

Royal North Shore Hospital NSW Fellowship Exam Course 2015.2 Practice Paper

- **This is a three hour written examination**
- **There are 30 questions**
- **Individual questions are not equally weighted but the questions are divided into 3 groups of 10 questions –each group of 10 is of similar weight & should be completed in an hour**
- **Write your answers on the exam paper**

Thanks to the many FACEMs/Fellows/friends from Northern Sydney & nearby who have contributed to these questions

These questions & answers can be freely distributed with appropriate acknowledgement

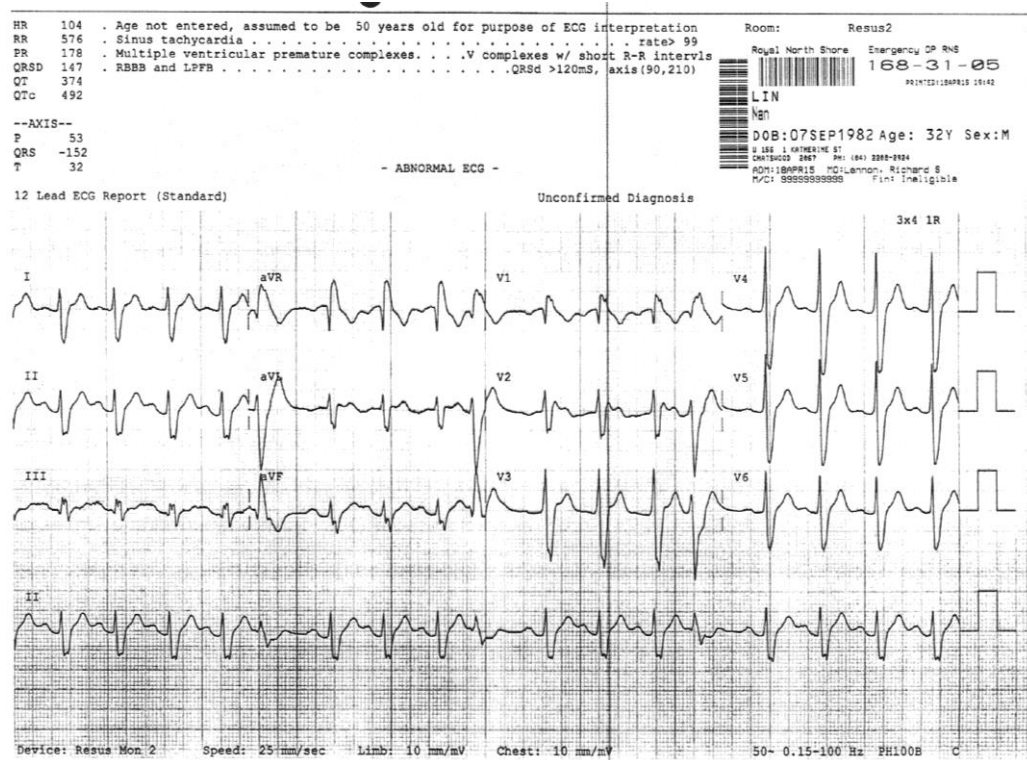
Section One

10 questions

SAQ 1

A 32 year old man presents following a syncopal episode. He has had previous problems with syncope and had a dual chamber pacemaker/defibrillator inserted 6 months previously. On arrival at the ED he reports having felt his defibrillator “fire” several times over the preceding hours.

