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

Answers Only

Booklet one

Queensland Government

SAQ 1 (9 Minutes) **Candidate name:**
(Total 18 marks)

Passmark; 12

A 28 yr old female is brought to your emergency department following a collapse in the street. She is pale, diaphoretic and complaining of abdominal pain.

1. List the top three differentials for her presentation. (3 Marks)

Pregnancy related complication- ectopic
Intraabdominal sepsis- appendicitis, pyelonephritis
Gynaecological – ovarian torsion, DUB

2. On review her vital signs are:

GCS 15/15
HR 110
BP 90/60
sats 100% RA
RR 22
She is tender in her left iliac fossa with peritonism.
List the investigations that should be performed immediately: (3 Marks)

Pregnancy test- bedside on urine/blood
X-match
Bedside USS for free intraperitoneal fluid
Other lab investigations- FBE, Chem20, VBG

3. You perform a bedside USS. List and interpret the main findings shown.

(3 Marks)

Free fluid in Morrisons space (Hypo echoic)
Free fluid in Splenorenal angle (Hypo echoic)

Interpretation:

Intraabdominal free fluid in young female of reproductive age. Likely ectopic pregnancy, confirm with bHCG

4. Outline 4 management priorities: (4 Marks)

Urgent O&G involvement for surgical management
Haemostatic resuscitation/large bore iv access
Analgesia/symptomatic management
Provision of psychological support to patient/family
Anti-D if Rh negative

5. You have been tasked by your director to outline a local guideline for the use of bedside ultrasound in early pregnancy. What inclusion/exclusion criteria will be included.

(3 Marks, 0.5 for each box)

Inclusion	Exclusion
Known IUP	Pregnancy of unknown location
8-14/40 gestation	<6-8/40
HD stable	HD unstable

6. Outline the preferred technique for fetal wellbeing assessment using POCUS in the <14/40 population: (2 Mark)

Fetal heart rate assessment in <14/40:
M mode preferred as PWD likely to cause thermal injury to fetus from heating of tissues

SAQ 2 (6 Minutes) **Candidate Name:**
(Total 12 Marks)

Pass mark: 8

A junior doctor approaches you for help regarding a patient. They have just seen an 11 month old girl who was brought in with increased work of breathing and cough. There is a 3 day history of coryzal features, but no other significant medical history. Examination demonstrated an alert interactive child with widespread fine crepitation's across both lung fields.
Observation:
HR 155bpm
RR 45r/min
SpO2 89% RA
Febrile 37.1
The junior doctor is concerned by the patient's observations and has organised for them to be moved to a resuscitation bay. They have written up orders for an adrenaline neb (5mg), and a salbutamol burst (6 puffs x3) as initial therapy.

1. State the likely diagnosis. (2 mark)

- Bronchiolitis

2. State the immediate management of this patient. (5 marks)

- Cancel orders for adrenaline and salbutamol
- Senior review to confirm diagnosis
- High flow nasal prongs: 2L/Kg, titrate fiO2 for SpO2 94-98%
- NGT placement
- Admission under paediatrics

The child's parents are endocrinologists employed at the hospital and are curious as to what criteria will be used to determine when the child is suitable for discharge.

3. List the criteria for discharge: (5marks)

- SpO2 consistently >90% (92%)
- Feeding well, and maintaining hydration. (>50%)
- Mild to moderate bronchiolitis
- Good parental understanding
- Ability to return (no isolated, transport restricted)

SAQ 3 (6 Minutes) **Candidate Name:**
(Total 12 marks)

Pass 8/12

A 34 yr old man is pulled from the surf face down and unconscious. He received CPR at scene and en route to your department.

