Metro North Hospital and Health Service

Facility/hospital/clinical service name

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 three

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Queensland Government

SAQ 19: (9 Minutes)
Total 18 Marks

Passmark:(11/18)

A 77 year old male presents with lower back pain after a recent minor trip. He has a normal lower limb neurological examination, and no focal spinal tenderness. He is noted to have bruising on his buttocks, and routine biochemical examination is taken and is as follows:

Hb 60
WCC 0.4
Plt 6
MCV 81
HCT 0.17
Neutrophils 0.18

I. Describe the relevant features of these blood tests: (1 Mark)

Pancytopenia – all cell lines affected – with critical anaemia and thrombocytopenia

II. List three central and three peripheral causes which must be considered as an underlying diagnosis. (3 Marks)

Causes of pancytopenia:	
Central	**Peripheral**
Empty Marrow: aplastic anaemia, myelofibrosis Infiltration by abnormal cells: leukaemia, lymphoma, solid tumours, TB Deranged marrow: MDS Drug induced: chemotherapy, sulpha drugs, alcohol	Hypersplenism Auto-immune Severe sepsis

III. He will require transfusion of blood products. List four (4) blood products which may be used (carefully) *without* confirming ABO compatibility?

(4 Marks)

a. O neg PRBC

b. Platelets

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c. FFP

d. Prothrombinex

e. Cryoprecipitate

IV. He is transfused 2 units and becomes acutely hypoxic, and dyspnoeic.

Please complete the following table with respect to transfusion reactions:

(10 Marks)

Type of reaction (1 mark each)	**Incidence (0.5 mark each)**	**Two (2)Discriminating features on examination or investigation (0.5 mark each)**
Anaphylaxis/allergy	Anaphylaxis 1:20,000-1:50,000 (very rare) Milder allergy <1-3%	Urticaria Bronchospasm Abdominal cramps Low grade fever
Acute haemolytic reaction	1:75,000 (rare)	Haemoglobinuria Flank pain DIC Shock Acute renal failure Positive COOMBs test Reduced haptoglobins
Febrile non-haemolytic reaction	0.1-1% (common)	Usually isolated fever Absence of any other cause found - Normal investigations
TACO (transfusion related circulatory overload)	<1%	Clinical signs of heart failure CXR suggestive of APO Raised BNP
Bacteraemic shower	1:75,000 for platelets; 1:500,000 for RBCs	Rigors High fever Positive culture from blood product and patient

Note marks will not be given for TRALI – this is a delayed reaction and would not be expected to onset <24hrs.

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SAQ 20: (6 Minutes)
(12 Marks)

Passmark: 9/12

A 28 year old male patient is brought to your ED following an injury in a tackle during a rugby match. There is concern for a C spine injury as he been unable to move his upper or lower limbs after the injury.
On arrival he is being managed in appropriate spinal immobilisation.
His vitals signs are:
GCS 15/15
Temp 36.0
HR 60 regular
BP 90/60
SpO2 93% RA

Questions:

I. Complete the following table with 4 indications for intubation that may occur in a patient with a spinal injury and state the supporting features you would look for on assessment. (8 Marks)

Model answers:
Any of the following acceptable:

Indication for intubation	Supporting Features on Assessment
Hypoventilation	Rising pCO2 >50 Shallow respirations Weak & ineffective cough Paradoxical breathing TV < 3.5mL/kg
Hypoxia	PO2 <60 or SpO2 <93% despite high flow O2 supplementation
Agitation/Concurrent head injury or ALOC	Non-compliance with spinal precautions GCS <13 or deterioration
Airway compromise or protection	Vomit or blood soiled airway with risk of aspiration Expanding haematoma in posterior pharynx due to fracture
To facilitate transport or further management	Need for prolonged transfer to tertiary spinal centre Need for prolonged imaging such as MRI

II. List 4 modifications would you make to your standard RSI in this patient if you were to proceed with intubation in the ED? (4 marks)

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Model answers: Any of the following for 1 mark each. Only 1 mark for intubation technique as candidate needs to mention other parameters.

