WESTMEAD EMERGENCY MEDICINE

November 2015

WRITTEN EXAMINATION

SHORT ANSWER QUESTIONS

EXAMINATION TIME: 120 minutes

DIRECTIONS TO CANDIDATES

1. Answer each question in the space provided in this booklet.
2. All questions should be attempted
3. All SAQ's are of equal weighting
4. Cross out any errors completely.
5. Do not begin the exam until instructed to do so.
6. Write your candidate number on every page — the booklet will be separated for marking purposes.
7. DO NOT write your name on the examination booklet.

QUESTION 1

A 45-year-old man presents to the emergency department with a history of sudden collapse on a golf course. He was initially unconscious but is now talking and asking what happened.

<u>His vital signs are:</u>

BP 95/60 mmHg

HR 126 / min

RR 15 / min

Picture of the 45-year-old man:

Describe the appearance of the patient's exposed torso and list 6 signs and symptoms that can be associated with this presentation

i) The appearance (1 mark):

_____

ii) The associated signs and symptoms (6 marks):

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

iii) List 3 complications of this injury (3 marks)

1. _____

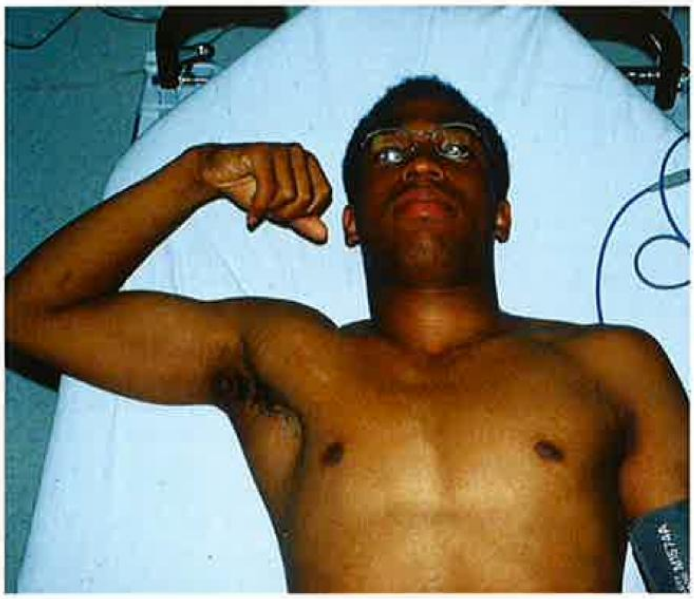
2. _____

3. _____

QUESTION 2

A 30-year-old man is brought to your emergency department after a wrestling match with a friend. He has pain in his shoulder and feels he is unable to move it.

You find the patient in the bed with the appearance shown below and x-rays are taken



i) Briefly describe the x-ray shown above in the context of the patient's presentation (2 marks)

_____

_____

Ii) Describe two potential complications of this presentation (2 marks)

a)_____

b)_____

iii) List 3 drug choices that could be used for procedural sedation in this patient and list 1 potential pros and cons for each (6 marks)

	Drug Choice and Dose	Pro	Con
1			
2			
3			

QUESTION 3

A 40-year-old man presents to the Emergency Department (ED) after a Motor Vehicle Accident. He is the front seat passenger and the driver, his wife, has died at the scene.

His initial observations are:

Blood Pressure	120/60 mmHg
Respiratory Rate	20 / min
Heart Rate	90 / min
Temperature	37.0 degrees

Oxygen Saturations 100% (on 6 litres by Hudson Mask)

i) Briefly describe 4 main abnormalities in the appearance of the patient in the above picture. (2 marks)

_____

_____

_____

_____

ii) List and justify 4 investigations of choice to identify common injuries associated with this presentation. (4 marks)

	Investigation	Injuries Sought / Justification
1		
2		
3		
4		

iii) The police arrive and confirm the patient's wife has died.

Briefly outline your approach to dealing with this situation in view of the patient asking the Trauma team "how is my wife?" (4 marks)

_____

_____

_____

_____

_____

_____

_____

_____

QUESTION 4

A 17-year-old man presents your Emergency Department by ambulance with shortness of breath and nausea following a “rave” at a locally infamous disused warehouse.

His friends called the ambulance because of a sudden collapse. His background history is un-known

Initial Observations:

Blood Pressure 110/70 mmHg

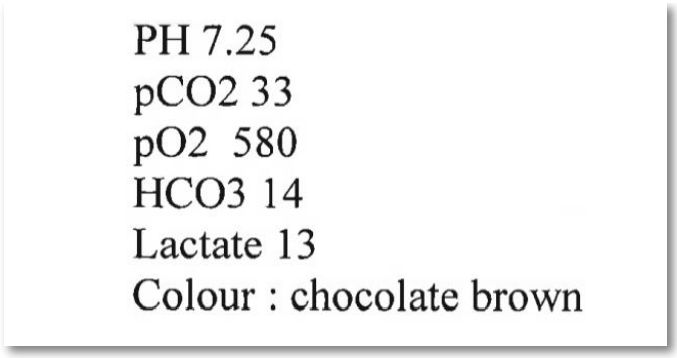
Respiratory Rate 32 / min

Heart Rate 120 / min (regular)

