

Illawarra Shoalhaven Local Health District Emergency Medicine Fellowship Program



Trial Written Exam
2019.2

ANSWERS



Question 1 (9 marks)

Describe the important features of the photograph provided (3 marks)

- Erythematous Rash / Blistering / Crust
- Distribution wide – groins / cubital fossae / face
- Child looks reasonably well

What is the most likely diagnosis? (1 mark)

Staphylococcal scalded skin syndrome (SSSS)

Name 2 other causes of blistering rashes in children? (2 marks)

- Bullous impetigo
- SJS – TEN

Outline the key components of your management of this child (3 marks)

- Intravenous antibiotics – flucloxacillin 25mg/kg IV QID
- Supportive care: Simple analgesia / Continue feeds / Monitor weight / dressings
- Admit to paediatric ward and monitor for deterioration

Question 2 (13 marks)

What are the components of the Ottawa Subarachnoid Haemorrhage rule? How can it be used? (5 marks)

Ottawa Subarachnoid Hemorrhage (SAH) Rule for Headache Evaluation ☆

Rules out SAH in patients with headache.

INSTRUCTIONS

This rule has very specific inclusion and exclusion criteria that must be followed closely for appropriate application:

Only apply In: Alert patients ≥ 15 years old, new severe atraumatic headache, maximum intensity within 1 hour.

Do not use In: Patients with new neurologic deficits, prior aneurysm, prior SAH, known brain tumors, or chronic recurrent headaches (≥ 3 headaches of the same character and intensity for >6 months).

Age ≥40	No 0	Yes +1
Neck pain or stiffness	No 0	Yes +1
Witnessed loss of consciousness	No 0	Yes +1
Onset during exertion	No 0	Yes +1
Thunderclap headache (peaking pain within 1 second)	No 0	Yes +1
Limited neck flexion on examination	No 0	Yes +1

Ruled Out

This patient can be ruled out for subarachnoid hemorrhage by the Ottawa SAH Rule, which was 100% sensitive for SAH in its validation.

Copy Results 📄
Next Steps »»

Given the patient presented >6 hours after the onset of the headache, name two options for the next investigation, along with a pro and con of each (4 marks)

Ix: LP	Ix: CT angiogram
Pro: <ul style="list-style-type: none"> • Diagnose SAH with xanthochromia 	Pro: <ul style="list-style-type: none"> • Diagnose aneurysm (manageable cause) • Diagnose alternate cause e.g. vertebral dissection (potentially venous sinus thrombosis but limited sensitivity)
Con: <ul style="list-style-type: none"> • Invasive • Some centres may not have access to xanthochromia study (particularly spectrophotometry) 	Con: <ul style="list-style-type: none"> • Aneurysm rate 1-2% and may be asymptomatic

Name 4 acute complications of subarachnoid haemorrhage (4 marks)

- Re-bleeding
- Seizures
- Hydrocephalus
- SIADH – hyponatraemia
- Cerebral vasospasm

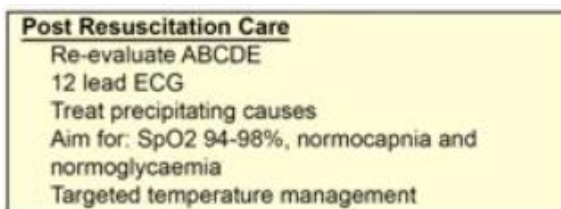
Question 3 (15 marks)

Name 3 causes of post-cardiac arrest hypotension (3 marks)

Underlying cause:

- Cardiogenic (can have element in post-arrest state)
- Hypovolaemia / Haemorrhage
- Obstructive shock: Tamponade / Pneumothorax (2o to CPR)
- SIRS response / distributive / anaphylaxis

Discuss the priorities of post-cardiac arrest care (5 marks)



With clinical goals of:

- preventing further cardiac arrest
- define the underlying pathology
- limit organ damage
- predict non-survivors

A 12 lead ECG is done (below) please describe main features and interpret ECG in this context (4 marks)

- Sinus rhythm, rate ~70, left axis deviation, LBBB with positive modified sgarbossa criteria (concordant ST depression V2-V3)
- STEMI-equivalent and may benefit from PCI

Name one trial evaluating endotracheal intubation vs. supraglottic airway device in patients in cardiac arrest? Summarise findings (3 marks)

