

# Illawarra Shoalhaven Local Health District Emergency Medicine Fellowship Program



Trial Written Exam

2019.1

# ANSWER BOOKLET

Candidate Name: \_\_\_\_\_

**Question 1 (19 marks)**

Describe the findings on the CT image provided (3 marks)

Extensive left sided abdominal wall haematoma  
Arterial blush – suggesting active bleeding  
Swirl sign – hypodensity – suggesting active bleeding  
No haemoperitoneum / pneumoperitoneum

You are considering reversing the anticoagulation, regarding prosthetic valve thrombosis, name 2 factors (relating to the valve) that effect this risk of this upon reversal (2 marks)

Valve Location: Mitral > Aortic  
Valve material: Bare metal > tis  
What is the daily thrombosis risk? (1 mark)

Likely <1%

You decide to fully reverse the patient's warfarin, outline your approach (3 marks)

Vitamin K 10mg IV  
Prothrombinex 50u/kg IV  
+/- FFP 2u (may be part of massive transfusion)

The patient requires a massive transfusion, name 6 laboratory targets for massive transfusion (6 marks)

pH >7.2  
Lactate <4  
Ca >1.1  
Platelets >50  
INR < 1.5  
Fibrinogen >1.0  
aPTT / PT <1.5x normal  
BE < -6

Note: Hb shouldn't be used during acute bleeding / haemodynamic parameters and measured blood loss more appropriate

Excluding resuscitation and reversal, outline your management plan for this patient (4 marks)

*Resuscitation: Covered*

Analgesia: Fentanyl IV aliquots 25-50mcg titrated to pain

Specific: Intervention Radiology for Embolisation of Vessel

Disposition: HDU / ICU for haemodynamic monitoring, transfusion targets etc

**Question 2 (6 marks)**

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Describe the findings on this photograph (3 marks)

Swelling right occipital region

Erythematous

Loss of hair

What is the likely diagnosis? (1 mark)

Kerion – fungal infection

Describe the management of this condition (2 marks)

Supportive: Simple analgesia e.g. paracetamol 1g PO Q6H PRN

Specific: 6-8 weeks ORAL antifungal (itraconazole, terbinafine, griseofulvin)

Oral or IV antibiotics incorrect, Incision & drainage = 0/2

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**Question 3 (13 marks)**

Other than preterm labour, name one other obstetric condition that requires consideration (1 mark)

Placental abruption (concealed)

Name one investigation that can exclude the diagnosis of preterm labour. Explain the principle of its use (2 marks)

Fetal fibronectin

Vaginal swab, if FFN not detected, labour very unlikely in next 1-2 weeks  
NPV > 99% (thus highly sensitive)

A cardiotocograph is performed (above), please interpret and provide summary (6 marks)

Summary = normal CTG  
Baseline rate ~140bpm = normal  
Normal variability ~15bpm  
Accelerations present  
No decelerations  
Contractions present 3 every 10min

Outline the management of preterm labour in this woman (4 marks)

Tocolysis: Nifedipine oral 20mg q30min up to 60mg, then QID  
Betamethasone 11.4mg IM x2 24hrs apart  
IV Antibiotics: Benzylpenicillin 1.2g stat  
Neuroprotection: MgSO<sub>4</sub> 4g over 30min, then 1g/hr infusion  
Disposition = Retrieval to obstetric / paediatric facility

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**Question 4 (10 marks)**

Name 4 stigmata of chronic liver disease on physical examination (2 marks)

Palmar erythema  
Spider naevi  
Jaundice  
Ascites  
Splenomegaly  
Gynaecomastia

Other than hepatic encephalopathy, name 4 relevant differential diagnoses in this patient? (4 marks)

Alcohol / other drug intoxication  
Head injury e.g. subdural haematoma  
Electrolyte disturbance e.g. hyponatraemia  
Endocrine cause e.g. hypoglycaemia  
Anything reasonable but must have 2/4 from above

Name 4 important precipitants of hepatic encephalopathy (4 marks)

Alcohol ingestion  
Upper GI bleeding  
Spontaneous bacterial peritonitis  
Portal vein thrombosis

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**Question 5 (8 marks)**

What is the diagnosis and viability of the pregnancy? (2 marks)

Non-viable

Missed Miscarriage / Anembryonic pregnancy / Blighted ovum

What are the 3 management options for this condition? (3 marks)

Expectant Mx

Medical Mx – misoprostol 800mg PV

Surgical Mx – suction evacuation

Regarding surgical management, name 2 absolute indications for its use (2 marks)

Severe bleeding / haemorrhagic shock

Septic miscarriage

The patient requires Rh immunoglobulin, what is the dose and route of this medication? (1 mark)