His ECG is shown

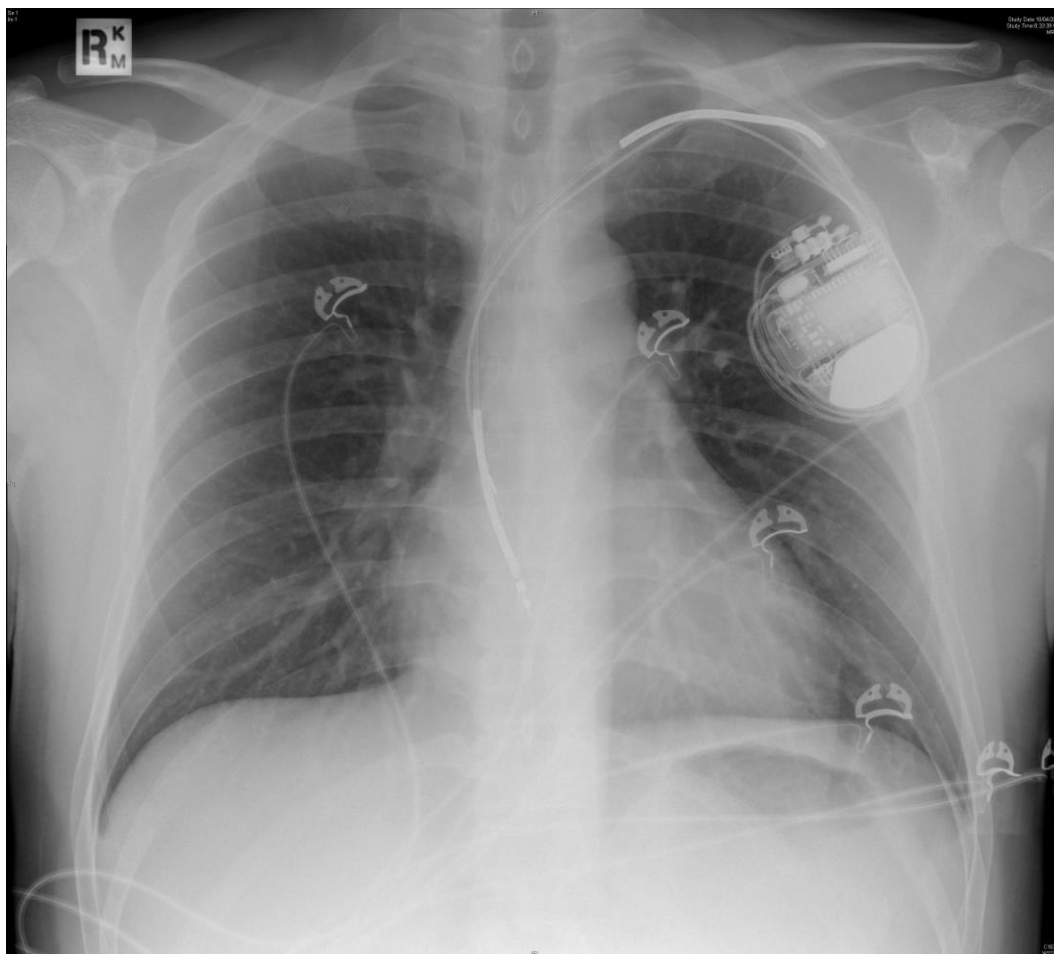


Question 1

List 3 abnormalities in this ECG (3 marks)

Question 2

The patient's chest x-ray is shown. Describe the significant abnormality (2 marks)



Question 3

Complete the following table identifying causes of pacemaker/defibrillator malfunction. Provide two examples/causes for each category (9 marks)

Category of pacemaker malfunction	ECG finding	Examples/causes
Failure to sense		
Failure to pace		
Oversensing		

Question 4

Circular magnets can be used to alter the function of implanted devices.

(a) What is the usual effect of placing a magnet over a pacemaker? (1 mark)

(b) What is the usual effect of placing a magnet over a defibrillator? (1 mark)

SAQ 2

You are working in a large tertiary hospital ED.

A call is received from ambulance control stating that in ten minutes your emergency department will receive seven unwell adult victims of chlorine gas inhalation from a factory accident.

Question 1

List six immediate actions you would take to prepare your ED in the ten minutes available (6 marks)

Question 2

List 5 clinical features are suggestive of significant exposure to chlorine gas? (5 marks)

Question 3

An arterial blood gas from one of the patients is shown
Arterial Blood Gas - On BiPAP 16/10 FiO2 80%

pH 7.07	(7.35 – 7.45)
paO ₂ 76 mmHg	(75 – 100)
paCO ₂ 42 mmHg	(35 – 45)
HCO ₃ 11 mmHg	(22 – 30)
BE – 14	(-3/3.0)

Na 144 mmol/L	(135 – 145)
K 3.2 mmol/L	(3.5 – 5)
Cl 131 mmol/L	(95 – 110)
Glu 7.4 mmol/L	(3.6 – 7.7)
Lact 4.9 mmol/L	(0.2 – 1.8)

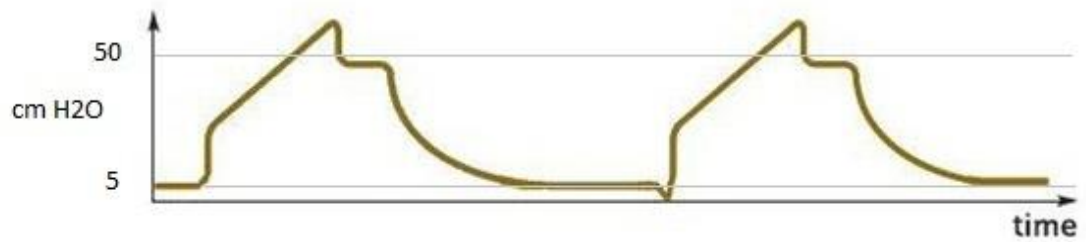
Provide a brief description and interpretation of the abnormalities in this ABG (4 marks)

Question 4

List 5 treatment modalities for patients with respiratory compromise following this exposure (5 marks)

SAQ 3

You are the retrieval doctor transporting a 47 year old woman intubated for severe pneumonia. She is on volume control ventilation. In transit, her airway pressure alarm has suddenly gone off. The airway pressure waveform is shown below.



Question 1

Complete the table (3 marks)

Peak pressure	
Plateau pressure	
PEEP	

Question 2

For each category below indicate 2 possible causes of a sudden increase in airway pressures in the intubated/ventilated patient. Indicate 2 corrective actions (12 marks)

<u>Category</u>	<u>Cause</u>	<u>Action</u>
Ventilator/Circuit		
Endotracheal tube		
Patient/lungs		

Question 3

List 3 adverse sequelae of high airway pressures (3 marks)

Question 4

Manipulating ventilator settings can affect oxygenation and ventilation.

a) Which two ventilator settings most influence PaO₂? (2 marks)

b) Which two ventilator settings most influence PaCO₂? (2 marks)

SAQ 4

This infant was born at 32 weeks gestation. She is now one week old. She has been vomiting for 6 hours and has a fever of 38 degrees. Here is her AXR.



Question 1

List the pathological features seen on this AXR. (3 marks)

Question 2

What is the most likely diagnosis? (2 marks)

Question 3

List 3 other possible diagnoses. (3 marks)

Question 4

List 4 key steps in her treatment. (4 marks)

SAQ 5

This 23 year old man has injured two of his teeth in a fall.



Question 1

Complete the following table naming the teeth involved (2 marks) and classifying the injuries (4 marks)

Name/location of tooth	Description/classification of injury

Question 2

List the potential complications of the injury of the upper left tooth in this patient (3 marks)

Question 3

Outline 3 important steps in the treatment of the injured tooth on the upper left (3 marks)

Question 4

What instructions would you give to a patient calling for advice about how to manage a completely avulsed tooth before getting to hospital? (2 marks)

SAQ 6

A 32 year old has been brought in an advanced stage of labour to your small district ED by her husband. She is G2P1 at 40 weeks gestation. The pregnancy was unremarkable except for gestational diabetes.

