

The Prince Charles Hospital



**The Prince Charles Hospital
Emergency Department**

ACEM Fellowship Trial Examination

2015.1

**Short Answer Questions
(SAQs)**

Model Answers

This paper is property of TPCHEM Emergency Department and should not be distributed or published in any way without previous permission

SAQ 1:

Questions:

1. List 6 possible causes for her tachycardia and describe one distinguishing historical feature for each (12 marks) 8/12

Answer 1

- 1) Toxidromes - Anticholinergic toxidrome :Empty packets of antihistamines, TCAs etc, /other features dry, hot, urinary retention etc
Sympathomimetic toxidrome : Hx of IVDU or theophyllene,/ hx tremor agitation and convulsions
- 2) Serotonin syndrome – history of fever, hypertonia, sweating and /history of taking SSRIs or TCA
- 3) Hypovolaemia : reduced input or output, history of vomiting or diarrhea, bleeding
- 4) Hypoglycaemia : sweaty, poor eating or /hypoglycaemic overdose
- 5) Hypoxia : difficult ventilation, intubation/ ALOC
- 6) Lack of sedation post intubation
- 7) Sepsis – IVDU, recent infections

2- Your Ventilator settings are as follows :

Volume control ventilation:

TV 280

Rate 16

PEEP 5

I:E ratio 1:3

List 2 unsatisfactory parameters with her ventilation and suggest 2 changes you would make to these settings to improve her ventilation. (6 marks) - 5/6

Answer 2

Hypoxia therefore increase TV to 6-8ml/kg likely >300, Increase I: E ratio to 1:4 or increase FiO₂ to 60% or increase PEEP to 6-8 (ensure Peak pressures <30)aim Sats > 93%

Hypercarbia therefore increase TV to 6-8ml/kg or Rate 18-20 Aim PCO₂ <40

3. Give 4 reasons (unrelated to her ventilator settings) why her ETCO₂ may be high and give one example of each. (8 marks) - 5/8

Answer 3

- 1) Increased CO₂ production – fever, thyrotoxicosis
- 2) Increased pulmonary perfusion – High CO, hypertension
- 3) Poor alveolar ventilation – hypoventilation, bronchial intubation
- 4) Technical mechanical errors – leak or faulty valve

Passmark 18/26 (adjust to /10) (7/10)

SAQ 2:

Questions:

1- List the abnormalities on the ECG.

(3 marks) – 3/3

Answer:

PR depression I, II, V5, V6 (PR elevation in aVR)

Diffuse ST elevation I, II and Chest leads

No geographical distribution - no reciprocation

(Except aVR)

2. What is your provisional likely diagnosis? Justify your choice. (3 marks) – 2/3

Acute pericarditis

Nature of pain - age young - no obvious risks for pe.

ECG pathognomonic

3. List 3 additional investigations that are indicated to further assess the extent and severity of this condition. (3 marks) – 2/3

Answer:

Troponin/CK

Echo

MRI

4. In the table below, list the possible underlying aetiological processes causing this patient's condition. Give 1 example of each and list the relevant investigation that could be ordered. (12 marks) – 9/12

Infectious

Viral - usually no testing needed, PCR, serology

Bacterial - bc if patient febrile

Tb - if contact history or from high risk group - mantoux cXR

Inflammatory

SLE / rheumatoid - if other symptoms or family history and no other cause apparent -

Ana screen / complement 1-2

Rheum factor / CRP

Metabolic - uremia - renal function testing

Malignant – lung Ca, if other symptoms or signs suggestive - CT chest / abdomen as appropriate to suspected source.

Passmark = 16/21 (adjust to /10) (7.6/10)

This paper is property of TPCHEM Emergency Department and should not be distributed or published in any way without previous permission

SAQ 3:

Questions:

1- What are the significant findings on this X-ray? (4 marks) - 2/4

Thickening of epiglottis (thumb printing)

Loss of cervical spine lordosis

Normal prevertebral soft tissue spaces

No visible FB in airway

2- List 4 likely organisms that cause this condition in this patient. (4 marks) - 3/4

Haemophilus influenzae b (Hib) (must have this for full marks)

H.parainfluenzae

Strep pneumonia

Group A Strep (pyogenes)

Staph aureus

Atypical organisms (Mycoplasma)

3- List 5 immediate treatment priorities in the ED? (5 marks) 4/5

Nurse in position of best comfort & avoid distressing the patient

Call for urgent assistance from Anaesthetics & ENT

Prepare to manage **potential airway obstruction** (difficult airway equipment including cric kit, but aim to intubate in OT with awake intubation unless acute deterioration)

Analgesia – IV Paracetamol 1g, Morphine 0.1mg/kg titrated to analgesia but not drowsiness

Antibiotics – Ceftriaxone (or Cefotaxime) 2g bd IV

Passmark = 9/13 (adjust to /10) (7/10)

SAQ 4:

Questions:

1. List 5 possible differential diagnoses. (5 marks) 3/5

Heat stroke - environmental

Sepsis

Drug ingestion – anticholinergic, sympathomimetic

Meningitis

UTI

Pneumonia

Thyroid storm

Phaeochromocytoma

Seizure

Metabolic causes

2. List and justify 6 investigations you would perform in ED in this patient. (6 marks) -4/6

Evidence of multi-organ failure due to heat stroke

ABG – metabolic acidosis and respiratory alkalosis

Electrolytes – hypokalaemia, hypocalcaemia, hypophosphataemia or hyperkalaemia – rhabdomyolysis

