

# **NEW FORMAT SAQ PAPER**

**Time allowed: 180 minutes**

**ANSWERS**

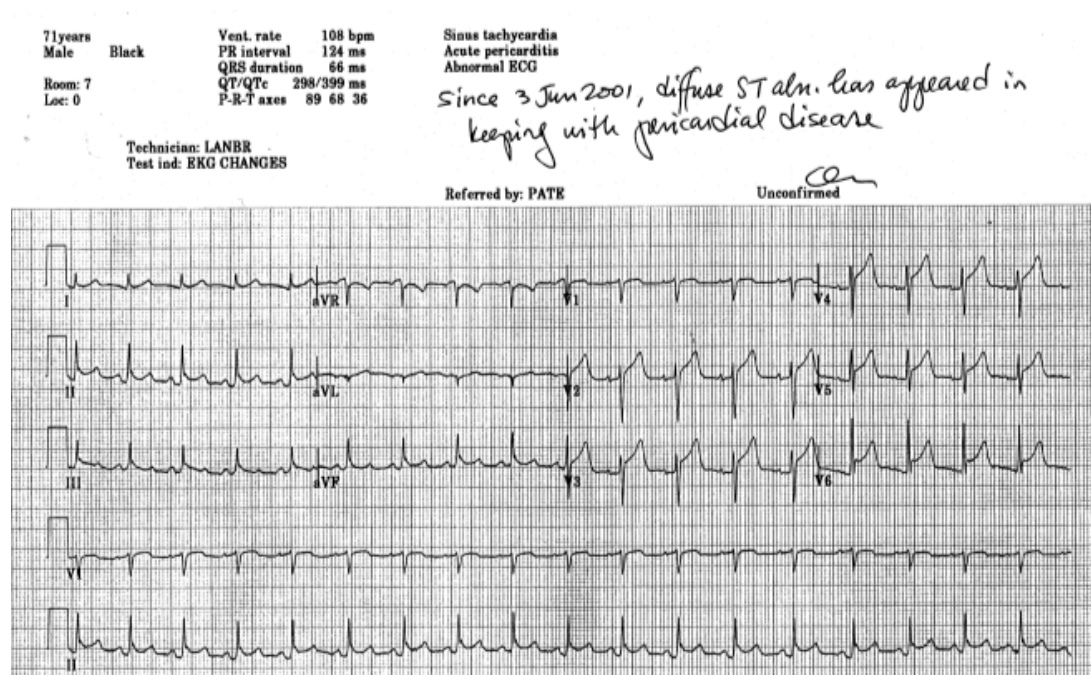
**30 questions**

**Approx: 6 minutes/10 marks per question**

**SAQ 1: (10 marks)**

A 36 year old man presents to the ED complaining of 3 hours of gradual onset central chest discomfort. The pain is heavy, worse on deep inspiration and radiates to his back. He is a smoker, denies the use of recreational drugs and has no other significant past medical history. His father had an MI at age 62 years.

An ECG is performed and shown below:



- a) List your two *most likely* differential diagnoses: (2 marks)

Pericarditis

Acute MI

?Pulmonary Embolus/dissection also acceptable

- b) List 3 investigations that could be performed to enable differentiation between these two possible diagnoses with justifications for each. (6 marks)

Fever—pericarditis more likely

Pericardial effusion/tamponade signs —muffled HS, raised JVP (pericarditis)

Pericardial rub —pericarditis more likely

PE ->pleural rub, tachypnoea, hypoxia, calf swelling

Dissection —r/r delay. Rfem delay, AR murmur, focal neurol, unequal BP arms

- c) Name 2 treatment interventions you would initiate for one of the possible diagnoses (2 marks):

Pericarditis —nsaid, analgesia, drain tamponade Acute myocardial ischaemia —  
aspirin, clopidogrel, clexane, GTN PE; clexane, oxygen Dissection —aggressive BP  
reduction, beta blockade, analgesia...