As she is being put into a bed, she has a powerful contraction and the baby's head is delivered onto the perineum. Further contractions and gentle axial head traction fail to deliver the foetal trunk which appears to be "stuck" despite delivery of the head.

Question 1

List 5 actions you can perform to assist urgent delivery and include a brief explanation (10 marks)

Action	Explanation

Question 2

The baby is successfully delivered and the placenta removed with controlled cord traction. The mother has brisk vaginal bleeding. List five haematologic changes in pregnancy and indicate the change that occurs (5 marks)

Haematologic Parameter	Change that occurs in pregnancy

Question 3

List 3 causes of primary post-partum haemorrhage and outline the treatment for each in the table (drug doses not required) (6 marks)

Cause	Treatment

SAQ 7

A 23 year old woman presents to your ED with fever and abdominal pain. On examination she has a very tender mass in her left upper quadrant. Temp 39.5 HR 125 BP 75/30

Question 1

List 4 examination findings that help differentiate an enlarged spleen from a large left kidney (4 marks)

Question 2

Complete the following table identifying 3 categories of causes of splenomegaly and 2 example conditions within each category (9 marks)

Category	Examples

Question 3

Given the abdominal pain & hypotension, an urgent CT abdomen is arranged. List 2 abnormalities in this scan image (2 marks)



Question 4

State the main long-term complication of splenectomy and list 3 pharmacological agents that are used to prevent the complication (4 marks)

SAQ 8

Penny is a 28 yo lady 19/40 pregnant with a 2 days of left sided pleuritic chest pain.

Question 1

List five potential diagnoses (5 marks)

Question 2

For each test indicated in the table below, provide two (2) examples of differential diagnoses that the test might help to rule-in or rule-out. Briefly explain the utility of the test in this setting. (8 marks)

Test	Differential diagnosis hopefully ruled-in/out by this test	Possible findings of this test & utility in this setting
ECG		

Chest US +/- echo		

Question 3

You decide formal imaging is needed to investigate for a PE. List the two (2) pros and two (2) cons of lung scan versus CTPA in this patient (8 marks)

	Pro	Con
VQ/lung scan		
CT PA		

Question 4

It is decided that a CT PA will be performed. The mother is a high school physics teacher and wants to ask about the risk of cancer arising from the CT scan (4 marks)

(i) "What is the approximate radiation dose – in milliSieverts?"

(ii) "Approximately how many normal chest X-rays is that equivalent to?"

(iii) "How many years of background radiation does that represent?"

(iv) "I've read that the likelihood of me developing a cancer from the radiation dose is less than 1 in 50,000...is that correct?"

SAQ 9

A 45 year old man presents following a syncopal episode while sitting down having lunch with friends.

Question 1

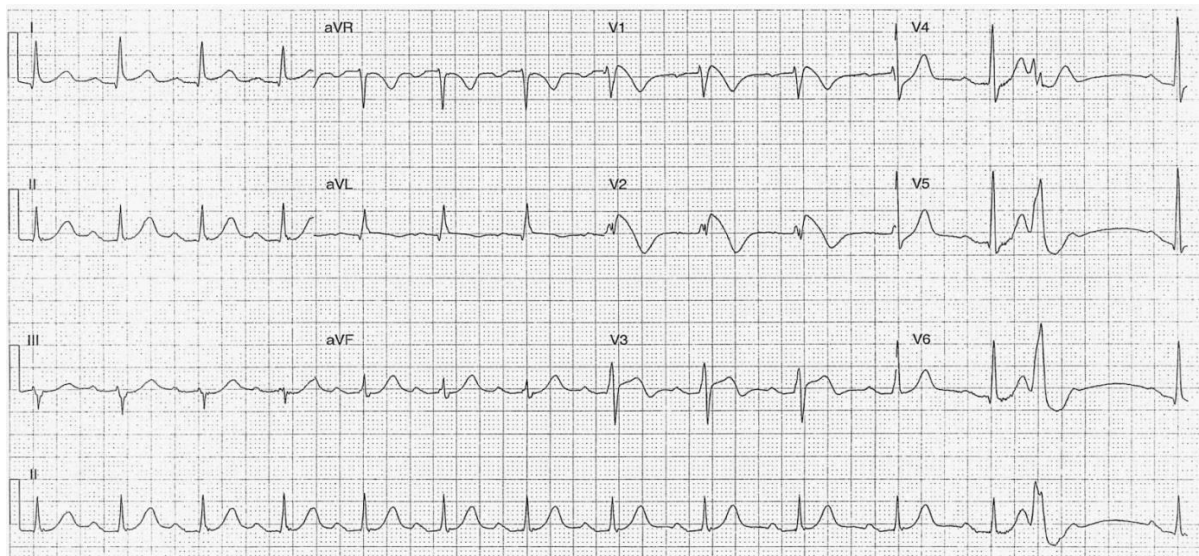
List 3 features of an episode of collapse that help to differentiate syncope from seizure (3 marks)

Question 2

Identify 2 “red flags” for sinister aetiology of syncope in each category of this table (6 marks)

Category	“Red Flag”
History	
Examination	
ECG	

An ECG is performed



Question 3

List 4 abnormalities in the patient's ECG (4 marks)

Question 4

List 2 differential diagnoses (2 marks)

SAQ 10

A 45 year old hiker has been brought to your ED after he fell into a cold mountain lake in mid-winter. He is unresponsive, has a weak palpable pulse and temperature 26 degrees.