Temperature 38.5 degrees

Oxygen Saturations 84% (on 10 litres via Hudson mask)

In view of the patient’s presentation you elect to take an arterial blood gas, which is shown below:



i) Briefly describe the abnormalities on this patient’s blood gas (4 marks)

_____

_____

_____

_____

_____

ii) State the likely unifying diagnosis in this case and 2 potential causes (3 marks)

A Unifying Diagnosis	
Cause 1	
Cause 2	

iii) Outline the key steps in the management of this patient (4 marks)

_____

_____

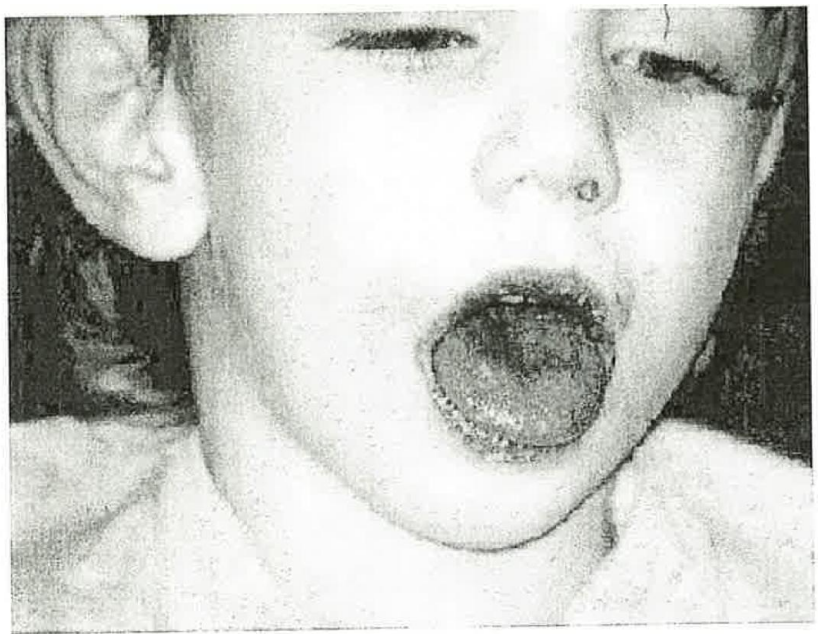
_____

_____

_____

QUESTION 5

A four (4)-year-old boy presents with his father to the Emergency Department.



He has a fever of 39.0 degrees and a sore mouth. He is miserable and shy at triage

i) What features in your clinical assessment in the Emergency Department would suggest a diagnosis of Kawasaki Disease? (5 marks)

_____

_____

_____

_____

_____

ii) In children with confirmed Kawasaki's disease what is the approximate prevalence of Coronary Artery Aneurysm? (1 mark)

_____

iii) What key steps do you take to:

a. Calculate the child's weight (1 mark)

_____

b. Decide on a disposition for the child (3 marks)

_____

_____

_____

_____

QUESTION 6

It is late evening on a weeknight.

You are the senior doctor in a tertiary level Emergency Department.

The 20 bedded ED currently has all but two cubicles occupied.

Ambulance control rings to notify you that an ambulance is en route (ETA 5 mins) with a 59-year-old man with a probable acute myocardial infarct.

All 5 of your resuscitation bays are occupied by the following:

1) A 75-year-old lady with unstable angina. She is awaiting a bed in the cardiology unit.

2) A 50-year-old man with resolved chest pain and normal ECG. He has just arrived by ambulance and is yet to be assessed.

3) A 3-year-old girl with croup. She is now stable 30 minutes after nebulised adrenaline.

4) A 22-year-old man being monitored 2 hours following an overdose of the drug Carbamazepine.

5) A 17-year-old man with a closed head injury. He is about to be intubated by your registrar because his GCS has fallen to 9/15.

i) How will you prepare the ED to accommodate the new ambulance patient? (3 marks)