250iu IM

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**Question 6 – (16 marks)**

What are the clinical features of mania? (4 marks)

- Inflated self-esteem / grandiosity
- Decreased sleep
- More talkative
- Flight of ideas
- Distractability
- Increased goal-directed activity
- Excessive involvement in pleasurable activities with high risk of bad outcome

What are the main clinical features of a large acute lithium overdose (2 marks)

Mainly GI toxicity (heavy metal): <25g mild-mod GI, >25g mod-severe GI +/- neurotoxicity (rare)

What are the main clinical features of a chronic lithium toxicity? (4 marks)

Mostly neurotoxicity / progressive based on symptoms

- Grade 1 = tremor, agitation, hyper-reflexia, ataxia
- Grade 2 = stupor, rigidity, hypotension
- Grade 3 = coma, seizures, myoclonus

Name 3 factors predispose a patient to chronic lithium toxicity? (3 marks)

- Impaired renal function
- Diabetes insipidus
- Sodium depletion
- Dehydration
- Drug interactions [NSAIDs / ACEi / thiazides]

What is the modality and name 3 indications for enhanced elimination in lithium toxicity. (3 marks)

Modality

Haemodialysis

Indications

Established neurotoxicity

Serum Li > 2.5

Renal impairment

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**Question 7 – (13 marks)**

Describe the main ECG findings of importance (4 marks)

Severe bradycardia, rate 20

AV dissociation / complete heart block

Broad complex escape – likely ventricular

Peaked T waves

What is the likely diagnosis? (1 mark)

Complete heart block with ventricular escape

What are 3 potentially reversible precipitants of this condition? Give examples where appropriate (3 marks)

Hyperkalaemia

Myocardial ischaemia / infarction

Drugs: Ca channel blockers / beta blockers / digoxin . . .

Outline your management of this patient (5 marks)

Seek and treat precipitant e.g. hyperkalaemia (calcium gluconate is reasonable empirically)

Medical Mx:

Atropine is likely to fail, so poor answer

Adrenaline 25-50mcg IV bolus' at bedside is reasonable

Isoprenaline / Adrenaline infusion with dose / rate is reasonable

Electrical Mx:

Transcutaneous Pacing with reasonable description / analgesia is reasonable

Disposition: Referral to Cardiology for Emergent Transvenous Pacemaker is essential

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**Question 8 (7 marks)**

What is the most likely diagnosis? (1 mark)

Phlegmasia cerulea dolens

Large DVT with potential for complete venous occlusion and infarction

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Name 2 investigations you could perform to confirm the diagnosis (2 marks). Give a justification for each.

US lower limb: Non-compressible deep veins / no variance to pulse wave doppler of iliac veins / assess arterial flow

CT venogram: Assess clot burden / degree of venous occlusion etc / anatomical mapping pre-intervention

What are the management priorities in this case (4 marks)

Analgesia – drug / dose / route required

Anticoagulation – Heparin infusion preferred with loading / maintenance and target aPTT

Emergent Vascular surgery referral for consideration of thrombectomy / catheter directed thrombolysis

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**Question 9**

What are the biochemical features of a pleural effusion that suggest empyema? (3 marks)

Purulent pleural fluid

1 or more of following:

- + gram stain / culture
- WCC > 50,000
- Pleural fluid glucose <3
- Pleural fluid pH <7.2
- Pleural fluid LDH >1000

You perform a bedside lung ultrasound and in the right lower zone, you obtain the image below

Describe 2 important features of this ultrasound (2 marks)

Effusion

Loculated

Consolidated lung

What is the likely diagnosis? (1 mark)

Empyema

Outline the medical and surgical management for this condition (5 marks)

Supportive:

- Supplemental O2
- Analgesia
- Fluids/nutrition (considering SIADH / catabolism etc)

Specific (Medical):

- IV Abs Broad Spectrum (Piperacillin-Tazobactam or Cefotaxime + Vancomycin if MRSA suspected)
- Large Bore Chest drain (large size) ~20Fr

Specific (Surgical Options):

- Fibrinolytics via chest drain
- VATS – video-assisted thoracoscopic surgery
- Open thoracotomy

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**Question 10 (16 marks)**

Describe 2 abnormal findings on this CT scan (2 marks)

Anterolisthesis (anterior displacement) of C4 on C5 without obvious fracture  
Narrowing of vertebral foramen at this site

What is the likely diagnosis? (1 mark)

Bilateral facet joint dislocation

Name 5 unstable C spine fracture patterns (5 marks)