Question 1

Classify the severity of hypothermia (3 marks)

Severity	temperature range
Mild	
Moderate	
Severe	

Question 2

Identify 3 patient groups particularly susceptible to hypothermia and list 2 reasons for this susceptibility for each group (9 marks)

Group	Reason 1	Reason 2

Question 3

List 5 ECG signs of hypothermia and the likely corresponding temperature (5 marks)

Question 4

List 3 differences from the normal ACLS protocol in dealing with cardiac arrest in severe hypothermia (3 marks)

Section Two

10 questions

SAQ 11

A 42 year old man is brought to your tertiary level emergency department following an MVA. He was the unrestrained driver of a vehicle travelling 80km/hr when it hit a tree.

His observations on arrival are:

GCS 15 but distressed complaining of chest pain.
HR 130 BP 90/50 SpO2 90% RA RR 24 Temp 35.5

Question 1

List 6 immediately life threatening conditions in chest trauma? (6 marks)

1	
2	
3	
4	
5	
6	

Question 2

Describe 2 bedside imaging investigations you would perform and describe possible findings that would indicate life threatening thoracic injury. (4 marks)

	Investigation	Findings
1		
2		

Question 3

He is found to have a haemopneumothorax and rapidly fills a 2000ml underwatersealed drain with blood after a large ICC is placed. Shortly after this he loses consciousness and has a witnessed PEA arrest.

What are 4 CONTRAINDICATIONS for performing an emergency thoracotomy?
(4 marks)

	Contraindications for emergency thoracotomy
1	
2	
3	
4	

Question 4

You decide to perform an ED Thoracotomy. The patient is intubated and has ongoing resuscitation efforts including massive transfusion being performed by the rest of your team. Outline how you will perform this procedure (6 marks)

SAQ 12

You are the duty Emergency Physician in a Regional Trauma Centre. You get a call from Ambulance Control Centre to state there's been a tour bus roll-over on the highway 10km outside town. There are numerous critical injuries.

Question 1

List 4 immediate steps you would take in preparation? (8 marks)

Action	Explanation

Question 2

You have been told your ED will be receiving 7 Red (seriously injured), 5 Amber (injured, non-ambulatory) and 14 green (walking wounded) patients in 45 minutes ranging from 60-80 years of age. List 3 main aspects in your plan for dealing with these patients as they arrive? (6 marks)

Action	Explanation

Question 3

Once the incident is declared "Stand Down", list 3 steps that you would carry out next? (6 marks)

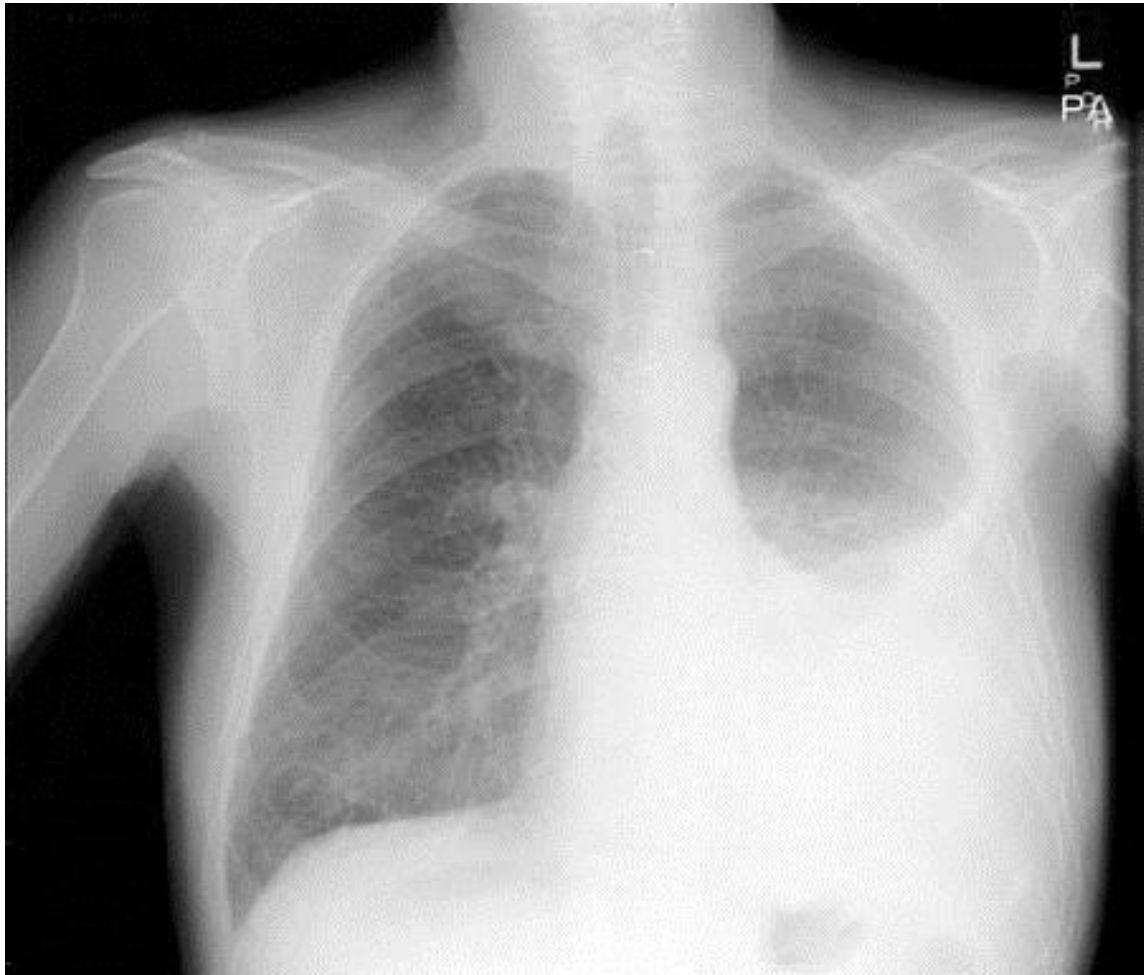
Action	Explanation

SAQ 13

A 65 yo female presents with increasing SOB and generalized fatigue for the past week. She has no other prior medical history besides HT controlled on medication and rheumatoid arthritis.

