

"List" = 1-3 words
"State" = short statement/ phrase/ clause

UNIVERSITY HOSPITAL, GEELONG
FELLOWSHIP WRITTEN EXAMINATION

WEEK 3– TRIAL SHORT ANSWER QUESTIONS Suggested answers

PLEASE LET TOM KNOW OF ANY ERRORS/ OTHER OPTIONS FOR ANSWERS

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Question 1 (19 marks) 9 minutes

You are assigned to be the retrieval doctor by fixed wing aircraft, for a 68 year old male who has been involved in a rollover car collision. The patient is located in regional centre that does not have CT facilities. After your clinical review, he appears to have isolated head and chest injuries.



- a. State three (3) abnormal findings shown in this CXR. (3 marks)
- **R subcutaneous emphysema**
 - **# 5th rib**
 - **R apical pneumothorax**
 - **Widened mediastinum- R hilar border appears widened**
 - **Blunting R costodiaphragmatic angle**

You decide to place a central venous line prior to transfer.

- b. What is your preferred site for placement of this line in this patient? (1 mark)
- **Femoral** (*preferred- L IJ acceptable but risk PTX, not R IJ or R SC due to surgical emphysema*)
- c. State three (3) justifications for your choice of site. (3 marks)
- **Either IJ will be difficult as C spine collar/ IL immobilisation will be mandatory without the ability to clear C spine without CT**
 - **R SC and R IJ will be difficult** (*even under US guidance*) **due to subcutaneous emphysema**
 - **Risk of compromising single remaining well functioning lung with placement LIJ or SC and possibility PTx**
 - **Access to groin during flight potentially better than neck**

- d. List six (6) specific medical problems that you would anticipate during the transport of this patient. For each problem state one (1) measure that you would take to minimise the likelihood of each problem. (12 marks)

Specific medical problems	Measure you would take to minimise
Airway compromise- secondary to reduced GCS, potential aspiration	<ul style="list-style-type: none"> • ETT • Fill cuff with saline
Ventilation compromise- Hypoxia due to evolving pulm contusion/ PTX	<ul style="list-style-type: none"> • ICC- with Heimlich valve • Secure ICC carefully • Lung protective ventilation strategy • May need sea level pressurisation if profound hypoxia • Paralyse
PTX increasing/ Tension	<ul style="list-style-type: none"> • ICC to right side/ secure well • Confirm position of tube • Prophylactic ICC to Left • Suction • Heimlich valve (if not haemothorax)
Haemodynamic instability	<ul style="list-style-type: none"> • Chest blood loss • Take Packed cells • Ensure 2 large bore, well secured IVC • Optimise vol status prior to departure
Increased intracranial pressure if HI	<ul style="list-style-type: none"> • avoid tube ties constricting IJV • PEEP as low as tolerated • Manitoba and seizure prophylaxis • Nurse at 30° (probably not possible in spinal immobilisation) • Keep warm- avoid hypothermia, covered with blankets and forced air warmer, heat on place, regular monitoring temp • Monitor glucose • Monitor ETCO2 etc
Gas in stomach	NGT
ETT dislodgement	Secure ETT carefully

Question 2 (12 marks) 6 minutes

A mother presents with her very distressed 18 month old child. The mother is concerned that the child may have eaten powder detergent from the dishwasher, 30 minutes ago.

- a. List three (3) features of toxicity of this ingestion. (3 marks)

(Agent is Sodium hydroxide)

- **Oropharyngeal burns- early**
 - **GIT**
 - **can occur in the absence of visible oropharyngeal burns**
 - **Oedema** (*maximal at 48/24*)
 - *Necrosis (7-10 days)*- **Perforation**
 - **Stricture** (*at 3 weeks*)
 - **Pulmonary oedema**
- b. What is the specific decontamination that is required if particulate matter is found in the mouth? (1 mark)
- **Physical removal** (*do not add liquid*)
- c. What is the treatment of choice if toxicity is suspected? (1 mark)
- **Milk lavage**

The child appears to have ocular exposure to the washing powder.

