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Question 1 (18 marks)

Soon after arriving for morning handover, you are asked to assist with a 68 year old previously independent female who presented 90 mins ago with septic shock thought to be urinary related. She has a past medical history of severe Rheumatoid Arthritis, Congestive Cardiac Failure and Chronic Renal Failure and her regular medications include: Methotrexate 10 mg weekly Prednisolone 5mg daily and Frusemide 20 mg mane.

The patient has received appropriate antibiotics and 1.5 L of intravenous fluid but remains hypotensive.

Her current vital signs in the resuscitation room are:

GCS	14 (confused)
HR	108 bpm
BP	80/50 mmHg
SaO ₂	86 % on 15L oxygen via NRM
RR	34

The team feels she requires intubation to facilitate further management.

Part a (6 marks)

Outline 6 factors that would influence your decision on the timing of intubation for this patient?

Part b (4 marks)

You decide to intubate the patient. The vital signs are unchanged.

Outline 4 strategies that address the anatomic challenges present in intubation

Model Answer

For Impaired neck mobility/ risk of harm from manipulation of neck in patient with RA/limited mouth opening:

- Use of hyper-angulated blade,
- patient position (ie ear to sternal notch, pillows etc),
- video laryngoscope
- use of external laryngeal manipulation/BURP Inability to lie flat (APO):
- Induce in sitting position
- use of CPAP, bilevel PAP as strategy for preoxygenation

Part c (8 marks)

Outline eight (8) treatment strategies that address the physiologic challenges present in intubation

Question 2 (12 marks)

A GP refers a 7 month old baby with a right sided parietal subgaleal haematoma, confirmed on U/S, for an opinion and ongoing management. The parents are not aware of any trauma, but had just noticed a soft lump on the right side of the head. The baby is otherwise well. and has not been vomiting.

Part a (6 marks)

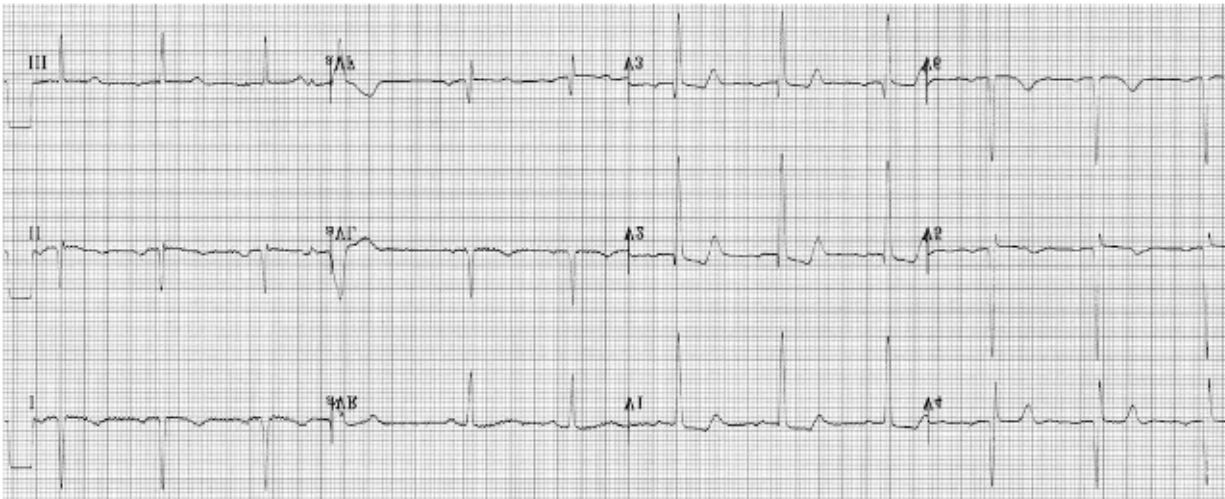
List six (6) features you would enquire about in your clinical history taking.

Part b (6 marks)

List six (6) examination findings you would look for.

Question 3 (12 marks)

A 55 year old man presents to ED after a resolved episode of chest pain. His ECG is shown.



Part a (3 marks)

List three (3) abnormal findings on the ECG.

Part b (1 mark)

What is your diagnosis?

Part c (4 marks)

List four (4) differential diagnoses.

Part d (4 marks)

List four (4) steps in your management of this patient.

Question 4 (12 marks)

A female patient presents to your emergency department with per vaginal bleeding.