AIRWAYS-2 – RCT

- Multi-centre, cluster RCT, 9269 patients (but not all got SGA or ETT)
- SGA (supraglottic airway) associated with higher success initial ventilation
- SGA and ETT had similar rate of favourable neurological outcome (mRS 0-3) at 30 days
- No advanced airway better outcome than SGA or ETT (may be confounded by close to ED)

Question 4 (11 marks)

Describe 4 abnormal findings on this clinical photograph (4 marks)

- Open fracture / dislocation left ankle
 - Profound displacement (90o external rotation)
 - Large wound with high potential for contamination
- Minimal active bleeding
- Left calf flap wound

What are your next three priorities in assessment of this patient (3 marks)

- Identify life-threatening injuries = primary survey
- Neurovascular status of limb / assessment of obvious injury
 - Pulse / doppler assessment
 - Define anatomy of bony injury with Xray
- AMPLE Hx (Allergies / Medications / Past Hx / Last ate (irrelevant) / Event)

What are the management priorities for this limb injury? (5 marks)

- Analgesia: Titrated fentanyl IV +/- low-dose ketamine
- IV Antibiotics (broad-spectrum given size of wound) / ADT
 - Gustillo-Anderson classification 3
- Gross wound decontamination – warm saline wash
- Reduction of fracture dislocation under sedation with immobilisation and re-evaluation of neurovascular status
- Admission to hospital:
 - Vascular surgery input immediately if vascular compromise post-reduction
 - Orthopaedic Admission with view to definitive ORIF / washout in OT emergently

Question 5

Describe this rash from the photograph provided (3 marks)

- Erythematous
- Raised plaques
- Confluent
- Target sign

What is your provisional diagnosis? What is the most common differential diagnosis for this rash? (2 marks)

- Provisional diagnosis: Erythema Multiforme
- DDx: Urticaria

Please give 2 causes of this condition, from 2 separate categories (4 marks)

Category 1 Infection (~90% of cases)	1. HSV 1 and 2 (essential) 2. Mycoplasma Others: VZV, adenovirus, CMV, viral vaccines, parapoxvirus
Category 2 Drugs (<10% of cases)	1. NSAIDs 2. antibiotics: penicillins / sulphonamides Phenothiazines / anticonvulsants

What specific treatment does this condition require? (1 mark)

None

Supportive only / monitor for progression to EM major etc

Question 6

Outline the key finding on this abdominal Xray (1 mark)

- Rectal foreign body
- No obvious evidence of perforation / insensitive Ix (supine AXR without diaphragms visible)

List 2 complications that may arise from this condition (2 marks)

- Rectal mucosa abrasion/laceration: Bleeding – 40%
- Perforation 6% (iatrogenic perforation 1%)

List patient factors that necessitate this condition be handled in the operating theatre (4 marks)

- Sharp/potentially dangerous object
- Failed extraction ED
- Unsuitable for attempt in ED / anaesthetic risk
- Proximal to sigmoid
- Signs suggestive of perforation

Outline your options for anaesthesia for removal of the foreign body in the ED (2 marks)

- Procedural sedation e.g. propofol / fentanyl
- Regional anaesthesia – perianal block

List 3 techniques for removing this foreign body (3 marks)

- Valsalva manoeuvre with generous lubricant
- Gentle traction with generous lubricant
- Foley catheter with 50mL balloon / traction

Question 7

What factors should be covered in consent for this procedure (5 marks)

- Condition suspected/present
- Proposed procedure and what that involves
- Risks of doing procedure
- Risks of not doing procedure
- Alternative management options

Please interpret the results and give your provisional diagnosis (2 marks)

- Significantly elevated WCC 137,000 – high LR (> +20) for septic arthritis
- Urate crystals present – unlikely acute gout, more likely displaced from septic arthritis

Outline your management of this patient (3 marks)

- Analgesia: Paracetamol 1g PO QID / Oxycodone 5-10mg PO Q4H PRN

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- IV Antibiotics: Cephazolin 2g IV TDS
- Orthopaedic admission with view to emergent joint washout in OT

Question 8 – (10 marks)

You are a new consultant and asked to attend a meeting with hospital management regarding emergency department key performance indicators. Prior to attending you ensure you adequately understand some of the relevant areas:

Regarding triage, please complete the table (5 marks)

- ATS 1 immediate 100% of patients
- ATS 2 10min 80% of patients
- ATS 3 30min 75% of patients
- ATS 4 60min 70% of patients
- ATS 5 120min 70% of patients

Explain ETP including the relevant target figure (3 marks)

ETP – emergency treatment performance

81% of patients presenting to public ED will leave the ED within 4hrs*, via:

- Discharge
- Admission
- Transfer

All patients are included

Based on data that prolonged length of ED stay / overcrowding / access block increase hospital mortality

*First point of contact in ED: Admin or Triage

Note: accepted that some patients should be in ED longer than 4 hours (for safety) and thus ETP should not override clinical judgement

What is 'Transfer of care? What is the target?'(2 marks)

Transfer of care = time to ambulance handover and patient moved to bed or waiting room
100% within 30min, if >60min = incident report

(Not required: 85% within 15min, 95% within 20min)

Question 9 (10 marks)

She has a venous blood gas which is attached. Please outline your interpretation of her acid-base status (4 marks)

Metabolic acidosis + metabolic alkalosis

- Anion gap: $132 - (17 + 86) = 29$, thus HAGMA
- DR: $29 - 12 / 24 - 17 > 2$, thus HAGMA + metabolic alkalosis

Expected respiratory compensation

- Exp CO₂ = $8 + 1.5 \times 17 = \sim 32$

Electrolytes: Hypokalaemia / Hypochloraemia

Lactate / Cr normal (relevant to DDx)

What is the most likely unifying clinical diagnosis? How would you confirm? (2 marks)

Hyperemesis Gravidarum with:

- HAGMA = starvation ketoacidosis / confirm with ketone level
- Metabolic alkalosis = vomiting

Outline the key aspects of your management of this woman (4 marks)

- Antiemetics: Metoclopramide 10mg IV
- Correct hydration: IV Hartmanns initially, then enteral when able
- Correct ketoacidosis: Dextrose infusion
- Replace electrolytes: KCl +/- MgSO₄

Question 10 (12 marks)

List 2 clinical symptoms that may be suggestive of Pulmonary Hypertension in this patient (2 marks)

- Dyspnoea
- Chest Pain
- Syncope

List 2 further ED Investigation that could be used to investigate this patient for evidence of Pulmonary Hypertension. (2 marks)

- Echocardiogram – Raised RV pressure / dilated RV
- ECG – Signs of RV strain (Right axis deviation, RBBB, RVH, p-pulmonale, tall R waves in V1)

With regards to the Aetiologies of Pulmonary hypertension complete the following table with 2 examples of disease for each classification group, except for group 4 which has been pre-completed. 8 marks

Classification ('Dana Point' – referenced in Dunn and LITFL)

Group I – Pulmonary arterial hypertension

- idiopathic (primary)
- drug use-cocaine or amphetamines

Group II – Pulmonary venous hypertension

- Systolic dysfunction, Diastolic dysfunction, Valvular disease: Mitral stenosis, Mitral

Group III - associated with chronic hypoxaemia (most common)

- Chronic obstructive pulmonary disease, Interstitial lung disease, Sleep-disordered breathing, Alveolar hypoventilation disorders, Chronic exposure to high altitude

Group IV - chronic thromboembolic disease

- Pulmonary Embolism

Group V – Miscellaneous (Unclear or multifactorial)

- Hematological disorders: myeloproliferative disorders
- Systemic disorders: sarcoidosis, vasculitis,
- Metabolic disorders: glycogen storage disease,
- Others: tumour obstruction, fibrosing mediastinitis, chronic renal failure on dialysis

Question 11 (14 marks)

With regards to this vomiting neonate presentation – list 3 obstructive and 3 non-obstructive causes for the vomiting. (6 marks)

Obstructive

- Obstructed hernia
- Necrotising enterocolitis
- Biliary atresia
- midgut volvulus
- pyloric stenosis

Non-obstructive

- Acute gastroenteritis
- Sepsis
- Inborn errors of metabolism
- Non-accidental injury (space occupying lesion e.g. SDH)

Identify the most significant clinical finding on the abdominal film and the likely diagnosis (2 marks)

- Pneumatosis intestinalis (gas in bowel wall)
- Pathognomonic for Necrotising Enterocolitis

Outline your further management for this child. Candidates can assume that apart from the NGT insertion and IV access obtained no further management has been performed. (6 marks)

- IV fluid bolus – fluid bolus of suitable crystalloid 10-20mls/kg – Aim CRT<3 sec
- IV Fluids maintenance (NaCl 0.9% + 5%D) – accept other suitable
- Nil by mouth / bowel rest –fluid solutions but must have dextrose in
- Nasogastric Tube on free drainage
- IV Antibiotics – Amoxicillin 50mg/kg QID, Gentamicin 7mg/kg, Metronidazole 12.5mg/kg
- Emergent surgical review