**SAQ 2 (10 marks):**

**A 35 year old woman who is 30 weeks gestation, is brought to your emergency department after a witnessed cardiac arrest.**

**(a) What are 4 leading causes of maternal death in pregnancy ? (2 marks)**

- Trauma (homicide, MVA, suicide)
- Pulmonary embolism (thrombus)
- haemorrhage (placental abruption/ placenta praevia)
- Maternal cardiac disease (AMI, peripartum cardiomyopathy, dysrhythmia)

**(b) List 4 airway and ventilation issues that may occur as a result of pregnancy. (4 marks)**

- Increased risk of aspiration – due to decreased lower oesophageal sphincter tone, increased abdominal pressure, decreased gastric emptying.
- More oedematous airways – tongue and supraglottic airways oedematous, and more friable (therefore more likely to bleed and swell) (may need to use smaller ETT)
- Decreased FRC and increased O<sub>2</sub> consumption – develop hypoxia more quickly, less tolerant of apnoeic periods.
- Mask ventilation more difficult due to low FRC, elevated diaphragms, and raised intra abdominal pressure.
- Obesity relatively common in pregnancy, causing relative neck extension when supine (causing greater anterior placement of larynx). Also shorter neck in obese gravid women
- Large breasts, causing difficult laryngoscopy
- When ventilating, significant respiratory alkalosis should be avoided as this can cause decreased uterine blood flow.

**(c) What are the indications for a perimortem caesarean section? (2 marks)**

- Cardiac arrest in mother, gestational age >24 weeks (age of fetus in weeks corresponds to the distance in cm from fundus to symphysis pubis from 18-30 weeks).
- Preferably within 5 minutes of arrest, up to 20 minutes – survival of infant directly related to the time elapsed from maternal arrest to delivery. Poorer neurological outcomes for child if performed > 5mins post arrest.

(May benefit maternal outcome also – as it removes the aortocaval compression, and decreases abdominal pressure.

CPR should continue during and after the procedure.

Consent not required)

**SAQ 3 (10 marks):**

This 45 year old woman presents to the Emergency Department in an agitated state. Examination reveals HR 150bpm, BP 105/45, temperature 38.1 C and respiratory rate 28/minute. There is no evidence of focal neurological findings on examination.



(a) What is the most likely diagnosis? (1 mark)

Graves Disease, hyperthyroid with exophthalmos and probable thyroid storm

(b) List 4 other important differentials you would consider as part of your assessment. (4 marks)

This is really the list of causes of a hyperthermic, altered mental state patient:

Toxicological causes including, amphetamines, cocaine, anticholinergic delirium, serotonin syndrome  
Sepsis, including pneumonia with hypoxia, intracranial sepsis (encephalitis/meningitis)  
Environmental Hyperthermia (would depend on the weather conditions)  
Neuroleptic malignant syndrome

Trauma (with environmental exposure to explain temp?)  
DKA (with sepsis)

(c) Outline 4 high priority emergency management interventions assuming your initial diagnosis is correct. (4 marks)

In view of the eye findings I would go with Thyroid storm.

Answer is more detailed than space allows, but is included to explain and cover options as a learning point

Mortality untreated approaches 90% and is due to CVS collapse.

1. Block peripheral effects  
beta blockade propranolol 0.5mg boluses IV up to 10mg or Esmolol 250-500 ug/kg bolus and 50-100 ug/min infusion.
2. Block thyroid hormone synthesis  
Propothiouracil 900-1200mg LD o/ng then 200-300mg 4-6/24  
Iodine na iodide 1gm IV 12/24 (use LiCO<sub>3</sub> in iodine allergic pts)
3. General supportive  
ABC stuff  
Correct dehydration/electrolyte disturbances  
Rx hyperthermia  
Corticosteroids (decreases T<sub>4</sub> -> T<sub>3</sub>)
4. Rx precipitating cause  
Eg trauma, surgery, infection, thyroxine OD, recent radioiodine exposure/iodinated contrast

**SAQ 4 (10 marks):**

**You have been invited to join your Emergency Departments Quality Improvement Workgroup**

**a). List the key steps in the Quality Improvement Cycle ? (4 Marks)**

*Plan - the change*

*Do - implement the change*

*Check - monitor and review the change - audit*

*Act - revise / review the plan and repeat the cycle*

*Exact wording not required statements consistent with concept will be given marks*

