

Illawarra Shoalhaven Local Health District Emergency Medicine Fellowship Program



Trial Written Exam 2020.1

Candidate Instructions

- Duration = 3hrs
- The examination is divided into 3 booklets, each consisting of 9 questions
- Props are included within the examination booklets
- Allocated marks for each question are shown
- Each mark is of equal weight
- There is no negative marking
- Write answers CLEARLY, and cross out any errors
- Answer within space provided
- Do not begin until instructed
- No examination paper or material is to leave the examination room

Good Luck!



Candidate Name: _____

Book 1

Candidate Name: _____

Question 1 (10 marks)

You are working for a prehospital and retrieval medicine service and fly 150km in a rotary wing aircraft to attend an 18 year old man who has been involved in a motor vehicle accident

On your arrival his observations are:

T 36.3

P110

BP 158/63

RR 22

SaO2 98%

No stridor but a mild degree of respiratory distress



Referring to the above clinical photograph and Xray, describe the main findings (2 marks) as well as the main potential acute complications (2 marks)

You decide to transport the patient without securing the airway as the tertiary receiving hospital has access to definitive surgical care as well as advanced airway equipment. The retrieval coordinator asks you whether you would like to transport the patient back via road or air. Outline 1 pro and 1 con to each mode of transport relevant to this case. (4 marks)

Candidate Name: _____

	Pro	Con
Rotary wing		
Road Transfer		

You elect to transfer the patient back by air and inflight the patient develops increasing respiratory distress then has a respiratory arrest. The pilot states you are unable to land for 18 minutes. You are unable to establish effective bag-valve mask ventilation despite adjuncts. Explain two management options you would institute whilst in flight (4 marks)

Candidate Name: _____

Question 2 (10 marks)

A 27 year old man with 3 days of abdominal pain, vomiting and diarrhoea has been admitted to the Emergency Department Short Stay Unit for intravenous fluid therapy and supportive care. He is still feeling unwell the next morning and isn't suitable for discharge. He has bloods taken which are below.

pH	7.19	7.35-7.45
pCO ₂	30	35-45mmHg
pO ₂	42	80-100mmHg
HCO ₃	15	22-26mmol/L
Na	143	135-145mmol/L
K	2.8	3.5-5mmol/L
Cl	114	96-106mmol/L
Lactate	1.8	< 2 mmol/L

Please interpret the above venous blood gas (4 marks)

Name the two most likely contributors to this acid-base disturbance (1 mark)

Name 3 other causes of the predominant disturbance (3 marks)

Outline two important aspects of correcting this disturbance (2 marks)

Candidate Name: _____

Question 3 (8 marks)

You are working as the consultant in a tertiary hospital and your intern has just seen a 23 year old woman who is 6 days following a vaginal delivery, assisted with obstetric forceps. She was discharged day 2 with a healthy girl and has returned to the emergency department with fevers.

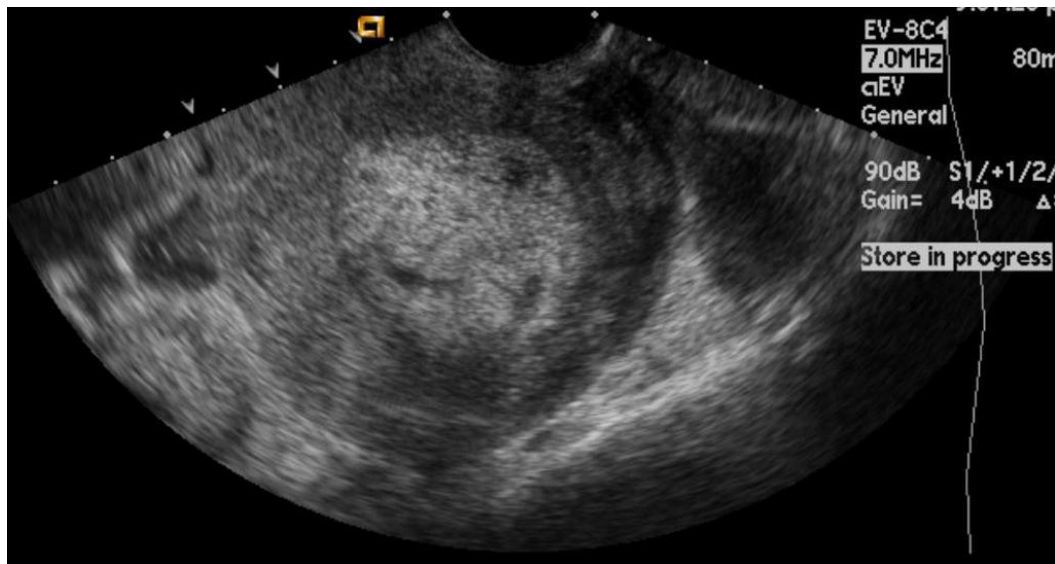
Her vital signs are:

T 39.2
P 133
BP 85/50
RR 24
SaO2 99% RA

You suspect endometritis, name 2 organisms from different categories (2 marks)

Name 3 other causes of post-partum fever to consider in this case (3 marks)

A transvaginal ultrasound is performed (below) and shows a distended endometrial cavity with heterogenous material without internal vascularity.



Outline the specific treatment you would facilitate for this woman (3 marks)

Candidate Name: _____

Question 4 (10 marks)

You are working on shift in a rural emergency department with a single junior medical officer. The nearest major referral hospital is 400km away. You receive a 20 year old man who has been shot in the mid-thigh, with a shotgun and has brisk haemorrhage from the entry site.

His vital signs on arrival are:

T 36.2

P 172

BP 58/27

GCS 8 (E2V2M4)

RR 24

SaO2 no trace recordable

Outline your immediate management (3 marks)

The patient clinically improves, but due to weather and other factors the retrieval coordination service advises you the patient won't be able to reach the referral hospital for ~4 hours.

Name 3 complications associated with tourniquet use (3 marks)

Explain the concept 'tourniquet conversion' (2 marks)

List 2 possible indications for tourniquet conversion (2 marks)

Candidate Name: _____

Question 5 (12 marks)

You are working in an urban district emergency department and have just received a 73 year old man with a long history of smoking, hypertension and COPD who has presented with extreme dyspnoea and hypoxia.

His vital signs are:

T 36.3

P 122

BP 177/98

RR 42

SaO₂ 82% on 10L/min via Hudson mask

You perform point of care ultrasound (PoCUS) and obtain the following pattern globally throughout the lungs in association with bilateral lung sliding.



What is the likely diagnosis? (1 mark)

What is the main feature on this image suggestive of this diagnosis (1 mark)

Outline the two main aspects of your initial care of this man (4 marks)

Candidate Name: _____

Please provide 2 findings on PoCUS for the following lung conditions (6 marks)

- Pneumonia
- COPD
- Pneumothorax

Candidate Name: _____

Question 6 (8 marks)

A 58 year old man has been referred from his GP with a painful skin rash that initially started as oral mucosa lesions several weeks prior. He has a background of hypertension and smoking but is otherwise slim and doesn't have any other comorbidities. He is in significant discomfort but his vital signs are normal.

A clinical photograph is below



Describe the photograph above (3 marks)

What is the most likely diagnosis? (1 mark)

Name 2 differential diagnoses and a clinical feature that may distinguish them from your provisional diagnosis (4 marks)

Candidate Name: _____

How is the diagnosis confirmed? (1 mark)

Outline the management priorities for this condition (3 marks)

Candidate Name: _____

Question 7 (7 marks)

A 21 year old man is brought into the ED with palpitations that came on 2 hours prior and were unprovoked. His ECG is shown below. He has been recently diagnosed with Wolf-Parkinson-White syndrome but has had no treatment to date.

His vital signs are:

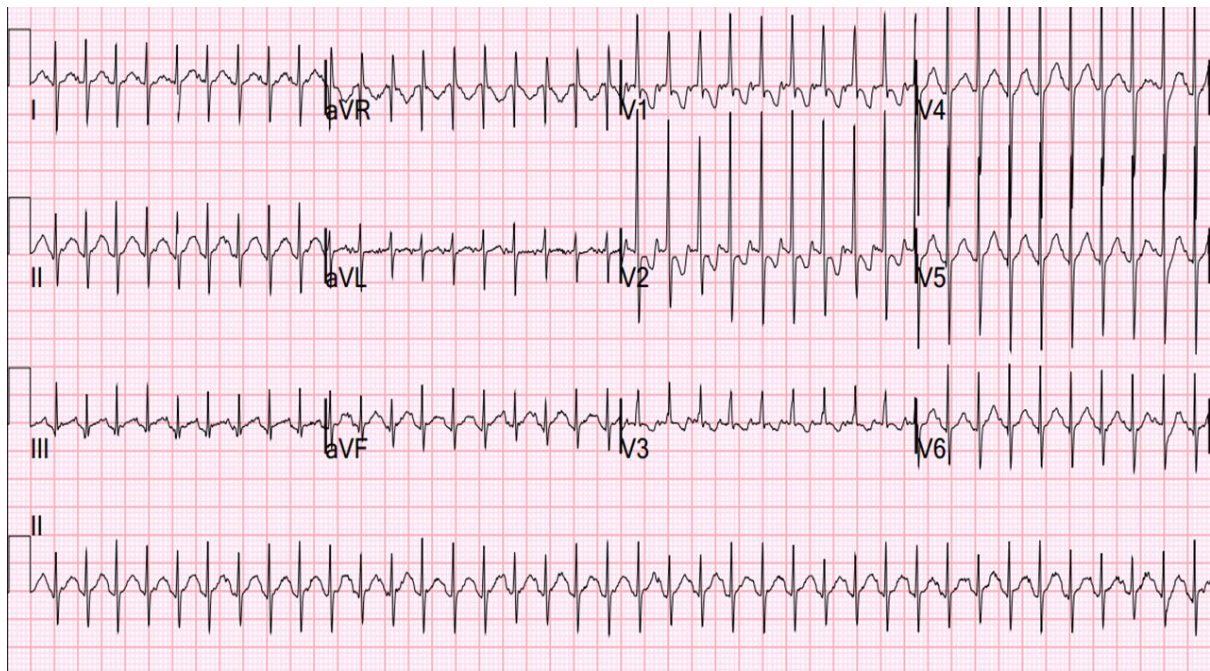
T 36.7

BP 132/87

RR 22

SaO2 99% RA

GCS 15



What is the diagnosis? (1 mark)

What ECG features suggest this diagnosis? (3 marks)

How does this man's history of WPW alter his emergency treatment? (1 mark)

Outline two management options for this man (2 marks)

Candidate Name: _____

Question 8 (14 marks)

You receive a pre-hospital notification that your department will be receiving an 18 year old man who has been struck repeatedly with an aluminium baseball bat across the face. He has an altered level of consciousness is bleeding profusely from the nose and mouth and has an obviously deformed / depressed face.

List your main priorities for the initial treatment of this man (3 marks)

How does midface trauma complicate laryngoscopy? (1 mark)

Describe how you would plan to modify a standard rapid sequence induction for this patient (4 marks)

Following successful intubation, outline your technique for minimising ongoing haemorrhage from the midface (6 marks)

Candidate Name: _____

Question 9 (14 marks)

A 12 year old girl is brought in to emergency by her mother, who appears intoxicated and leaves the department without notice soon after and is unable to be contacted. The girl has abdominal pain and you suspect acute appendicitis. Current observations are

GCS 15
BP 105/77
HR 95
Sat 100% RA
T37.8

List 4 ultrasound findings that increase the suspicion of appendicitis (4 marks)

List two factors on history that would make you suspect a perforated appendix in this patient (2 marks)

She is reviewed by the surgical registrar who decides she is best managed operatively. List 5 reasons why a patient may be unable to give informed consent? (5 marks)

You assess the girl as competent and mature. She refuses surgery on the grounds her grandmother died in your hospital. Explain the concept of a mature minor in this case (3 marks)

Candidate Name: _____

Book 2

Candidate Name: _____

Question 10 (13 marks)

You are the trauma team leader in a tertiary emergency department and you are receiving an unstable blunt trauma patient who has been struck by a truck whilst riding a motor cycle. The prehospital team has performed an RSI, bilateral finger thoracostomies, placed a pelvic binder and commenced a blood transfusion with 4 units of O negative blood. The patient dies in the emergency department. During review of the case, it is suggested that the patient may have benefited from resuscitative endovascular balloon occlusion of the aorta (REBOA).