Part a (6 marks)

Complete the table below to list three (3) causes of abnormal vaginal bleeding for each age category.

Reproductive Age	Post Menopausal

Part b (3 marks)

You suspect that the patient might have Pelvic Inflammatory Disease. What three (3) essential questions, that have the potential to alter ongoing management, will you ask the patient and why?

Part c (3 marks)

On further consideration, you determine that the patient does not have PID but instead has heavy uterine bleeding secondary to anovulatory menstrual cycles. List three (3) specific medications that may be considered for the patient to take at home. (*Doses are not required*).

Question 5 (12 marks)

A 63 year old with no significant past medical history has presented with lower abdominal pain. An abdominal CT has been obtained.



Part a (4 marks)

List four (4) abnormal findings in the CT

Part b (4 marks)

Give four (4) differential diagnosis for this pathology in this patient.

Part c (4 marks)

In the most likely situation, if the patient can be discharged, briefly state 4 things that should be done to ensure safe and comfortable discharge.

Question 6 (10 marks)

You receive a pro-notification call, from the ambulance service, about a 5 year old boy who had a drowning episode in a swimming pool nearby to your rural emergency department.

Part a (3 marks)

List three (3) pieces of information you would seek from the ambulance officers?

Part b (2 marks)

On arrival to the ED, list two (2) predictors of a poor outcome for a drowning patient?

Part c (3 marks)

The child arrives and he is awake GCS 15 with vitals

HR	90
BP	90/50
Temp	34 °C
Sats	99% on Room Air
RR	20

He looks well and does not have any recollection of what happened.

You have been told that he is a competent swimmer and was found submerged in the water for 2 minutes by his coach during training session in the pool

List three (3) possible causes for his drowning

Part d (4 marks)

You decide to admit him to your short stay unit for observation overnight.

Once a sinister cause has been excluded for his drowning, please state four (4) discharge criteria you would consider before discharging him the next day?

Question 7 (12 marks)

25-year-old man presents to your ED with neck pain associated with bilateral upper limb paraesthesia. He states that he was in a pool when his friend jumped on to his neck, pushing him into the pool. He then suffered from brief bilateral lower limb weakness followed by pins and needles in his arms, associated with neck pain. The lower limb weakness resolved after a few minutes but the upper limb symptoms persist till arrival to your Regional District ED. He denies taking any recreational drugs but has drunk a few bottles of beer.

His vitals are normal, he has mild tenderness over his mid cervical region in midline and the only abnormalities in his examination are posterior lower cervical spine tenderness with Grade 3 power in the upper limbs bilaterally. His upper limb sensory exam is normal. His lower limb neurological exam is normal.

His C-Spine X Ray is shown below.



Xray courtesy of Assoc Prof Craig Hacking, Radiopaedia.org, rID: 66804

Part a (2 marks)

List two relevant abnormal findings from this x-ray.

Part b (8 marks)

Complete the following table for four (4) cord syndromes with differentiating clinical features and aetiology.

Model Answer

Cord Syndrome	Central Cord	Anterior Cord	Posterior Cord	Brown-Sequard
Aetiology (4 marks)				
Clinical Features (4 marks)				

Part c (2 marks)

List one (1) differentiating clinical feature each for Neurogenic and Spinal Shock.

Model Answer

Neurogenic Shock	
Spinal Shock	

Question 8 (12 marks)

A 70 year old female presents with a 3 day history of abdominal cramping, vomiting and diarrhoea. In the past 12 hours she has also become mildly confused with drowsiness and fatigue. This is in the background of a past history of hypertension and type 2 diabetes for which she is medicated with Amlodipine and Jardiamet (Empagliflozin and Metformin).

VBG

pH	7.03 mmHg
pCO ²	18 mmHg
pO ²	52 mmHg
HCO ₃ ⁻	6.7 mmol/L
Na ⁺	139 mmol/L
K ⁺	3.7 mmol/L
Cl ⁻	103 mmol/L
Glu	6.2 mmol/L
Lactate	2.2 mmol/L

Part a (8 marks)

List four (4) important findings from the VBG and the calculations or an explanation for each abnormality.

Model Answer

Finding	Calculation

Part b (4 marks)

The patient's blood ketone level is elevated at 4.2 while the glucose level is confirmed as remaining at normal levels (currently 6.2). They have normal vital signs but remain mildly confused with ongoing gastrointestinal symptoms. List four (4) initial intravenous (IV) treatments you would commence for this patient in the ED.

