP concerned that his leg is infected. The GP suspects necrotising fasciitis.

III. List seven (7) features on history and examination that would support a diagnosis of necrotising fasciitis.

(7 Marks)

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Underlying risk factor: diabetes, PVD, immunosuppression incl. HIV, recent injury, recent surgery, malignancy – ONE mark for risk factor(s)
Pain out of proportion to physical findings
Erythematous skin
Change in skin colour: red-purple progressing to blue-gray, then bullous (accept 'Change in skin' as an *additional* mark to erythematous)
Poorly demarcated skin changes
Swelling
Induration of limb
Exquisitely tender
Pain on passive movement of involved muscle groups
Weakness of involved muscle groups
Paraesthesiae / anaesthesia (late)
Systemic toxicity with sepsis (late)
[***https://www.uptodate.com/contents/necrotizing-soft-tissue-infections***]

The man is transported urgently to your ED. He looks unwell, and you agree that he has likely necrotising fasciitis.

IV. List three (3) priorities in his immediate management. (3 Marks)

Immediate surgical referral for exploration and debridement
Empiric broad-spectrum antibiotics
Analgesia
Intravenous fluids
Haemodynamic support, including vasopressors (*must* be going for Surgery regardless)

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SAQ 11: (6 Minutes)
(Total 12 Marks)

Pass mark: 10/12 marks

A 3-year-old boy is brought in to your ED by his mother with concerns that he may have swallowed a foreign body. The child is sitting on his mother's lap, alert.

I. List four (4) signs of airway obstruction from a swallowed foreign body that you would look for in this child.

(4 marks)

Stridor
Drooling
Abnormal/hoarse voice or cry
Respiratory distress
Wheeze

II. State the relevant features of the x-ray. (2 marks)

Radio-opaque FB (likely coin) seen in oesophagus.
FB is clearly below the laryngeal inlet and not causing obstruction of trachea.

Shortly after your assessment, the child becomes agitated and has a vomit. He subsequently becomes apnoeic and unresponsive.

III. State your management by filling in the following table. (6 marks)

Open Airway. Remove FB if visible
If unsuccessful progress to…
Attempt 5 rescue breaths with BVM
If unsuccessful progress to…
Deliver 5 back blows or chest thrusts
If unsuccessful progress to…
Direct laryngoscopy and removal of FB with Magill's forceps

Note: Marks are allocated for actions as well as sensible order/prioritization

References:
Textbook of Paediatric Emergency Medicine, Cameron et al, 2nd edition, chapters 2.2 and 6.2

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SAQ 12: (6 Min)
(12 Marks)

Passmark: 7-8/12

A 74 year old female patient presents to your ED with central chest pain, dyspnoea and feeling lightheaded. This came on 1 hour ago whilst resting on the couch at home.
Her background history includes a pacemaker which was inserted for slow AF.
Her vital signs are:
GCS 15/15
BP 85/50
SpO2 94% RA
Her ECG is shown below:

I. State the key findings of her ECG and how they may be relevant to her presentation. (4 marks)

Paced rhythm at rate 130/min
Pacing spikes after every QRS
Retrograde P waves (Seen best in Leads 1, V1, V2, V5, V6)
Likely pacemaker mediated tachycardia causing rate related ischaemic symptoms

II. Outline your immediate management priorities for this patient in the ED. (6 marks)

Cardiac monitoring and defibrillation pads applied
Supplemental O2 to maintain SPo2 >94%
Fluid bolus 250mL N/saline aiming for MAP < 70
Analgesia – Fentanyl 25-50mcg IV for chest pain
Apply magnet to pacemaker
Discussion with Cardiology and interrogation of pacemaker.

III. What is the role of a magnet in managing pacemaker dysfunction? (2 marks)

When applied converts to asynchronous pacing which turns of the sensing mode of the pacemaker and allows the pacemaker to pace the atria & ventricles asynchronously.