Question 12 (13 marks)

What are the two major vessels involved in blunt cerebrovascular injury? (2 marks)

- Internal carotid artery dissection
- Vertebral artery dissection (as it passes through the transverse foramina)

List four (4) clinical features of blunt cerebrovascular injury in the aforementioned vessels. (4 marks)

Internal Carotid dissection	Vertebral artery dissection
Unilateral headache (usually frontotemporal) <ul style="list-style-type: none">• Severity may mimic SAH, previous migraine	Headache – typically occipital
Anterior neck pain	Posterior neck pain

Partial Horner syndrome – miosis and ptosis	Facial paraesthesias
Cranial nerve palsies	Lateral medullary syndrome
	Diplopia, Ataxia

Name a screening criterion used to evaluate blunt cerebrovascular injury (BCVI) (1 mark)

- Denver screening criteria (divided in to risk factors and signs and symptoms)

List 3 risk factors for a blunt cerebrovascular injury? (3 marks)

- Neck trauma (accept a maximum of 2 from this category)
 - cervical spine injuries (fractures involving the transverse foramen, cervical spine subluxation)
 - severe facial injuries
 - base of skull fractures (especially those involving the carotid canal).
- Cervical manipulation
- Connective tissue disease
- Near hanging with anoxic brain injury

List 3 signs and/or symptoms which would suggest a blunt cerebrovascular injury (3 marks)

- Focal neurological deficit
- Cervical bruit or thrill
- Infarct on head CT
- Expanding neck haematoma
- Neuro-exam inconsistent with head CT

Question 13 (14 marks)

What is the primary abnormality seen on the above ECG (1 mark)

- Prolonged QT interval
- QT interval > 0.6mS

List 5 pharmacological causes (each from a different class of drug) that may cause the above abnormality (5 marks)

Drugs Associated with QT Prolongation and TdP				
Antiarrhythmics	Antimicrobials	Antidepressants	Antipsychotics	Others
Amiodarone	Levofloxacin	Amitriptyline	Haloperidol	Cisapride
Sotalol	Ciprofloxacin	Desipramine	Droperidol	Sumatriptan
Quinidine	Gatifloxacin	Imipramine	Quetiapine	Zolmitriptan
Procainamide	Moxifloxacin	Doxepin	Thioridazine	Arsenic
Dofetilide	Clarithromycin	Fluoxetine	Ziprasidone	Dolasetron
Ibutilide	Erythromycin	Sertraline		Methadone
	Ketoconazole	Venlafaxine		
	Itraconazole			

List 3 non-pharmacological causes or risk factors for the above abnormality (3 marks)

- Age, Female gender
- Congenital QT prolongation
- Left ventricular failure
- Recent cardioversion
- Metabolic abnormalities
 - Hypomagnesemia
 - Hypokalemia
 - Hypocalcemia
- Hepatic dysfunction

What is the abnormality seen on the rhythm strip? (1 mark)

- Torsades de pointes (polymorphic VT)

Discuss your management of this man (4 marks)

- Resuscitation with respect to ABC
- Correct abnormalities and administer electrolytes
 - Intravenous magnesium sulfate (appropriate dosages)
 - Treatment of hypokalemia – if any. (appropriate dosages)
- Consideration of acute cardiac pacing
- Monitoring

Question 14 (15 marks)

What is the minimal level of monitoring would you require, in order to conduct a safe procedural sedation? (3 marks)

- Continuous pulse oximetry - mandatory
- If available suggest end tidal CO₂ / CO₂ waveform capnography
- 5 minute interval pulse and blood pressure
- ECG monitoring.

Please complete the following table regarding this medication (8 marks)

Ketamine	
Onset of effect	IM – 2-4 minutes IV – 60-90 seconds
Dose	IM – 4mg/kg IV - 1mg/kg
Duration of effect	IM – 15-30 minutes IV – 10-15 minutes
Adverse effect	<ul style="list-style-type: none"> • Laryngospasm • Hyper salivation • Emergence phenomenon • Vomiting • Respiratory depression

List four (4) factors which will predict difficult bag-mask ventilation (4 marks)

- Poor Mask seal e.g. beard / thin face
- Obesity
- Age >55yrs
- No teeth
- Stiffness of chest e.g. Asthma, COPD

Question 15 (15 marks)

List the criteria to say a child had a Brief Resolved Unexplained Event (BRUE) (5 marks)