- d. Other than referral to Ophthalmology, list (5) steps in the management of this exposure. (5 marks)

NB: Bold are best answers

- **Explanation and reassurance to parents and child**
 - **Remove particulate matter with swab stick**
 - **Evert eyelid**
 - **LA drops- Repeat as needed**
 - **Irrigate continuously 30 min-** Test litmus paper- until pH 6.5-8
 - Cyclopentolate (cycloplegic)
 - Chlormycetin
 - Steroids (after ophth consultation)
 - **Pad**
- e. List three (3) indications for urgent Ophthalmological referral. (3 marks)
- **VA change**
 - **Scleral involvement**
 - **Corneal opacification** (*> 30-50%*)

Question 3 (14 marks) 6 minutes

An 18 year old year old female presents with a 2 week history of malaise, cough and shortness of breath. A CXR shows a large right pleural effusion.

Observations of pleural fluid helpful in diagnosis		Suggested diagnosis	
Color of fluid			
Pale yellow (straw)	Transudate, some exudates		
Red (bloody)	Malignancy, benign asbestos pleural effusion, postcardiac injury syndrome, or pulmonary infarction in absence of trauma		
White (milky)	Chylothorax or cholesterol effusion		
Brown	Long-standing bloody effusion; rupture of amebic liver abscess		
Black ^[1-4]	Aspergillus niger, Rhizomes oryzae, metastatic melanoma, pancreaticopleural fistula, crack cocaine use, bronchogenic adenocarcinoma, esophageal perforation during treatment with activated charcoal, chronic hemothorax		
Yellow-green	Rheumatoid pleurisy		
Dark green	Biliothorax		
Color of:		Site: Pleural	
Enteral tube feeding	Feeding tube has entered pleural space	Appearance: Hazy	
Central venous catheter infusate	Extravascular catheter migration	Supernatant: Clear yellow	
Character of fluid			
Pus	Empyema	CELL COUNT:	Reference range
Viscous	Mesothelioma	White cells 800 x 10 ⁶ / L	(<100 x 10 ⁶ /L)
Debris	Rheumatoid pleurisy	Red cells 31400 x 10 ⁶ / L	(5,000 – 10,000 x 10 ⁶ /L)
Turbid	Inflammatory exudate or lipid effusion	DIFFERENTIAL:	(Deposit film)
Anchovy paste	Amebic liver abscess	Lymphocytes 95%	
		Monocytes 5%	
		GRAM STAIN:	No organisms seen
Odor of fluid		GLUCOSE:	5.0 mmol/L (3.0 - 5.5mmol/L)
Putrid	Anaerobic empyema	TOTAL PROTEIN:	49 g/L (3.0 - 4.1g/L)
Ammonia	Urinothorax		

- a. List four (4) likely differential diagnoses for this patient. For each diagnosis, state how the diagnosis would be confirmed. (8 marks) *NB: lymphocyte predominance*

Diagnosis (4 marks)	How is the diagnosis made? (4 marks)
TB	<ul style="list-style-type: none"> • Zeil Nielsen stain on fluid/ sputum • Quantaferon Gold on blood
PE	<ul style="list-style-type: none"> • CTPA
Mycoplasma	<ul style="list-style-type: none"> • Culture of pleural fluid • Serology
Legionella	<ul style="list-style-type: none"> • Culture of pleural fluid • Serology
Influenza	<ul style="list-style-type: none"> • Viral assay/ immunofluoresce on fluid
HIV- PCP	<ul style="list-style-type: none"> • Viral assay/ immunofluoresce on fluid • HIV serology
Malignancy <ul style="list-style-type: none"> • 1° • 2°(lymphoma or ovarian- Meigs syndrome) 	<ul style="list-style-type: none"> • CT chest fine cut • Cytology of pleural fluid
Autoimmune diseases- Sarcoid	<ul style="list-style-type: none"> • Serum markers - eg ACE levels • Biopsy