1. List 4 key phases in the drowning process. (4 marks)

- voluntary breath holding
- involuntary laryngospasm secondary to liquid in oropharynx / larynx
- hypoxia, hypercarbia, acidosis
- may swallow large amounts water
- active respiratory movements but no gas exchange because of laryngospasm
- worsening hypoxia results in laryngospasm abating
- subsequent active breathing of liquid (volume very variable)
- changes in lungs, body fluids, acid-base and electrolyte balance
- washout of surfactant, pulmonary hypertension and shunting contribute to hypoxia
- tissue hypoxia leads to multi-organ dysfunction and death

2. List the Conn and Modell classification for neurological function in drowning. (3 marks)

Category A
- awake

Category B
- conscious but obtunded

Category C
- comatose
  - C1 = flexion to pain (decorticate)
  - C2 = extensor to pain (decerebrate)
  - C3 = flaccid

3. What factors suggest a poor prognosis in drowning? (3 marks)

submersion >10 minutes
GCS 5 or less
resuscitation duration > 25 minutes
VT or VF on initial ECG
fixed dilated pupils
cardio or respiratory arrest

4. When should resuscitation cease following drowning? (2 marks)

stop CPR if persistent apnoea and asystole after 1 hour of post-rescue CPR provided not hypothermic
if serum K+ > 11 mmol/L cease resuscitation

SAQ 4 (6 Minutes) **Candidate Name:**
(Total 12 Marks)

Pass mark: 8

A 9 year old girl is brought in to ED by her mother. She states that her daughter has been on 2 courses of antibiotics for her ear infection which she doesn't feel has helped. The child is now complaining of a headache and is vomiting. On examination, her tympanic membrane is erythematous and there is discharge in the external auditory canal. There is also some post-auricular erythema of her right ear with swelling.

Her vitals on arrival

Temp	38.9
HR	120 bpm
BP	90/60
Sats	98% on room air

1. List four (4) differential diagnoses to consider for her presentation
(4 marks)

    - Chronic suppurative otitis media
    - Mastoiditis
    - Acute bacterial Lymphadenitis
    - Cholesteotoma
    - Encephalitis
    - Meningitis
    - Cerebral abscess

2. List four (4) important features you would look for on examination with reasoning
(4 marks)

    - Boggy fluctuant swelling over mastoid process → mastoiditis
    - Neck stiffness/Kernigs/Brudzinski sign → meningitis
    - Confusion/disorientation → encephalitis/cerebral abscess
    - Decreased GCS → encephalitis/raised intracranial pressure
    - Ataxia/cerebellar signs → cerebellar abscess

3. List four (4) investigations you would consider performing with justification
(4 marks)

    0.5 mark for each invstigation and 0.5 mark for justification

    - FBC – elevated WCC would indicate infection
    - Inflammatory markers – CRP/ESR for inflammation/infection
    - Blood culture – possibility of sepsis
    - Imaging – CT/MRI brain to rule out mastoiditis/intracranial extension/abscess
    - Ultrasound looking for focal lymph nodes with drainable collection
    - Lumbar puncture – if meningitis suspected

SAQ 5 (6 minutes) **Candidate Names**
(Total 12 Marks)

Passmark: 8

A 25 year old male patient is to be retrieved from a remote property by your helicopter service. The nearest tertiary hospital is 1 hour flight time. He has fallen from his horse 30 minutes ago and has sustained a closed head injury and is now unresponsive. He also has a deformed L lower leg with an open wound. Local ambulance staff are on the scene and have obtained IV access and applied 15L O2 via NRB mask.
On your arrival he is GCS 5 (E1V1M3).
His vital signs are:
T 36 HR 55 BP 160/65 RR 8 O2 sats 96% 15L mask

1. **What drugs would you use for RSI in this patient? (2 marks)**

Fentanyl/Midazolam or Ketamine (doses)
Suxamethonium or Rocuronium (doses)

2. **Describe the measures you would take to minimise secondary brain injury in this patient enroute to the nearest neurosurgical centre**
(6 marks)

Head up 30 degrees
Maintain oxygenation (Titrate O2 to maintain SpO2 > 95%)
Maintain normal CO2 (PCO2 35)
Avoid hypotension (Maintain MAP > 80 with fluids and vasopressors)
Maintain normothermia (Active cooling if temp > 39)
Sedation and paralysis to minimise rises in ICP with transfer
Hypertonic saline 3% 3mL/kg over 10 minutes

3. **List 4 other management priorities for this patient other than those listed above.**
(4 marks)

C spine immobilisation & spinal board
Secure IV access and invasive monitoring of BP prior to flight
FAST scan to assess for intra-abdominal bleeding (if possible pre-hospital)
Immobilisation of any limb fractures
Antibiotics cover for compound fractures (Cephazolin 2g IV)

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

A 22 year old male is brought to your emergency department following the ingestion of 'some pills' at a nightclub.
He is diaphoretic, pale and complaining of chest pain.