Atlantoaxial dislocation or dissociation  
Jeffersons # (Burst C1)  
Hangmans # (Bilateral pedicle C2)  
Type 2 or 3 Odontoid Process #  
Tear drop fracture  
PLUS: Bilateral facet joint dislocation

Compare the clinical features of spinal and neurogenic shock (4 marks)

Spinal shock = neurological injury to spinal cord / initial period of cord 'confusion' that may overestimate degree of permanent neurological injury

Neurogenic shock = distributive shock due to lack of sympathetic tone

Spinal Shock	Neurogenic Shock
Arreflexia Flaccid paralysis	Bradycardia / Hypotension / Warm skin / Poikilothermia (which is usually hypothermia in a hospital bed)

Above what spinal level is neurogenic shock likely to occur? (1 mark)

Injury above T6

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Describe the supportive care (and targets) in neurogenic shock (3 marks)

Supportive care: Immobilisation of injury / Analgesia / Antiemetics  
Maintain MAP 85-90 with IV Fluid Hartmanns 1-2 L then noradrenaline infusion  
Maintain normoxia / normoglycaemia / normothermia  
IDC / pressure area care / VTE prophylaxis etc

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**Question 11 (12 marks)**

A 35 year old man has a fall onto his out-stretched right hand after a fall down several steps. He has an isolated right wrist injury. The following Xrays are taken.



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Please outline the abnormalities on this Xray (4 marks)

Extraarticular distal radius #

25% posterior displacement

45o dorsal angulation

Minimally displaced ulna styloid #

With the exception of neurovascular compromise, please outline 4 indications for closed reduction of this fracture type/pattern, include with specific targets (4 marks)

View	Measurement	Normal	Acceptable criteria
AP	Radial height	13mm	< 5mm shortening
	Radial inclination	23°	change < 5°
	Articular stepoff	congruous	< 2 mm stepoff
Lateral	Volar tilt	11°	dorsal angulation < 5° or within 20° of contralateral distal radius

You chose to perform a Biers block to facilitate closed reduction. Name 4 contraindications to performing this procedure (4 marks)

Allergy to local anaesthetic

BP >200

Methaemoglobinaemia

Cuff wont reliably fit (small child, morbidly obese)

Uncooperative patient (child, elderly) – judgement call

Lymphoedema / Reynauds / Peripheral vascular disease

Candidate Name: \_\_\_\_\_

**Question 12 (9 marks)**

Name 4 goals of an individualised care plan for a 'frequent presenter' (4 marks)

- not to miss serious illness
- help patient in the long term
- improve patient care
- minimise ED stay
- improve engagement with community supports/services
- reduce disruption to staff

Who are the likely key stakeholders in this instance (5 marks)