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SAQ 13:(6 minutes)
(Total 12 marks)

Passmark: 8/12

You have been approached by a senior clinical nurse in your ED informing you of a problem with a trainee. She is concerned that the trainee has an alcohol problem. On multiple occasions, the trainee has posted about his alcohol use on social media. She is concerned that there may also be other recreational drug use. Several other nurses have reported that he is abrupt, rude and does not communicate his plans. This registrar is an early phase advanced trainee who recently completed his primary examinations.

I. List 4 examples of conduct that would fulfil Mandatory Reporting requirements to the Medical Board. (4 marks)

- Practising while intoxicated on alcohol or drugs
- Sexual misconduct in the practice of the profession
- Placing the public at substantial harm because of an impairment / health issue
- Placing the public at risk because of a significant departure from accepted professional standards

II. You have organised to meet with this trainee to further discuss this issue. List 5 main points you would cover in this meeting. (5 marks)

- Investigate and ensure no need for mandatory reporting
- Identify work stressors
- Identify personal stressors
- Identify lifestyle factors - drug or alcohol use
- Identify and offer ongoing support - Family/Friends/Mentor/DEMTs
- Offer alcohol/drug liaison service referral
- Offer time off / roster changes to accommodate for trainee burnout

III. Following this meeting, you have identified that your department does not have a guideline on mandatory reporting.

List 6 important aspects required when developing a guideline. (3 marks)

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- Gather information
    - Benchmarking
    - Evidenced based guidelines
    - Guidelines from other hospitals
- Identify and involve all relevant stakeholders
- Set objective and time frame
- Develop draft guideline and circulate for comment
- Implementation
    - Regular education and guideline promotion until targets achieved
- Post-implementation evaluation and adjustment
    - Regular guideline review

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SAQ 14: (6 minutes)
(Total marks 12)

Passmark: 8/12

You are the ED consultant on duty in an urban district hospital with obstetric and paediatric services available.
A 29 year old pregnant female who is 32 weeks pregnant (G1 P0) presents to your department with a 2 day history of headache, blurry vision, lethargy and upper abdominal pain.
She has so far had an uncomplicated pregnancy and has been receiving antenatal care in your hospital.

The patient's vitals signs on arrival are as follows
HR 105 per minute
BP 150 / 95 mmHg
RR 20 per minute
Oxygen Sats 97% on room air

One of your registrars has already picked up the patient and arranged for some bloods and the patient's early blood results are as follow:

Parameter	Patient Value	Normal Adult Value
Hb	76 G/L	(115 – 160)
Platelets	65 x 10^9 / L	(140 – 400)
INR	2.1	(0.9 – 1.3)
APTT	62 seconds	(25 -38)
LDH	704 U/L	(110 – 250)
Total Bilirubin	58 micromol/L	(< 20)
Urea	28 mmol/L	(3 – 8)
Creatinine	324 micromol/L	(70 – 120)
Potassium	5.0 mmol/L	(3.2 – 4.5)

I. List four (4) most likely differential diagnoses. (4 Marks)

Model answers:

- Pre-eclampsia
- HELLP Syndrome
- Sepsis with DIC
- HUS – TTP

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- Acute fatty liver of pregnancy

II. List four (4) more investigations you think are warranted for this patient and state the clinical reasoning. (4 marks)

Model Answer

Investigation (0.5 mark for each)	Clinical Reasoning (0.5 Mark for each)
Urinalysis	Proteinuria, WBC, WCC, Casts
Full set LFTs	Assessment of HELLP syndrome
Peripheral Blood Smear	Evidence of haemolysis
Haemolysis Screen	Reticulocyte Count, Haptoglobins, Conjugated / Unconjugated Bilirubin for causes of haemolysis and anaemia
Full Septic Screen	Sepsis as potential cause for DIC: Blood cultures / Urine mcs / Sputum / Vaginal swabs
USS Liver	Seeking haematoma / rupture

