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

Metro North Hospitals ACEM Fellowship Trial Examination

2018.1

Short Answer Questions

SAQ Paper

Model Answers Booklet three

SAQ 19: (9 Minutes) **Candidate Name:**
Total 18 Marks
Pass mark: 12/18

A 75yo man presents to your ED with a 2 day history of lower abdominal pain, fevers and malaise. You are unable to obtain more information.

Vital signs:

HR 110
RR 24
Temp 38.2
BP 95/55
GCS E3V4M6 13

A Venous Blood Gas and basic bloods are performed:
pH 7.12
pCO2 34
HCO3 13
Hb 124
Na 138
K 6.2
Cl 110
Creat 443

FBC:

Hb 121
WCC 15
Plt 4

Chemistry:

Urea 20
Creat 465
ALP 174
GGT 86
ALT 97
AST 372
LDH 1180

His previous liver and renal function tests have all been normal

Questions:

1. For the venous blood gas, calculate, showing your workings, the anion gap (2 marks)

Anion Gap = Na + K – HCO3 – Cl
= 138 + 6 – 13 - 108
= 144 – 121
= 23
Therefore, this is a HIGH Anion Gap Metabolic Acidosis

2. List 3 likely causes of the metabolic derangement in this patient (3 marks)

Lactic acidosis from shock – tissue hypoperfusion and possible sepsis
Uraemia/renal failiure – pre-renal acute kidney injury
Other toxic effect of overdose, such as Metformin or salicylates etc (less likely)

3. What is the MOST likely unifying diagnosis in this patient, and what are the supporting features? (4 marks)

Sepsis with multi-organ failure, likely urinary source
Supporting features:
Evidence of multi-organ failure
Deranged LFTs
Haemodynamic compromise
Renal Failure
Thrombocytopaenia – likely DIC

Elevated WCC – supports infective process/sepsis

Likely urinary source – lower abdominal pain, renal failure

A single slice of the patient's CT scan is shown. List 1 positive and 2 negative features, relevant to this patient's presentation (3 marks)

Positive Feature
Radio-opaque density in distal ureter at VUJ likely to represent stone – some evidence of dilated ureter proximal to this

Negative features
Aorta normal calibre – unlikely AAA
No evidence free gas or pneumatosis coli – unlikely ischaemic gut/perforation

Must get stone for full marks
Any other reasonable negative feature acceptable

4. List your 3 main management priorities, with justification, for this patient (6 marks)

Likely urosepsis with infected obstructed kidney

1. Fluid resuscitation/inotropic support aim MAP >65 in patient with severe sepsis
2. Broad spectrum ABs – early administration reduces mortality
3. Urgent operative intervention with Urology to insert stent/relieve obstruction – source control

SAQ 20: (6 Minutes) **Candidate Name:**
(12 Marks)
Pass mark: 8

A severely emaciated 14-year-old girl presents to ED with her parents who are very concerned about her weight. She has a known diagnosis of Anorexia Nervosa.

1. List 4 overarching goals in the management of Anorexia Nervosa when admitting patients to the hospital for acute inpatient care.

(2 marks)

Medical stabilization of medical complications eg cardiac failure
Prevent or manage Refeeding syndrome
Weight restoration
Reversal of cognitive deficit due to starvation
Inpatient psychotherapy

2/4

2. List 6 clinical, bedside test or lab criteria that would require her to be admitted to the hospital under the Medical inpatient Team.

(6 marks)

BMI <12 (or rapid weight loss >1kg per week for many weeks)
HR < 40 or > 120
BP <80
Postural drop >20
Temp <35
ECG – arrhythmia, QTc prolonged, ST deviation or repolarization abn
BSL <2.5
Na <125
K <3
Mg<0.7
PO4 <0.8
eGFR <60
ALT >500
Albumin <30
Neutrophil <1
Pass mark 7/10

3. You decide this patient requires admission to a medical ward.

List 4 medical complications that may occur after this patient commences treatment.

(4 marks)

Refeeding syndrome associated complications –
Hypomagnesemia,
hypophosphatemia,
thiamine deficiency
Hypocalcemia
Hypokalemia

Hypoglycemia
Cardiac failure
Occult infection
Pass mark 2/4

References

1. **Queensland Health Guidelines for Eating Disorders (available on APEM website)**
2. **http://www.rch.org.au/clinicalguide/guideline_index/Anorexia_Nervosa/**
3. ***RANZCP Clinical Practice Guidelines for Eating Disorders. Australian & New Zealand Journal*** *of Psychiatry* 2014, Vol. 48(11) 1–62 (APEM website)

SAQ 21: (6 Minutes) **Candidate Name:**
Total Marks 12
Pass Mark:8

A 28 year old female patient presents to your regional ED with a fever and cough. She is 6 months post-op from a double lung transplant for cystic fibrosis.

Her vital signs are:

Temp	38.0
HR	105
BP	120/75
RR	24
O2 sats	91% on RA

Her CXR is shown below.