Question 9 (18 marks)

20-year-old woman is brought to your Emergency Department with one week of vomiting and confusion.

A venous blood gas is performed as part of her initial assessment. The results are as follows:

pH	7.16
pCO ₂	33 mmHg
pO ₂	40 mmHg
HCO ₃ ⁻	12 mol/L
BE	-15.7 mmol/L
Hb	137 g/L
Na ⁺	130 mmol/L
Cl ⁻	90 mmol/L
K ⁺	5.2 mmol/L
Glucose	37.0 mmol/L
Lactate	2.2 mmol/L
Ketones	3.0 mmol/L

You suspect Diabetic Ketoacidosis (DKA).

Part a (3 marks)

List 3 (three) other possible causes for raised ketones in this patient.

Part b (3 marks)

List three (3) diagnostic criteria for DKA.

Part c (1 mark)

What is the formula for Strong Ion Difference?

Part d (1 mark)

What acid-base derangement is expected by this patient's Strong Ion Difference?

Part e (1 mark)

What is a formula that could be used for Sodium Correction?

Part f (2 marks)

You decide to commence an insulin infusion along as part of your initial management. State the rate and goal of the insulin infusion.

Part g (1 mark)

You commence initial resuscitation of the patient in ED with an insulin infusion, intravenous fluids and intravenous antibiotics. Three hours later a venous blood gas is repeated. The results are as follows:

pH	7.12
pCO ₂	30 mmHg
pO ₂	63 mmHg
HCO ₃ ⁻	18 mmol/L
BE	-17.7 mmol/L
Hb	114 g/L
Na ⁺	133 mmol/L
Cl ⁻	103 mmol/L
K ⁺	4.2 mmol/L
Glucose	25.0 mmol/L
Lactate	1.9 mmol/L

Ketones 1.1 mmol/L

What acid-base derangement is now demonstrated by this patient's strong ion difference?

Part h (6 marks)

List the most likely cause of this acid-base derangement, along with four (4) other possible causes.

Question 10 (18 marks)

A 34 year old man is brought in by ambulance after being found unconscious at home. He has a history of depression and had written a suicide note. You suspect an intentional overdose. He is unconscious and can provide no further history.

Part a (18 marks)

Complete the table by listing six (6) toxic causes of coma that may require SPECIFIC treatment and state one (1) specific diagnostic feature you would look for on physical examination or investigation that would be consistent for each toxic agent and one specific treatment, with rationale, for each ingestion.

Model Answer

	Toxic agent (6 marks)	Diagnostic feature (6 marks) <i>Each finding can only be used once</i>	Specific treatment with rationale (6 marks)
1			
2			
3			
4			
5			
6			

	Toxic agent (6 marks)	Diagnostic feature (6 marks) <i>Each finding can only be used once</i>	Specific treatment with rationale (6 marks)
7			

Question 11 (12 marks)

A 78 yo man presents with tearing chest pain suggestive of aortic dissection.

Part a (8 marks)

Complete the following table, by listing two pro's and two con's, regarding the utility of the following investigations in the diagnosis and management of aortic dissection.

Model Answer

	Pro	Con
CT Aortogram		
Transthoracic Echocardiogram		

Part b (2 marks)

List two principles of blood pressure management when treating aortic dissection.

Part c (2 marks)

State two (2) key issues in the management of a patient with proven Type A aortic dissection in addition to blood pressure management.

Question 12 (12 marks)

A 35-year-old female presents to the emergency department with low mood, non-specific body aches, and generalised weakness. She has presented with similar complaints twice in the last week but did not wait to be seen. During your assessment she tells you that she has been feeling "under the pump" and stressed over the past month. She does not take any medications.

Part a (5 marks)

Other than a persistent depressed mood, list five (5) other symptoms you would seek to aid in the diagnosis of major depressive disorder.

Part b (4 marks)

You suspect that this patient is currently suffering major depressive disorder. The psychiatry registrar asks you to consider medical causes of the patient's symptoms. List four (4) medical conditions that can mimic depression, specific to this patient.

Part c (3 marks)

List three patient-based reasons why patients do not wait to be seen following triage.

Question 13 (12 marks)

You are working in a rural Emergency Department when a 27 year old with a swollen leg and shortness of breath presents to your department. Your resident has reviewed the patient but asks you some questions regarding the diagnostic strategy for a Pulmonary Embolus.