After you have reviewed the blood results with your registrar you head promptly to review the patient and to inform her of the blood results.
As you enter the cubicle the patient has a witnessed generalised tonic clonic seizure. The patient is moved to resus cubicle for full non-invasive monitoring during this process:

III. List four (4) immediate clinical response to this situation. (4 Marks)

Model answers:
Prevent maternal hypoxia, left lateral position to prevent aortocaval compression + O2 as required to maintain sats > 92%
Seizure termination: MgSO4 4g over 5 minutes followed by infusion 1g/hr for 24 hours.
Management of maternal hypertension

- Hydralazine 10 – 20 mg IV slowly
- Beta blockers: Labetolol 5 – 10 mg IV slowly (also accept metoprolol, esomolol)
- GTN / SNP also accepted

Escalation for prompt delivery of baby: Urgent obstetric attendance and arrangement for prompt delivery.
Steroid therapy for fetal lung maturation: Betamethasone 12mg IM

- References: Tintinalli 7th Edition: Chapter 104 Emergencies after 20 weeks of pregnancy and postpartum period, Page 696 - 698

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SAQ 15 :(6 minutes)

(Total 12 Marks)

Passmark: 8/12

Your local wilderness agency is requesting assistance in review of their medical protocols for a mountaineering expedition. They need to provide a brochure to give to potential clients who wish to trek up the nominated mountain (6000m).

I. List four (4) risk factors for Acute Mountain Sickness (AMS)
(4 Marks)

Previous AMS
Rapid ascent
Higher altitudes >3000m
Strenuous physical exertion
Younger patients

II. List four (4) symptoms of High Altitude Cerebral Oedema (HACE)
(4 Marks)

Headache
Confusion
Ataxia
Drowsiness
Stupor
Coma

III. List four (4) treatment options required for patients with HACE
(4 Marks)

Descent
Supplemental O2
Portable HBO
Acetazolamide 250mg po BD
Dexamethasone 8mg iv initially, then 4mg qid iv/po/im

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SAQ 16: (6 Minutes)

(Total marks 12)

Pass mark (8/12)

A 40 year old woman was just intubated in your department following a severe exacerbation of her asthma. She weighs approximately 60kg. Your registrar comes to you seeking advice as the ventilator keeps alarming.

The patient's vital signs are:

HR	120 bpm
BP	90/60 mmHg
Sats	100%

You find the ventilator settings below

Tidal Volume	600ml
Pressure support	10
PEEP	10
FiO2	100%
Rate	16
I:E ratio	1:2

I. Which ventilator settings would you alter from the above settings?

(4 marks)

Ventilator settings	Alterations
Tidal Volume	Aim 6-8ml/kg = 360-480 ml
PEEP	Decrease to 5 or 0
FiO2	Titrate down to maintain sats > 90% or pO2 > 60mmHg
Rate	Reduce to 8-10 breaths/min
I:E ratio	Increase 1:4-6

II. List two (2) other steps you could perform to optimize her ventilation

(2 marks)

- Deep sedation
- Paralysis

The patient becomes hypotensive with a BP 80/50 mmHg ten minutes after intubation

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III. What is your immediate action? (1 mark)

- Disconnect ETT from ventilator and hand ventilate with BVM

IV. List five (5) possible reasons for the hypotension (5 marks)

Oversedation/induction drugs

- Anaphylaxis
- Tension pneumothorax
- Dynamic hyperinflation
- Arrhythmias
- Hypovolemia

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SAQ 17: (6 Minutes) **Candidate Name:**
(Total Marks 12)

Passmark 8/12

A 28 year old office worker presents by ambulance following a conscious collapse at work. She had been unwell at work that day.
On arrival, her vital signs are:
HR 160 -190
BP 190/110
Temp 39.5
RR 30
Sats 92% on RA
GCS 14/15
BSL 11.6
She is confused, tremulous and anxious.
There is mild pitting oedema

I. List five (5) differential diagnoses other than Thyroid storm?

(2.5 Marks)

- CNS infection
- Heat stroke
- Sympathomimetic overdose
- Serotonin syndrome
- Neuroleptic malignant syndrome
- Phaeochromocytoma

II. The husband arrives and reports a recent history of a neck lump which is due to be investigated. Closer examination reveals a diffuse multinodular goitre. What five (5) underlying conditions can cause thyrotoxicosis?

