

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

Metro North Hospitals and SCUH

**ACEM Fellowship Trial
Examination**

2018.2

SAQ Paper

Answers only

Booklet three

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SAQ 19: (9 Minutes)
(Total 18 Marks) Passmark 12/18

You are working as the doctor on a helicopter retrieval service that is dispatched to retrieve a patient that has collapsed on a dive boat on a nearby reef.

Questions:

1. List 6 diving related or non-diving related differential diagnoses for this collapse.
(6 marks) 4/6

Diving related:

CAGE/DCI

Toxic gas CO₂, CO, hydrocarbon

Immersion pulmonary oedema

Near drowning

Hypothermia

Marine envenomation (coneshell, box jelly/irukanji, blue-ringed octopus etc)

Non-diving related:

Hypoglycaemia

Seizure

ICH/CVA

CVS collapse (ACS, arrhythmia, PE)

Trauma

Drug/medication intoxication

2. Indicate 6 aspects of the history that might help differentiate the cause of the collapse.
(6 marks) 4/6

Diving history:

Symptoms preceding diving?

Number of dives that day/preceding days

Depths of dives

Time spent at bottom

Surface intervals between dives

Which breathing gases used in SCUBA apparatus

Decompression or safety stops performed/omitted

Any rapid ascents

Witness account: Onset of any distress in relation to depth/ascent, ?breath holding/seizure during ascent, trauma or contact with venomous species.

Timing of symptoms/collapse in relation to resurfacing (during ascent/within minutes typical for CAGE, esp in relation to uncontrolled ascent/breath hold)

?Others with similar symptoms (contaminated breathing gas)

General history:

Past medical history (esp cardiac, respiratory, CNS/seizures, DM)

Medications

Previous DCI, especially neurological/skin (assoc with PFO)

3. List 4 body systems that may be affected by decompression illness and give one clinical feature for each. (4 marks) 2/4

CNS (confusion, headache, unsteadiness, ALOC)

Spinal (sensory/motor deficits: esp paraparesis, urine retention, loss of anal tone)

Pulmonary (chest pain, dyspnoea, hypoxia)

Musculoskeletal (myalgia, arthralgias)

Vestibular (vertigo, tinnitus, hearing loss, ataxia)

Skin (rash)

Lymphatic (swelling)

4. Outline 2 key considerations whilst retrieving this patient by helicopter. (2 Marks) 1/2

Retrieval: winch from dive deck vs meet boat onshore

Bubble injury considerations: Maintain horizontal position if concern re CAGE. Patient needs to be flown as close to sea level altitude as safely possible.

ABCDE/supportive care: Needs highest flow O2 available, restore volume with prompt IV fluids, warming and drying

Addressing differential causes of collapse as indicated

Urgent transport to nearest centre with recompression chamber. (Delay >hrs to recompression in CAGE= poorer outcomes)

Passmark: 12/18

SAQ 20: (6 Minutes)
(Total 12 Marks) Passmark 8/12

A 59 year old male presents to your ED with syncope. His ECG shows a broad complex tachycardia.
Questions:

1. List 4 different causes of a broad complex tachycardia (2 Marks)

- Ventricular Tachycardia
- SVT with aberrant conduction due to bundle branch block
- SVT with aberrant conduction due to the Wolff-Parkinson-White syndrome
- Pace-maker mediated tachycardia
- Metabolic derangements e.g. hyperkalaemia
- Poisoning with sodium-channel blocking agents (e.g. tricyclic antidepressants)

2. List 4 clinical features that increase the likelihood of VT (4 Marks)

- Age > 35
- Structural heart disease
- Ischaemic heart disease
- Previous MI
- Congestive heart failure
- Cardiomyopathy
- Family history of sudden cardiac death (suggesting conditions such as HOCM, congenital long QT syndrome, Brugada syndrome or arrhythmogenic right ventricular dysplasia that are associated with episodes of VT)

3. List 4 ECG features that increase the likelihood of VT (4 marks)

- Absence of typical RBBB or LBBB morphology
- Extreme axis deviation ("northwest axis")
- Very broad complexes (>160ms)
- AV dissociation
- Capture beats
- Fusion
- Positive or negative concordance throughout the chest leads
- Brugada's sign
- Josephson's sign
- RSR' complexes with a taller left rabbit ear

4. List 2 medications used to treat stable VT (2 Marks)

- Amiodarone 5mg/kg
- Procainamide 50mg/min
- Lignocaine 1mg/kg
- Sotalol 1mg/kg
- Magnesium 10mmol

Pass mark: 8/12

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SAQ 21: (6 Minutes)
(Total 12 Marks) Passmark 8/12

Your Registrar has asked you to review a 28 year old man who is having a reduction of his fractured left radius performed under Bier's block using Prilocaine. 15 minutes into the procedure he is complaining of shortness of breath and light-headedness.