Questions:

1. Describe the key findings on her CXR. (2 marks)

Bilateral areas of consolidation in RML, RLL & LLL
Multiple clips bilaterally consistent with double lung transplant
CTR within normal limits
(No Pneumothorax or pleural effusions)
(No free gas under diaphragm)

2. List 5 differential diagnosis for her presentation.
(5 marks)

Infection – Bacterial, viral or fungal (1 mark for each = 3 marks)
Acute Rejection (1 mark)
(1 mark for any of the following, up to max 2 marks)
CCF
PE
ARDS secondary to sepsis/immunosuppression
Bronchiolitis obliterans

3. Outline 5 key steps in your management of this patient in the ED.
(5 marks)

O2 therapy via NRBM to maintain PO2 > 60 (1 mark)
May need respiratory support with NIV or intubation if failing to maintain oxygenation on NRBM alone. (1 mark)

Broad spectrum antibiotics (1 mark) with antifungal & antiviral cover (1 mark)
Eg Piptaz + Fluconazole + Aciclovir (or similar is acceptable)

(1 mark for any of the following up to 2 marks)
Steroids (under guidance of transplant team)
Early referral to transplant specialist team for ongoing management
Caution with IV fluid resuscitation
Check levels of immunosuppressant drugs

SAQ 22: (6 Minutes) **Candidate Name:**
(Total Marks 12)
Pass Mark: 7

A mother arrives at Triage carrying her son age two years. He is choking on a toy and has an ineffective cough and is cyanosed.

Questions:

1. List three features of an effective cough: (3 Marks)

- crying, speech, vocalisation
- loudness of cough
- able to take a breath before coughing
- child alert

2. List the three treatment options in the universal algorithm for the choking child (3 Marks)

- Ineffective cough (conscious): 5 back blows, 5 chest thrusts, assess and repeat
- Ineffective cough (unconscious): open airway, 2 rescue breaths, CPR 15:2, check for foreign body, intubation
- Effective cough: encourage coughing

3- Name four (4) features in the basic life support algorithm for children (4 Marks)

- dangers?
- Responsive?
- Send for help?
- Open airway
- Normal breathing?
- Check pulse – take no more than 10 seconds
- Start CPR 15:2 compressions
- Attach defibrillator/monitor

4- Name two (2) features of chest compressions in children: (2 Marks)

- 15:2 for all children
- compression rate 100/min
- heel of one or two hands to compress chest by one third of chest diameter
- uninterrupted chest compressions

SAQ 23: (6 Minutes) **Candidate Name:**
(Total marks 12)
Pass Mark: 8/12

A 45 year old man has been brought into ED following a fall onto his outstretched arm. On initial assessment, he has tolerable left shoulder pain. He is lying with his left arm abducted above his head. He has no other injuries identified.

This patient's left shoulder XRAY has been reproduced below:

Questions

1. List 2 radiological abnormalities seen in the XRAYs above.
(2 marks)

- Left inferior glenohumeral joint dislocation
- Left greater tuberosity #

2. State the expected mechanism that has led to this injury. (1 mark)

- Sudden forceful arm hyperabduction or
- Direct loading force on fully abducted arm, with extended elbow and pronated forearm

3. List 4 complications that may be associated with this injury.
(4 marks)

- Brachial plexus injury
- Rotator cuff injury or shoulder instability
- Vascular injury - Axillary artery
- Fracture association - Acromion, Glenoid

Answers needs to be specific

4. In 5 steps, state how you would approach this patient's management.
(5 marks)

- MUST mention to give Analgesia & dose
- Pre/post neurovascular assessment
- Informed consent
- Reduction under PS and will require pre-sedation risk assessment,
- Mention one technique
    - -Axial (in-line) traction
    - -Two step manouvre - Convert to Anterior reduction and reduce with Anterior methods

SAQ 24: (6 minutes) **Candidate Name:**
Total Marks 12
Pass Mark: 8

A 52 year old male is brought into your Emergency Department after being involved in an altercation at a pub on Friday night.

He sustained a single punch to his face, witnessed to not lose consciousness and complains of facial pain.

On your review he is GCS 15 with normal vitals.

1. What historical and examination features are important to elicit during assessment? (3 Marks)

Confirm mechanism of injury
Symptoms- pain, local tenderness, diplopia, crepitus after nose blowing
Epistaxis, ptosis and local tenderness
Restricted eye movements
Complete eye examination- ocular injury (hyphema, sub conjunct haem, retinal detachment)
Infraorbital n involvement
Other facial trauma

2. What three features on plain Xray suggest an inferior orbital wall fracture? (3 Marks)

Fluid in the maxillary sinus
Orbital emphysema
'Tear drop sign'- herniation of fat inferiorly

3. He undergoes a CT of his facial bones. Describe the major findings shown on the coronal slice below. (3 Marks)

Fracture and displacement of inferior wall of R orbit
Herniation of orbital contents into maxillary sinus
Fluid in maxillary sinus

4. With trauma, list the three (3) causes of optic neuropathy.

(3 Marks)

Compressive optic neuropathy (retrobulbar haemorrhage, orbital foreign body or orbital emphysema)
Optic n sheath haematoma
Optic n head avulsion
Optic n laceration

SAQ 25 (6 minutes) **Candidate name:**
(Total marks 12)

Pass mark: 8

A 40 year old known schizophrenic patient presents to your ED by ambulance on an involuntary order. He had been behaving erratically at a train station. Whilst waiting to be seen he absconds from the ED and is unable to be located by ED staff.