Part a (5 marks)

List 5 hereditary risk factors for a Pulmonary Embolism.

Part b (3 marks)

In the Simplified Wells Score, list three (3) of the features with the highest points.

Part c (4 marks)

List one diagnostic finding for each of the following tests in Pulmonary Embolism.

Model Answer

ECG	
ABG	
Echocardiogram	
Chest X-ray	

Question 14 (12 marks)

Your Director of Emergency Medicine has asked you to contribute to a departmental guideline. The guideline aims to improve the Wellbeing of its Emergency Physician (EP) workforce. They have suggested you focus on:

- Rostering and Fatigue Management
- Infrastructure

Part a (5 marks)

State five rostering and fatigue management strategies which address EP Wellbeing

Part b (4 marks)

State four departmental infrastructure management strategies which address EP Wellbeing

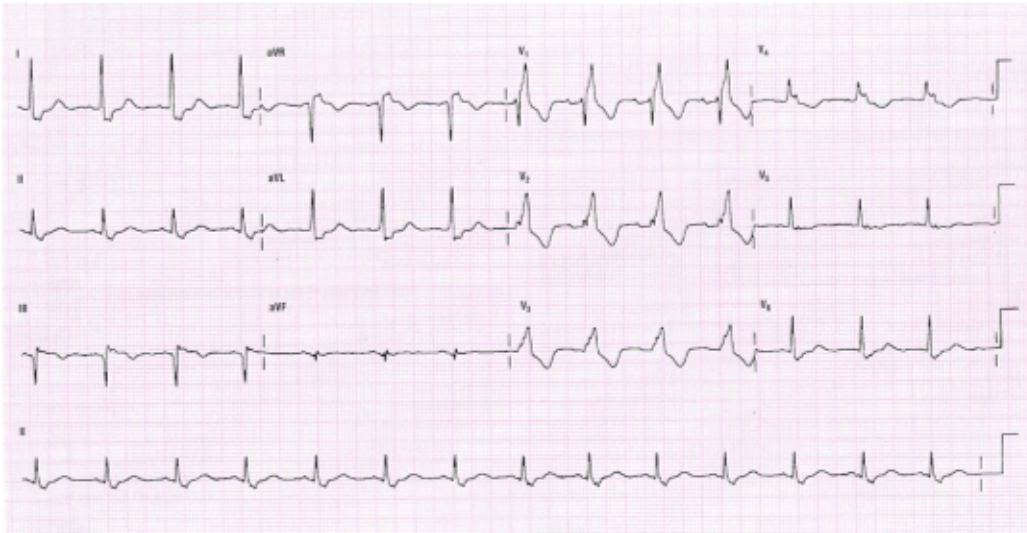
Part c (3 marks)

List three positive outcomes FOR YOUR DEPARTMENT that addressing EP Wellbeing may provide

Question 15 (12 marks)

A 54 year old male presents to your Emergency Department with two hours of ischaemic sounding chest pain and increasing shortness of breath in the background of known COPD.

His ECG on arrival is below.



Part a (2 marks)

List two significant abnormalities in the ECG.

Part b (2 marks)

List two possible pathological causes based on the ECG and the given patient information.

Part c (8 marks)

List four important steps in the management of this patient and outline the rationale for each of them.

	Management Step	Rationale
1		
2		

	Management Step	Rationale
3		
4		
5		
6		

Question 16 (12 marks)

A 35 year old female presents to the Emergency Dept. with an acute onset of severe LIF pain.

GCS 15
HR 110reg
BP 120/80
RR 16
Sats 100% RA

Part a (12 marks)

List three (3) differential diagnoses and complete the table below with one feature each on history, examination and investigation finding that is most supportive of the diagnosis.

	Diff. Diagnosis	History	Examination	Investigation Findings
1				
2				
3				
4				

Question 17 (12 marks)

A 40 year old female has presented to ED with diplopia.

Part a (6 marks)

Complete the following table by listing the extra-ocular muscle involved and likely clinical findings for each of the different pathologies listed.

Pathology	Name one extra-ocular muscle involved	Situation where diplopia would occur/worsen
Cranial nerve III palsy		
Cranial nerve IV palsy		
Cranial nerve VI palsy		

Part b (3 marks)

You suspect this patient has Horner's syndrome. List 3 clinical findings that would suggest this.