Renal function – renal impairment in dehydration

CK – increased in rhabdomyolysis

Coags – abnormal in DIC

Urinary myoglobin – present in rhabdomyolysis

BSL – ensure normoglycaemia

Septic screen – BC, urine, CXR +/- LP

Urine drug screen – exclude ingestion as cause for hyperthermia

ECG – may be arrhythmias if electrolyte abnormalities

Metabolic screen – urine VMA, TFTs

3. Outline your approach to cooling this patient in the ED. (8 marks) 5/8

Close monitoring of skin and core temperature (rectal temp, IDC catheter)

Remove clothing

Active cooling to < 40 degrees (give 2 options minimum)

Tepid water spray with fan cooling

Ice water packs in axilla and groin

Cooling blankets

Cold IV fluids.

May require RSI for sedation and paralysis if unsuccessful or unable to tolerate cooling.

N.B No role for anti-pyretics in heat stroke.

Passmark: 12 /19 (adjust to /10) (6.5/10)

SAQ 5:

Questions:

1- List 4 factors associated with significant toxicity following calcium channel blocker poisoning?

(4 Marks) 3/4

Answer:

Agent - diltiazem and verapamil associated with toxicity other CCBs do not cause significant toxicity

Dose - x2-3 therapeutic dose can cause toxicity with XR prep and >10x tablet ingestion likely to cause significant toxicity

Co-ingestion of other cardiotoxic medication increases likelihood of significant toxicity

Extremes of age - paediatric ingestion and elderly

Presence of significant co-morbidities

2- List 4 clinical features that may occur with significant calcium channel blocker toxicity.

(4 Marks) 3/4

Answers:

Bradycardia (must have)

Hypotension (must have)

(Any of the following for 1 mark)

AV block - 1st degree AV block

Myocardia ischaemia

Hyperglycaemia

Pulmonary oedema

Lactic acidosis

Seizures

The Prince Charles Hospital

3- Several hours later the patient becomes agitated and clammy. He is being managed in a Resus area with non-invasive monitoring.

His vital signs now are:

BP 87/40
HR 40
Sat 93% on RA
GCS 15/15

List in a step-wise approach your management of this patient. (8 Marks) 6/8

Answer:

Fluid bolus 10-20 ml/kg

Calcium - 60mls Calcium gluconate 10% or 20mls Calcium chloride 10% - rpt bolus up to three times

Atropine 600mcg iv, repeat if response

Invasive monitoring with art line & CVL

Catecholamine infusion - adrenaline or dopamine or noradrenaline

High Dose Insulin Infusion

Sodium bicarbonate - if metabolic acidosis

Cardiac pacing

ECMO / By-pass / IABP

Passmark = 12/16 (adjust to /10) (7.5/10)

SAQ 6:

Questions:

1. List 8 Differential Diagnoses for this presentation (8 marks) – 6/8

Answers:

Sepsis: meningitis, UTI, gastroenteritis

Metabolic – Inborn errors of metabolism

Neurologic – Increased ICP

Surgical

 Pyloric Stenosis

 Malrotation

 Intussusception

Congenital cardiac abnormality

Gastrooesophageal reflux

2. A VBG is performed as part of his workup:

pH	7.5
Pco ₂	52.8
Po ₂	33
Lac	1.8
HCo ₃	42

Hb	116
K	1.8
Cl	95
Na	143
Ca	1.28
Glucose	6.3

Describe 3 key abnormalities of the VBG and briefly comment on the possible cause of each. (6 marks) - 4/6

Answers:

Severe Metabolic Alkalosis – vomiting resulted in loss of Hydrogen ions

Respiratory Compensation – Expected CO₂ 46 is 52 therefore degree of Resp acidosis – mixed picture 2ndary to obtunded baby

Hypokalaemic and hypochloraemic – loss of HCL with vomiting and intracellular exchange of cl with K to balance alkalosis

3- What is the most likely diagnosis and explain why. (2 mark) – 2/2

Pyloric Stenosis with the pathognomonic VBG of hypochloraemic, hypokalaemic metabolic alkalosis and the clinical picture of a significant increase in vomiting in a male baby in the appropriate age range.

4- List and justify 3 further investigations required for this baby: (6 marks) 4/6

USS – confirm pyloric stenosis

Septic workup – exclude sepsis

AXR – rule out malrotation, obstruction

Passmark = 16/22 (adjust to /10)

(7.5/10)

SAQ 7:

Questions:

1. List 3 relevant positive and 2 relevant negative findings on this CXR. (5 Marks) 4/5

Positive:

(Large) Pleural effusion

Pneumothorax

Tracheal deviation / mediastinum displaced to the left / radiological signs of tension

?? 2 marks for hydropneumothorax

NEGATIVES

No surgical emphysema

No oxygen tubing seen

No visible mass / evidence of infection

No bony lesions

2. In point form, describe the immediate management priorities in this case (3 Marks) - 2/3

Identify any established limitations of care and manage appropriately

Improve oxygenation – Additional oxygen via NRBM

Decompression of pneumothorax + Formal ICC insertion

3. List the parameters needed to help distinguish between a transudate and an exudate pleural effusion in general? - 3/4

(4 Marks)