_____

_____

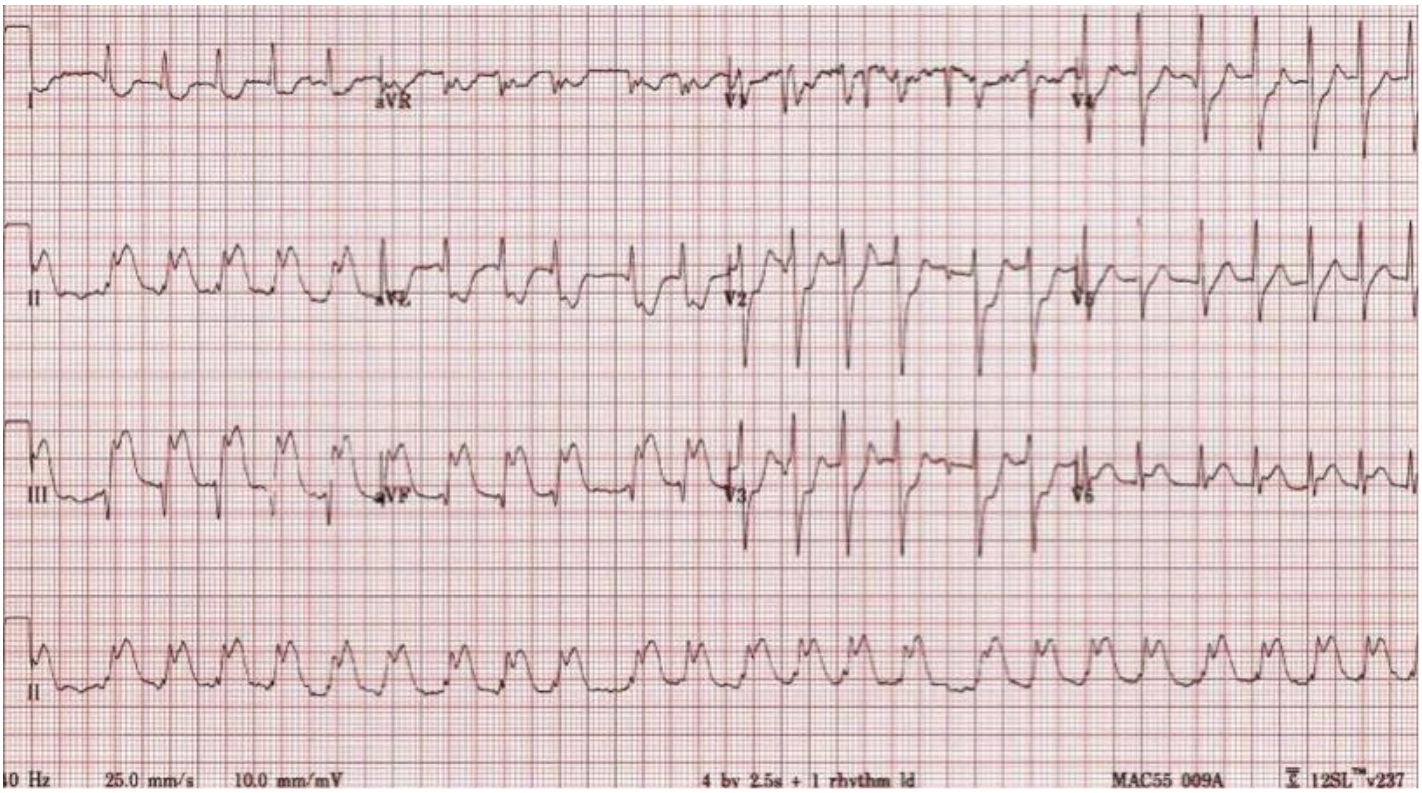
_____

_____

_____

_____

ii) The patient arrives please comment on his ECG (3 marks)



_____

_____

_____

_____

iii) The patient has a short run of non-sustained VT. Describe 4 possible anti-arrhythmic agents that could be used specifying drug, dose as well as 1 pro and 1 con of each (4 marks)

Drug	Dose	Pro	Con
1			
2			
3			
4			

QUESTION 7

A 65 year old male, known diabetic on oral hypoglycaemics, presents having been unwell for about one week. He is brought in by family as they have been having trouble waking him up.

His observations upon arrival are as follows:

GCS 12

Temperature 38 degrees Celsius

HR 95 / minute

BP 100/60 mmHg

BSL "Hi"

Ketones 0.3 on finger prick.

ABG result:

pH	7.32		(7.35 – 7.45)
pCO2	30	mmHg	(35- 45)
pO2	90	mmHg	(60 – 110)
HCO3	22	mmol/L	(22-30)
BE	-2		(-2 to 2)
Na	140	mmol/L	(135 – 145)
K	4	mmol/L	(3.5 – 5.0)
Cr	300	umol/L	(60 -110)
Glucose	60	mmol/L	(3.5 – 5.0)

You suspect this patient has Hyperglycaemia Hyperosmolar Non Ketotic Syndrome.

i) List six (6) differential diagnoses that may have precipitated the event (3 marks)

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

ii) What is the estimated plasma osmolality (include your equation)? (1 mark)

_____

iii) What is the estimated water deficit (inlcude your equation)? (1 mark)

_____

iv) Outline your fluid and electrolyte management of this patient (5 marks)

1._____

2._____

3._____

4._____

5.

_____

QUESTION 8

A 23 year old who is 28/40 pregnant has arrived by ambulance post alleged assault. She has obvious head injuries and is complaining of abdominal pain.

Her vital signs are:

GCS 10

HR 160 / min

BP 90 mmHg

RR 40 / min

i) List 2 potential obstetric causes of the abdominal pain for this patient (1 mark)

1. _____

2. _____

ii) What are the airway considerations in this patient (4 marks)

1._____

2._____

3._____

4._____

iii) Describe your preparation for rapid sequence intubation of this patient (5 marks)

1._____

2._____

3._____

4._____

5.

_____

QUESTION 9

An 85 year old female from a nursing home presents with abdominal pain and confusion.

She has history of atrial fibrillation on warfarin and type 2 Diabetes on oral hypoglycaemics.