What is the main indication for REBOA? (1 mark)

Complete the following table regarding REBOA catheter placement (4 marks)

	Location of placement	Location of haemorrhage
Zone 1		
Zone 3		

Name one alternative to REBOA in this setting (1 mark)

Describe the surface anatomy of the common femoral artery (2 marks)

You are asked by your director to gather information towards developing a business case to institute REBOA into your department. State 5 aspects to your research (5 marks)

Candidate Name: _____

Question 11 (16 marks)

A 12 month old girl is brought in by her parents after they found her playing with an open bottle of her mothers antiepileptic medication. This occurred around an hour before arrival in the ED and upon counting remaining tablets it is suspected she may have taken 5 tablets



Discuss the main features of toxicity in this ingestion (4 marks)

What is the expected weight for this child? (1 mark)

Outline your dose-related risk assessment for this child (1 mark)

The child develops significant toxicity and is intubated. Both multiple dose activated charcoal (MDAC) and haemodialysis can be used as enhanced elimination techniques.

Describe how you would perform MDAC in this child (3 marks)

Name 2 other agents in which MDAC may be used (2 marks)

List 2 indications for extracorporeal elimination in this child (2 marks)

List 3 properties of drugs that make them ideal for haemodialysis (3 marks)

Candidate Name: _____

Question 12 (7 marks)

A 34 year old man is brought to your emergency department following a work place injury. He was using a pressurised paint injector with a high-pressure hose that snapped, striking him in his hand. He washed his hand immediately and presented to the department. He is complaining of pain and has been given oral analgesics with some relief to his pain. His vital signs are normal.

A picture of his hand post injury is attached.



What is your choice of initial investigation and your rationale for it? (2marks)

What are your immediate management priorities? List 5. (5 marks)

You have difficulty managing this man's pain and your resident suggests a peripheral nerve block. What is your response and what are the additional options (3 marks)

Candidate Name: _____

Question 13 (11 marks)

A 58yo man presents to the emergency department with nausea, vomiting, pruritis, back pain and reduced urine output over the last 2 days. He is currently being investigated for a retroperitoneal mass. His VBG shows a creatinine of 634.

What are the main causes of AKI? Include 2 examples of each (3 marks)

Outline 3 investigations you would perform in the ED for this patient. Justify each (3 marks)

List 5 indications for Continuous Renal Replacement Therapy (5 marks)

Candidate Name: _____

Question 14 (10 marks)

You are accompanying a Climbing team to the Everest Base camp on the Tibetan side of the mountain. The altitude is 5150m. A 30 year old man who has suffered Nausea, vomiting and headache over the past week has been breathless at rest over last couple of days and is only talking in short sentences. His vital signs are:

T: 37.2

HR: 110

O₂sat 84%

RR 28

BP: 134/78

What is the most likely diagnosis? Outline 3 management interventions (4 marks)

What was the most likely explanation for his preceding symptoms? What would the most appropriate management have been? (3 marks)

High altitude cerebral oedema can also occur in this situation. Name 2 clinical features and 1 specific medication for this condition. (3 marks)

Candidate Name: _____

Question 15 (10 marks)

A 32 year old man presents to the emergency department with painful defecation and a tender swelling adjacent to his anus. You diagnose a superficial perianal abscess.

List the 3 other anatomical types of perianal abscess (3 marks)

You elect to perform an incision and drainage on his superficial perianal abscess. He is adequately sedated by a senior colleague in your resuscitation room. Outline your approach (4 marks)

You successfully drain his perianal abscess. List 3 aspects of your post-procedure care of this man (3 marks)

Candidate Name: _____

Question 16 (12 marks)

A 26 year old woman who is breastfeeding her 3 week old girl has developed fevers, rigors and left breast pain. She is haemodynamically stable and you suspect mastitis.

List 2 risk factors for mastitis (2 marks)

Name 2 organisms that commonly cause mastitis? (2 marks)

You decide to admit the woman and place her on intravenous antibiotics. Please outline two antimicrobial regimens (include dose, route and frequency)

First Line (1 mark)

Beta-lactam allergy (1 mark)



Describe the image and state the most likely diagnosis (2 marks)

Candidate Name: _____

Outline the preferred management of the above condition (2 marks)