Diagnoses established "definitively" by pleural fluid analysis

Disease	Diagnostic pleural fluid tests
Empyema	Observation (pus, putrid odor), positive culture
Malignancy	Positive cytology
Tuberculous pleurisy	Positive AFB stain, culture
Esophageal rupture	High salivary isoenzyme form of amylase, low pH (often as low as 6), ingested vegetable or meat fragments
Fungal-related effusions	Positive fungal stain, culture
Chylothorax	Triglycerides >110 mg/dL, chylomicrons by lipoprotein electrophoresis
Cholesterol effusion	Cholesterol >200 mg/dL with a cholesterol to triglyceride ratio >1, cholesterol crystals under polarizing light
Hemothorax	Ratio of pleural fluid to blood hematocrit >0.5
Urinothorax	Pleural fluid creatinine to serum ratio always >1 but diagnostic if >1.7
Peritoneal dialysis	Protein <0.5 mg/dL and pleural fluid to serum glucose ratio >1 in peritoneal dialysis patient
Extravascular migration or misplacement of a central venous catheter	Pleural fluid to serum glucose ratio >1, pleural fluid gross appearance mirrors infusate (eg, milky white if lipids infused)
Rheumatoid pleurisy	Cytologic evidence of elongated macrophages and distinctive multinucleated giant cells (tadpole cells) in a background of amorphous debris
Glycinothorax	Measurable glycine after bladder irrigation with glycine-containing solutions
Cerebrospinal fluid leakage into pleural space	Detection of beta-2 transferrin
Parasite-related effusions	Detection of parasites

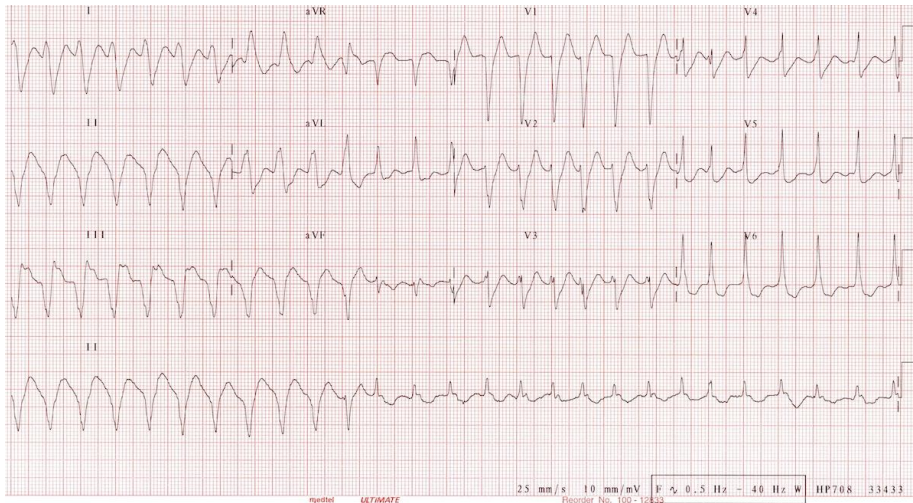
- b. List four (4) indications for therapeutic needle thoracocentesis in this patient. (4 marks)

- Significant symptoms & otherwise stable
- Respiratory compromise
- Haemodynamic instability
- Massive effusion with mediastinal shift
- Poorly controlled pain by other means

Question 4 (15 marks) 6 minutes

A 23 year old man presents with a complaint of palpitations and dizziness.

His vital signs on presentation include: BP 70/50mmHg RR 16/min Temp 37°C GCS 15



a. State seven (7) abnormal findings on this ECG. (7 marks)

- **2 rhythms:**
 - **1st**
 - **BCT**
 - **Rate 150**
 - **QRS ~ 160 msec**
 - **Extreme right/ NW axis**
 - **2nd**
 - **NCT**
 - **Rate 150**
 - **Irregular, no p waves- AF**
 - **STD V3-V6**

b. List three (3) possible underlying causes for this condition in this patient. (3 marks)