1. Describe 3 main features on his ECG (3 Marks)

Narrow complex tachycardia
Widespread ST elevation
ST depression aVR
Intervals normal

He remains GCS 15 but agitated,
His vital signs are:

HR 120
BP 180/95
Sats 100% NRB.

2. List 2 illicit drugs and their class are likely to be responsible for his presentation. (4 Marks)

Sympathomimetic- amphetamines, cocaine and ecstasy
Hallucinogenic- LSD and psilocybin
Volatile agents

3. Outline your management of this patient specifically in regards to his cardiovascular status. (5 Marks)

Benzodiazepines- iv midazolam/diazepam
Calm environment
GTN- SL or infusion
Phentolamine if refractory to GTN/benzos
If ongoing chest pain and ECG changes- for intra-coronary thrombolytics/vasodilators

* Can also consider nitroprusside for HTN

SAQ 7: (6 Minutes) **Candidate Name:**
(Total 12 Marks)
Pass Mark: 8

You are the Consultant in charge of a rural Emergency Department. Your Registrar has seen a 6 month old child with cellulitis and prescribed Flucloxicillin intravenously. During the infusion the child deteriorates and you are called by the nurse to urgently review the child.

The vital signs are:

HR 176
RR 60
BP 60/40
SpO2 87% in room air
GCS 14

She has obvious wheeze on examination and has a widespread erythematous urticarial rash.

1. List 5 immediate management steps (Include any doses and routes) and state the endpoints you would aim for as appropriate.
(5 marks)

Stop antibiotic infusion
O2 via Hudson mask or non rebreather 100% O2, for sats >95%
IM adrenaline 10mcg/kg into lateral thigh, repeat after 5mins if no improvement
Adrenaline neb 1:1000 – 5 ml stat
NS bolus (10mls/kg) and repeat after 5mins - endpoint CRT <2, HR 140
Hydrocortisone IV 5mg/kg
(4/5)

The patient does not respond to the initial treatment.

2. List 2 further treatment options would you consider. (2 marks)

1/2

IV adrenaline infusion – 0.1mcg/kg/min – 1 mcg/kg/min
Further IM adrenaline doses – 10mcg/kg
Normal Saline 10ml/kg bolus

3. You decide the child will need to be intubated as she has developed stridor that is not improving. SpO2 is still below 90% despite treatment.

What equipment will you need to intubate this patient in your ED? (5 marks)

4/5

ETT – 4 / 4.5 – cuffed tube
Straight laryngoscope blade – miller – 1
LMA size 1

Suction catheter
Baby bougie / stylet / introducer
Baby bag mask ventilation – 250 ml

Reference – ASCIA guidelines for anaphylaxis

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

Pass mark: 8

A 74yr old man is being managed in your department. He has a history of benign prostate disease and nothing else of note. He has been unwell for three days with fevers, dysuria and frequency. Today he feels more unwell and dizzy.

On examination he is febrile, and warm peripherally. He is alert, his chest is clear and he has some mild low abdominal tenderness. He has no rashes.

His vital signs are:

Temp 38.9 C
P 130 sinus rhythm
BP 80/45 after two litres of crystalloid
RR 24
O2 98% room air
GCS 15

His urine sample suggests a UTI and he is commenced on appropriate intravenous antibiotics. He has received a total of two litres of crystalloid in boluses over ninety minutes since arrival. You start haemodynamic support.

1. What inotrope/vasopressor do you choose? Give starting dose, range of doses and end points. (2 marks)

Could choose noradrenaline or adrenaline as similar overall benefit

Noradrenaline 6mg in 100ml crystalloid
Commence 5ml/hr = 5mcg/min
(Dunn suggests start at 1mcg/min, up to 2 - 4 mcg/min but this seems very conservative)
Rapid titration up to 20, 25 or 30ml/hr (probably doesn't matter what upper level they give)
Titrated to effect ie end points SBP >90, MAP >60, signs of end organ perfusion (orientation, UO >0.5ml/kg/hr)

Adrenaline same doses and end points

Your preferred agent is commenced peripherally and his perfusion improves. You elect to insert a central venous catheter to continue the agent.