Question 1

This is her CXR. Describe the abnormality (2 marks)



Question 2

List five (5) common causes of pleural effusions in each category of the table below (5 marks)

Type of effusion	Common causes
Transudate	
Exudate	

Question 3

Various biochemical criteria are used to distinguish transudate from exudate. List two (2) of the most important of these criteria? (2 marks)

Question 4

What is the role of analysing the pleural fluid pH in a confirmed effusion? (2 marks)

SAQ 14

A 45 year old has presented 10 hours after the sudden-onset of a severe headache typical of subarachnoid haemorrhage (SAH).

Question 1

List five (5) risk factors for subarachnoid haemorrhage (5 marks)

Question 2

In this clinical context:

- What is the prevalence of subarachnoid haemorrhage (i.e. what proportion of patients presenting in this manner prove to have SAH)? Provide an estimate/range (1 mark)

- What is the sensitivity of CT scan for detecting SAH in this patient? Provide an estimate/range (1 mark)

Question 3

A lumbar puncture is performed to look for xanthochromia. It is a “traumatic tap” and the CSF looks lightly blood-stained. Briefly explain the components of “xanthochromia” and why a formal CSF xanthochromia assay can distinguish traumatic tap from SAH (3 marks)

Question 4

What is the incidence of post-lumbar puncture headache?

Question 5

List three (3) alterations to lumbar puncture technique which help to decrease the incidence of this complication?

SAQ 15

A 55 year old woman has fallen and presents with a wrist fracture. Her X-ray is shown.



Question 1

In the table identify 3 radiologic lines (shown on the X-ray above) in Colle's-type fractures that usually indicate the need for fracture reduction. Include lengths and/or angles (9 marks)

Radiographic finding	Normal	Indication for reduction

Question 2

Identify 3 other Xray-determined indications for reduction (3 marks)

Question 3

List 5 complications of plaster immobilisation (5 marks)

Question 4

List 5 contraindications to Intravenous Regional Anaesthesia (IVRA – “Bier’s block”) (5 marks)

SAQ 16

The dermatology service at your large tertiary hospital has proposed that phone consultations regarding rashes/lesions be accompanied by images taken by smart phone and sent to the on-call dermatologist.

This would breach the existing “medical photography policy” at your hospital and your ED Director has asked you to develop a new policy to sort this matter out

Question 1

List two (2) important steps/tasks in the process of policy development in each of the three (3) categories below (6 marks)

Category	Steps/Tasks
Research/background	
Working group	
Follow-up	

Question 2

Your policy development team have some concerns about informed consent in sending photographs by phone. What are the requirements for obtaining valid consent for any test, operation or other intervention? (4 marks)

Question 3

In what settings can a treatment be given without the patient's consent? (2 marks)

Question 4

Briefly explain the concept of "implied consent" (2 marks)

SAQ 17

A 43 year old man is brought to your ED with a 48 hour history of fever and headaches. When he woke this morning his wife found him to be unusually lethargic and vague. In the ED he has HR 97, BP 135/78, Temp 38.7 GCS 15, and there are no focal neurological findings

An urgent CT brain is reported as normal and a lumbar puncture performed

Question 1

Complete the following table outlining typical CSF findings (10 marks)

	Normal	Viral encephalitis	Bacterial meningitis
Opening pressure (low-normal-high)	Normal		
White cell count ($10^6/L$)	< 5		
Predominant white cell type	(If present) lymphocytes or monocytes (no neutrophils)		
Glucose CSF:plasma ratio (low-normal-high)	Normal		
Protein (low-normal-high)	Normal		

Question 2

This man's CSF is suspicious for viral encephalitis but does not exclude the possibility of bacterial meningitis. List six (6) possible organisms that can cause viral encephalitis (6 marks)

Question 3

You decide to treat him for viral encephalitis and to cover the possibility of bacterial meningitis until MRI can be organised.

What are the two (2) most important antimicrobials to give this patient? Include doses. (4 marks)

Question 4

(a) In which settings or in which patients should penicillin be added to ceftriaxone in the empiric treatment of bacterial meningitis? List three (3 marks)

(b) In which settings or in which patients should vancomycin be added to ceftriaxone in the empiric treatment of bacterial meningitis? List three (3 marks)

SAQ 18

A 35 year old woman is BIBA after having a witnessed LOC in the shopping centre. She was seen to fall and was unconscious for about 2 minutes before a spontaneous and full recovery. She complains of feeling light headed with SOB for the past few days.

Question 1

What are 6 life threatening differential diagnoses of syncope in this patient that you would consider given the above information?