On examination, he appears cyanotic with oxygen saturation of 85% on pulse oximetry.

SAQ 1 Answer

Q1: 1. Methemoglobinemia (need to mention to pass) – SE of Prilocaine

2. Anaphylaxis/ Bronchospasm
3. Accept VT/ arrhythmia
4. Seizure

Local anaesthetic toxicity is not sufficient unless they give specific cause such as arrhythmia or seizure

Q2:

ABG (must for pass)	Saturation gap. Normal Pao2 (with low SpO2 on pulse oximetry)
ECG	To check for ischemia/ arrhythmia

Accept CXR to check for aspiration/pneumothorax instead of ECG

Q3:

1. Methylene blue 1 to 2 mg/kg IV over 15 min (must for pass – dose not required)
2. Exchange transfusion
3. Hyperbaric Oxygen
4. NAC
5. Vitamin C

Q4:

- a) Open fracture
- b) Local Anaesthetic allergy
- c) Severe hypertension – SBP >180
- d) Sickle Cell
- e) Raynauds
- f) uncooperative/confused patient
- d) unable to obtain access in both arms

SAQ 22: (6 Minutes)
(Total Marks 12) Passmark 8/12

You join an outer urban Emergency Department as a new consultant. The department occasionally provides road retrieval and inter-hospital transfer services in support of the ambulance service, using a nurse and doctor from the department.

The Department Director asks you to formalise the arrangements and make recommendations for the safe provision of these retrievals.

Questions:

1. List two categories of Personal Protective Equipment (PPE) that should be provided to staff.

(2 Marks)

(needs these two broad categories, with examples)

- a. Against body fluid exposure – eg glasses, gloves, aprons/gowns
- b. Against extreme environments – eg boots, dedicated long sleeve clothing, hats/helmets, sun and cold protection

2. List four patient monitoring modalities required for safe transportation of patients.

(4 Marks)

(4 out of these 5 needed. This taken specifically from ACEM guidelines)

- Continuous ECG
- Pressure monitoring – invasive and non-invasive
- Patient Oxygenation with continuous pulse oximetry
- Patient Ventilation with wave form capnography
- Ventilator alarms including high pressure and disconnection

3. List three important items of non-clinical equipment that might be needed. (3 marks)

(4 of these, or other sensible suggestions)

- Communication – phones
- Documentation and pens
- Taxi vouchers
- Spare batteries for equipment
- Torches and/or head torches

4. What clinical governance review processes are required? (3 Marks)

(Can be formatted any way, but needs to include an audit of events and using this to feedback into future practice)

Audit of cases

- i. Tasking
- ii. Staffing mix and seniority
- iii. Equipment performance
- iv. Clinical decisions and patient outcomes
- v. Closed loop of feedback to staff and to inform future practice

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SAQ 23: (6 Minutes)
(Total Marks 12) Passmark 8/12

A 24-year-old male is brought to your Emergency Department by his friends after an altercation. He is moribund, with no palpable radial pulses and a thready carotid pulse, with a HR of 155 bpm.

His photograph is shown below:

1. State the important features in this clinical photograph and their significance.

(3 marks)

- 3 stab wounds to back/thorax
- Active bleeding
- Proximate to heart – high risk of cardiac injury, likely Pneumo or HaemoTx

2. List 2 ultrasonographic signs that would be consistent with pericardial tamponade on

ultrasound?