*Taken from Dunn Emergency Medicine Manual 5th Edition Volume 1 Chp 22 Pg 351*

**b). List 4 clinical indicators used in Emergency Medicine to measure clinical care and outcomes. (4 Marks)**

*ATS Compliance*

*% Access block*

*STEMI - time to angio / thrombolysis*

*Admission rates*

*DNW Rates*

*Number of deaths in ED*

*Time to antibiotics*

*Time to analgesia*

*NEAT Compliance*

*Trauma audits*

*Satisfaction surveys - patients or staff*

*Staff retention / sick leave*

*Patient complaints audit*

*Notes audits*

*Occupational health and safety audits - staff injuries or needle sticks etc.*

*Missed results audit*

**c). State 2 reasons why quality improvement is of value in the emergency department setting. (2 marks)**

- *identification of safety issues/deficits in care of patients enabling measures to be instituted to rectify thus improving outcomes and quality of care provided*
  - *comparison to other similar centres to see if performance is adequate or needs improving*
-

**SAQ 5 (10 marks):**

A 4 year old boy with a history of congenital heart disease, is brought to your Emergency Department after suffering a VF arrest. A number of DC shocks were unsuccessful and he remains in VF with CPR occurring. The ambulance crew have intubated at the scene, but were unable to obtain IV access.

a). List 3 medications which can be administered via the endotracheal route and the dose for each. (3 marks)

- Adrenaline 100mcg/kg
- Atropine 30mcg/kg
- Lignocaine 2-3mg/kg

b). Outline the steps for gaining intraosseous access in a paediatric patient in an arrest scenario (4 marks)

- Uninjured extremity, proximal tibial route (other options...)
- knee 30 degree flexed
- anteromedial surface of upper tibia, 1-3 cm below the tubercle
- Insert EZIO at 90 degree angle (with the needle directed away from the growth plate)
- Confirm placement by aspirating bone marrow, flush with NS
- Commence fluid/medication infusion as appropriate (must be syringed in under pressure)

3. List 3 possible complications of intraosseous puncture ? (3 marks)

- Infection
- through and through penetration of the bone
- haematoma formation
- pressure necrosis of skin
- SC infiltration/compartment syndrome
- Growth plate damage

**SAQ 6 (10 marks):**

A 25 year old man sustains facial injuries in a high speed motor vehicle crash in which he was the unrestrained driver.

His observations are:

GCS	15	
HR	100	/min
BP	130/75	mmHg supine
O <sub>2</sub> saturation	97%	room air



a) List 3 abnormal findings seen in the above photograph. (3 marks)

- Periorbital bruising bilaterally
- Facial swelling especially over the right zygoma
- Haemoserous nasal discharge
- Possible swollen tongue
- Chipped right upper incisor

b) What underlying injuries are of most concern given the above information (3 marks)

- Facial bone fractures
- Mandibular fracture
- Base of skull fractures
- Intracranial haemorrhage

c) Outline 4 potential clinical concerns potentially affecting management of this patient's airway? (4 marks)

- Swollen tongue – haematoma
- Direct trauma to airway
- ICH causing depressed GCS or cerebral irritation
- Blood loss into airway from facial fractures
- Potential difficult intubation; Mandibular fracture, Small mouth



### **SAQ 7** (10 marks)

You work in a rural emergency department with only basic specialties represented. An 80 year old man is delivered to your emergency department with an acute anterior ST elevation myocardial infarction. He has had severe central chest pain for 2 hours which is ongoing. He is anxious, pale and diaphoretic, with widespread crepitations heard throughout his lung fields. Obs reveal GCS 15, HR 100, BP 190/100, RR 24 and oxygen saturations 36.8 C Local retrieval services are unable to support transfer of this patient to a higher level facility for at least 4 hours.

- a) List 2 proposed clinical benefits of thrombolysis in this patient (2 marks)

Elderly man with early anterior STEMI confers significant benefits for mortality and morbidity. LV function both acute and long term improvements. Although PTCA is best option, it cannot be accessed in adequate time frame and pt has evidence of significant LV dysfunction clinically.

- b) List the absolute contraindications to fibrinolytic treatment in patients with acute myocardial infarction. (6 marks)

- Aortic dissection
- New neurological signs
- Significant head or facial trauma in past 3/12
- Any previous ICH
- Ischaemic stroke within 3/12
- Known intracranial AVM/neoplasm
- Acute pericarditis
- Acute bleeding

- c) Name 2 significant mortality risks associated with thrombolytic therapy in patients with acute myocardial infarction (2 marks)

- Major haemorrhage eg GIT
- Intracerebral haemorrhage
- Tamponade if given in pericarditis

Check out Bob's book pp110-115 which covers the above

**SAQ 8 (10 marks):**

A 21 year old male presents to the ED with severe asthma. He is receiving continuous nebulised salbutamol, bolus corticosteroid and a magnesium infusion. Despite these interventions he is noted to be increasingly drowsy and confused, with HR 150 bpm, sats 86% on 15 L/min O<sub>2</sub> via mask, RR 32/minute and temperature 37.9 C.