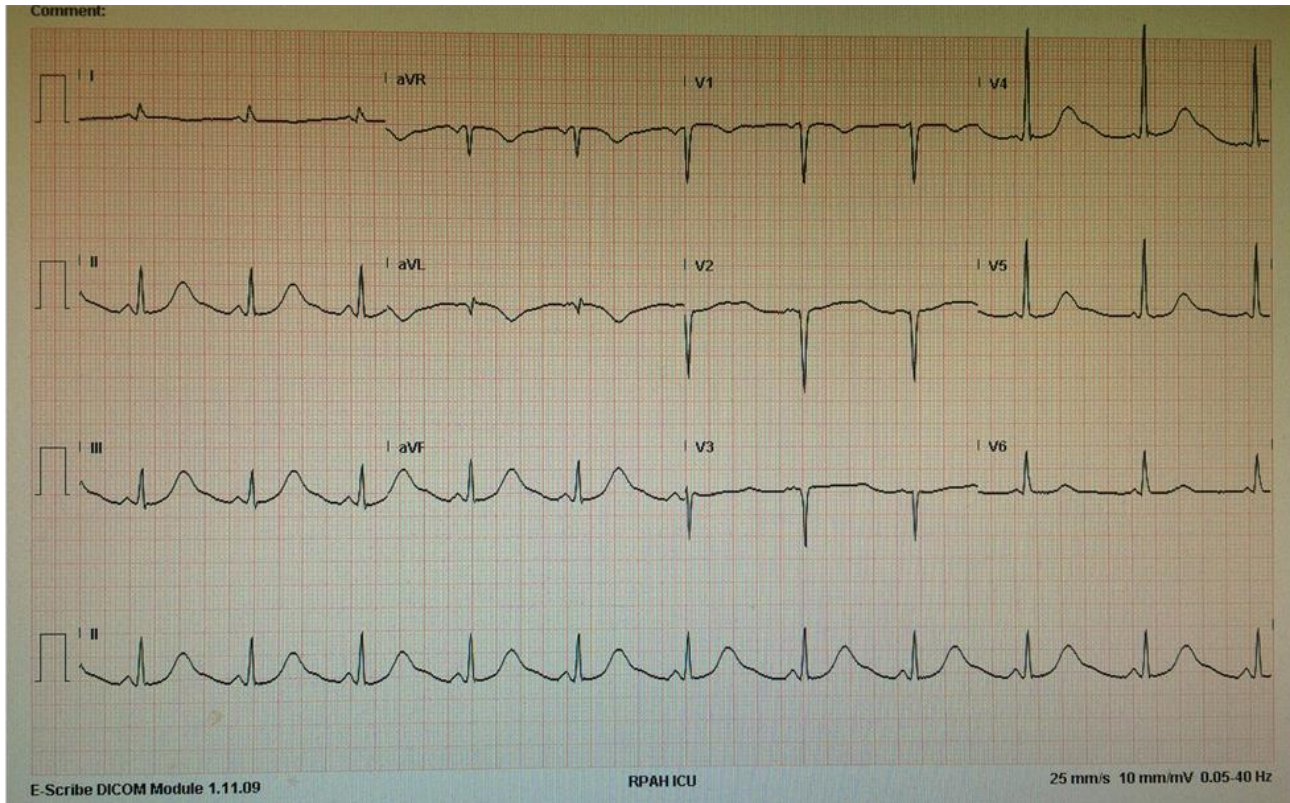
List one investigation you would do to check for each of the diagnoses you listed (including radiology). (6 marks)

Differential Diagnosis	Investigation

Question 2

As part of the work up she gets the following ECG. All other bedside tests and radiology performed are unremarkable. You take further history and find she has recently been treated for suspected PID with azithromycin and metronidazole.

What are the four most important findings on the ECG? (4 marks)



Question 3

(A) What Life Threatening Arrhythmia would the patient be at risk of developing? (B) Would they be more at risk if they were in a sinus bradycardia or sinus tachycardia? (2 marks)

(A)
(B)

Question 4

If the patient arrests with a shockable rhythm, what drug (with dose and route of administration) would you use during the arrest other than Adrenaline and Amiodarone (2 marks)

Drug	Dose	Route of administration

Question 5

The patient remains stable in the department but has one episode of witnessed self-limiting tachyarrhythmia. What are 3 treatment options if she goes into a conscious, stable, version of the tachyarrhythmia associated with the above ECG (3 marks)

Management Plan

SAQ 19

A 6-year-old boy with Down's Syndrome is brought to ED by ambulance with fever and dyspnoea.

On examination he is bright & alert. HR 120/min BP 95/- Temp 38.7 Respiratory rate 30/min. He has a moderate systolic heart murmur.

Question 1

List your 3 top differential diagnoses at this point? (3 marks, bold plus at least another)

Question 2

What criteria would support the diagnosis of bacterial endocarditis? (4 marks)

Question 3

You decide he has infective endocarditis. Identify the empiric antibiotics that should be used including the appropriate dose for this patient (6 marks)

Antibiotic	Dose regime & route

Question 4

What are potential complications of infective endocarditis? (2 marks)

SAQ 20

You are the locum ED consultant on duty at The Royal Darwin Hospital for the month of January.

You have the “access line” phone and receive a call from a frantic father to say that his 5yr old daughter ran screaming from the shallow water near the casino resort where she was walking and then collapsed on the beach.

Question 1

What immediate pre-hospital treatment is required? (3 marks)

Question 2

Ambulance rings to say they are 5 minutes away. The child is drowsy with a weak thready pulse. List 5 initial steps in your preparation for this patient (5 marks)

Question 3

What are the established indications for Chironex antivenom? (3 marks)

Question 4

Identify key differences between Irukandji syndrome and Chironex envenomation? (4 marks)

Clinical Feature	Irukandji	Chironex
Local effects/skin		
Systemic effects		

Section Three

10 questions

SAQ 21

You are the consultant in a rural emergency department. A 32 year old woman is BIBA in labour, it is her 4th child. There is no on-call obstetrician but a midwife will attend.