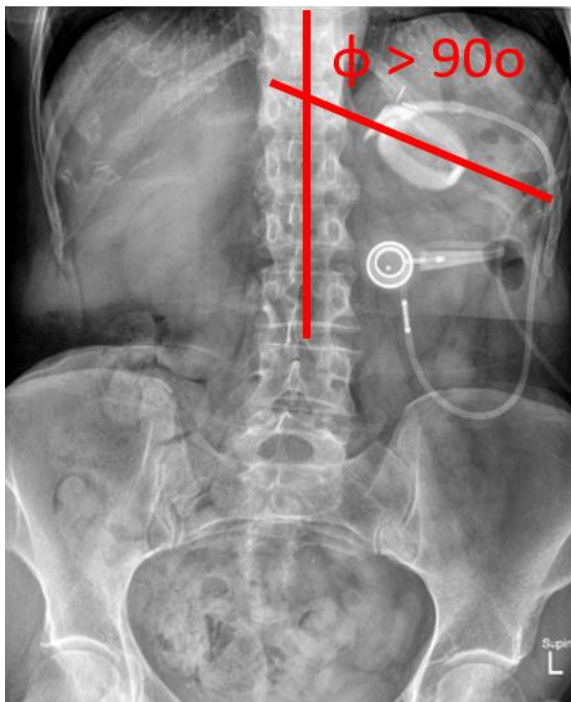
Outline 2 important aspects of breast-feeding advice for this patient (2 marks)

Candidate Name: _____

Question 17

A 32 year old woman comes to the ED with persistent vomiting and epigastric discomfort. She has no other symptoms. She has no significant comorbidities with the exception of significant weight loss following laparoscopic gastric banding done 3 years ago.

What is the most significant finding on this AXR? What is the normal appearance? (2 marks)



What is the diagnosis? (1 mark)

How common is this? (1 mark)

List 2 complications of this condition (2 marks)

Outline your management (4 marks)

Candidate Name: _____

Question 18 (12 marks)

You are working as a new consultant in a rural emergency department and have been tasked with developing a clinical governance team to augment the local health care service

What is clinical governance? (3 marks)

List the 7 pillars of clinical governance (7 marks)

What is the main difference between research and audit? (2 marks)

Candidate Name: _____

Book 3

Candidate Name: _____

Question 19 (13 marks)

You are an ED physician working in a mixed tertiary ED when a 2 year old boy is brought in by his step-father refusing to weight bear, agitated and distressed. His stepfather states that he been limping for a few days, but becomes defensive on specific questioning. He is 12kg and has normal vital signs.

You are concerned for the possibility of non-accidental injury.

In addition to non-accidental injury, what are three other differentials for a limb in this patient? (3 marks)

On examination, you notice several bruises around the trunk and circumferentially around the upper arm of the child. The stepfather states "he falls a lot".

Name 5 other examination findings that may be consistent with non-accidental injury (5 marks)

Given your concerns, you decide to perform a skeletal survey and find several old fractures, healing at different stages across several limbs. Name two other differentials apart from non-accidental injury that may give a similar appearance on imaging. (2 marks)

The child remains irritable and inconsolable in the ED. What other investigation would you consider? Provide justification. (3 marks)

Candidate Name: _____

Question 20 (15 marks)

A concerned parent of a 15 month old boy presents to your emergency department with concerns for measles after her child has developed fever at home of 39.5 degrees. She was notified some days prior of exposure to a confirmed case of measles during a flight from overseas. The child does not have a visible rash.

What is the incubation period for measles (1 mark)

List 3 signs on examination that would lead you to suspect measles over other causes of fever (3 marks)

You are suspicious this may be measles.

List 3 specific investigations you would perform (3 marks)

Describe the appearance of the measles rash (2 marks)

List 3 complications from the measles virus in this patient (3 marks)

The child examines otherwise well and a decision is made for discharge after appropriate investigations. Outline your discharge advice for the mother. (3 marks)

Candidate Name: _____

Question 21 (15 marks)

A 7 week old boy is brought in by his parents with inconsolable crying for 16 hours. The parents look exhausted and dejected. The boy has unremarkable birth history and is thriving.

List the potential causes of the boys crying (5 marks)

What are important features in history that need to be obtained? (5marks)

You do not find a significant cause for the boys crying and decide to discharge him. What approach to discharge would you use? (5 marks)

Candidate Name: _____

Question 22 (12 marks)

A 17 year old female has been brought in from school after a collapse. Her mother tells you that her GP has referred her to a psychiatrist over concerns of her body weight, they suspect she has an eating disorder. They are currently awaiting an appointment.