- Occurred in an infant less than 12 months old
- Less than one minute duration but typically 20 – 30 seconds.
- Accompanied by a return to a baseline state
- Not explained by identifiable medical conditions.
- Characterised by ≥ 1 of the following
 - Central cyanosis or pallor
 - Absent, decreased or irregular breathing

- Marked change in tone. (hypertonia or hypotonia)
- Altered level of consciousness

List 5 differential diagnosis of BRUE in broad categories with 1 specific example each (5 marks)

- Normal physiological response: laryngospasm, gagging
- Inflicted injury: (shaken baby, drug overdose, Factitious illness by proxy or intentional suffocation)
- Infection : Pertussis, septicaemia, pneumonia, meningitis,
- Airway obstruction: congenital abnormalities, infection, hypotonia
- Abdominal: intussusception, strangulated hernia, testicular torsion
- Metabolic problems: hypoglycaemia, hypocalcaemia, hypokalaemia, other inborn errors of metabolism
- Cardiac disease: congenital heart disease, arrhythmias, vascular ring, prolonged QT.
- Respiratory: inhaled FB
- Toxin / Drugs: accidental or non-accidental
- Neurological causes: head injury, seizures, infections, cerebral malformations etc.

Describe the features of a Lower Risk BRUE (5 marks)

- occurs when there are no concerning features on history or examination
- Age > 60 days
- Born \geq 32 weeks gestation and corrected gestational age \geq 45 weeks
- No CPR by trained healthcare professional
- First event (cannot be lower risk if event has been repeated)
- event lasted < 1 minute

Question 16 (20 marks)

Give 5 differentials for this patient's presentation. Each should be in a different category (5 marks)

- Infectious - Sepsis, Meningitis, Encephalitis, Cerebral malaria
- Toxidrome- Neuroleptic malignant syndrome, Serotonin syndrome, Malignant hyperthermia, Sympathomimetic toxicity (cocaine, amphetamine, ketamine), Anticholinergic toxicity
- Endocrine - Thyroid storm
- Environmental- Heat stroke
- Delirium tremens
- Hypothalamic stroke
- Pheochromocytoma

List the Hunter Toxicity Criteria Decision Rule (5 marks)

- Serotonergic agent (must have to score full points) plus at least 1 of the following:
 - Spontaneous clonus
 - Inducible clonus AND (agitation or diaphoresis)
 - Ocular Clonus AND (agitation or diaphoresis)
 - Tremor AND hyperreflexia
 - Hypertonia AND temperature >38 AND (ocular clonus or inducible clonus)

Fill in the table with respect to the different Toxidromes (10 marks)

Table 4. Signs And Symptoms Of Toxidromes

Toxidrome	Mental Status	Eyes	Lungs	Vital Signs	Bowel Sounds	Bladder	Neurological
Sympathomimetic / GABAergic withdrawal	<ul style="list-style-type: none"> • Agitated • Delirious 	<ul style="list-style-type: none"> • Mydriasis 	Normal	<ul style="list-style-type: none"> ↑ HR, ↑ BP ↑ Temp ↑ RR 	Normal or increased	Normal or increased	<ul style="list-style-type: none"> • Nonfocal • Hyperreflexia
Cholinergic	<ul style="list-style-type: none"> • Normal 	<ul style="list-style-type: none"> • Miosis • Mydriasis 	Bronchorrhea	<ul style="list-style-type: none"> HR ↓ or ↑ BP ↓ or ↑ RR ↓ or ↑ 	Increased	Increased	<ul style="list-style-type: none"> • Fasciculations • Weakness
Anticholinergic	<ul style="list-style-type: none"> • Agitated • Delirious 	<ul style="list-style-type: none"> • Mydriasis 	Normal	<ul style="list-style-type: none"> ↑ HR, ↑ BP ↑ Temp 	Decreased	Decreased	<ul style="list-style-type: none"> • Nonfocal • Ataxia
Opioid withdrawal	<ul style="list-style-type: none"> • Dysphoric 	<ul style="list-style-type: none"> • Mydriasis 	Normal	<ul style="list-style-type: none"> ↑ HR (mild) 	Increased	Increased	<ul style="list-style-type: none"> • Nonfocal • Ataxia
Neuroleptic malignant syndrome	<ul style="list-style-type: none"> • Agitated • Delirious 	<ul style="list-style-type: none"> • Oculogyric crises (rare) 	Normal	<ul style="list-style-type: none"> ↑ HR, ↑ BP ↑ Temp ↑ RR 	Normal	Normal	<ul style="list-style-type: none"> • Lead-pipe, cog-wheel rigidity
Serotonin syndrome	<ul style="list-style-type: none"> • Agitated • Delirious 	<ul style="list-style-type: none"> • Ocular clonus 	Normal	<ul style="list-style-type: none"> ↑ HR, ↑ BP ↑ Temp ↑ RR 	Normal or increased	Normal or increased	<ul style="list-style-type: none"> • Hyperreflexia • Clonus

Abbreviations: BP, blood pressure; HR, heart rate; GABA, gamma-Aminobutyric acid; RR, respiratory rate; temp, temperature.