You decide to intubate this patient.

a) List 3 significant risks associated with intubating this patient (3 marks)

- Profound hypoxia, very limited time to cannulate the airway successfully, and likely uncooperative with preoxygenation if confused.
- Drowsy suggests raised pCO<sub>2</sub> and marked acidosis, will worsen with apnoea and risk of arrest
- Hypotension and hypoperfusion due to marked intrathoracic pressure limiting VR and CO
- Secondary measures high risk of failure eg LMA may not be adequate due to high airway pressures

b) List the medications and doses you would use (2 marks)

Ketamine 1.5 mg/kg

Suxamethonium 1.5-2 mg/kg

Other options may be reasonable eg fentanyl/midazolam

c) List the specific risks of ventilating this patient. (3 marks)

Post intubation hypotension

Lung hyperventilation

Barotrauma

Worsening of bronchospasm due to ETT stimulation

d) Given the risks listed above, outline your ventilator settings for this patient with particular attention to how they would differ from those in a nonasthmatic patient (2 marks)

- Adequate sedation and paralysis essential
- Permissive hypercarbia, aiming for adequate oxygenation
- May need to hand ventilate initially
- Prolonged I:E ratio allowing prolonged expiration time to reduce the risk of breath stacking and barotrauma
- Minimise TV and low RR, start with TV of 5ml/kg RR 6-8/minute
- Limit peak pressures
- Minimal PEEP where possible

**SAQ 9 (10 marks):**

A 45 year old man presents to the ED with an intensely itchy rash on his palm, as pictured in the photograph below.



- a) Describe 2 features of the rash pictured above (2 marks)

Erythematous

Linear Scaling suggestive of burrows

- b) Give the most likely Diagnosis and one differential (2 marks)

Scabies

DDx Insect bites, dermatitis, psoriasis

- c) What causes the itching? (1 mark)

Itch caused by reaction to the faeces, eggs and the mites themselves during later disease

- d) How can the diagnosis be confirmed? (1 mark)

Response to treatment, skin scrapings or clinical features: worse at night and during winter, tends to affect multiple household members, if undiagnosed lasts for years.

- e) What treatment and advice would you give the patient? (4 marks)

*Scabicide – e.g permethrin*

*Antihistamines- tablets or creams*

*Steroid cream/ointment- 1% hydrocortisone*

*Advise thorough hygiene and treatment of all household members*

*advise to boil wash all clothing and bedding*

*See GP if not effective or returns*

**SAQ 10 (10 marks):**

A 24 year old woman has just died in your ED despite active resuscitation after sustaining massive head injuries in a motor vehicle accident. Police are in attendance but her family members are unaware of the situation.

a): List in point form the major steps you will take to break this bad news to her family. (6 marks)

Do not tell them over the phone

Say relative is unwell and they need to attend urgently

On arrival, greet in person

Delegate other roles so you will be uninterrupted

Have another staff member present

Introduce yourself and confirm identity and relationship to deceased of all present

Find out what they already know

Summarise what has happened and state that the patient has died

Do not use euphemisms

Allow whatever form of grief reaction occurs the time and space needed

Ask for and answer questions

Allow viewing of body

Use touch to comfort if appropriate

Offer food and drink

Give access to telephone

Offer pastoral care referral

b) List 4 circumstances in which a death must be reported to the coroner? (4 marks)