Her findings on examination are:

Pale, diaphoretic and in obvious distress

Temperature	37.8 degrees Celsius
HR	90 / min
BP	90/50 mmHg

Abdominal examination reveals diffuse tenderness.

i) List the steps you would take to manage her confusion? (4 marks)

1. _____

2. _____

3. _____

4. _____

ii) List 4 differential diagnoses of her abdominal pain? (2 marks)

1. _____

2. _____

3. _____

4. _____

iii) List 3 Pros and 3 Cons for the use of abdominal-pelvic CT in this patient (3 marks)

Pros	Cons
1.	1.
2.	2.
3.	3.

iv) In the event of life threatening haemorrhage, what agents and dose would you use to reverse warfarin effect? (1 mark)

1. _____

2. _____

QUESTION 10

One of the nurses approaches you with a drug chart requesting analgesia for a 45 year old male who is a known alcoholic. She tells you that he is sweaty, agitated and complaining of severe epigastric pain. She is having difficulty obtaining observations on him because he will not sit still

i) What are your first steps in response to the nurse's request (1 mark)

1._____

2._____

ii) List 6 differential diagnoses for his epigastric pain? (3 marks)

iii) What other acute issues need to be considered in management of this patient? (2 marks)

1. _____

2. _____

The patient becomes drowsy after 2.5 mg of morphine. He appears pale.

Observations are noted:

Temperature	36.5 degrees Celsius
HR	110 / min
BP	80/50 mmHg

iv) What are the ED management of suspected acute upper GI bleed in this patient? (4 marks)

1._____

2._____

3._____

4._____

QUESTION 11

An 80 year old male presents to your ED with lethargy and progressive functional decline over the last week.

He has a background of Ischaemic heart disease and is on Aspirin, Digoxin and Pantoprazole.

Physical examination reveals signs of biventricular failure

Vital signs are as follows:

BP	105/60 mmHg
RR	25 / min
O2 saturation	97% room air

Afebrile

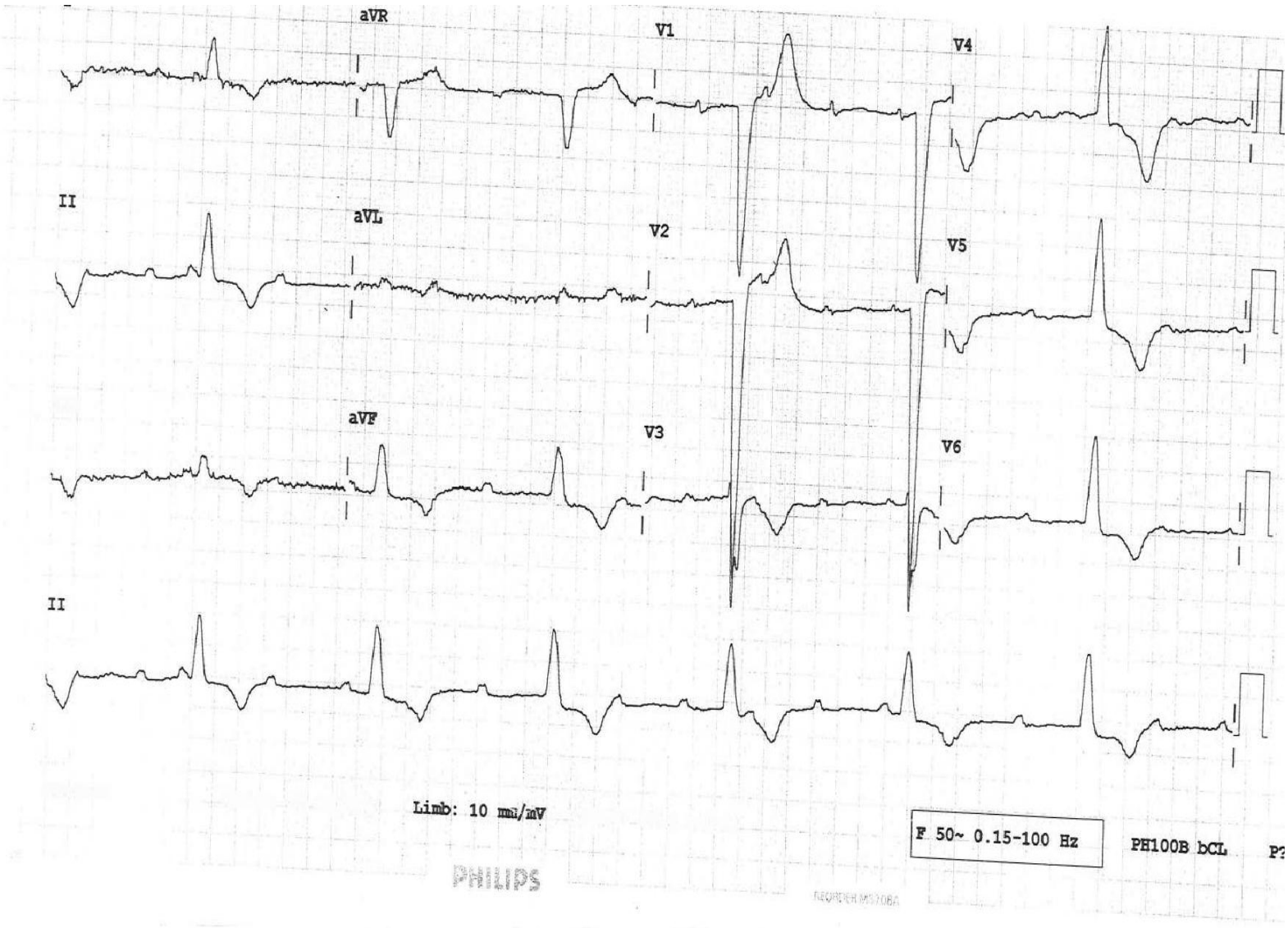
A 12 lead ECG is performed while the patient is in the resuscitation room