Questions:

1-List 5 immediate steps in managing this situation (5 marks)

Security to search premises
Attempt to contact patient by his listed mobile phone.
Notify police that patient has absconded & request welfare check at listed address
Notify NOK that patient has absconded & ask them to bring him back to ED if they have contact with him.
Notify psychiatric unit that patient on involuntary order has absconded
Document attempts to locate patient in chart

2-List 4 features that would make this patient at high risk of self harm.
(4 marks)

Recent cessation of medications
Active auditory hallucinations or delusions
Recent suicidal ideation
Past suicidal ideation or attempts
Recent depressive symptoms
Concurrent drug abuse
Lack of social supports
Loss to follow up with psychiatric care
High number of psychiatric hospitalisations
Access to firearms/means for suicide

3- A few hours later the patient is returned to the ED by police. On arrival he is behaving aggressively and is resisting being moved into a treatment cubicle.
(3 Marks)
List 3 options for chemical restraint, including doses:

Droperidol 10mg IMI, repeat 15 mins later if required
Midazolam 2.5-10mg
Haloperidol 5mg IV, titrated to a maximum of 10mg over 15 minutes.

SAQ 26 (6 Minutes) **Candidate name:**
(Total Marks 12)
Passmark:8

A 62 year old female is brought to your emergency department with central pleuritic chest pain and shortness of breath from the local cruise ship terminal.

1. What are the potential differential diagnoses?

(3 Marks)

Pulmonary Embolus
Ischaemia
Pericarditis
Pneumothorax
Pneumonia
Aortic dissection

During your assessment she deteriorates clinically and becomes agitated, tachycardic, hypotensive and hypoxic.

Her vital signs are now:

GCS 13/15 (agitated)
HR 130 Sinus tachy
BP 90/60
Sats 89% RA
RR 28.

2. List 4 immediate investigations and the rationale for each:

(4 Marks)

CXR	Alt DX- LRTI, PTx, cardiac size and shape
ECG	Ischaemia, arrythmia
ABG	Gas exchange, metabolic status, Hb, creat for contrast Ix, bsl
Bedside ECHO	Fluid status, RWMA, Dx- PE/dissection
Lung USS	PTx

3. You diagnose a pericardial effusion from your history/examination and investigations.

What are the common causes of **ANY** pericardial collection for patients presenting to the emergency department? (3 Marks, 0.5 each)

Infectious pathogen (viral, bacterial, HIV)
Neoplastic
Renal failure
CCF
Aortic dissection
AMI +/- free wall rupture
Myxoedema
SLE
Rheumatoid arthritis

4. What are the main ECHO features to support the clinical diagnosis of cardiac tamponade? (2 Marks 0.5 each)

Pericardial effusion
Late diastolic collapse of RV free wall
Early diastolic collapse of RA free wall
Abnormal septal motion due to reciprocal ventricular filling
Dilated IVC with no respiratory collapse
Diastolic flow reversal in hepatic veins

SAQ 27: (9 Minutes) Candidate name:

(18 marks)

Pass Mark: 12

An 8 year old boy is brought into your ED by his mother after falling off a trampoline onto his outstretched arm. He is uncomfortable, crying and has an obvious deformity to his arm. He has a palpable radial pulse with no convincing sensory change. There are no other injuries.

His urgent X-RAY was performed and reproduced below:

1. List 3 abnormalities seen on the XRAY above. (3 marks)

- Spiral fracture of midshaft of ulna
- Ulnar fracture has significant displacement and angulation
- Dislocation of proximal radius

2. State the eponymous name of this fracture. (1 mark)

   Monteggia fracture

3. In the table below, list 3 complications of this injury which should be sought for in the ED. In you answer, list the clinical features associated with them.
   (6 marks)
   - Radial nerve injury - Paraesthesia in dorsum of hand and 3 1/2 fingers, Wrist drop
   - Compartment syndrome - Refractory pain, Generalised distal paraesthesia/numbness (less likely to be in nerve distribution)
   - Compound fracture - Open wound, Bone in view

4. In 4 steps, state how you would approach this patient's care in your ED.
   (4 marks)

- Analgesia - Oral, IN, IV - **Must state route and doses**
- Assess and confirm NV status
- Fracture splint - Trauma backslab
- Urgent Orthopaedic input for ORIF
- ***Fail question if candidate decides to reduce fracture in ED**

It is 21:00 hrs and the Orthopaedic registrar on call has asked you to reduce this fracture in ED.

5. State 4 factors to consider before responding. (4 marks)

- Patient factors
    - Severity of injury - Complications evident
    - Need for ORIF regardless of ED reduction
    - Patient preference
    - No marks for <u>other injuries</u> - Already stated that the patient has no other injuries
- Departmental factors
    - Staffing
    - Skillset
    - Environment - Not controlled, Unpredictable work loads
    - Time of the day

***Any other reasonable answers**