Part c (3 marks)

List 3 causes of Horner's syndrome in an adult.

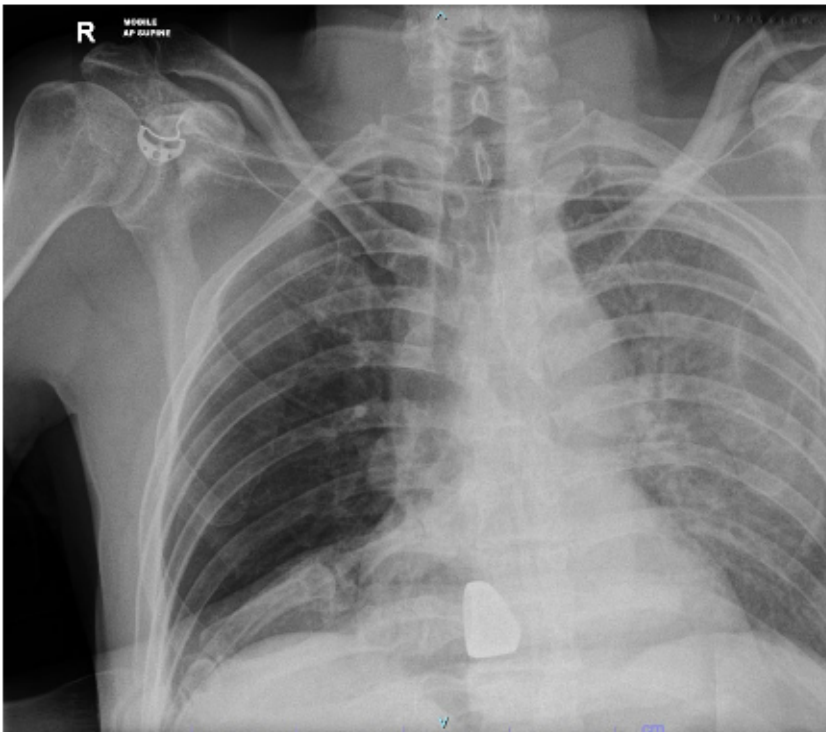
Question 18 (18 marks)

You are working as a consultant at a tertiary trauma centre. Prehospital notification is received that a 50 year old male will arrive in 10 minutes post high-speed MVA vs a tree.

Arrival observations are:

HR	140
BP	90/64
GCS	15
Sats	90% on 15L NRB

As part of your initial assessment the following CXR is performed.



Part a (4 marks)

List two critical conditions you are concerned the patient may have and for each, a supporting finding visible on the CXR.

Part b (1 mark)

Based on these findings, state your immediate emergency department management?

Part c (5 marks)

Soon after the patient becomes agitated, pulling off his O2 mask.

List five possible causes of altered conscious state in this patient?

Part d (5 marks)

You elect to intubate the patient. Soon after intubation the patient's observations are:

HR	90
BP	100/52
Sats	84%
FiO ₂	1.0

List five possible causes of this deterioration.

Part e (3 marks)

CT imaging demonstrates isolated chest injuries. For trauma with isolated chest injuries, list three indications for immediate emergent operative management?

Question 19 (18 marks)

You are the Consultant in an Urban Emergency Department. A 6 day old baby presents with lethargy, reduced feeding, reduced wet nappies, pallor and a weak cry.

NVD at term, no anti-natal or post-natal issues.

Vital signs on arrival:

HR	180 bpm
Temp	38.5 °C
Cap refill	4 seconds
RR	70 sats 98% RA
AVPU	p

Part a (8 marks)

List eight (8) initial management priorities.

Part b (3 marks)

List three (3) common pathogens responsible for the above condition, in infants <3 months old?

Part c (4 marks)

Prescribe the empiric appropriate antibiotics for this patient?

Part d (3 marks)

Despite 40ml/kg IV fluid bolus the baby remains shocked. State three (3) further management steps in this situation?

Question 20 (12 marks)

A 18yo M has been brought to your rural Emergency Department suffering a mixture of mid-deep dermal burns to his face, left arm and thorax and full thickness burns to his right arm. He was lighting a campfire and poured petrol onto the fire which resulted in his burns. The paramedics report initial first aid was given at the scene. You estimate the extent of the burns to be around 35% Total Body Surface Area. This was an isolated injury, and no other trauma was reported.