(See attached)

(i) Describe the two (2) most important abnormalities on this ECG (2 marks)

_____

_____


aVR
V1
V4
II
aVL
V2
V5
aVF
V3
V6
II
Limb: 10 mm/mV
F 50~ 0.15-100 Hz
PH100B bCL
PHILIPS

(ii) List the two (2) important investigations you would perform in the ED to assist you and justify your selection (4 marks)

Investigation (2 marks)	Justification (2 marks)
1.	
2.	

(iii) List your preferred three (3) options to manage his heart rhythm in the ED

(in order of use, with doses where required) and 2 contraindications for each

Treatment option including doses (3 marks)	Contraindication (6 marks)
1.	1. 2.
2.	1. 2.
3.	1. 2.

QUESTION 12

A previously well 66 year old male is brought to your rural Emergency Department following a fall.

He has a history of lung cancer which was successfully managed 10 years ago and has been in remission since.

He is on no medications.

He has an abrasion to his forehead, for which he has associated pain, but has no other injuries

<u>His vital signs upon arrival are as follows:</u>

Confused

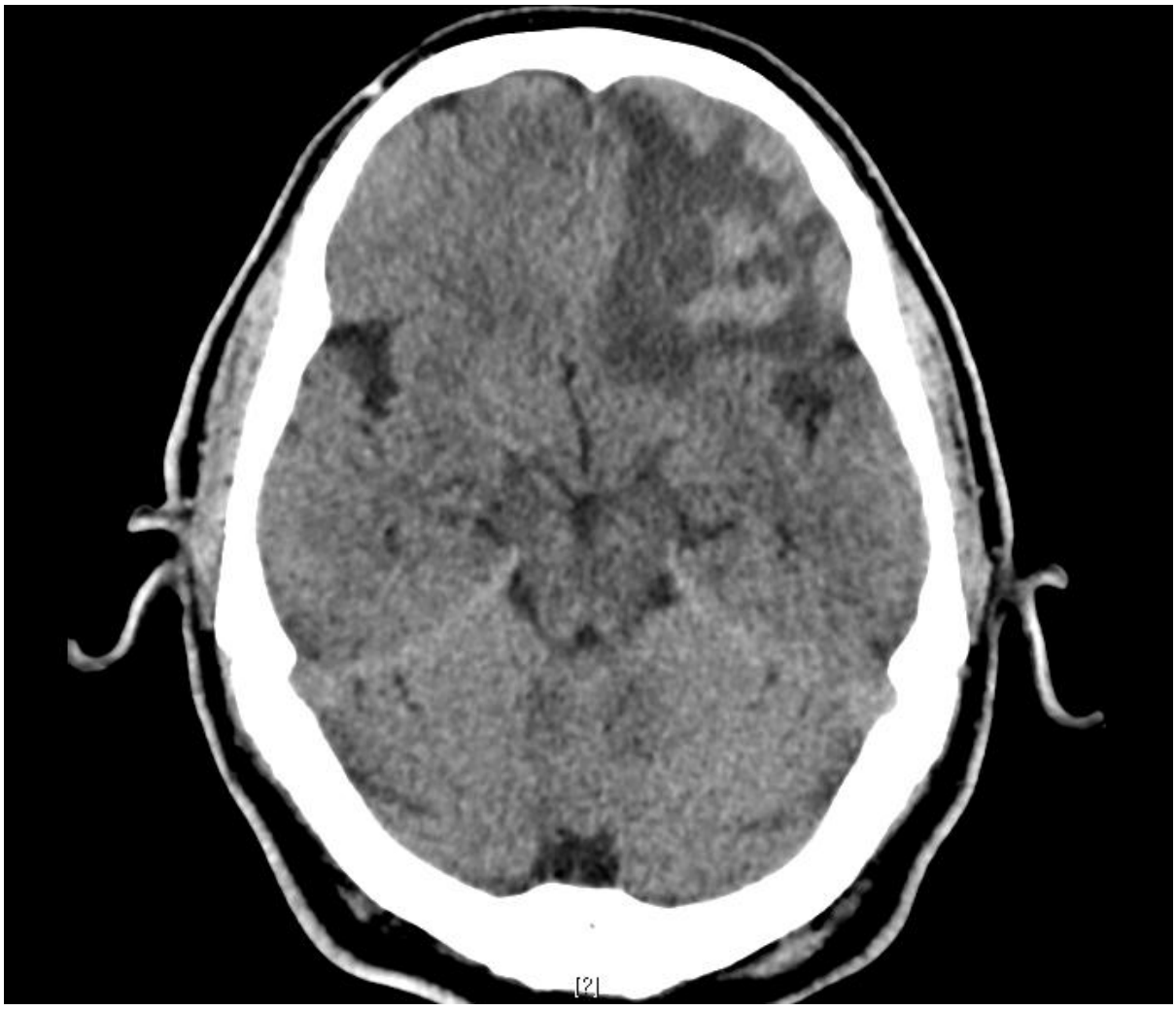
HR 75 / minute

BP 145 / 75 mmHg

Afebrile

BSL 7.5 mmol / L

A CT is ordered (see image)



(i) Describe 3 important findings on this CT (3 marks)

_____

_____

_____

(ii) In order of likelihood (most to least likely), list 4 locations where this lesion could have emerged from (2 marks)

_____

_____

_____

_____

(iii) List 2 important medications you would administer in the 1st hour and the dose (4 marks)

Medication (2 marks)	Dose (2 marks)

The patient has a grand mal seizure requiring benzodiazepines and phenytoin loading.

He is noted to have a reduced GCS and a unilateral dilated pupil.

You have successfully intubated him. His current HR is 45/min and BP 195/65 mmHg

iv) Describe your next 5 steps in his immediate management (5 marks)

_____

_____

_____

_____

_____

QUESTION 13 / 14 (double question)

A 62 year old known brittle asthmatic arrests at home following a viral illness and shortness of breath for the last 6 hours not responding to her usual bronchodilators.

She is rapidly attended to by the local ambulance service who intubate her on scene and bring her to your Emergency Department.