- **RVOT/HCM**
- **Na channel blocker overdose eg TCA**
- **Sympathomimetic drugs**
- **↑QT- eg Severe Hypokalaemia**
- **IHD**

c. What is your first line treatment for this patient. (1 mark)

- **DCR 100-150J synchronised** (given BP and dizziness no other answer is acceptable)

d. State four (4) possible additional treatments for this patient in the ED, following your first line treatment. (4 marks)

- **If 2 unsuccessful shocks synchronised, then unsynchronized**
- **Rx underlying electrolyte abnos**
- **Rx tox with NaHCO3- 8.4% 100ml IV**
- **Rx non toxic recurrence with amiodarone- 300mg IV stat then 900mg over 16hours**
- **Diazepam if stimulant use- 10mg IV titrated to response**
- **Bblocker if HCM**

Question 5 (12 marks) 6 minutes

A 2 ½ year old female presented with a history of injuring her feet on hot bitumen. This is a picture of the child after her feet have been cleaned. She is very distressed with pain.



a. State four (4) steps in your management of her pain. (4 marks)

- **Feet in ice water slurry/under cool running water**
- **High level of distress so at least one of:**
 - **IN fentanyl- 1.5mcg/kg repeated once if needed**
 - **IM ketamine- 3-4mg/kg**
 - **IM/IV morphine- 0.1mg/kg aliquots titrated to response**
- **Oral adjuncts:**
 - **Paracetamol/ ibuprofen**
- **Distraction** - eg TV, ipad, bubbles

b. Other than analgesia, list four (4) important issues in the management of this child. Provide a justification for the importance.

Important management issue	Justification
Dressings	Assist with healing/ analgesia
Admission	Will need admission for analgesia/ RN care
Specialist burn care	Likely deep dermal/ full thickness Sole of feet i.e. special area Burn surgeon/ Specialist
NAI	Explore possibility of neglect Paed review
Tetanus prophylaxis	Likely covered (if immunised)

Question 6 (15 marks) 6 minutes

- a. List the five (5) anatomical structures that may be involved in Herpes Zoster Ophthalmicus. (5 marks)
- **Skin**
 - **Cornea (keratitis)**
 - **Sclera (Scleritis)**
 - **Uvea (Uveitis)**
 - **Retina (acute retinal necrosis)**

A 36 year old male presents to ED with sudden loss of vision in his left eye.

- b. Complete this table with five (5) likely diagnoses and list the expected characteristic examination findings of each condition. (10 marks)

NB: Optic neuritis not usually sudden onset, glaucoma not likely given age, sex and sudden onset

Diagnosis	Characteristic examination findings
CRVO	<ul style="list-style-type: none"> • "sunset" or "tomato sauce" "thunderstorms" retina, large areas haemorrhage with cotton wool
CRAO	<ul style="list-style-type: none"> • Pale retina/ "cherry red" spot
Retinal detachment	<ul style="list-style-type: none"> • "Curtain"-like segmental retinal defect
Vitreous haemorrhage	<ul style="list-style-type: none"> • Focal retinal haemorrhage • Field defect
Acute anterior ischaemia	<ul style="list-style-type: none"> • ↓ VA • normal appearance of optic disc/fundus
Chiasm compression from aneurysm/ AV malformation	<ul style="list-style-type: none"> • Bitemporal hemianopia • CN III palsy

Question 7 (12 marks) 6 minutes

A 45 year old male presents to ED with vertigo and ataxia. A single cut from his CT brain is shown below.