His initial vital signs are:

GCS	15
BP	150/80 mmHg
HR	130 bpm
SaO ₂	98% (Room Air)
estimated weight	80kg

Part a (2 marks)

List 2 features on initial assessment of the airway that would make you concerned for an inhalation injury.

Part b (10 marks)

State 5 key principles and a rationale for each in the management and resuscitation of this patient with severe burns EXCEPT for airway management. Please include any interventions, calculations, dosing, and targets in your answer.

	Principle/Priority	Rationale
1		
2		

	Principle/Priority	Rationale
3		
4		
5		

Question 21 (12 marks)

It is 19:00 hours, a 6 year-old boy is brought to your ED with facial trauma, he collided with another child while both were running In opposite directions. His right maxillary central incisor is partially fractured (partly missing) and the left maxillary central incisor is completely avulsed (parents have brought the avulsed tooth in milk).

Part a (6 marks)

List six (6) steps in your management of this child

Part b (6 marks)

Regarding providing local analgesia for the following teeth, please complete the table below.

	Maxillary 1st premolar	Mandibular 1st premolar
Technique		
Location of injection		
Area that will be anaesthetised		

Question 22 (12 marks)

A 75 year old man presents with severe left sided abdominal pain with associated nausea and loss of appetite. The pain is worse with movement and deep breathing.

Past medical history: Type II DM, Hypertension, Hyperlipidaemia, GORD and is a smoker.

Vital signs on arrival are:

HR 114
BP 115/70
RR 24
SaO₂ 96% on room air
Temp 38.3 °C

On examination, he is generally uncomfortable and diaphoretic.

Part a (8 marks)

Complete the table by listing two investigations that can be performed at the bedside which may immediately influence management, the findings you are looking for with each of these tests and then two immediate management priorities for each if the findings are present.

Investigation	Potential Finding	Management Priorities	
		1	
		2	
		1	
		2	
		1	
		2	

Part b (1 mark)

A CT is done later as part of his work up. Please list the most significant finding from it.



Part c (2 marks)

List two potential causes for this finding?

Part d (1 mark)

State the most appropriate disposition for this patient?

Question 23 (12 marks)

A 5 yr old presents to your Emergency Dept with a painful forearm following a fall from a monkey bar. Her x-ray is displayed below.



Part a (4 marks)

List four (4) key findings in her x-ray.

Part b (1 mark)

What do you estimate her weight to be?

Part c (3 marks)

Prescribe three analgesic options for this patient.

Part d (4 marks)

She is now comfortable. List four further management steps in her ongoing care.

Question 24 (12 marks)

You are the consultant in charge of the Emergency Department. Over the last 1 hour there have been 6 patients present with acute shortness of breath and wheeze; The ambulance have just called to notify you that they are transporting 2 acutely unwell patients with asthma who are likely to require a resus bay.

Part a (4 marks)

List four (4) actions you will take to prepare for a potential thunderstorm asthma event.

Part b (6 marks)

You decide that you will need to implement a modified triage system to manage large numbers of patient presentations.

Complete the following table regarding triage specific to asthma presentations by entering a single point per box.

Model Answer

Priority	Triage criteria	Initial management
One - Immediate		
Two - Urgent		
Three - delayed		

Part c (2 marks)

List two general principles that should apply when managing thunderstorm asthma during the COVID-19 pandemic.

Question 25 (12 marks)

You receive a phone call from the partner of a patient who was seen in your Emergency Department and discharged home. The partner has advised the patient has been admitted to ICU at another hospital following a ruptured ectopic pregnancy.

The patient is a 35 year old female who presented with left iliac fossa pain and was seen and discharged by one of your junior registrars.

Part a (3 marks)

List three (3) hospital personnel that you would notify of this event.

Part b (5 marks)

You review the ED clinical record for the patient's attendance.

State five (5) important aspects of the case that you wish to investigate.

Part c (4 marks)

You plan to meet with and inform the junior registrar involved.

State four (4) points that you need to cover during the conversation with the registrar.