Light's Criteria – therefore tests needed are pleural fluid and serum LDH, pleural fluid and serum cholesterol, pleural fluid and serum albumin

Passmark = 9/12 (adjust to /10)

(7.5/10)

SAQ 8:

Questions:

1. What is your interpretation of the ECG and state your evidence.
(5 marks) – 3/5 – VT pass fail

Broad complex tachycardia – likely **Monomorphic VT**

NW axis

Concordance – esp V6 – negative

Jeffersons notch

2. What is the likely anatomical origin of the abnormality? (1 mark) – 1/1

Left VT – origin on left with electrical activity flowing to right

3. What initial treatment would you give this patient in ED? INCLUDE DOSE AND ROUTE.
(5 marks) – 4/5

2 priorities – Ischemia and VT

Treat likely ischaemia

Aspirin 300mg / morphine 2.5 mg IV / heparin 1000IU loading / GTN – sublingual

Treat VT

Amiodarone loading 300mg IV OR DCCV with sedation

Correct electrolytes

Passmark = 8/11 (adjust to /10)

(7.3/10)

SAQ 9:

Questions:

- 1- List the radiological abnormalities on the above scan. (4 marks) -3/4

Answer:

Extensive subarachnoid haemorrhage

Intra-ventricular haemorrhage – lateral ventricles, anterior horns, L) posterior horn

No apparent hydrocephalus

Evidence of cerebral oedema

No midline shift

2. List your immediate management priorities in this patient: (10 marks) -6/10

Answers:

Instigate neuroprotective measures. (2 marks)

Maintain pCO₂ 30-35,

Maintain pO₂ > 80

Head up 30 degrees

Maintain normothermia

Maintain normoglycaemia

Ensure adequate sedation +/- paralysis (1 mark)

Morphine/Midazolam infusion

Treat Hypertension: (1 mark for drug & 1 for endpoint)

Invasive arterial BP monitoring

aim for SBP 160

GTN infusion, titrated to above endpoints

Hydralazine (5mg aliquats to 20 mg)

B-Blocker (Metoprolol 2.5mg aliquats to 20 mg or HR 60)

SNP infusion

Expedite **Neurosurgery** review (1 mark)

- definitive Mx with early vs delayed clipping with CTA, 4-vessel angio or MRA prior

- ICP monitoring

- EVD for monitoring/CSF drainage if developing hydrocephalus

Monitor for vasospasm: (**Discriminator – if mention this get 2 marks**)

- Nimodipine Infusion (d/w neurosurgeons): start at 1mg/hr and titrate up to 4 mg

Supportive cares (2 marks)

IDC – hourly measures (DI or SIADH)

The Prince Charles Hospital

NGT if intubated
Correct electrolyte abnormalities
Coagulation abnormalities
Maintenance fluid (isotonic)

3. What criteria would you use to estimate this patient's likely prognosis.
(4 marks) – 2/4

Scoring System (Need to mention 1/3 scoring systems to pass)

- WFNS – Grade 4 (GCS 8, focal motor deficit)
- Hunt & Hess criteria – Grade 4-5
- Fisher criteria – Grade 4

Likely **poor prognosis**, given low GCS with motor deficit and extensive CT findings and age > 50.

Passmark = 11/18 (adjust to /10)

(6/10)

SAQ 10:

Questions:

1- List 4 peripheral & 4 central causes of vertigo. (8 marks) 7/8

* Peripheral

BPPV

Labyrinthitis

Vestibular neuritis

Meniere's disease

Acoustic neuroma

Cerebellopontine angle tumours

Barotrauma

Ototoxicity

* Central

Posterior circulation CVA

Cerebellar haemorrhage/infarction

Vertebrobasilar insufficiency

Cerebellar tumour

MS

Lateral medullary syndrome

Vertebral artery dissection

2- List 5 features on examination that would be suggestive of central vertigo. (5 marks) 4/5

Vertical nystagmus

Truncal ataxia

Dysdiadochokinesis

Romberg's sign positive

Dysarthria

Limb weakness (focal neurology)

Absence of a positional component (Negative Dix-Hallpike test)

3- List and justify 3 investigations that could be arranged from the ED to distinguish between central and peripheral causes for vertigo. (6 marks) 5/6

CT Brain – Identify abnormalities of posterior fossa (eg bleed, tumour)

MRI – Highly sensitive for posterior circulation CVA

CTA Neck vessels – Identify vertebral artery dissection

Passmark = 16/19 (adjust to /10)

(8.4/10)

SAQ 11:

Questions:

1- List 8 sequential steps in the management of this patient?

(8 marks) 6/8

- IV fluid bolus (N Saline 1-2L. Aim SBP 100)
- Central venous access and commence vasopressor if patient remains hypotensive (Noradrenaline infusion – Aim MAP 60-65)
- Organise bed side echo – look for elevated RV pressure and/or deviation of interventricular septum suggestion increased RV pressure
- Find further information of cerebral aneurysm – were there more than one aneurysm/ what interventions done
- Discuss with cardiothoracic surgery regarding suitability for surgical embolectomy (preferred treatment option)
- Discuss other treatment options with patient and family – thrombolysis with tenecteplase (if RV pressure is high) / anticoagulation with heparin (if RV pressure normal)
- If patient arrests – thrombolysis