There is no other available history.

Her initial ABG is as follows:

pH	6.7
PCO2	205 mmHg
pO2	110 mmHg
Fi02	100%
Bicarbonate	21 mmol/L
Lactate	9.7 mmol/L
EUC's	normal

(i) Describe the three (3) main abnormalities on the gas (3 marks)

_____

_____

_____

Her current vital signs show HR 140 regular, BP 145 / 80 mmHg, saturations 98%

(ii) Outline your initial ventilator settings in the table below (5 marks)

Ventilator settings (1 mark each)	
Fi02	
I/E ratio	
PEEP	
Tidal volume	
Respiratory rate	

Ten minutes after arrival, she starts 'bucking' on the tube and becomes agitated.

Her blood gas result remains unchanged

(iii) Describe 5 important medications (with doses) that you would administer at this time (5 marks)

Medication	Dose

After 1 hour she remains intubated, her blood pressure drops to 60/40mmHg and she becomes difficult to ventilate

(iv) Describe your stepwise approach to this problem (5 steps, 5 marks)

_____

_____

_____

_____

_____

QUESTION 15

A 10 year old boy presents with a 1 week of lethargy and urinary frequency and a day of severe vomiting.
He is drowsy and breathless. Mucosal membranes are very dry.
He has no other known medical problems

Vital signs upon arrival are as follows:

HR	140 / minute
BP	90/40 mmHg
RR	30 / minute
SpO2	100%
Afebrile	

VBG shows:

pH	7.05	
PCO_2	28 mmHg	
PO_2	40 mmHg	
HCO_3	6 mmol/L	
BE	-18	
K	4.5 mmol/L	(3.5 – 5.2)
Na	120 mmol/L	(135 – 145)
Cl	90 mmol/L	(96 – 106)
Glucose	45 mmol/L	(3.5 – 5.0)
Lactate	2.3	

(i) List two (2) formulae that will aid your analysis of these blood results, and use them to calculate three (2) values. (4 marks)

Formula (2 marks)	Value (2 marks)

(ii) What is the main diagnosis? (1 mark)

_____

(iii) Prescribe your initial treatment for this child on the fluid chart below (4 marks)

No.	Date	Fluid type	Volume	Rate	Additives (if any)
1					
2					

(v) The mother decides she is taking the daughter home without treatment.
List 3 strategies to deal with this. (3 marks)

_____

_____

_____

Question 16

A 69-year-old lady presents to the Emergency Department (ED) with a history of sudden collapse.

She is brought in by ambulance and has a GCS of 7 on arrival in the ED.