Define Anorexia Nervosa (2 marks)

Define Bulimia Nervosa (2 marks)

List 4 complications of Anorexia Nervosa from 4 separate systems (4 marks)

List 4 criteria for medical admission in anorexia Nervosa (4 marks)

Maximum of 1 indication per body system

Candidate Name: _____

Question 23 (11 marks)

A 33 year old Indigenous man from remote Northern Territory presents during the wet season with 3 days of fever, cough and abdominal pain with decreased oral intake. He looks quite unwell from the end of the bed.

His vital signs are:

P 120

BP 85/50

Temp 39.6

SaO₂ 88% R/A

GCS 14

Your resident has ordered basic blood tests including VBG, FBC, EUC, CRP and blood cultures and ordered a CXR which is shown below.



List 2 abnormal features on the CXR (2 marks)

List 3 potential causative organisms in this patient (3 marks)

Candidate Name: _____

List 2 further investigations with justification for each (4 marks)

Investigation Justification

Name 2 target areas of the federal 'closing the gap' framework (2 marks)

Candidate Name: _____

Question 24 (13 marks)

You are overseeing the care of a 63 year old woman with septic shock who has been given appropriate broad spectrum antibiotics and 2L of intravenous hartmanns solution. She has no clinically apparent source however her urine dipstick is positive for leukocytes and nitrites. She was previously healthy with no significant comorbidities, medications or known allergies.

Her current vital signs are:

P 122

BP 72/40

GCS 12 (E3V4M5)

RR 32

SaO2 poor trace

Your registrar is planning to commence a noradrenaline infusion to support that patients MAP. They would like to insert a CVC prior to commencing therapy however you encourage them to start via peripheral IVC.

What is the advantage of peripheral vasopressor therapy? What is the safety profile? (2 marks)

List 2 factors associated with reducing complications associated with extravasation (2 marks)

Outline your management of extravasation (4 marks)

A central line is inserted in the right internal jugular vein and vasopressor therapy continued.

List 3 modalities of confirming venous placement, including expected findings (3 marks)

The patient remains hypotensive despite 30mcg/min of noradrenaline. You are planning to commence a second vasoactive agent and perform a bedside cardiac ultrasound. Please suggest a second-line agent based on the following findings. Assuming no pericardial effusion, normal volume status, no RV strain (2 marks)

Reduced LV function	Hyperdynamic LV function

Candidate Name: _____

Question 25 (12 marks)

A 10 year old boy with known haemophilia A presents to the emergency department with a painful ankle after trivial trauma at home. He has a diffuse tenderness and is unable to weight bear. He is systemically well. His X Ray shows no fracture. He weighs 30kg and his vital signs are normal.

What is Haemophilia A (1 mark)

How is the severity of Haemophilia defined into mild, moderate and severe (3 marks)

What is the likely diagnosis in this case? (1 mark)

Outline two aspects of supportive care in this case (2 marks)

State the specific factor replacement, including initial dose and target (3 marks)

How would this dose be altered in the setting of intracranial haemorrhage, and why? (2 marks)

Candidate Name: _____

Question 26 (11 marks)

A 13 year old boy presents after a head collision whilst playing rugby. He had a witnessed loss of consciousness lasting approximately 10 seconds and was assisted from the field. He has been transported to your ED by his parents.

He is GCS 15 and you are not concerned about an intracranial bleed. Your diagnosis is concussion. You are planning to discharge the patient from your department

Aside from headache, list 5 symptoms of concussion that may occur in the days following the injury (5 marks)

Name one assessment tool, which may assist in the diagnosis and ongoing monitoring for a patient with a concussion (1 mark)

The boy tells you his Grand Final match is in 1 week. Outline your discharge advice (5 marks)

Candidate Name: _____

Question 27 (12 marks)

A 45 year old man presents with shoulder pain. A junior doctor has performed an X ray which shows no fracture. She plans to discharge him with a diagnosis of 'soft tissue injury'.

Complete the following table (12 marks)

	Time course (Acute, sub-acute, chronic)	Mechanism	Specific physical examination test
Subacromial impingement			
Glenoid labrum tear			
AC joint sprain			
Adhesive Capsulitis			

Candidate Name: _____