Where there is any suspicion the death is not from natural causes

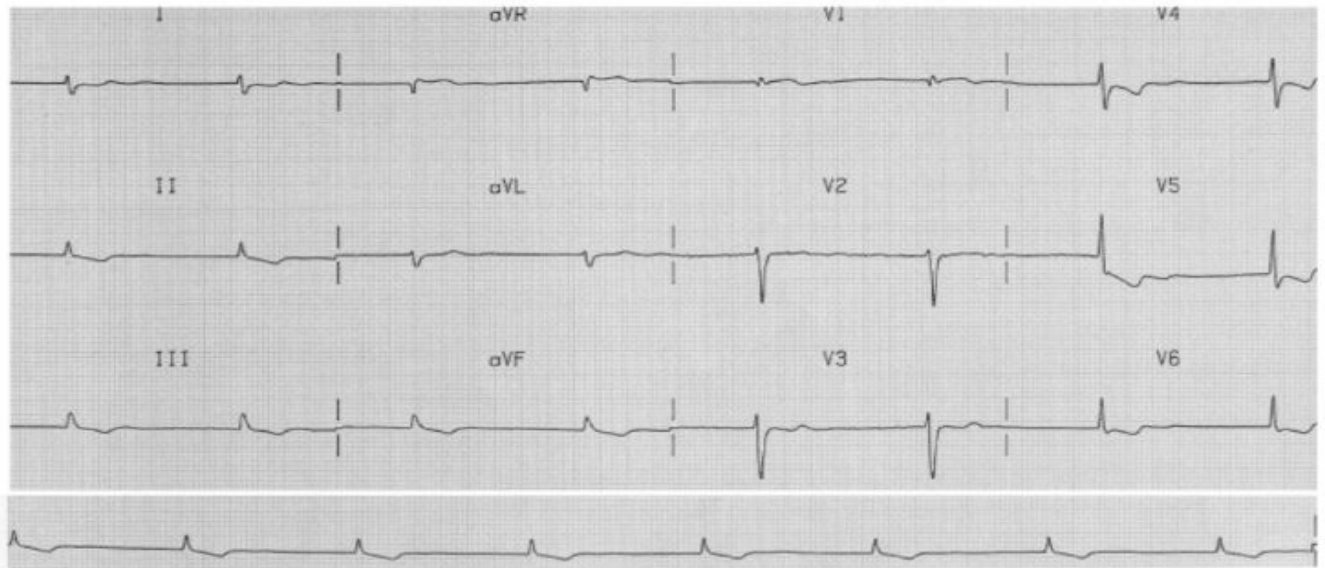
Additional material (may vary from state to state)

The term "reportable death" means a Western Australian death –

- that appears to have been unexpected, unnatural or violent or to have resulted, directly or indirectly, from injury;
- that occurs during an anaesthetic;
- that occurs as a result of an anaesthetic and is not due to natural causes;
- of a person who immediately before death was a person held in care
- that appears to have been caused or contributed to while the person was held in care;
- that appears to have been caused or contributed to by any action of a member of the Police Force;
- of a person whose identity is unknown;
- that occurs in Western Australia where the cause of death has not been certified under section 44 of the Births, Deaths and Marriages Registration Act 1998;
- (that occurred outside Western Australia where the cause of death is not certified to by a person who, under the law in force in that place, is a legally qualified medical practitioner.

**SAQ 11 (10 marks):**

A 65 year old man is sent to your ED by his LMO with confusion and vomiting. He is known to be on Digoxin to treat AF. He has a BP 95 systolic and HR 40/minute at triage. Bloods performed by his LMO earlier in the day reveal: Na 142, K 6.7, Creatinine 502 and Urea 50.1. A digoxin level has been sent but the result is not yet available. An ECG is performed on arrival:



- a) List 3 features of this patient's ECG that confirm your clinical suspicion of digoxin toxicity. (3 marks)

Supraventricular bradycardia ?slow AF as no visible p waves  
T wave inversion and ST depression inferolaterally,  
Reverse tick sign laterally and prominent u waves laterally

- a) Name an 2 indications for digibind treatment *in this patient* and 2 other general indications. (4 marks)

Haemodynamically unstable bradyarrhythmia and symptoms in presence of renal impairment

Generally: Cardiac arrest  
Any symptoms in presence of impaired renal function  
Moderate-severe GIT symptoms  
K>5.0 mmol/L (acute)  
Serum digoxin >15 nmol/L (acute)