Question 17 (12 marks)

List 6 general key steps for developing a guideline (6 marks)

- Identify the Need - Is it a priority? Review the status quo
- Complete a Project Initiation Proposal
- Establish a Steering Committee & Project Team
- Define the problem
- Review of evidence
- Understand the current state
- Draft the guideline
- Seek endorsement from appropriate stakeholders
- Develop Implementation Plan
- Implementation
- Ongoing monitoring
- Review and evaluation

List diagnostic tools used to identify how care is provided? (6 marks)

- Root Cause Analysis (RCA) reports
- Process mapping
- Patient journey mapping
- Patient/carer/staff interviews
- Staff/patient "tagalongs"
- Process observation
- Reviewing patient survey results
- Wait list analysis
- Variation analysis
- Data analysis – outcome indicators
- Adverse events – Incident & Injury Management System (IIMS)

Question 18 (11 marks)

Provide 4 differential diagnoses for this patient apart from Myxoedema coma (4 marks)

- Neuro – Seizure, ICH
- Endocrine – Adrenal insufficiency
- Infective – sepsis, Meningo-encephalitis
- Environmental Hypothermia
- Toxicological – Opioids, Barbituates, Valproate overdose

Excluding medication non-compliance, list 4 possible triggers for this presentation (2 marks)

- Hypothermia - Increased incidence in winter months
- Infection - Pneumonia > UTI > Cellulitis
- Cerebrovascular Events
- Acute Myocardial Ischemic Events
- Trauma
- Medications - Amiodarone, Lithium, Anaesthetic agents, Lithium, Diuretics
- Cessation of Hypothyroid Replacement

Outline your treatment of this patient in the ED (5 marks)

Replace Thyroid Hormones (T4 + T3)

1. Levothyroxine (T4) 200 to 400 mcg IV loading – 1 mark
(daily doses of 50 to 100 mcg)
2. Triiodothyronine (T3) 5 to 20 mcg IV – 1 mark
(2.5 to 10 mcg every eight hours)

Hydrocortisone 50-100mg QID – 1 mark

Supportive Care – Max 2 marks

- IV Fluid replacement
- Vasopressors and Inotropes - accept sensible regime of either Adrenaline, NA or Dobutamine with MAP 65mmHg target
- Electrolyte management
 - Hypocalcaemia IV replacement IV Ca gluconate 10mls 10%

Question 19

What is this condition called? (1 mark)

- Shoulder dystocia

What is the underlying anatomical issue in this situation? (1 mark)

- Bony impaction of anterior shoulder behind pubic symphysis
- NOT a soft tissue obstruction, bony

What is the most important complication of this condition and why does it occur? (2 marks)

- Hypoxic injury to newborn: Hypoxic-ischaemic encephalopathy / death
- Cord compression / lack of blood flow / hypoxia

Outline your stepwise management of this condition (6 marks)

- Call for help: Obstetric consultant / registrar
- McRoberts Manoeuvre / Legs up knees to nipples
- Suprapubic pressure
 - Constant
 - CPR-like / intermittent
- Internal manoeuvres
 - Rubins II
 - Woodscrew
 - Reverse Woodscrew
- Remove posterior arm
- Roll onto all 4s

Question 20

What is the most likely diagnosis? (1 mark)

- Jaw (bilateral TMJ) dislocation

Name the anatomical structures involved and the direction of displacement (2 marks)

- Mandibular condyle (of mandible) moves anteriorly and out of mandibular fossa (of temporal bone)

Outline your approach to imaging in this condition (2 marks)

- Spontaneous = no imaging
- Traumatic = CT facial bones

Describe two techniques for managing this condition (6 marks)

- Syringe technique
 - 10mL syringe placed between mandibular and maxillary molars
 - Patient to roll syringe anterior & posterior