Preload with fluid prior to induction to prevent hypotension (eg N/saline 500mL bolus) and prepare push dose pressors (eg Metaraminol, Ephedrine) to maintain MAP >70
Pretreat with Atropine 600mcg to minimise bradycardia with intubation
Inductions drugs to ensure haemodynamic stability (eg Ketamine 102mg/kg)
Use of Video laryngoscope to minimise neck movements during intubation Anticipate difficult view on laryngoscopy and prepare adjuncts such as bougie, VL Consider awake fibreoptic intubation in theatre if necessary resources & expertise available
Maintain manual inline stabilisation during intubation to minimise neck movement

N.B Suxamethonium is not contraindicated in first 72 hrs after spinal injury so no mark given for this answer

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SAQ 21: (6 Minutes)

(Total Marks 12)

Pass mark: 9/12 marks

A 50 year-old woman is in your ED with epigastric pain and vomiting. She has a background of hypertension and GORD. You are reviewing her on the ward round as an ECG is being performed.

She states that she feels a bit light headed.

The following ECG is recorded:

I. List three (3) relevant abnormalities on her ECG. (3 marks)

Polymorphic VT/Torsade de Pointes (must state this)
Extreme sinus Bradycardia (rate approx. 20 bpm)
Likely prolonged QTc
Ventricular ectopic
'R on T' phenomenon causing Torsades

II. State 3 possible causes for this clinical presentation. (3 marks)

Severe hypokalaemia/hypomagnesaemia secondary to vomiting
Use of QTc prolonging medication relevant to clinical scenario – anti-emetics, eg metoclopramide, ondansetron
Myocardial ischaemia, with epigastric pain an ACS equivalent presentation

Note: The above causes should be relevant to the clinical scenario, hence the wording of the question.

III. The patient's BP is 100/60 mmHg. List three (3) potential treatment, including doses and endpoints where relevant.

(6 marks)

IV magnesium (10 mmol or 2g) over 1-2 minutes to termination of rhythm
IV potassium if associated hypokalaemia 10-20 mmol IV over 1 hour to K+ >3.5 mmol
Overdrive cardiac pacing to rate of 90-120 bpm

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Isoprenaline infusion 0.05-1 microg/kg/min to rate of 90-120 bpm

References:

Textbook of Adult Emergency Medicine, Cameron et al, fourth edition, chapter 5.4
Tintinalli's Emergency Medicine, Tintinalli et al, 8th edition, chapter 18

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SAQ 22: (6 Minutes)
(Total Marks 12)

Passmark: 7/12

A 32 year old male is brought to your ED by the ambulance in refractory VF. He has a down time of approximately 35minutes and has received advanced life support in accordance with published guidelines.
His partner states he self discharged yesterday after being diagnosed with myocarditis.

I. The Australian and New Zealand Committee on Resuscitation recommend the use of prospectively validated termination of resuscitation (TOR) rules for out of hospital cardia arrests (OHCA).

List 4 criteria used by a prospectively validated TOR rule in the setting of OHCA receiving advanced life support:
(4 marks need bold to get full marks)

- No ROSC has occurred
- **No Shock has been administered**
- The OHCA was not witnessed by EMS
- **No bystander CPR performed**
- The OHCA was not witnessed by bystanders

II. **List two (2) pros and two (2) cons with respect to the use of mechanical CPR devices in OHCA (4 marks , need bold for full marks)**

- **No mortality benefit**
- No ROSC benefit
- No positive neuro outcome benefit
- May be useful were manual CPR is difficult eg moving vehicle, cath lab etc
- Maybe usefule for prolonged CPR
- When ECMO CPR is being performed

III. **Which Extra Corporeal Membrane Oxygenation (ECMO) modality would be most appropriate for this patient and why? (2 marks)**

- Veno-Arterial ECMO

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- Heart failure and needs cardiac support. VV ECMO most suitable for respiratory failure and provides no cardiac support.

IV. List two (2) contraindications to commencement of ECMO.
(2 marks, need bold)

- **Futile (bridge to nowhere)**
- Inappropriate use of resources
- Poor baseline level of function
- Terminal illness

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SAQ 23: (6 Minutes) **Candidate Name:**
(Total marks 12)

Passmark 8/12

A 32 year old female self presents to your emergency department following a fall down 6 stairs at work.
She is 28/40 G1P0.
She has no complaints of pain but wants to be 'checked out'.