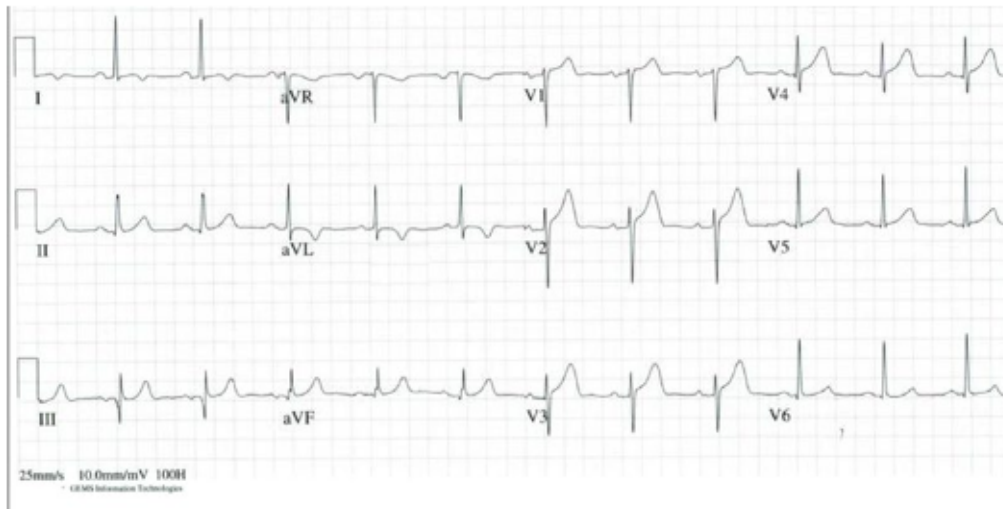
Question 26 (12 marks)

During morning hand over, you are taking over the care of a 63 year old male with a past history of untreated hypertension who presented to your non-tertiary Emergency Department overnight with central chest pain radiating to his left arm.

His vital signs on arrival:

BP	175/100 mmHg
RR	22 bpm
SaO ₂	95% RA
Temp	36.2 °C

He had an ECG on arrival and is shown below:



Part a (2 marks)

State two (2) abnormal findings in his ECG.

Part b (3 marks)

As a result of his elevated troponin, the patient was referred to cardiology overnight and accepted for transfer to the CCU of the nearby tertiary hospital. In the interim he has received anti platelets as well as Enoxaparin. During the morning hand over, the emergency alarm is activated by the bedside nurse and the patient is found to be unresponsive without any cardiac output.

State three (3) management changing utilities of Point of care / Resuscitative Ultrasound in this case.

Part c (3 marks)

His POCUS during Resus is shown below:



List three (3) important findings on his POCUS exam.

Part d (2 marks)

List two (2) important differential diagnosis for the above pathology in this case.

Part e (2 marks)

State two (2) specific strategies for utilising POCUS in the emergency management of above pathology.

Question 27 (18 marks)

Grace is a 6 year old girl, who has been brought in by her father after she inserted a small bead into her right nostril. She has no significant past history, and has no regular medications or allergies.

Her vital signs are within normal limits for age. Grace is 20 kg in weight.

Although "parent's kiss" has failed to expel the nasal foreign body, the bead is visible and anterior enough for removal in ED. The child however is very anxious about the procedure.

You have discussed a trial of midazolam with the father, and have reassured Grace a "no needle" approach to this anxiolytic medication.

Part a (2 marks)

How would you prescribe this midazolam (route and dose in mg), and when would you expect peak sedative effect from time of administration?

Part b (6 marks)

The midazolam has resulted in mild sedation, but not enough for the foreign body removal to proceed safely. The father is still keen to have the bead removed in ED - you discuss the use of ketamine with him. What are the benefits (3) and risks (3) of ketamine to Grace that you should be discussing with the father, as part of the consent process?

Benefits	Risks

Part c (1 mark)

Her father consents to ketamine to facilitate nasal foreign body removal. Despite the earlier midazolam, she remains anxious and is moving too much for safe insertion of a peripheral intravenous catheter. How would you prescribe (route and dose in mg) the ketamine for procedural sedation in this situation?

Part d (3 marks)

Prior to ketamine administration, the nurse sets up equipment for the airway trolley and has sought your guidance regarding the sizing of the airway equipment for Grace. Please list your three options.

Part e (6 marks)

Grace is sedated with ketamine, and the bead is removed in an atraumatic fashion. You re-examine the child and confirm that there are no further foreign bodies in her nose or airway.

Soon after this, the child develops a stridor and SpO₂ drops to 92% despite oxygen through a non-rebreather mask. She is still sedated by the ketamine. You and an assisting emergency physician in the procedure room conclude that the airway is not soiled and that there is no allergic reaction present.

List 4 steps in your approach to treat this condition (include doses of any medications uses)?