2-Briefly describe 3 ethical and medico-legal issues in this situation

(3 marks) 2/3

- Consent – challenging situation as previous h/o clipped aneurysm. May have difficulty in obtaining previous clinical information. Patient should be given information (risks and benefits) on each treatment modality for informed consent
- Possible thrombolysis of a patient with previous aneurysm without full clinical information
- Adequate documentation of discussions with patient and other specialties

Passmark 8/11 (Adjust to /10)

(7.3/10)

SAQ 12:

Questions:

1. List 7 potential complications of this burn and describe the key management option for each. (14 marks) - 10/14

Answer :

Airway burns with stridor – early intubation

Breathing – ventilation issues with restriction of chest wall movement–
escharotomy

Inhalational burns – oxygen and ventilatory support for ARDS – NIV with PEEP

Hypovolaemia – third spacing – rehydration using Parkland’s formula $4\text{ml} \times \text{kg} \times \%$ burn

Circumferential limb burns/Compartment syndrome – escharotomy

Rhabdo and ARF – 20ml/kg N saline to treat shock and then calculate burn surface area and replace fluids over 48hrs. Maintain UO.

Infection – cover burns and silver impregnated dressings for prevention of infection

2. You are preparing to do an escharotomy of the torso when your resident asks whether the patient needs to consent to the procedure.

List the principles of consent that apply in this situation. (3 marks) - 2/3

Answer 2

Patient is critically unwell and will be **unable to provide consent for this life-saving procedure**. He is unlikely to have capacity to consent given he is intoxicated, hypoxic and shocked and there is suspicion of self-harm.

We will treat this patient’s life-threatening injuries under the principle of **Duty of Care** (Guardianship Act) and proceed with treatment whilst attempting to notify next of kin or the Adult Guardian to inform them of the events.

Documentation all discussions and decisions carefully in the medical record.

Passmark = 12/17 (adjust to /10) (7/10)

The Prince Charles Hospital

SAQ 13:
Questions:

1-Classify the radiological abnormality & state the findings that support this.
(3 Marks) - 3/3

Vertical shear injury of pelvis (Malgaigne Fracture) consisting of:
Superior and inferior pubic rami fractures
Fracture of L iliac wing

2-List 5 possible complications of this injury in this patient. State how you would assess for these in the ED. Complete the table below. (10 marks) 8/10

Complication	Assessment
Arterial injury	Haemodynamic instability, blush on CTA
Injury to genitalia	PV bleeding, perineal haematoma, vaginal tears on PV exam
Urethral injury	Bloods at urethral meatus, inability to insert IDC without resistance
Bladder injury	Retrograde CT urethrogram with contrast extravasation
Lumbosacral plexus nerve injury	Paraesthesias, weakness of lower limb
Rectal injury – compound fracture	PR bleeding, bony fragments of PR exam

3- List 2 alternate options for further management for this patient's pelvic injury.
(2 Marks) 2/2

Interventional Radiology – for embolization of potential arterial injury
Operating theatre for surgical management/pelvic packing/external fixation

4- List 5 factors which may affect your choice in the above management options.
(5 Marks) 3/5

Availability of interventional radiology resources & staff vs theatre resources & staff

(- eg time of day, location, hospital resources)

Haemodynamic stability of patient – better to go to OT if ongoing instability

Associated injuries of patient – better to go to OT if associated **chest or abdo injuries**

Results of FAST scan – positive FAST for intraabdominal bleeding should go to OT

Presence of blush on CTA of pelvis – may benefit from interventional radiology & embolization

Passmark = 16/20 (adjust /10) (8/10)

This paper is property of TPCHEM Emergency Department and should not be distributed or published in any way without previous permission

SAQ 14:

Questions:

1. List 5 key examination findings that may support a diagnosis of meningitis (5 marks) – 4/5

Answer 1:

Shock with Cardiovascular collapse

ALOC with delirium and coma

Signs of meningism - Neck stiffness - Kernigs sign, Brudinski's sign

Focal neurological signs or CN lesions – 15%

Rash and arthritis particularly meningococcal if a petechial/purpuric rash

2. Lumber puncture is required as part of this patient's workup, Describe in a stepwise fashion this procedure (in point form) (7 marks) – 6/7

Answer 2:

Preparation for the procedure – patient prep including **consent** and consideration of sedation.

Mark landmarks – sup aspect of Iliac crest

Preparation of equipment – LP tray including 2 needles, anaesthetic 2% lignocaine 5ml, chlorhexidine for the site, drape, gloves, gown and mask and tubes for collection labelled and numbered

Preparation of staff – surgical assistant to catch CSF etc

Position the patient either seated or L lateral curled up

Aseptic technique – glove, gown and prep skin

Local anaesthetic 5-10ml

Insertion 22-25g spinal needle midline cephalad bevel parallel 20-30degrees and wait for two loss of resistance

ICP measurement if indicated

Collection CSF 10 drops three sequential tubes

Replace stylet

Apply dressing and ambulate

Send labelled specimens for testing

3. The results of your LP are as follows.

CSF:
WCC 700 (predominance polymorphs)
RCC 15
Protein 1.0
Glucose 2.0 (normal ranges?)
Gram stain +ve for bacteria

Describe the key features and interpret (3 marks) - 2/3

WCC > 500 predominance of polymorphs increased **likelihood that it is bacterial meningitis.**

Protein raised and glucose low supportive of bacterial meningitis also

But also **could be partially treated meningitis or could be viral meningitis in particular enterovirus which can mimic this picture**