- Await spontaneous reduction
- Manual reduction
 - Gloves / rolled gauze, thumbs placed on mandibular molars
 - Firm, constant pressure inferoposteriorly until reduction
 - May require procedural sedation (often not)

Outline your discharge instructions (not including return precautions) in this case (2 marks)

- Simple analgesia – paracetamol / ibuprofen
- Soft / liquid diet
- Avoid yawning / taking large bites
- If recurrent, maxillofacial review

Question 21 (13 marks)

What is the name of this cardiac window/view? (1 mark)

- Apical 4 chamber view

List 3 echocardiographic findings suggestive of pericardial tamponade on bedside ultrasound (3 marks)

- Presence of pericardial effusion (>2cm)
- Right atrial collapse (end of Diastole)
- Right ventricle collapse (start of Diastole)

List 5 causes of a Pericardial Effusion in this patient – candidates should list 5 causes from different categories of causes (5 marks)

- Viral – Enterovirus / Adenovirus / EBV / Mumps
- Bacterial – Staph aureus / Streptococci / Pneumococci / Legionella / TB
- Malignancy – lung / Breast / Leukaemia / Lymphoma / Melanoma
- Autoimmune – RA / SLE / Dressler's syndrome
- Uraemia
- Serum sickness
- Post Myocardial Infarction

Weaker answers – Post cardiac surgery and Irradiation not accepted for this patient given no history of.

You have decided to perform a therapeutic pericardiocentesis on this patient for cardiac tamponade. Complete the following table outlining your technique for this procedure (4 marks)

Positioning of the patient for procedure	Sat up at 45 degrees
Gauge of needle used	14-18 G
Insertion point of needle	Between left xiphoid and costal margin

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Direction of needle advancement	Left shoulder or right clavicle (2 Techniques) Or accept 'Ultrasound guided'
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Question 22

List two findings / signs in the above picture. (2 marks)

- Pemberton's sign
- Thyroid swelling / Goitre

State the significance of these findings (1 mark)

- Suggests SVC obstruction

List four (4) causes of this finding (4 marks)

- Mediastinal mass
 - Tumours
 - 1° lung
 - Lymphoma
 - metastatic lymphadenopathy (testicular)
 - teratodermoid
 - parathyroid
 - thymoma
 - aortic aneurysm
 - retrosternal thyroid
- Non mass- thrombosis, radiation Rx
- Indwelling vascular catheters
- Pericardial constriction
- Tuberculosis

List the most important investigation that you would order to determine the underlying cause (1 mark)

- CT chest with contrast

Question 23

List two likely diagnoses (2 marks)

- Aortoenteric fistula
- Supratherapeutic anticoagulation
- Embolic mesenteric ischemia

List four investigations you would order, and for each, provide one rationale. (8 marks)

Investigation	Rationale
FBC	Assess Hb and platelet count to guide product resuscitation

Investigation	Rationale
Coagulation studies/ROTEM	Assess coagulopathy secondary to blood loss requiring product replacement
Thrombin time/dilute thrombin time/ecarin clotting time	Assess coagulopathy due to dabigatran necessitating antidote or enhanced elimination
Blood cultures	Identification of bacteria and sensitivity will guide antibiotic selection and duration
CT angiogram of abdomen	Define aortoenteric fistula and determine ongoing bleeding Confirm mesenteric ischemia Establish other cause for bleeding ie tumour requiring resection/embolisation

List one drug that may be used to reverse the effect of dabigatran. (1 mark)

- Idarucizumab
- Ciraparantag

List three organisms which may cause vascular prosthetic infection. (3 marks)

- S. aureus
- Coagulase-negative Staphylococci
- Enterococcus
- E. coli
- Salmonella spp.
- Coxiella burnettii/Q-fever

Question 24

Other than pulmonary hemorrhage and renal failure, list two other manifestations of Wegener's granulomatosis (Granulomatosis with Polyangiitis - GPA) (2 marks)

- Respiratory
 - Subglottic stenosis
 - Collapsing nasal bridge
 - Upper airway granulomas
 - Pulmonary fibrosis
- Pulmonary hypertension
- Myalgia, arthralgia/arthritis
- Conjunctivitis, episcleritis, uveitis
- Cranial and peripheral neuritis
- Myo/pericarditis

Contrast the rationale for intubation and treatment of pulmonary hemorrhage in GPA and solitary lung tumour. (4 marks)