Question 1

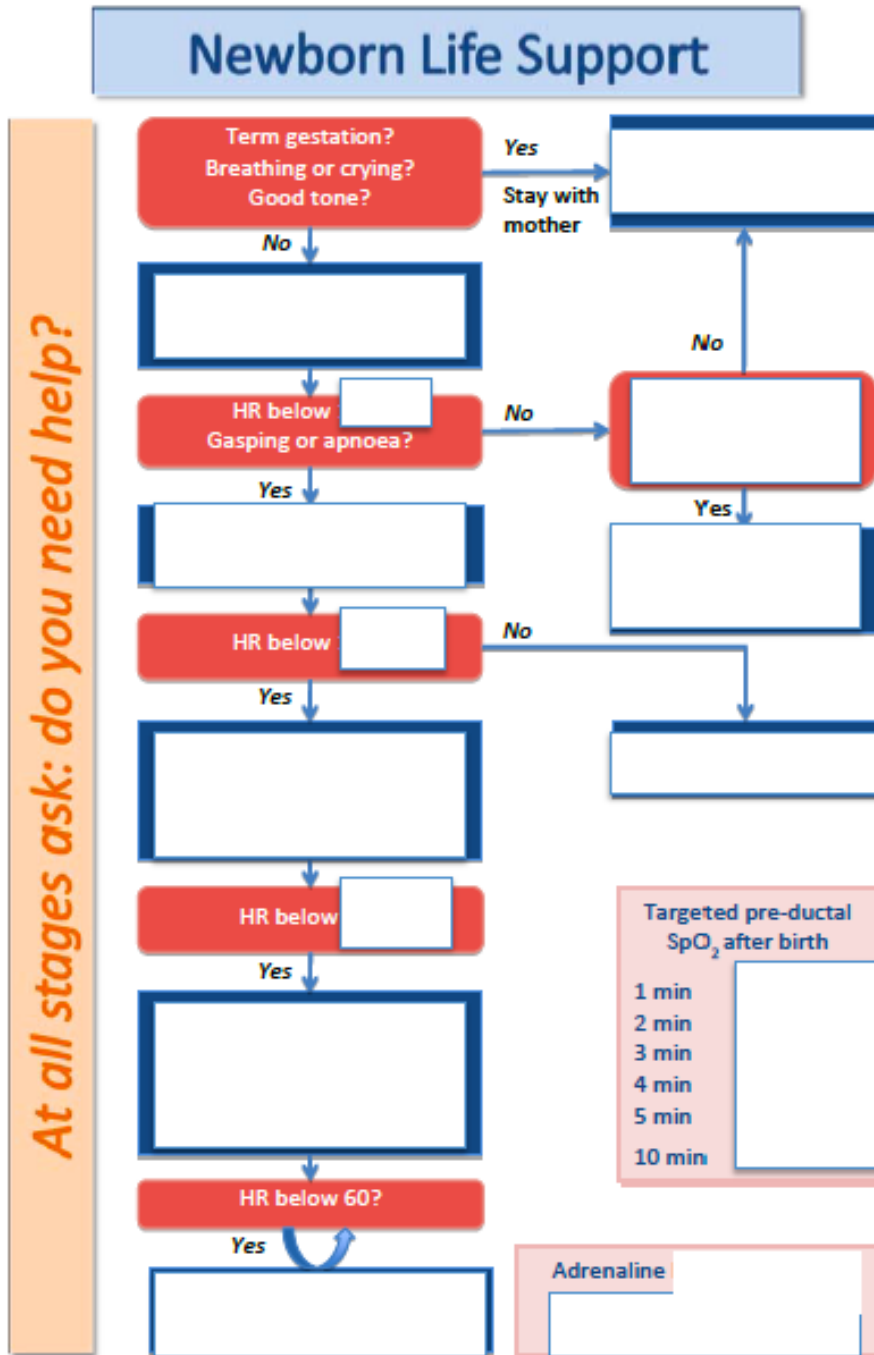
List 4 examples of maternal, fetal and intrapartum circumstances that place the newborn infant at risk of needing resuscitation. (12 marks)

	Maternal	Fetal	Intrapartum
1			
2			
3			
4			

Question 2

She delivers the baby within 15 minutes of arrival in your ED. The baby is floppy and not breathing. You have been tasked with leading the resuscitation of the newborn.

Please fill in the blank boxes in the algorithm for newborn resuscitation below. (12 marks)



Question 3

What SpO2 would you be aiming for at 1,5 and 10 minutes (3 marks)

Time	1 minute	5 minutes	10 minutes
SpO2			

Question 4

What dose of adrenaline would you use if the baby was 3kg? (1 mark)

SAQ 22

A 3 year old boy was playing with a digital camera and had a brief episode of coughing. His mother thinks he has ingested a button battery and has brought him to the ED.

Question 1

What product or patient factors increase the risk of injury in button battery ingestion - list 3.
(3 marks)

Question 2

(a) By what main mechanism does an impacted oesophageal button batteries cause injury?
(2 marks)

(b) By what other mechanisms can injury occur? (2 marks)

Question 3

1. An X-ray of the child is shown. He remains entirely asymptomatic and with a normal examination in the ED. Outline your treatment plan for this child now - including discharge/follow-up instructions (4 marks)



SAQ 23

Pre-hospital bypass of smaller centres directly to designated trauma centres is routine practice in many metropolitan environments.

Question 1

What criteria used by pre-hospital personnel to determine which patients should bypass smaller centres? List 4 examples for each category (12 marks)

Category	Examples
Mechanism	
Injuries	
Signs/Symptoms	

Question 2

List 3 advantages and 3 disadvantages of trauma bypass (6 marks)

Advantages

Disadvantages

Question 3

A long distance to reach a major trauma service requires paramedics to manage trauma patients en route. What evidence (if any) supports the use of “permissive hypotension” (or “hypotensive resuscitation”) in the pre-hospital setting (5 marks)

SAQ 24

A 34 year old man presents 10 days after a business trip to Papua New Guinea. He has had fevers, malaise, generalised aches and frequent episodes of diarrhoea. HR 130 BP 100/50 Temp 38 Sats 98% on air.