Patient

GP

Emergency physicians + medical staff

Cardiology department

Emergency nursing staff

Emergency Department Management Team – Directors / Managers etc

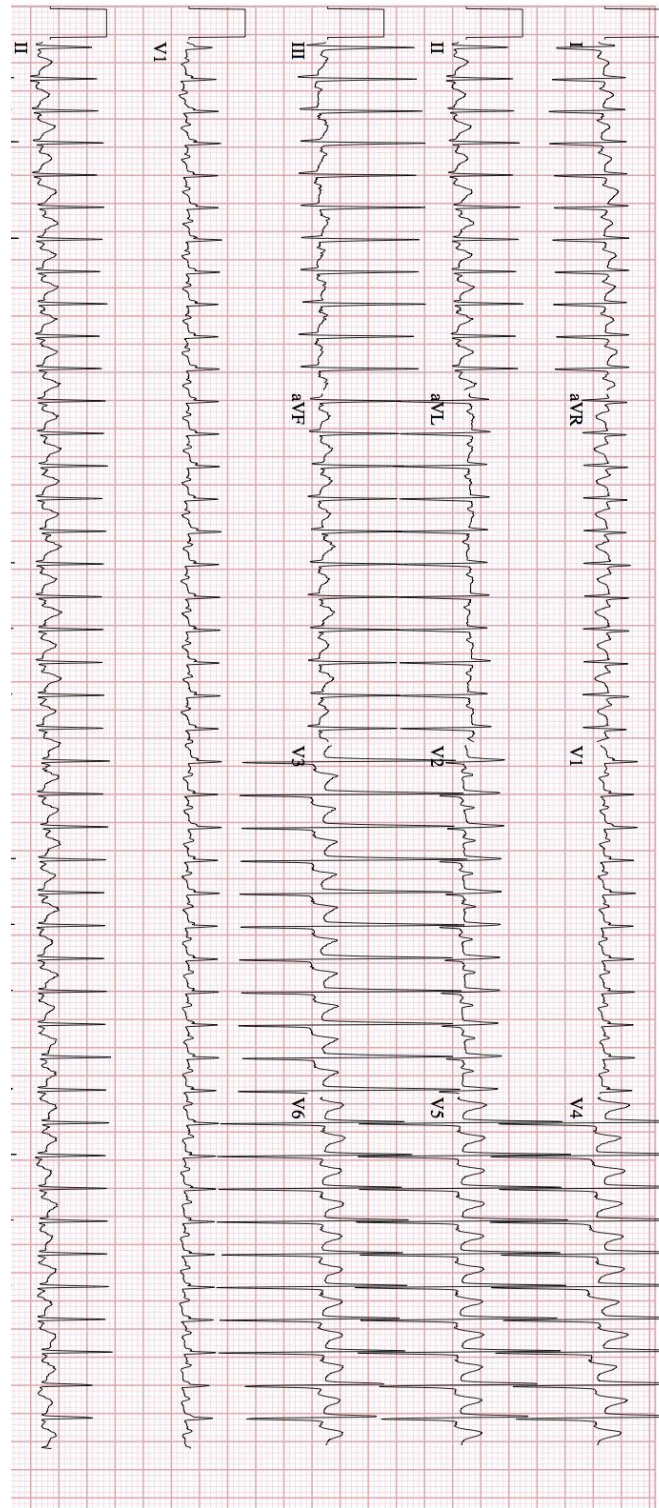
Maybe psychologist

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**Question 13 (10 marks)**

A 4 year old boy is being managed in the paediatric bay as asthma. He presented with tachypnoea and has had a burst therapy of 3 doses of 6 puffs salbutamol with no improvement. Nursing staff have asked for you to review the patient as they have noticed the patient is very tachycardic.

On review the child is mildly tachypnoeic, has normal central capillary refill and has a clear chest on auscultation. An ECG is performed and is below.



Candidate Name: \_\_\_\_\_

Describe the main features of this 12 lead ECG (4 marks)

Tachycardia – rate ~260

Narrow complex

Regular R-R intervals

No clear sinus P waves

What is the likely diagnosis? (1 mark)

Supraventricular tachycardia

Describe the escalating management options for this child (4 marks)

Simple manoeuvres – e.g. ice pack on face

Adenosine 100mcg/kg IV

Repeat adenosine 200mcg/kg then 300mcg/kg

(Verapamil IV is an option, not <1yr, still controversial <5yrs)

DC cardioversion (under sedation): 1J/kg , then 2J/kg

Candidate Name: \_\_\_\_\_



**Question 14 (21 marks)**

A 32 year old man has been brought in by ambulance with altered level of consciousness after being seen to be well by family throughout the day. He has no past medical history and takes no regular medications.

His vital signs are:

T 37.2

P 126

BP 110/72

RR 30

GCS 7 (E1V2M4)

SaO<sub>2</sub> 100% on RA

He has a venous blood gas taken on arrival in the resus room

pH 7.09  
pO<sub>2</sub> 32  
pCO<sub>2</sub> 18  
HCO<sub>3</sub> 7  
Na 134  
K 6.2  
Cl 98  
i Ca 1.02  
Lactate 5.1  
Glucose 8.1  
Creatinine 67  
Urea 8.0  
Hb 143  
Osm (meas) 307

Candidate Name: \_\_\_\_\_

Please interpret this venous blood gas including all relevant calculations (8 marks)

Profound acidaemia pH 7.09

Isolated raised anion gap metabolic acidosis (DDx lactaemia / ketoacidosis / toxic alcohol)

- $\text{HCO}_3^-$  7
- Anion gap
- Delta ratio  $\sim 1$

Additional respiratory acidosis  $\text{CO}_2$  32

- Expected  $\text{CO}_2$  = 18

Corrected  $\text{K}^+$   $\sim 3.2$

Raised Osmolar gap = 23

Oxygenation not assessible

What is the likely diagnosis? (1 mark)

Toxic alcohol poisoning

What 2 physiological factors may complicate this rapid sequence induction (RSI). For each, please outline a modification to the RSI process (4 marks)

Physiological Factor	RSI Modification
Haemodynamic collapse	IV Fluid pre-loading Vasopressors at bedside or running
Worsening acidaemia	Ventilate through apnoeic period Target pre-induction $\text{EtCO}_2$ as end-point of ventilation

What are the management priorities for this patient? (4 marks)

Secure airway / control ventilation

Support haemodynamics

Ethanol

- 8mL/kg of 10% ethanol IV loading dose, then 1-2mL/kg/hr
- 4 x 30mL shots of vodka ( $\sim 40\%$  EtOH), then  $\sim 1$  shot per hour) via NG or OG