Her observations upon arrival are as follows:

BP 66 / 40mmHg

HR 40 / min

RR 8 / min

Oxygen Saturations 89% (on 15 litres by Hudson Mask)

An ECG is performed (see next page)

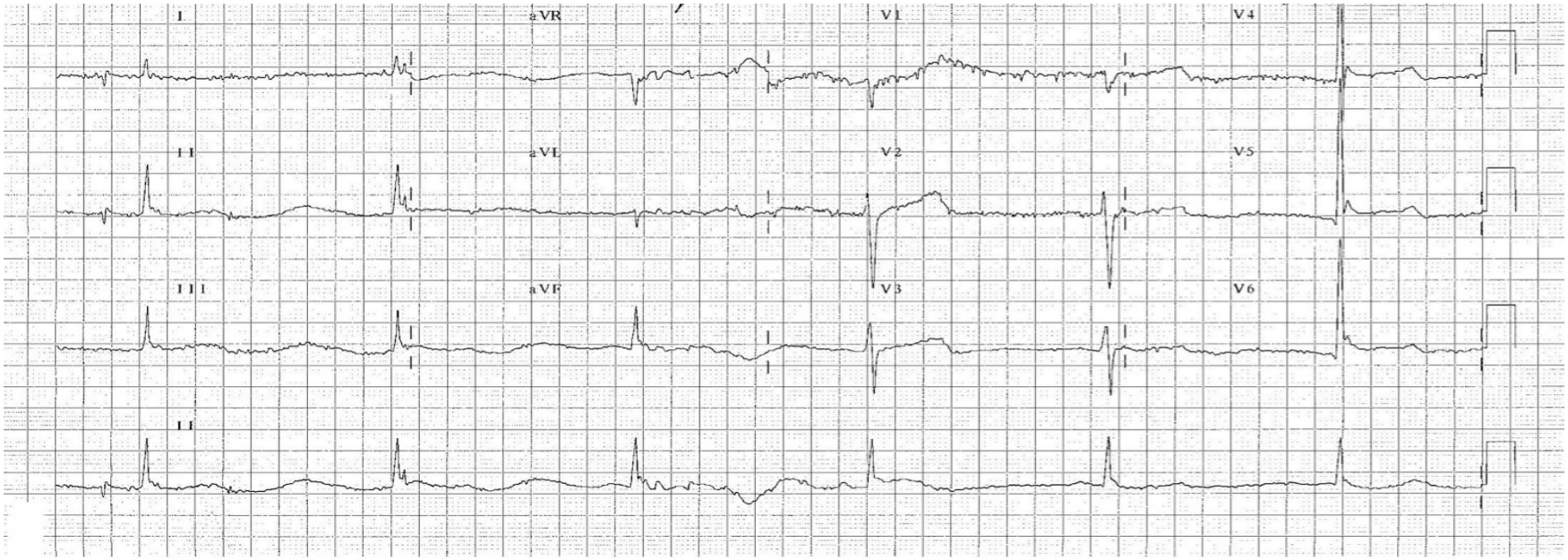
a) List the main abnormalities on this patient's Electrocardiogram (3 marks)

_____

_____

_____

_____


I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
II

b) List four (4) differential diagnosis for this ECG (2 marks)

_____

_____

_____

_____

c) List your priorities in the management of a Cardiac Arrest in this patient (5 marks)

_____

_____

_____

_____

_____

Question 17

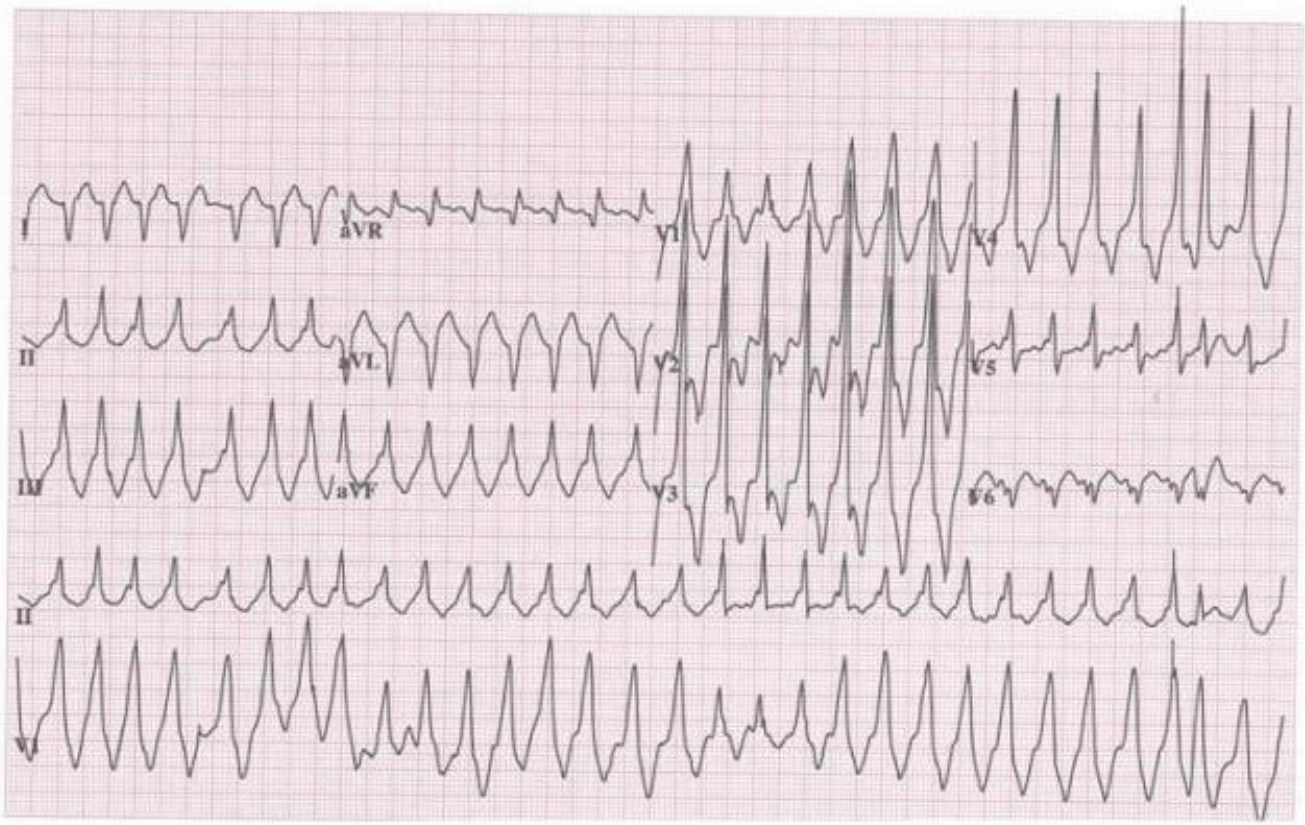
A 40 year old woman presents with palpitations and shortness of breath.