(2 Marks)

- Pericardial effusion
- R sided heart collapse during diastole

3. List 2 indications for emergency department thoracotomy for penetrating trauma.

(2 marks)

- Cardiac arrest <15 minutes with initial signs of life
- Systolic blood pressure below 50 mm Hg after fluid resuscitation
- Severe shock with clinical signs of cardiac tamponade

4. List five potential complications from resuscitative thoracotomy?

(5 marks)

- a. Coronary artery injury/ligation
- b. Phrenic Nerve laceration
- c. Diaphragmatic injury
- d. Chest wall vascular injury (intercostals, internal mammary)
- e. Infection
- f. Health care worker body fluid exposure

Total marks=12

Passmark = 8/12

References:

Robert's and Hedges

Rosen'

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SAQ 24: (6 minutes)
(Total Marks 12) Passmark 7/12

A 14 year old girl presents to ED with a rash, as seen in the accompanying clinical photograph. The rash has been present for the last 24 hours. She has been playing rugby league today and has a headache.

She has had heavy PV bleeding the past hour. B-hCG is negative.

She appears alert and active.
Her vital signs are as follows:

GCS	15/15
HR	88
RR	16
SpO2	100% in room air
Temp	36.5 C
CRT	< 2
BP	119/80

Questions:

1. Describe the main features present. (2 marks) 1/2

Petechiae & Purpura on both legs
Bruising to upper thighs

2. You perform a full blood count.

List 3 other investigations that you would perform in ED for this patient, with justification (6 marks)

Investigations:

Coagulation profile – investigate possible bleeding disorder and/or DIC

Urea and creatinine – AKI in MAHA or TTP

CT head if low platelets in context of trauma

LFTs re: DIC and haematological malignancy

X-match/G+H re: possible need for transfusion

Other reasonable investigations as suggested by candidates (examiner discretion), but would not include:
Septic screen/blood cultures (stem suggests well, afebrile)

B-hCG – given in stem

BSL – generic, non-contributory

VBG – generic, non-contributory in this setting (not shocked, Hb can wait)

Candidates must have bold plus 2 others with justification for full marks

3. The patient's FBC shows the following:

Hb	112 g/dL	(115-165)
MCV	72fL	(80-100)
WCC	$6 \times 10^9 /L$	(4-11)
Neutrophils	47%	(40-70%)
Lymphocytes	30%	(14-45%)
Monocytes	6%	(4-13%)
Eosinophils	1%	(0-7%)
Basophils	0%	(0-3%)
Plt	$2 \times 10^9 /L$	(150-400)

What is the most likely diagnosis in this patient?

(2 marks)

Immune Thrombocytopenic Purpura

4. Her PV bleeding increases and is difficult to control. Her GCS is now 12. List 2 specific treatments you would give as part of your management to stop her bleeding

(2 marks)

Intravenous Immunoglobulin

IV Methylprednisolone

IV platelets

Total 12 marks

Expected candidate score for just at standard: 7/12

SAQ 25 (6 minutes)
(Total marks 12) Passmark 8/12

You are the consultant on the morning shift and just before handover the night registrar asks you to whether he should complete a death certificate for a 78-year-old man who died in the emergency department overnight. He had advanced dementia and was suspected to have a ruptured abdominal aortic aneurysm which had been previously deemed unsuitable for surgical intervention by the vascular surgeons.

- a. List six situations where a death is notifiable to the coroner (6 marks)

Identity of the person is unknown
Violent or unnatural Death (accident/suicide/homicide/overdose/snakebite/anaphylaxis/drowning/electrocution/ work-place)
Death in suspicious circumstances (homicide suspected)
Healthcare-related death (healthcare caused/contributed to the death or failure to provide care)
Cause of death certificate has not been issued and is not likely to be issued (not able to ascertain cause of death)
Death in care
Death in custody
Death in the course of or as a result of a police operation

- b. State one important consideration that is required after notifiable death is reported to the coroner or the police (1 mark)

Consider need for scene /personal items and body preservation (all items entering the body plus devices attached to these must be preserved)

- c. List five actions required by a medical officer in the event of a non-notifiable death in the department (5 marks).

Pronounce the death in the medical record
Complete cause of Death certificate
Consider whether a hospital autopsy is desirable
Notify the family of the death
Complete discharge summary
Notify the GP
Begin the death review process
Consider tissue donation

Source: Management of the Deceased -Practice Manual 2012, State Coroner's Guidelines 2013

SAQ 26 (6 Minutes)
(Total Marks 12) Passmark 8/12

A 29 year old lady presents to ED on a Friday night, with bizarre behaviour following a recent admission under the medical team with cellulitis.