	GPA	Tumour
Rationale for intubation (1 mark each)	- Purely for respiratory support	- Protect contralateral lung from soiling - Also facilitates bronchoscopic intervention and biopsy, which may not be tolerated if significant distress - Provide respiratory support if significant blood aspiration
Treatment of hemorrhage (1 mark each)	- Immunotherapy - Steroids - Plasma exchange - Immunosuppressants	- Interventional - Bronchoscopic injection - Vascular embolisation - Wedge resection/lobectomy

List one blood test you may order to confirm a diagnosis of GPA. (1 mark)

- ANCA (anti-neutrophil cytoplasmic antibodies; typically PR3 or C-ANCA; 90% sensitivity for GPA)

List two infectious diseases which may cause hemoptysis and renal failure. (2 marks)

- Malaria
- Leptospirosis
- Bacterial sepsis ie tricuspid valve endocarditis/lung abscess/S. aureus bacteremia
- Influenza H1N1
- Dengue fever
- Hantavirus
- Pulmonary + renal Tuberculosis

List two other non-infective causes for a patient presenting with both hemoptysis and hematuria. (2 marks)

- Goodpasture's syndrome/Anti-GBM disease
- Churg-Strauss syndrome (EGPA)
- SLE
- IgA nephropathy
- Microscopic polyangiitis
- Henoch-Schonlein Purpura
- Disseminated malignancy
- Thrombotic microangiopathies
 - HUS/TTP
 - Antiphospholipid syndrome
 - Malignancy
- Others
 - Drug-associated ANCA-positive vasculitis

- Bechet's disease

Question 25

Describe the important findings in the above photograph (3 marks)

- Conjunctival injection
- Peri-limbal or ciliary flush
- Constricted pupil
- hypopyon

What is the most likely clinical diagnosis? (1 mark)

- Anterior uveitis / iritis

List 2 findings on clinical exam (not evident above) that would support the diagnosis (2 marks)

- Cells/flare in anterior chamber on slit lamp examination
- Consensual photophobia

List 4 causes of this condition (2 marks)

- Inflammatory
- Traumatic
- Infectious
- Drug-induced

List the management priorities for this condition in the ED (3 marks)

- Topical cycloplegics – e.g. homatropine/cyclopentolate
 - Topical steroids if not infectious e.g. prednisolone
 - Close follow up with ophthalmologist within 24hours
-

Question 26

A 45 year old woman with a history of schizophrenia and medication non-compliance is brought in by an ambulance after being found trying to run into oncoming traffic. She is acting erratically and states she is being experimented on by the Government. She is becoming increasingly agitated.

List 3 clinical features suggestive of an organic cause for her presentation (3 marks)

- Fever
- Drug use
- Visual hallucinations
- Altered level of consciousness / cognition
- Altered vital signs – e.g. tachycardia / hypotension

List 5 features suggestive of acute psychosis (5 marks)

- Delusions
- Hallucinations
- Disorganised speech
- Grossly disorganised or catatonic behaviour
- Negative symptoms – flattened affect, alogia etc

Patient becoming increasingly agitated and attempting to leave the department. Verbal de-escalation fails and you decide to initiate chemical restraint.

List 2 options for parenteral administration (different classes) including dose / route / 1 side effect (4 marks)

Expect

Benzodiazepine: Midazolam / Lorazepam: Respiratory depression

Antipsychotic: Droperidol / Olanzapine / Haloperidol: Extrapyramidal side effects / Prolonged QT

Question 27

What is the diagnosis? (1 mark)

Urinary retention

Name 4 causes of this condition, each from a different category (4 marks)

Infective – e.g. UTI

Medication – e.g. anticholinergic

Neurological – e.g. cauda equina

Structural – e.g. BPH / haematuria / phimosis

Inefficient detrusor muscle (usually with above precipitant, or even fluid challenge etc)

In standard circumstances, how is this condition diagnosed? (2 marks)

Voiding difficulty +/- lower abdominal pain

Post-void residual volume > 300mL

You are unable to insert an indwelling catheter and decide to insert a suprapubic catheter. Outline the steps involved in performing the procedure (6 marks)

- Confirm and bladder position with bedside US
- Position supine / Prep and drape / sterile gloves
- Infiltrate local anaesthesia 2cm above pubic symphysis
 - insert needle until aspirate urine
 - direction ~perpendicular (more cephalad in children, more caudal in adults)
- Core steps
 - Needle to bladder / introduce wire / scalpel to skin / dilator / catheter / split away sheath
 - Scalpel incision / firm pressure into bladder with trocar, remove trocar / insert catheter / split away sheath
- Post-procedure: Attach collection bag / dress skin / cares and follow up organised