- a. State four (4) abnormal findings shown in this image. (4 marks)
- **Bilateral cerebellar lesions**
 - L- poorly defined hypodense ~ 3x3cm
 - R- well defined hypodensity 2x2 cm
 - **Sulcal effacement**
 - **Loss of Grey-white differentiation**
 - **Dilated 4th ventricle**
- b. List four (4) key investigations that you would perform in this patient. Provide one (1) justification for each choice. (8 marks)

Investigations	Justification
MRI	Further delineate diagnostic features of lesions
ECG	AF- would increase likelihood embolic event
CT with contrast	? ring enhancing- delineate Ca from ischaemia
Carotid US	? embolic focus- stenosis incr risk of further CVA, although distribution on slice seen suggests posterior circulation
ECHO	? Valve lesions/ thrombus- embolic source
CXR	looking for lung ca and potential septic source
CT Chest/ abdo / pelvis	For primary / mets

Question 8 (12 marks) 6 minutes

A 30 year old female who is 36 weeks pregnant presents to the ED with an ongoing tonic clonic seizure. She has received no prehospital care. She is triaged to a resuscitation cubicle with standard non-invasive monitoring. She has IV access. Her observations include: BP 190/120 mmHg PR 120/min RR 18/min Temp 37°C

- a. List four (4) key steps to the management of this patient over the next 1 hour. Provide one (1) detail for each step. (8 marks)

Management step	Details
Seizure control	MgSO ₄ IV 4g over 15 minutes followed by maintenance over hrs eg hr IV Benzodiazepine
BP control	Hydralazine 10mg IV repeat up to 3 times start infusion at mg/hr Labetalol IV 10-20 mg bolus, repeat or double dose every 10 minutes until target BP obtained Labetalol infusion 1-mg/min, titrate Target dB 90 and sBP < 160
Immediate obstetric consult	Facilitate delivery
L Lateral position	Aspiration risk Weight off IVC- prevent compression
Oxygenation	NRB with O ₂ revision 15L

You are unable to contact the Obstetric registrar via the on call mobile phone number.

- b. State four (4) steps to rectify this problem. (4 marks)
- Overhead page
 - Call O+G consultant on call
 - Call another member of the O+R team (resident)
 - Call obstetric code blue

Question 9 (18 marks) 9 minutes

Your director is keen to commence a chest pain unit in your department.

- a. State four (4) advantages of a chest pain unit. (4 marks)
- **Allow more rapid evaluation by EST/ nuclear med scanning compared to standard ward care**
 - **Facilitate early referral for those reclassified as low risk**
 - **Pt flow through dept**
 - **Shorter length of stay**
 - **Focusses specialisation to one area of ED**
 - **Pt satisfaction**
 - **Reduction of cardiology ward admissions**
- b. State four (4) disadvantages of a chest pain unit. (4 marks)
- **Protocol driven over Ix**
 - **Hx/ Ex often overlooked- overreliance on blood tests/ XR**
 - **Resource intense**
 - **Focus shift away from non cardiac causes**
 - **Cost to set up**
 - **Space required may be better used for other ED functions**

Your director suggests using the TIMI risk score as a discharge decision tool.

- c. List the seven (7) components of the TIMI risk score. (7 marks)
- **Age > 65 years**
 - **At least 3 coronary risk factors**
 - **Prior angiographic coronary obstruction > 50%**
 - **ST segment deviation**
 - **≥ 2 episodes of angina within 24 hours**
 - **Use of aspirin within 7 days**
 - **Elevated cardiac biomarkers**
- d. State three (3) limitations of applying the TIMI score to ED patients. (3 marks)
(NB: TIMI score should not be used for discharge decision making from the ED)
- **No weighting of factors in the score**
 - **Most of the predictive power is in elevation of biomarkers**
 - **Unknown coronary angiography results**
 - **Score of zero still has cardiac event rate of 2%**

Alternative possible Q: Your Director requests that you take responsibility for setting up the unit.

List six (6) individuals that you would involve in your working party. (6 marks)

- **RN representative/ Charge RN**
- **Other ED SMS**
- **Cardiologist**
- **Radiology/ Nuclear Medicine representative**
- **Pathologist**
- **Building/ works**

This resource is produced for the use of University Hospital, Geelong Emergency staff for preparation for the Emergency Medicine Fellowship written exam. All care has been taken to ensure accurate and up to date content. Please contact me with any suggestions, concerns or questions.

Dr Tom Reade (Staff Specialist, University Hospital, Geelong Emergency Department)

Email: tomre@barwonhealth.org.au

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