Haemodialysis

Critical care unit / Consideration of suicidality

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What are 4 indications for enhanced elimination in this patient (4 marks)

Haemodialysis is EE modality of choice

Indications:

- Large ingestion with Osmolar gap >10
- pH <7.30
- Renal failure
- Deterioration in vital signs
- Specific level:
  - Methanol > 16mmol/L
  - Ethylene glycol >8mmol/L

Candidate Name: \_\_\_\_\_

**Question 15 (10 marks)**

A 21 year old man is brought into the ED from a music festival complaining of shortness of breath and chest pain. His lips are cyanosed and vital signs are as follows:

T 36.2

P 121

BP 130/88

RR 34

SaO<sub>2</sub> 85% (10L/min)



What is the likely diagnosis? (1 mark)

**Methaemoglobinaemia**

What is the pathogenesis of the patient's symptoms? (2 marks)

**Fe 2+ portion of haem is changed to Fe 3+ causing to haemoglobin to be converted to methaemoglobin  
Reduced O<sub>2</sub>-carrying capacity and resultant hypoxia**

Name 4 agents that can cause this condition (4 marks)

**Exposure to oxidising agents:**

- **Local anaesthetics: Prilocaine / Lignocaine**
- **Nitrites e.g. amyl nitrate**
- **Dapsone**
- **Antimalarials e.g. chloroquine**

Outline your management of this patient (3 marks)

**Apply oxygen via non-rebreather mask (NRBM)  
Methylene blue 1mg/kg over 5min, repeat dose at 30-60min  
Remove precipitating agent / admit to HDU / seek & treat complications and consider DDX**

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**Question 16 (8 marks)**

A 73 year old man is brought into the ED with left sided chest discomfort and is diagnosed with a NSTEMI on the basis of high lateral T wave inversion and a positive initial troponin T of 64 (reference range 0-14). The nurse notifies you that he wishes to self-discharge as his pain has resolved and he feels well.

Outline some important medical risks of self-discharge in this scenario (3 marks)

Progression to STEMI  
VT / VF – sudden cardiac death  
CCF

Name 5 considerations when assessing a person's capacity to make a decision (5 marks)

<b>C</b>	<b>ommunicate</b>	Is the patient able to choose and communicate a choice?
<b>U</b>	<b>nderstand</b>	Does the patient understand the risks/benefits/ and alternatives?
<b>R</b>	<b>eason</b>	Can the patient make a rational choice?
<b>V</b>	<b>alue</b>	Is the choice consistent with the patient's values?
<b>E</b>	<b>mergency</b>	Is there impending risk to the patient?
<b>S</b>	<b>urrogate</b>	Are there surrogates or allies available?

Candidate Name: \_\_\_\_\_

**Question 17 (7 marks)**

You are a new consultant working in an urban emergency department. The director approaches you and asks you to investigate the high proportion of 'did not wait' presentations. She is concerned these DNW figures represent

What is the (generally accepted) maximum accepted percentage of patients who DNW? (1 mark)

<5%

Name two patient groups who are often over-represented within DNW statistics (2 marks)

Children  
Mental health patients

Name 4 reasons for high DNW numbers and propose 4 solutions (4 marks)

High DNW is mainly caused by long-wait times which is generally due to ED overcrowding and access block. Any reasonable reasons/solutions are ok. Examples below.

Reason	Solution
WR not suitable for patients awaiting care	Access to food / water / entertainment / nurse in WR
Long wait to fast-track / paed cases	FT/paed stream / separate staff allocation
Inadequate medical staffing	Hire more staff
Poor access to ED beds due to admissions	Hospital-wide approach to access block – early discharge, senior review etc

Candidate Name: \_\_\_\_\_

**Question 18 (18 marks)**

You are working as the consultant in a large metropolitan emergency department when you receive a pre-notification of a 16 day old child who is unresponsive, floppy with tachypnoea. They will arrive in 10min.

Outline the key aspects of your preparation (4 marks)

**Staff**

- ED staff: roles
- Inpatient staff: notification / roles

**Space**

- Resus bay

**Stuff: Equipment / Drugs**

- Airway / vascular access equipment
- Antibiotics / Dextrose / Fluid / Adrenaline doses

**Strategy**

- Debrief staff expected patient issues / priorities / direction of care
- Offload responsibility to rest of department / notify RN in charge

Regarding the differential diagnosis of a critically unwell neonate, name 5 major aetiologies with an example for each (5 marks)

- Sepsis
- congenital heart disease
- metabolic disturbance
  - electrolyte abnormality – often Na<sup>+</sup>
- endocrine disturbance
  - adrenal insufficiency
  - hypoglycaemia
- non-accidental injury
- Others:
  - Overdose/tox
  - Seizures
  - GI emergencies