2. In general what factors can make the insertion of a CVL more difficult? (5 marks)

inexperienced operator
increasing number of attempts
previous surgery, trauma, radiotherapy
BMI > 30 or < 20

previous catheterisation
children
short neck

The CVL is inserted correctly, and the central venous pressure (CVP) is measured at 20cmH2O.

3) What factors, *in any patient*, can lead to an elevated CVP? (5 Marks)

Fluid overload
pregnancy
IPPV
PEEP
vasopressor administration
pulmonary embolism
right ventricular failure
tamponade (may be normal if also hypovolaemic)
tricuspid incompetence

SAQ 9: (9 Minutes) **Candidate Name**
(Total 18 marks)

Pass Mark - 12/18

A 35 year old male has represented to your ED with right wrist swelling and pain. He was seen the night before following a fall off his pushbike. The junior registrar on shift diagnosed him with a distal radius fracture, applied a backslab and referred him to the fracture clinic. On examination, the patient is in obvious discomfort. He has a short arm backslab in place and his visible fingers are markedly swollen with a capillary refill time of 3 seconds.

His XRAYs from the night before has been reproduced below:

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

    a. Perilunate dislocation
        i. Dorsal displacement of Capitate at the Capitate/Lunate junction
    b. Scaphoid fracture
        i. Unstable given association with Perilunate dislocation and displacement > 1mm
    c. Distal radius fracture
        i. Intra-articular - Through the palmar aspect of the distal radius
        ii. >1 mm step in articular surface of the radio-carpal joint

2. List 3 potential complications that may occur as a result of his injury. (3 marks)

    a. Carpal ligament instability (DISI, VISI (Dorsal / volar intercalated segment instability)
    b. Chronic wrist pain , Osteoarthritis (particularly of radio-carpal joint)
    c. Reduced hand function / grip strength
    d. AVN of the Scaphoid
    e. Median nerve compression / dysfunction but less common than in lunate dislocation

3. State 7 priorities in your assessment and management of this patient. (7 marks)

    a. Analgesia
        i. Likely to require oral or parenteral opioids
    b. Urgent Backslab removal + assess injury including N/V status
        i. Given evidence of poor venous return and increasing pain
    c. Explain injuries + plan to patient
        i. Apologise for missed diagnosis at initial presentation
        ii. Outline plan for ongoing care

iii. Open disclosure - review of initial presentation + feedback to clinicians involved

d. Expedite orthopaedic review
    i. Will need ORIF semi-urgently
e. Consider reduction of Peri-lunate dislocation in ED
    i. After discussion with orthopaedics – If definitive ORIF not possible in a timely fashion
f. Immobilise injury
    i. Below elbow backslab +/- thumb spica
g. Explore circumstances around missed diagnosis and feedback to involved clinicians

Following internal review, you have identified that the registrar involved in this case was only promoted from a senior house officer position 3 months ago. Feedback from your fellow FACEM colleagues have identified an issue with his professionalism. Their main concerns relate to his punctuality and regular sick calls. You have decided to meet up with this registrar.

4. State 5 important points that you would discuss in this meeting. (5 marks)

a. Explore wellbeing of the junior doctor
    i. Home stressors / situation
    ii. How they feel they are coping with the recent increase in responsibility
b. Outline expectations
    i. Punctuality, early notification if likely to be sick for a night shift
c. Offer support if required
    i. If struggling with increased responsibility may be a period of supervised practice, no night shifts
d. Explain missed diagnosis
e. Offer reassurance
    i. Unlikely to be any significant long term harm to patient with <24 hour delay in definitive therapy
    ii. Commonly missed diagnosis even by experienced clinicians (25% missed at initial presentation)
f. Explore + address contributing factors to missed diagnosis
    i. Patient / system factors(eg busy shift, ,multiple competing interests
    ii. Clinician factors (Knowledge gap, wellbeing)