I. What are four of the major cardiovascular physiological changes in pregnancy that may impact on the clinical assessment of this patient?
(4 Marks)

Plasma volume increased by 50%
Heart rate increased by 15-20bpm
Cardiac output increased by 40%, gravid uterus pressure on IVC significant
Uterine blood flow 10% cardiac output

Also: SVR decreased, arterial BP decreased by 15mmHg, decreased venous return by gravid uterus on IVC, increased concentrations of most clotting factors

II. On assessment, her primary and secondary survey is normal. List one (1) specific examination and three (3) investigations related to the pregnancy that need to be performed for this patient?
(4 Marks)

Uterine examination- fundal height, tenderness, contractions
CTG- role debatable between 24-28/40 but early sensitivity for abnormal fetal HR
Ultrasound- useful as FAST, examination of solid organ injury, confirm fetal presentation and gestation, placental location and amniotic fluid volume. Not a good predictor of placental injury.
Blood test- Kleihauer, to determine amount of Anti-D required for fetomaternal haemorrhage

III. What four criteria need to be met for safe discharge of this patient?
(4 Marks)

Normal examination with no abdominal tenderness, bruising or contractions
No PV loss or discharge
Normal fetal movements
Safe discharge environment- s/work, explored DV, increased antenatal surveillance

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

Passmark: 9/12

A 60 year old man is brought by ambulance to your tertiary ED following a 'one punch' attack, where he was punched and fell, hitting his head. There was a brief (<5 minutes) loss of consciousness.

He has no prior medical history and is on no medications.

On arrival his vital signs are:

GCS	14/15 (E3, V5, M6)
Pupils equal and reactive	
P	85
BP	125/85
RR	18
O2 sats	98% room air

He has no injuries other than bruising and a large haematoma to the right parietal region of his head. He has a collar in place.

I. A single slice from a CT of his head is shown. List four (4) key findings?
(4 Marks)

Right parietal extradural haematoma (can describe bi-convex density and other features but need to say it is an EDH)
Air within EDH
Overlying scalp haematoma
Sub-arachnoid haematoma left frontal, likely contre-coup injury
Mass effect
Effacement of sulci right parietal
No appreciable mid-line shift

On return from CT he is poorly responsive. His GCS is now 7 (E1 V2 M4). His other vital signs do not change. He has an endotracheal tube placed for airway protection and commenced on ventilation without incident. The neurosurgical service is called to attend.

II. List six (6) priorities in his care while waiting for neurosurgery,
(6 Marks)

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Avoid hypotension, maintain cerebral perfusion
- aim MAP 70, using cautious fluid bolus 500ml NSaline, escalate to noradrenaline 5-20mcg/minute

Encourage cerebral venous drainage
- head up 30deg
- loosen cervical collar
- loosen ETT ties

Ventilation settings
- avoid hypoxia, titrate FiO2 for Sats >96%
- aim pCO2 35

General care of ventilated patient
- IDC and orogastric tube (not NGT)
- analgesia and sedation

Repeat neurological exam
- pupils

III. His pupils are noted to be different sizes left 3mm, right 7mm. List (2) additional interventions that you will perform?

(2 Marks)

Osmotherapy - with 500ml 3% Saline IV
Facilitate urgent transfer to OT for neurosurgical intervention
Continue above measures

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

Passmark = 8/12

You are the ED Consultant on the day shift at a district general hospital.
A 61 year old man presents with an injury after a fall while pushing his grandchildren down a slide.
After the primary and secondary survey, you determine that his only injury of significance is to his left shoulder.
You order x-rays of this joint.

I. List two (2) relevant positives and two (2) relevant negative findings on the above x-ray views. (4 Marks)

Answer:

- 1 mark for each.
- Left infra-glenoid shoulder dislocation.*
- Hill-Sachs lesion.*
- Nil Bankart lesion.
- Nil AC-joint dislocation.
- Nil rib fracture.
- Nil subcutaneous emphysema.
- Nil pneumothorax.
- * expected answers.

II. He has received Methoxyflurane from the ambulance officers, but is still in considerable pain.

List four (4) options for acute pain management of this injury.
(4 Marks)

Answer:

- Analgesic + route + dose considered as one fact/mark.
- Titrated intravenous opioid (Fentanyl 25-100mcg, Morphine 2.5-10mg).

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- Analgesic dose intravenous Ketamine (10-20mg).
- NSAID (Ketorolac 30mg imi/ivi, Indomethacin 100mg per rectal).
- Nerve block e.g. Supraclavicular Block or Intra-capsular Block with Bupivacaine 2mg/kg +/- USS-guidance.
- Nitrous Oxygen inhaled.