Question 1

List 8 potential causes of fever & illness in this man (4 marks)

Question 2

Which two specific tests for malaria will you order? (4 marks)

Investigation	Description/Justification

Question 3

List 5 major complications of severe Plasmodium falciparum malaria (5 marks)

Question 4

What are the two main choices for the urgent initial treatment of severe Plasmodium falciparum malaria? (2 marks)

SAQ 25

A 32 week pregnant lady presents with a headache and BP of 170/110.

Question 1

Apart from headache and HT, list 5 diagnostic criteria for pre-eclampsia (5 marks)

Question 2

List 3 risk factors for pre-eclampsia (3 marks)

Question 3

How would you reduce the blood pressure (list 2 medications including route & dose)? (4 marks)

Medication	Dose/Route

Question 4

Her condition deteriorates and she starts to fit. What definitive drug treatment would you give (one drug: name, dosage and route)? (2 marks)

Question 5

What are the signs of magnesium toxicity? (2 marks)

SAQ 26

62yr old lady presents to your Urban District ED with increasing left sided headache, vomiting and blurred vision affecting the left eye. She has a past medical history of COPD for which she has been prescribed salbutamol inhalers.

Her visual acuity is 6/6 in the unaffected right eye and significantly reduced to 2/24 on the left. On examination she has an irregular shaped fixed pupil, which is not reacting to light.

Question 1

What is the most likely diagnosis? (1 Mark)

Question 2

List 3 risk factors for this condition? (3 Marks)

Question 3

Apart from analgesia and anti-emetic, list 3 specific pharmacological treatments for this condition and briefly describe the mechanism of action. (6 marks)

Medication	Mechanism

Question 4

List 2 likely triggers for this lady's presentation? (2 Marks)

SAQ 27

A 45 year old female has been BIBA after being found drowsy by her sister at home. She had not been feeling well over the past few months, complaining of generalised fatigue and lethargy to her family.

She lives alone and had not been seen by friends or family for the past week. Her sister found her today drowsy on the couch. She had been incontinent of urine and faeces and appeared to have been on the couch for some time. On arrival her observations are:

GCS E2V3M5 = 10

Temp 34 degrees

SpO2 94%RA

RR 10 HR 90 BP 110/60

Question 1

What are 6 differential diagnoses (with categories and a specific example) for her presentation and what investigation(s) will you do or arrange to look for each one? (12 marks)

Category	Specific example	Investigation

Question 2

You get a call from the lab, saying the TFT's you have taken are abnormal. They are shown below.

TSH: 47mIU/L (normal 0.27 to 4.2 mIU/L)

T4: 2.8 mIU/L (normal 12 to 25pmol/L)

With this information what is the likely diagnosis (1 mark)?

Question 3

Name two other biochemical abnormalities you might expect to find (1 mark)?

Question 4

What are 2 pharmacological agents you would give as part of your management for this condition? (6 marks)

	Drug	Dose	Route
1.			
2			

SAQ 28

There has been a commuter train derailment with multiple casualties. You are a retrieval service doctor sent to the scene by road.

Question 1

Identify the correct triage category using the “triage sieve” (Green, Orange, Red or White/Black) for each of the following patients (4 marks)

Patient description	Triage Category (colour)
47 year old male. Talking – complains of chest & abdominal pain. RR 40. HR 105	
17 year old female. Open abdominal wound with herniation of ?viscera. RR 25. HR 110	
Elderly female. Head injury/scalp laceration. Confused/disorientated. RR 12. HR 85	
29 year old male. Leg +/- pelvic injury. RR 29. HR 132	

Question 2

How does “sort triage” differ from the system in Question 1? (2 marks)

Question 3

Define the “Warm Zone” of a disaster site (2 marks) and list two casualty-related activities that emergency personnel carry out in the Warm Zone (2 marks)

Question 4

Identify difficulties that might exist and/or alterations to “normal” care that might exist in the disaster setting. List 4 difficulties in each category (8 marks)

Airway/Breathing	
Circulation	

SAQ 29

You have received pre-arrival notification that paramedics are bringing an 18-month old infant to your ED in cardiac arrest.

Question 1

You have a few minutes to prepare your staff, drugs and equipment.

Name four (4) different methods that can be used to estimate a child's weight based on the patient's age or any other known parameter (4 marks) Provide the formula for one of the calculation-based methods (2 marks)

Question 2

Complete the following table for the 18-month old. Include values, units and formulae used to calculate where indicated (4 marks)

Item	Answer
Estimated weight	
Endotracheal tube size	
Joules per DC shock	
Adrenaline dose	

Question 3

The child regains spontaneous circulation but is agitated and requires a rapid sequence induction. Please list the drugs you will choose, including doses (4 marks)

a. Sedation

b. Paralysis

Question 4

In the event of failed intubation attempts in this patient, briefly describe two (2) rescue oxygenation/ventilation techniques (4 marks)

(i)

(ii)

SAQ 30

A 61 year old obese woman receives 7.5mg of intravenous morphine for abdominal pain. She is on O2 via a Hudson mask at 6l/min. After 20 minutes her GCS falls to 12. An arterial blood gas is performed

pH 7.24
pCO2 92
pO2 50
Bicarb 49
BE 10
O2 sats 78%

Lactate 1.2
Na 142
K 3.8
Cl 86
Glu 11.4
Hb 184

Carboxy Hb 7%

Question 1

Describe the *acid-base* abnormalities including any relevant calculations (3 marks)

Question 2

List four (4) abnormalities other than the acid-base abnormalities already noted (4 marks)

What are the likely causes for these metabolic abnormalities and why? (3 marks)