Candidate Name: \_\_\_\_\_

Name 3 clinical signs on examination that would make you suspect a duct-dependent cardiac lesion?  
(3 marks)

Cyanosis / Hypoxia

- Hyperoxia test: failing to increase SaO<sub>2</sub>

No femoral pulses

Hepatomegaly

Murmur

What are the two main groups of duct-dependent cardiac lesions? Give 2 examples from each (4 marks)

Duct-dependent pulmonary circulation	Duct-dependent systemic circulation
Pulmonary atresia	Coarctation of aorta
Critical pulmonary stenosis	Critical aortic stenosis
Tricuspid atresia	Hypoplastic left heart syndrome
Present with hypoxia / cyanosis	Present with shock / acidosis

Note: Duct-dependent pulmonary AND systemic circulation = transposition of the great arteries

What medication can be used in the treatment of duct-dependent cardiac lesions? How is it administered and name one adverse effect? (2 marks)

Prostaglandin E1 (Prostin) Infusion: 50ng/kg/min, can increase to 100ng/kg/min

Adverse effects:

Main one = apnoea

Others: Hypotension, Hypoglycaemia, Transient hyperthermia and others

Candidate Name: \_\_\_\_\_



# Book 3

Candidate Name: \_\_\_\_\_

**Question 19 (13 marks)**

Your junior registrar is seeing a 46 year old woman with fevers and altered mental status who looks unwell. At this stage they haven't been able to locate a source of infection and have empirically treated her with intravenous flucloxacillin and gentamicin.

You review the patients full blood count (FBC), results below

Hb 108

WCC 6.5

Platelets 43

In ideal circumstances, below what platelet level would you organise a platelet transfusion to facilitate (1.5 marks)

Lumbar puncture (afebrile): < 50

Central venous catheter: < 20

Asymptomatic patient: < 10

What are the 5 features of TTP? (2.5 marks)

Fever

Thrombocytopenia

Microangiopathic haemolytic anaemia

Renal impairment

CNS changes (e.g. headache, seizure, altered mental status, coma)

Discuss the treatment options for TTP (3 marks)

Plasmapheresis = 1<sup>st</sup> line

Corticosteroids

Splenectomy

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Complete the following table that compares the following serious causes of thrombocytopenia (6 marks)

	TTP	DIC	ITP
Platelet count	Low	Low	Low
INR / PT	Normal	High	Normal
Microangiopathic haemolytic anaemia	Present	Present	Absent
Fibrinogen	Normal	Low	Normal
Safe to give platelets	No	Yes	Yes

Candidate Name: \_\_\_\_\_

**Question 20 (13 marks)**

A 62 year old man with peripheral vascular disease and atrial fibrillation comes to the emergency department with an extremely painful right leg. The triage nurse gives him a category 2 on the basis of pain score plus concern over distal perfusion.

What are the causes of limb ischaemia? Give examples (2 marks)

Thrombotic – atherosclerotic plaque

Embolic – AF / CCF / AAA

Other – e.g. dissection

How do features of clinical assessment at the bedside, correlate with the Society for Vascular Surgery (SVS) classification of lower limb ischaemia? (4 marks)

Category	Description	Capillary return	Muscle paralysis	Sensory loss	Doppler signals	
					Arterial	Venous
I Viable	Not immediately threatened	Intact	None	None	Audible	Audible
Ila Threatened	Salvageable if promptly treated	Intact/slow	None	Partial	Inaudible	Audible
IIb Threatened	Salvageable if immediately treated	Slow/absent	Partial	Partial/complete	Inaudible	Audible
III Irreversible	Primary amputation	Absent staining	Complete tense compartment	Complete	Inaudible	Inaudible

Name 2 medications, including dose / route / targets that you would prescribe in this case (4 marks)

Fentanyl – IV aliquots titrated to pain

Heparin IV bolus + infusion, titrated to aPTT

Name 3 interventional procedures that may be used in acute limb ischaemia (3 marks)

Catheter-directed thrombolysis

Embolectomy

Bypass

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**Question 21 (11 marks)**

A 63 year old man presents to the ED with bilateral leg weakness. He has had a recent diarrhoeal illness and you suspect Guillain-Barre syndrome.