She has a history of depression and self-harm. She is accompanied by her husband, who states that she has not slept since discharge.

She is currently taking antibiotics and an SSRI. Her husband states that she started to hallucinate while she was an inpatient but didn't mention it to medical staff as she wanted to go home.

You are concerned that she has an acute presentation of psychosis.

1. What features of her mental state exam indicate psychosis.

List 4 features:

(4 Marks)

Positive symptoms – Hallucinations, delusions, disorganised speech, disorganised behaviour, catatonic

Negative symptoms – Blunted affect, emotional withdrawal, anhedonia, attention impairment.

Functional decline

Appearance

Lack of insight

2. Missed medical diagnoses in psychiatric patients are reported in up to 45% of patients. What are the main pitfalls in the “medical clearance process”.

List 4 pitfalls:

(2 Marks)

History – difficult to get from patient, failure to seek collateral, limited by location of review.

Exam – Location of patient, failure to do full examination, no vitals or MMSE, no Neuro exam.

Patient cooperation.

Acceptance of “medical clearance” or over reliance on investigations, failure of ongoing review.

3. She is calm and responsive to your assessment and request for further investigations. She is referred to the mental health team for review. What features of her presentation suggest she should remain for inpatient assessment?

List 2 features:

(2 Marks)

1st presentation

History of depression and self harm – high risk of harm

Carer fatigue

Weekend therefore delay to follow up

4. She suddenly becomes more agitated in the department whilst waiting for the mental health team review. She is pacing in her cubicle and threatening harm to herself. Her husband has left the department.

How do you manage this situation?

**List 4 steps
(4 Marks)**

Patient – verbal de-escalation

Area – move to resus/monitored bed

Staff – security, nursing

Teams – include mental health

Equipment – to provide safe chemical sedation or physical restraint

Drugs – oral/iv/im options- with suggested doses

Pass mark: 8/12

SAQ 27: (9 Minutes)
(Total 18 marks) Passmark 13/18

A 56-year-old female is brought in to your ED after a generalized tonic-clonic seizure. On your assessment, you note that there is right-sided weakness and history reveals frequent falls and headache in recent months.

She has no significant past medical history and as part of the ED assessment, you have performed a CT brain, which is included in the Props booklet.

The patient is now GCS 15 and complaining of a headache. Her vital signs are as follows:

Temp 37.5C
HR 65
BP 135 / 85
RR 15
O2 Sats 97%

Questions:

1. List 3 pertinent findings on this CT. (3 Marks)

- Large ring enhancing lesion to left frontoparietal hemisphere
- Surrounding vasogenic oedema is evident
- Mild mass effect with a minor degree of midline shift
- Irregular thick margins with hyperattenuation (or heterogenous enhancement of the margin)

2. List 5 differential diagnoses for these radiological findings. (5 Marks)

- Primary malignancy (Glioblastoma Multiforme most likely, others include anaplastic astrocytoma)
- Cerebral metastasis (Lung, Breast,
- Cerebral abscess
- Primary CNS lymphoma
- Cerebral toxoplasmosis
- Cerebral Tuberculosis
- Subacute cerebral infarction
- Tumefactive demyelination

3. List your management priorities in the Emergency Department (5 Marks)

- Analgesia with dose
- Steroid Therapy (Must name drug and dose and route)
Dexamethasone 4-8mg stat then 4mg QID IV
- Consultation with neurosurgery team for admission and further management
- Seizure prophylaxis
Will accept either phenytoin load 15-20mg/kg or leviteracetam 20-30mg/kg
- Social support for patient and family

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4. State 5 important aspects to breaking bad news to this patient. (5 marks)

Any of the below

- Appropriate setting: quiet area is desirable
- Ask if she wants any family or NOK present
- Having other support staff present: Senior RN or Social Worker
- Use of a 'Warning Shot'
- Explain findings on the CT and the likely diagnoses in layman terms
- Explain the next step in her treatment will be guided by the neurosurgical team
- Use of silence for news to sink in
- Offer tissue and water
- Social worker to assist with any social issues
- Answer any questions posed by patient and family

Will accept any combination of the above

Pass Mark is 13/18