She has no significant past medical history and is on no medications

On arrival her BP is 70/40 mm Hg.

She is taken to a monitored bed

An ECG is taken.



a) What are five (5) important features on this ECG that aid you in your diagnosis (5 marks)

_____

_____

_____

_____

_____

b) List three (3) possible differential diagnoses (3 marks)

_____

_____

_____

c) List three (3) important steps in your immediate management (3 marks)

_____

_____

_____

d) List 3 medications which are contraindicated in this patient and why (3 marks)

Medication (3 marks)	Reason for contraindication (3 marks)

Question 18

A 78 year old male pedestrian has been knocked over by a cyclist.

He is brought into your tertiary ED.

He complains of Right hip pain.

His vital signs are stable and he has no other injuries

An x-ray is performed.

a) Describe one (1) major abnormality and one (1) negative finding on these x-rays. (2 marks)

_____

_____

b) List 5 important complications of this injury. (5 marks)

_____

_____

_____

_____

_____

c) He was given 10 mg of intravenous morphine by the paramedics en route to hospital. His pain is still not well controlled.

Outline four (4) pain management options for him including doses where appropriate.
(4 marks)

_____

_____

_____

_____

Question 19

A 52 year old male is brought in by ambulance after a witnessed seizure at home.

He has a history of hypertension and depression and is normally completely independent.

Upon arrival he has a GCS of 10 (E3 V3 M4),

A venous blood gas has been performed:

pH	7.28		(7.35 - 7.45)
pCO2	70	mmHg	(35 - 45)
pO2	35	mmHg	(80 -110)
HCO3	26	mmol/L	(21- 28)
Na	113	mmol/L	(135 - 145)
K	5.6	mmol/L	(3.5 - 5.0)
Lactate	13	mmol/L	(< 2)
Glucose	6	mmol/L	(3.5 - 5.0)

a) List 6 diagnostic categories to explain her low GCS and give one example of each (6 marks):

Diagnostic category (3 marks, 1/2 mark each)	Example (3 marks, 1/2 mark each)

b) List 3 main abnormalities on the gas and explain their significance (6 marks):

Abnormality (3 marks)	Significance (3 marks)

c) List and justify 4 investigations pertinent to this case (4 marks):

Investigation (2 marks, 1/2 mark each)	Justification (2 marks, 1/2 mark each)

d) What fluid therapy is immediately required given the biochemistry result?
Give dose, concentration and endpoint. (2 marks)

Fluid therapy (1 mark)	Specifics (1 mark)

e) The patient has two tonic clonic seizures without full recovery between. List 4 immediate management priorities with justification for each. (4 marks)

_____

_____

_____

_____

Question 20

A 46 year old man presents with fever, headache, and meningism.
He has a history of chronic alcoholism. There are no allergies. He is on no medications.
His vital signs upon arrival are as follows:

alert and orientated

temperature	38.1 degrees Celsius
HR	95 / min
BP	105/60 mmHg
BSL	9.4 mmol/L

a) List 6 indications for performing a CT brain before lumbar puncture in this man (6 marks)

_____

_____

_____

_____

_____

_____

b) Following a normal CT head, you proceed with an uncomplicated lumbar puncture.
These are the results:

Clear colour		
Opening pressure	25 cm H20	
Protein	0.6 g/L	(0.18 - 0.45)
CSF Glucose	4.2	(2.5 - 3.5)
White cells	965 x 10^6 / L	(50% polymorphs)
Red cells	350 x 10^6 / L	

Describe 3 main abnormalities and what is your working diagnosis (4 marks)

_____

_____

_____

_____

c) List 3 medications you would give empirically for this patient. Give doses and frequency. (3 marks)

Medication	Dose	Frequency
1		
2		
3		

d) List 5 complications of a CNS infection you may encounter (5 marks)

_____

_____

_____

_____

_____