4. List 3 additional tests that need to be performed on the obtained CSF:
(3 marks) - 2/3

Culture
Meningococcal, Pneumococcal PCRs
Viral PCRs – (enterovirus, HSV)

Passmark = 14/18 (adjust to /10) (7.5/10)

SAQ 15:

Questions:

1- What is the diagnosis and list 4 supportive ECG finding: (5 marks) – 3/5

Suggests **rapid AF with likely accessory pathway, eg WPW**

Irregularly irregular broad complex (but will accept narrow – it's borderline)
tachycardia (QRS widened, or borderline (approx 100ms)

Rate up to 300 bpm in parts

Delta waves visible in lead V3

2- In point form, List your management steps. For any drugs used, please provide the dose and route of administration. (8 marks) – 5/8

Answer:

Apply defibrillation pads - Monitor for degeneration into VF

Synchronised DC cardioversion 100-150 J

- Consent for DC cardioversion

- Analgesia: Fentanyl 0.5-1 mcg/Kg IV

- Sedation: Propofol 0.5 mg/kg IV titrated to effect

Ensure restoration of sinus rhythm and repeat ECG to look for accessory pathway

OR Chemical Cardioversion

- **Avoid drugs that act on AV node – Ca channel blockers, digoxin, b blocker**

- IV amiodarone 300 mg or Procainamide 15mg/kg IV, IV Flecainide

Cardiology referral/input/follow-up

Passmark = 8/13 (adjust to /10)

(6/10)

SAQ 16:

Questions:

1-In your initial ED assessment of this patient, list 5 conditions specific to trauma in pregnancy that you would be trying to exclude? (5 Marks) 4/5

Fetal distress

Placental abruption

Amniotic fluid embolism

Uterine injury/rupture

Laceration of placenta or cord

Premature rupture of membranes

Premature labour

Foetomaternal haemorrhage

Direct fetal injury

2- Briefly outline 5 potential uses for ultrasound in the ED in this patient and how pregnancy may limit its utility.
(4 Marks) 3/4

3- She starts to show painless bright red heavy PV bleeding just after her arrival in the ED. Outline your initial 6 steps in the management of this patient in the ED.

Fetal heart beat – does not negate the need for CTG

FAST exam – Accuracy limited by gravid uterus, positive scan still of use

Assessment for abruption – May miss up to 50%, poor Sensitivity

Pneumothorax – May be more accurate than CXR, can help identify site for insertion of ICC

(6 marks) 4/6

Resuscitate the mother if signs of shock – IV fluid boluses aiming for MAP > 60

Check fetal heartrate with USS +/- CTG if available

Urgently notify with **O&G** and theatre re possible placental abruption & possible need for urgent delivery of fetus

Large bore IV Access & bloods sent for Xmatch

Urgent USS to assess for fetal wellbeing, abruption, uterine rupture, placenta praevia

Speculum examination by O&G team to assess causes of bleeding

Steroids for fetal lung maturation (Betamethasone 12mg)

Passmark (11/15) (adjust to 10)

(7.3/10)

SAQ 17:

Questions:

1- What do the images show? (2 marks) 1/2

Left inferior glenohumeral joint dislocation + greater tuberosity #.

2- List 3 complications associated with this injury (4 marks) 3/4

Brachial plexus injury

Rotator cuff injury or shoulder instability

Vascular injury

Associated fracture of acromion, glenoid

3- Briefly explain how you would treat this injury (4 marks) 3/4

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 (eg axial traction)

Passmark - 7/10

SAQ 18:

Questions:

Answer 1:

Diagnosis	Features
Testicular torsion (Pass/fail)	History: sudden onset Exam: Transverse lie, loss of cremasteric reflex
Epididymo-orchitis	History: Known STD, dysuria, discharge Exam: Warm hemiscrotum, temp
Torted appendix testis	History: may have local trauma Exam: Blue dot sign
Direct inguinal hernia	History: Known hernia, post valsalva Exam: Cough impulse, bowel sounds on auscultation

2- You phone the surgical registrar on call to request that he review the patient urgently in ED. The surgical registrar states he will not come to review the patient until you have the results of an ultrasound of the testes.

Briefly describe your approach to this situation.

(5 marks) 3/5

This is a time critical clinical event.

USS assessment is secondary to clinical assessment by a surgeon for suspected torsion of testis and need for urgent de-torsion in theatre +/- orchidopexy.

USS is reserved for cases where the surgeon does not feel urgent OT is required or an alternate diagnosis is more likely.

Urgent escalation to the Surgical Consultant to arrange clinical review of the patient prior to any further investigations.

Feedback to the surgical team at a later stage with respect to the inappropriate refusal of the surgical registrar to review the patient in a timely fashion.

Review of existing guidelines for acute testicular pain in the ED.

Passmark = 12/17 (adjust to /10)

(7/10)

SAQ 19:

1. Her ECG is reproduced for review. What is the most likely diagnosis and provide supporting evidence. (5 marks) - 4/5

Answer:

Bradycardia - Rate 50

Long QT interval

T wave flattening and inversion

U waves

Characteristic of **hypokalaemia**

2. Describe 6 management steps for the above patient including any drugs required: - 5/6

Multi-disciplinary team approach including medical, psychiatric and social worker.