Please describe the differences in clinical features between GBS and spinal cord compression (8 marks)

	Guillain-Barre Syndrome	Spinal Cord Compression
History	<p>Prior infectious illness</p> <p>Others potentially ok</p>	No prodrome
Exam Finding 1	<p>Arreflexia (LMN)</p> <p>Sensory typically preserved</p>	<p>Hyperreflexia (UMN)</p> <p>Sensation impaired (level)</p>
Exam Finding 2	<p>Ascending</p> <p>Respiratory muscle involvement</p>	<p>Fixed level</p> <p>No respiratory muscle involvement unless above C5</p>
Diagnostic Investigation	<p>MRI not showing lesion (can show enhancement of anterior spinal nerves)</p> <p>CSF showing albumin-cytological dissociation (e.g. high protein, low WCC)</p> <p>EMG / nerve conduction</p> <p>FVC not accepted answer as below</p>	<p>MRI shows lesion</p> <p>Normal CSF</p>

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Describe the use of forced vital capacity (including threshold values) in the monitoring of a patient with GBS and suspected diaphragmatic weakness (3 marks)

FVC result	Management/Disposition
<15mL/kg	Indication for mechanical ventilation
15-20mL/kg	Close monitoring in intensive care setting
>20mL/kg	Observe, ward-based setting if no other indication for ICU

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**Question 22 (10 marks)**

A 27 year old woman with no significant comorbidities presents to the emergency department with constant right upper quadrant abdominal pain for 16 hours duration. She feels hot and generally unwell and notes that she has had prior episodes of transient RUQ pain following meals but has never had any investigation.

Her vital signs are:

T 38.1

P112

BP 135/86

RR 21

SaO2 99% RA

On examination she has significant RUQ tenderness and you suspect acute cholecystitis. Your intern has some questions relating to biliary disease.

Name 4 features on abdominal ultrasound that are consistent with cholecystitis (4 marks)

GB wall >3mm  
Pericholecystic Fluid / hyperaemia  
Sonographic murphy sign  
Gallstones

What is the normal diameter of the common bile duct? (1 mark)

<8mm

Name 3 causes of extrahepatic biliary obstruction (3 marks)

Choledocholithiasis  
Pancreatic mass  
cholangiocarcinoma

Name 2 complications of extrahepatic biliary obstruction (2 marks)

Cholangitis  
Reduced absorption fat soluble vitamins – most importantly K

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**Question 23 (15 marks)**

Your RMO is treating a patient with suspected pulmonary embolism who presented with shortness of breath and light-headedness. You are discussing the classification of PE.

Define (3 marks)

- Massive PE

Acute PE + haemodynamic compromise (no longer defined by size)

- BP < 90 for 15min
- Vasopressor requirement
- Pulseless

- Submassive PE

Acute PE, not haemodynamically compromised but:

- Right heart strain (ECG / Echo / BNP)
- Troponin Leak

- Non-massive PE

Acute PE + none of above

What are the 8 features of the PE rule out criteria (PERC) score? (4 marks)

**PERC Rule for Pulmonary Embolism**

Rules out PE if all criteria are present and pre-test probability is  $\leq 15\%$ .

<b>Age &gt; 50</b>	<input type="checkbox"/> NO	No need for further workup, as <2% chance of PE.  If no criteria are positive and clinician's pre-test probability is <15%, PERC Rule criteria are satisfied.
<b>HR <math>\geq 100</math></b>	<input type="checkbox"/> NO	
<b>O2 Sat on Room Air &lt; 95%</b>	<input type="checkbox"/> NO	
<b>Prior History of DVT/PE</b>	<input type="checkbox"/> NO	
<b>Recent Trauma or Surgery</b>	<input type="checkbox"/> NO	
<b>Hemoptysis</b>	<input type="checkbox"/> NO	
<b>Exogenous Estrogen</b>	<input type="checkbox"/> NO	
<b>Unilateral Leg Swelling</b>	<input type="checkbox"/> NO	

Candidate Name: \_\_\_\_\_



The patient has a bilateral PE confirmed on CTPA. You review the patient and find them to be significantly dyspnoeic with the following vital signs:

T 37.7

P 134

BP 83/44

RR 32

SaO<sub>2</sub> 87% on 10L/min

Name 3 key aspects of your management of this patient, give specifics (6 marks)

Improve oxygenation: HFNO<sub>2</sub> 50L/min, titrate fio<sub>2</sub> to target SaO<sub>2</sub> 92-96%

Vasopressors: Noradrenaline infusion target BP 90-100

Systemic thrombolysis: Alteplase IV

- Deteriorating or arrest = 50mg alteplase bolus
- Stable 100mg (10mg bolus, 90mg over 90min)

Name 2 abnormalities on bedside echocardiography when evaluating the right ventricle in this setting (2 marks)

RV strain:

- RV dilated >0.9 LV
- Reduced TAPSE
- McConnell's sign

Dilated IVC

Candidate Name: \_\_\_\_\_

**Question 24 (6 marks)**

A 23 year old man comes to the ED after a direct blow to the right knee complaining of significant pain. His lateral knee Xray is below.