(2.5 Marks)

- Graves' disease
- Toxic multinodular goitre
- Toxic adenoma

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- Thyroiditis
- Drug induced e.g. amiodarone, lithium iodine
- Postpartum

III. What are three (3) clinical findings with thyrotoxicosis? (3 Marks)

- Temperature >37.8
- Tachycardia out of proportion to fever
- CNS disturbance

IV. List four (4) immediate treatment priorities with drug names and doses? (4 Marks)

- Supportive including sedation and active cooling
- Management of cardiac complications with nonselective beta-blocker – propranolol
    - 1mg Q5min to max 10mg
- Prevention of peripheral conversion of T4-T3 with corticosteroids
- Decreased production with propylthiouracil (900-1200mg)
- Referral for definitive management of underlying disease

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SAQ 18 (9 minutes)
(Total 18 Marks)

Passmark: 12/18

You are the consultant working in an urban district ED. The ambulance bring in a 14 year old girl on an involuntary order after her mother found her in the bathroom with some empty pill packets.
She weighs 40kg.

Observations:
HR 105
RR 21
Sats 97% RA
BP 105/60
GCS 13/15 E3V4M6

The ambulance also bring in some empty pill packets, which were all prescribed yesterday. The missing pills include:

20 x 20mg Citalopram
20 x 300mg Quetiapine
50 x 25mg Amitriptylline
24 x 500mg/30mg Paracetamol/Codeine

I. List four (4) key aspects of your risk assessment based on what she has taken?

(4 marks)

Answer
1. Taken multiple serotonergic medications – risk of serotonin syndrome
2. Multiple medications that may cause sedation – ALOC/need for airway protection
3. tCA overdose >30mg/kg – associated with severe toxicity
4. Paracetamol potential toxic dose ie >10g, or >150mg/kg

II. For the table below, List three (3) key investigations that you would perform to help refine your risk assessment, including your reasoning

(6 marks)

Answer
ECG – signs of sodium channel blockade or QT prolongation in context tCA and SSRI/antipsychotics – QRS broadening, R prime in aVR
VBG – metabolic acidosis and/or resp acidosis in setting ALOC
Paracetamol level – help determine need for NAC in this potentially toxic ingestion

III. What specific toxidrome would you assess this patient for? (1 mark)

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Serotonin syndrome

IV. List 4 clinical features consistent with this toxidrome (4 marks)

Mental Status Changes
Delirium
Psychomotor agitation

Autonomic stimulation
Diarrhoea
Flushing
Hypertension
Hyperthermia
Mydriasis
Sweating
Tachycardia

Neuromuscular excitation
Clonus – especially ankle/ocular
Hyperreflexia
Increased tone – lower limbs>upper
Rigidity

Bold points are those signicantly associated
Ideally candidates would give at least one sign from each of the 3 areas
Clonus/hyper-reflexia/increased tone/rigidity – probably all count as one point ie almost similes
Same as
hypertension/tachycardia
Sweating/flushing

Further information

She clinically deteriorates, with GCS now 9, and BP 80/40

V. List 4 key treatments you would provide, including details (4 marks):

Answer

1. Intubate, hyperventilate aiming for pH>7.5
2. Fluid bolus 20ml/kg 0.9% NaCl
3. Sodium bicarbonate 100mmol IV
4. Activated charcoal 50g via NGT post intubation

Would also accept inotropes if given as answer

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