Treat shock with 20ml/kg normal saline, aim for Systolic > 90 and MAP >65 and Urine output 0.5 ml/kg/hr

Identify and treat hypoglycaemia with 50 ml of 50% Dextrose

Electrolyte correction: K and Mg IV supplement

Treat hypothermia with passive rewarming (Bear hugger)

IF HR remains low with hypotension: consider atropine 300 mcg boluses and start atropine infusion

Thiamine 100 mg TDS and multivitamin supplement.

Will require admission under Psych and Medicine in order to commence feeding once shock has been managed. Monitor for refeeding syndrome.

3. List the potential ethical and legal pitfalls that could be anticipated in the management of this patient: (2 marks) – 1/2

Patient might refuse the above treatment or lack insight into her condition, therefore **lacking capacity** to consent.

Under **duty of care** principle, this patient could be kept in hospital to receive the above treatment even if she is unable to consent.

The Prince Charles Hospital

Patient may try to leave requiring escalation of restraint. (Verbal de-escalation with input from her NOK, family and Psych team , next step will be pharmacological restrain as last resource.)

4. List 7 common physical symptoms that a patient with anorexia nervosa may present with to the ED. For each list one potential underlying cause.

(12 marks) – 8/12

Answer:

Chest pain - Cardiomyopathy, arrhythmias secondary to electrolytes

Palpitations - brady/tachycardia, arrhythmias

Constipation – dehydration, hypocalcaemia

Abdo pain - pancreatitis post binge, secondary to ileus

Collapse or syncope – hypoglycaemia, hypocalcaemia, anaemia

Fractures – secondary to osteopenia

Weakness – electrolyte abn hypokalaemia, hypocalcaemia, hypoglycaemia, peripheral neuropathy, hypothyroidism

Passmark = 18/25 (adjust to /10)

(7.2/10)

SAQ 20:

Questions:

1- Describe the features of the rash (4 marks) -3/4

Answer:

- Multiple vesicles with erythematous base
- Coalescing around right cheek
- Crusted
- Lower lip involved, some lesions close to eye

2- What is the most likely diagnosis? List two other alternative diagnoses. (3 marks) - 2/3

Answer:

- **Eczema herpeticum** (most likely diagnosis)
- **Impetigo**
- Chicken pox
- Hand foot and mouth with secondary bacterial infection
- Steven-Johnsons syndrome

3- List 4 management priorities for this child (4 marks) – 3/4

Answer:

- Analgesia – sensible choice with doses
- Treat skin condition
 - Acyclovir 5-10mg/kg IV
 - Flucloxacillin 50 mg/kg IV
- Look for complications – shock, hypovolaemia, sepsis, eye, meningitis, encephalitis
- Admit for treatment, analgesia +/- rehydration

Passmark = 8/11 (adjust to /10) (8/10)

SAQ 21:

Questions:

1. State the most likely diagnosis and give justification from the photo and the stem (4 marks) - $\frac{3}{4}$

CRAO because pale optic disc, **white oedema** of infarction and **cherry red spot** and **also the rapidity of onset of visual loss, the completeness of it and the risk factor of IVDU therefore embolism.**

- 2- In point form, list your management priorities of this patient's presentation: (4 marks) - $\frac{2}{4}$

Ophthalmology referral
 Anticoagulation with Heparin
 Localised pressure to eye
 Identify source of emboli

- 3- In the table below, list 8 other common causes of acute visual loss (unrelated to this patient) and give one distinguishing historical feature of each (16 marks) - $\frac{10}{16}$

Answers:

Glaucoma	Pain
Retinal vein occlusion	Painless onset minutes not complete loss assoc hyperviscosity, DM etc
Retinal detachment	Shade over eye slow onset flashes and floaters
Optic neuritis	Over days, colour vision progresses, assoc pain, APD
Vitreous haemorrhage	Assoc trauma and diabetes and detachment – sudden painless vision loss
Optic N chiasm compression	Often incomplete fields other symptoms tumour
Uveitis	Pain and redness and decreased VA
Toxic and metabolic neuropathies	Hx of methanol etc – bilateral loss
Amaurosis fugax and TIA and migraine	Temporary

Passmark = 15/24 (adjust to /10)

(6.2/10)

SAQ 22:

Questions:

1-Describe the abnormalities on her ECG. (2 marks) - 2/2

RBBB and LAFB/L axis deviation (Bifascicular block)

2- What is the significance of these findings? (2 marks) – 1/2

Complete heart block may have occurred, with intermittent block of the posterior fascicle with resultant syncope.

3-List 4 causes contributing to the findings on the ECG. (4 marks) - 3/4

Ischaemic heart disease
Rate related LBBB with complete heart block
CCF
Outflow tract obstruction - HT/Aortic stenosis
Infiltrative/Degenerative
Inflammatory - SLE
Medication related – B Blockade, Digoxin
(Any 4 of these for 1 mark each)

4- What definitive cardiac investigations does this patient need and state why?
(3 marks) 3/3

(3 issues to address – heart failure, arrhythmia and need for pacemaker, underlying ischemia → 2/3 of these to pass)
Test for cardiac ischaemia - Stress Echo / MPS/ Angiogram
Test for arrhythmias - Holter monitor, Electrophysiological study
Tests for underlying cardiac structure & function - Echo

Passmark = 9/11 (adjust to /10) (9/10)

SAQ 23:

Questions:

1-Describe the abnormalities in the X-ray above. (4 marks) - 4/4

Answer:

- Monteggia fracture (can use eponymous name but should also describe abnormalities that make up a Monteggia fracture)
- Spiral fracture of midshaft of ulna
- Dislocation of proximal radius
- Ulnar fracture has significant displacement and angulation

2- List three analgesic options you could use in this case, including doses and routes of administration. (6 marks) – 5/6

Answer:

- Fentanyl 1-1.5 mcg/kg IN
- Morphine 0.05-0.1mg/kg IV
- Oral analgesia (Paracetamol 15mg/kg or Ibuprofen 10mg/hr)
- Will accept any third option that implies analgesia to facilitate **splinting** and urgent reduction in OT, eg Entonox

3- List three complications of this injury which should be sought in the ED and the clinical features associated with these complications. (6 marks) – 4/6

Answer:

Radial nerve injury	Paraesthesia in dorsum of hand and 3.5 fingers Wrist drop
Compartment syndrome	Refractory pain, distal paraesthesia/numbness (less likely to be in nerve distribution)
Compound fracture	Open wound, bone on show

Passmark = 13/16 (adjust to /10)

(8/10)

SAQ 24:

Questions:

1- List & briefly justify 5 additional tests you would perform in the ED in this case. (10 Marks) – 8/10

Bloods cultures – peripheral and from indwelling catheter
Urine m/c/s - not dipstick as may be false negative leuk esterase if neutropenic
CXR
Sputum m/c/s – if productive cough or SOB
Culture of any other sites of likely infection eg skin, wound, port site
CT brain - if confused or ALOC
LP - if concerns for meningitis

2- State your antibiotic choice/s and doses in this case where no source can be identified. The patient has no known allergies and normal renal function. (3 Marks) - 3/3

Piperacillin + Tazobactam 4.5g tds IV
Gentamycin 5mg/kg IV daily
Vancomycin 1g bd IV (as indwelling line insitu)

3- The patient's blood pressure drops and is unresponsive to fluid resuscitation. He requires inotropes to maintain an adequate MAP and local practice is to use central venous access. His indwelling line is now unable to be successfully accessed.

Outline 6 strategies you would use to minimize potential complications of central venous line insertion in this patient. (6 Marks) - 4/6

Commence inotropes peripherally via large bore line whilst awaiting CVL placement
Check coags prior to insertion & correct coagulopathy as required with FFP, Cryoprecipitate
Platelet transfusion just prior to line insertion
USS guided CVL insertion technique to minimize complications
Use easily compressible site such as femoral vein.
Procedure to be done by most experienced operator.
Strict sterile technique to minimize risk of infection in neutropenic patient
Confirm line position with CXR prior to use if IJ or SC sites

Passmark = 15/19 (adjust to /10) (7.8/10)

The Prince Charles Hospital

SAQ 25:

Questions:

1- What is the significant finding on his FBC? (1 mark) – 1/1

Pancytopenia/Marrow failure with all cell lines involved.

2- List 5 possible causes of the above finding (5 marks) – 4/5

Marrow failure (aplastic anaemia, viral illness, toxins)

Marrow infiltration (leukaemia, lymphoma, myelofibrosis, myeloma, megaloblastic anaemia)

Drugs/Toxins (chemotherapeutic agents, immunosuppressants)

(Any of these is acceptable for 1 mark each)

3- List 5 investigations that would assist with your diagnosis in the ED and briefly state why. (10 marks) -8/10

Blood smear/films looking for blast cells (Must have this to get 1 mark)

CXR – looking for malignancy

USS/CT Abdo – possible malignancy, splenomegaly

Coags – looking for coagulopathy

Viral serology – (EBV, CMV, HIV)

B12/Folate levels – megaloblastic anaemia

LFTS – looking for liver disease as a cause

(N.B Bone marrow aspirate would not be considered an “ED test” for this condition)

The Prince Charles Hospital

4- Your director requests you to provide feedback to the Registrar regarding this case.

List the steps involved in this process.

(5 marks) – 4/5

Gather information on case from other sources (chart, GP letters, interview staff)
Contact Registrar and arrange to meet to discuss the case
Discuss case in open, nonjudgmental manner with Registrar
Discuss cognitive error & premature closure with diagnosis
Direct additional learning required from this case
Refer case to departmental M&M process, suggest Registrar to be involved in presenting the case.

Passmark = 17/21 (adjust to /10)

(8/10)

SAQ 26:

Questions:

1- What immediate steps will you take to assess this patient safely in your ED?

(5 marks) – 4/5

Answers:

Avoid direct physical contact with patient

Triage patient in a designated area away from other patients

Dedicated medical and nursing staff member to assess pt

PPE for all staff dealing with pt

Patient to enter ED via decontamination area (if necessary) and then to negative pressure isolation room

Minimise patient-staff interactions

Any tests to be carefully labelled as potentially hazardous

Notify relevant people – Infectious Diseases physician/Med Super/Public health

2- List five differential diagnoses for this patient and for each one name the investigation of choice to exclude or confirm the diagnosis. (10 marks) - 8/10

Answers:

Ebola haemorrhagic virus	Serum for PCR or antigen testing
Malaria	Thick and thin films for direct malarial parasite identification
Dengue fever	Serology for Dengue PCR
Bacteraemia	Blood culture
Typhoid	Blood culture; Serum for antibody testing
Influenza	Nasopharyngeal aspirate for viral PCR

3- The patient is appropriately managed in your department. The triage nurse states to you that she felt under-prepared for dealing with this specific patient. List three strategies you could employ to further educate the department.