Please outline the abnormalities on this Xray (3 marks)

Comminuted fracture of patella  
Haemarthrosis

Name 3 indications for operative fixation for this type of injury (3 marks)

Open fracture  
Extensor mechanism not intact / unable to straight leg raise  
Displaced fracture >2mm

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**Question 25 (10 marks)**

A 74 year old woman comes to the ED after suffering a significant loss of vision from her right eye. She has some perception of light, mainly at the periphery of her vision. Her main comorbidities are hypertension and type II diabetes mellitus.

Name 5 causes of unilateral sudden painless vision loss (5 marks)

Central retinal artery occlusion

Central retinal vein occlusion

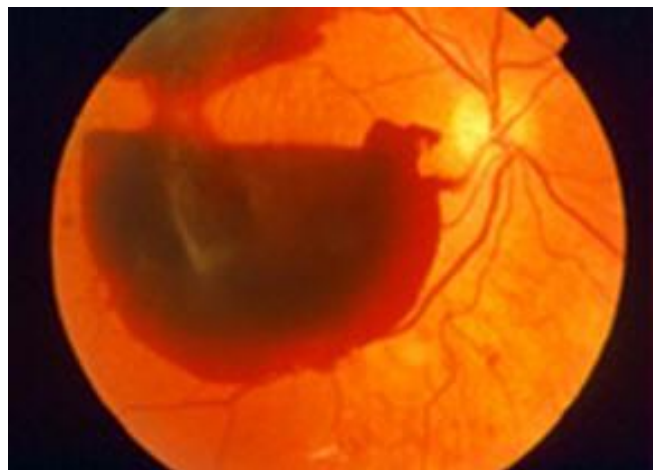
Vitreous haemorrhage

Retinal detachment

TIA/Stroke

Temporal arteritis

Optic neuritis



She undergoes fundoscopy (above). What is the diagnosis? (1 mark)

Vitreous haemorrhage

What is the main cause of this condition? (1 mark)

Proliferative diabetic retinopathy

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What is a relative afferent pupillary defect (RAPD)? Name 2 conditions in which this will be seen (3 marks)

Suggests retinal or optic nerve pathology

Pupil constricts normally during consensual response but not during direct light (gives appearance of paradoxical pupil dilation)

Seen in:

- CRAO
- CRVO
- Retinal detachment
- Stroke/TIA

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**Question 26 (11 marks)**

You are working in a rural hospital in North Queensland and the ambulance bring in a 19 year old man with a suspected jellyfish envenomation.

What 2 jellyfish have life-threatening envenomation? (2 marks)

1: Box Jellyfish / Chironex

2: Irukandji

Compare and contrast them in terms of their clinical features (4 marks)

	1: Box Jellyfish	2: Irukandji
Timing of pain	Immediate	Delayed 15-30min or so
Location of pain	At site of sting	Generalised / trunk
Skin changes	Characteristic laddering lesion	None
Cardiac arrest?	Early	None

He has been stung by this jellyfish



What is the name of this jellyfish? (1 mark)

Irukandji

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Discuss the components of management relevant to this envenomation (4 marks)

Prehospital:

- Apply vinegar / no PBI

Hospital:

- Analgesia – fentanyl aliquots titrated to pain
  - If refractory: MgSO<sub>4</sub> controversial / PCA / ketamine
- Control hypertension if refractory to opioid (GTN infusion), aim systolic BP <160
- Admit to HDU setting / seek and treat complications such as MI/APO

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**Question 27 (9 marks)**

You receive a pre-notification that you will be receiving a 23 year old male who has been in a high-speed motor vehicle accident. He has obvious head, torso and limb injuries and is haemodynamically unstable with an unrecordable blood pressure.

On arrival to your emergency department he has lost output and CPR has been commenced 2 minutes prior.

What interventions will you prioritise in this setting? (5 marks)

- Intubation and mechanical ventilation
- Bilateral finger thoracostomies
- Pelvic binder application
- Reduction of long bone fractures
- Blood product administration / massive transfusion protocol

Discuss the role of CPR in this setting (2 marks)

**\*\*Controversial area\*\* / no evidence**

If medical cause of arrest – has a role

If important procedures NOT done – likely no role / inhibits

If important procedures done – maybe role

What is the role of ED thoracotomy in blunt traumatic cardiac arrest? (2 marks)

Survival poor <2%

Potential indication:

- Blunt trauma + arrest <10 min WITH pericardial effusion + cardiac activity on PoCUS

**END OF BOOKLET**

Candidate Name: \_\_\_\_\_