III. Having seen the X-rays, you determine the need for reduction. Name and briefly describe two techniques for reduction. (4 Marks)

Answer:

- 1 mark for name of technique and 1 mark for brief description.
- Kocher's; arm flexed and ad-ducted, gentle traction, external rotation until resistance, then extend to saggital plane, then internal rotation to opposite shoulder.
- Spaso; Extend arm in saggital plan, gentle traction, external +/- internal rotation.
- Scapular manipulation; patient sitting/prone with arm extended and gentle traction, move tip of scapular medially/towards spine.
- Milch; ab-duction and external rotation to overhead position with fixation of head of humerus.
- Stimson; Patient prone with gentle traction/weight to arm.
- Cunningham's; support patient's arm flexed 90 degrees & ad-ducted, gentle traction, massage Trapezius/Deltoid/Biceps sequentially.
- Hippocrates; gentle, sustained traction of ab-ducted and flexed arm, with counter-traction with sheet.

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SAQ 26 (6 Minutes)
Total Marks 12

Passmark = 6/12

A 22 year old HIV negative male presents to an urban district emergency department with a history of unprotected anal intercourse with an anonymous male partner the previous night. He is asymptomatic and requesting post-exposure prophylaxis (PEP).

I. List (4) other factors on assessment that are important in determining his risk of contracting HIV in this setting?

(4marks)

Model answers: (1 mark for each)

- Receptive or insertive intercourse (higher risk if receptive)
- Presence of ejaculation or withdrawal if receptive (higher risk if ejaculation)
- Circumcision status of patient if insertive (lowers risk, may consider not giving PEP if insertive and circumcised)
- Presence of concurrent STI (increases risk)
- Trauma during intercourse (increases risk)

II. List (6) important principles of discharge advice that you will provide to the patient. (6 Marks)

Model answers (1 mark for each):

1. PEP is not 100% effective
2. The importance of compliance with the treatment regime
3. Requires further HIV testing to confirm
4. Emphasize behaviours to prevent re-exposure
5. Attend clinic appointment and provide contact details of sexual health clinic to which patient is referred.
6. Starter pack is not a full treatment course, this will be provided at follow up
7. Needs to seek medical advice if feeling unwell as potential for adverse drug reactions.

III. What other condition may require urgent treatment in this setting and what will determine if this is required? (2 Marks)

Model answers (1 mark for each):
Hepatitis B
If unimmunised the patient requires hepatitis B immunisation
No marks for immunoglobulin as this is only indicated if the source individual was known to be infective.

Source: Australian national guidelines Post Exposure Prophylaxis 2016.

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SAQ 27: (9 Minutes)

(18 marks)

Passmark: 11/18

A 5 day old baby girl is brought into the emergency department. She has had poor feeding for the last 24 hrs and has had increasing lethargy. The baby appears pale, floppy and mottled.
The child is 3.8kg.

Initial vital signs are:

HR	190
RR	60
Cap refill	5secs
BP	Unable to record
Sats	Not reading

I. List eight (8) differential diagnoses for this presentation (8 Marks)

- Cardiac (Duct dependant lesion)
- Sepsis
- Electrolyte disturbance
- Metabolic/Endocrine - CAH
- Formula dilution or overconcentration
- Inborn errors of metabolism
- Intestinal catastrophe
- Toxins
- Seizures
- Trauma (Accidental or non accidental)

II. List four (4) immediate actions you would take (4 Marks)

- Oxygen 15L non-rebreather
- IV/IO/UV access
- Fluid bolus – 10-20ml/kg bolus
- IV Cefotaxime + ampicillin or reasonable alternative
- Check Blood sugar level

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III. You decide to intubate the baby. (6 Marks)

List six (6) pieces of equipment (including sizes –multiple sizes do not count as separate answers) that you would prepare for the intubation of this child.

- Bag/valve mask/neopuff/anaesthetic circuit
- ETT size 3.5 cuffed (Accept 3 and 4)
- Paedcap/capnography
- Laryngoscope size 1 &2 miller and/or mc blade
- Ventilator
- Suction catheter
- Oropharyngeal/nasopharyngeal airways
- Stylet/bougie
- LMA (Size 1)

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