(3 marks) 2/3

Education of staff

Protocols

Audits

Passmark = 14/18 (adjust to /10)

(7.7/10)

SAQ 27:

Questions:

1- Describe the significant abnormalities on this CXR. (2 marks) 1/2

Alveolar opacities – patchy alveolar **opacification**
predominantly in the **bilateral**, perihilar upper lobes.

2- List 4 important negative findings on this CXR. (4 marks) 3/4

No hilar lymphadenopathy

Cardiac silhouette normal/Normal CTR

No Effusions

No rib fractures or pneumothorax

3- List 5 conditions in your differential diagnosis. (5marks) – 4/5

Alveolar hemorrhage (secondary to underlying lung disease, vasculitis
coagulopathy or drug use – cocaine abuse)

Acute Pulmonary oedema – (non cardiogenic or Cardiogenic pulmonary oedema)

Infection

- Bacterial (? Staph), viral or atypical pneumonia,
- Immunocompromised host infections such as PCP, TB
- Aspiration pneumonia secondary to respiratory depression and obtundation & alcohol abuse

Traumatic lung contusion

Septic emboli from cardiac valvular disease / infective endocarditis

4- List 5 investigations this patient will require to further refine the diagnosis
and provide your justification for each. (10 marks) 8/10

The Prince Charles Hospital

CT Chest (High resolution +/- CTPA) - delineate and identify the nature of lesion / extent & exclude trauma as a cause

Blood culture – identify organisms in sepsis, diagnosis of IE

Sputum m/c/s & PCR – for bacteria pathogens (strep / staph)

Viral swabs/NPA – confirm or exclude viral pathogens as cause

ECG – assess for myocardial ischaemia as cause for CCF

Echo – assess LVEF for cardiomyopathy or valve lesions for infective endocarditis

Urine drug screen – assess for drugs of abuse such as cocaine as cause for CCF/haemorrhage

Screening for HIV, TB

Vasculitis screen – (Wegeners / Goodpastures) – SLE / RH factor / ANCA's / ANA

Passmark = 16/21 (adjust to /10)

(7.5/10)

SAQ 28:

Questions:

1-Outline your 5 immediate steps in managing this situation (5 marks) – 4/5

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 6 features that would make this patient at high risk of self harm.

(6 marks) - 4/6

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.

List 3 options for chemical restraint, including doses and endpoints of treatment.

(7 marks) 5/7

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.

Endpoint: Titrated to effect of sedation but still spontaneously breathing & maintaining own airway

Passmark = 13/18 (adjust to /10)

(7.2/10)

SAQ 29:

Questions:

1- List 8 steps in your approach to managing this issue. (8 marks) 5/8

Assign the next most senior doctor to attend SSU and coordinate review these patients urgently.

Arrange to move any unstable patients to a higher area of care (eg Resus)

Take handover for rest of the department.

Assign handovers & prioritise assessment of new patients to day staff.

Proceed to SSU after handover to review SSU patients with Night Registrar & discuss management.

Arrange to **debrief with Night Registrar** about the shift and any difficulties at another time.

Identify any critical errors that have occurred and ensure key learning has been addressed in these cases with treating doctor.

Notify your director of the situation.

Refer any cases where patient safety was compromised for review through departmental M&M process.

Review any current SSU guidelines.

2- In light of this incident, your director asks you to develop a set of exclusion criteria for the Short stay unit. List your criteria. (8 marks) 6/8

Unstable haemodynamic status

Need for ongoing cardiac monitoring

GCS < 14

LOS likely to exceed 24 hours

Patients requiring intensive 1:1 nursing

Care better managed by inpatient unit (eg complex medical or surgical patients)

Patients without clear diagnosis or treatment plan

Patients posing risk to staff (eg psychotic, violent, forensic history)

Elderly patients who are unable to mobilise

Passmark: (11/16) Adjust to /10

(6.8/10)

SAQ 30:

Questions:

1. List 5 differential diagnosis for this presentation (5 marks) 4/5

Embolic – from AF
Thrombotic
Traumatic – penetrating injury
Iatrogenic – IVC or IV drug arterial injection
Aortic dissection extending to subclavian artery
Neuro – spinal SAH
Thoracic outlet syndrome

2. List 5 investigation and justify each one of them: (5 marks) 4/5

FBC – polycythaemia – increased risk of thrombus
ECG – AF as a risk factor for embolism
Doppler US – pulse presence or absence and quantify flow
US upper arm – thrombus or embolism
CXR – cervical ribs in thoracic outlet syndrome
CT neck/thorax – SAH and cervical ribs/thoracic outlet

3. Your investigation suggested that the cause related to his arrhythmia, in point form, list your management priorities (5 marks) 3/5

Medical specific management –
Heparin bolus 5000IU then infusion
Correct any underlying contributors – dehydration etc
Rate control B blocker etc,
Analgesia – morphine 5-10mg
Surgical consultation to direct definitive management (will need subspecialty input)– rapid revascularisation required within 8 hours.
Either embolectomy or catheter directed thrombolysis.
Organise retrieval to subspecialty services

Passmark (11/15) adjust to /10 (7.3/10)

Over all passmark: 220/300