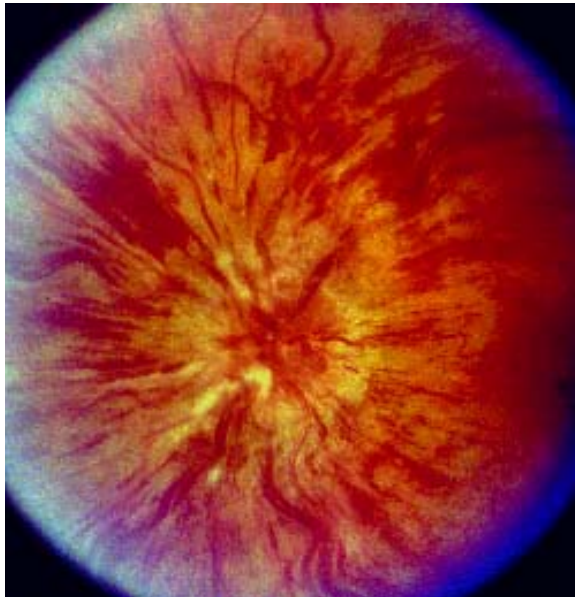
- b) List 3 further treatments specific for this patient and give a brief reason justifying each. (3 marks)

Atropine 0.6-1.2mg IV for bradycardia (unlikely to be successful)  
Insulin/dextrose to Rx hyperK  
IV fluid bolus 20ml/kg to aid hypoperfusion

**SAQ 12. (10 marks)**

A 65 year old male attends complaining of loss of vision in his left eye

Fundoscopy of his eye is shown below



- a) List six features you would enquire about in the history (3 marks)

*Visual acuity*

*Flashers/floaters/ amaurosis fugax*

*trauma*

*headache/temporal pain/ systemic upset*

*neurological signs or symptoms*

*eye pain*

*previous medical history e.g. AF, TIA*

- b) Name 2 abnormalities of the fundus photograph above. (2 marks)

*Venous engorgement*

*Widespread haemorrhage*

*Sunset appearance*

- c) What is the diagnosis? (2 marks)

*Central retinal vein occlusion*

- d) Give 3 known associations of this condition (3 marks)

*Trauma –closed head injury*

*Vasculitis*

*Hypercoagulability states*

*Alcohol*

*glaucoma*

*HT*

*DM*

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**SAQ 13** (10 marks)

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A 4 year old boy is brought to your Emergency Department having sustained a 4 cm eyebrow laceration following a fall at a playground. He is accompanied by his mother. You plan to suture the wound under procedural sedation using ketamine.

**a) List 4 contraindications to ketamine use in this patient ? (4 Marks)**

- 
- Parental refusal
- Procedural required unsuitable for ketamine sedation
- Inadequate staffing / area / equipment
- Previous adverse reaction to Ketamine
- Altered conscious state
- Unstable patient: seizures, vomiting, hypotension
- Cardiovascular disease - heart failure, uncontrolled hypertension, congenital heart disease
- Procedures involving stimulation of posterior pharynx
- Known airway instability or tracheal abnormality
- Psychosis
- Thyroid disorder or medication
- Porphyria
- Risk of raised intraocular or intracranial pressure
- Active pulmonary infection or disease including acute asthma and URTI
- Full meal within 3 hours (relative contraindication only, balance risk against urgency of procedure)

**b) List 4 potential side effects/complications associated with ketamine use in this patient. (2 Marks)**

- *Airway obstruction*
- *Nystagmus*
- *Muscle rigidity*
- *Random movements (can resemble seizure like activity)*
- *Vomiting (during or after procedure)*
- 
- *Emergence phenomena*
- *Apnoea*
- *Failed procedure (need for a General Anaesthesia)*
- *Hypersalivation*

**c) Complete the following table regarding ketamine usage in paediatric procedural sedation by route of delivery (4 Marks)**

	Intra-muscular (i.m)	Intra-venous (i.v)
Initial dose	<i>4 mg/kg</i>	<i>1-1.5mg/kg</i>
Top-up dose	<i>2 mg/kg</i>	<i>0.5 mg/kg</i>
Important Advantage	<i>No IV reqd Longer duration action</i>	<i>More predictable Quicker onset Easier titration</i>
Important Disadvantage	<i>Pain/distress from IM Longer duration to onset</i>	<i>IV line required Shorter duration action</i>

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**SAQ 14** (10 marks)

An 82 year old woman is brought in by ambulance on the third day of a heat wave with an altered conscious state.

Her observations are: HR 98 bpm and regular, BP 86/54, RR 38/min, Core temperature 42.3, O2 saturations 94% on room air, GCS 12.

a) List the potential risk factors for heat stroke in this patient (4 marks)

- Inappropriate adaptations to heat eg inappropriate clothing, esp if underlying confusion.
- Coexistent medical conditions eg cardiac failure decreases ability to thermoregulate
- Medications eg anticholinergic effects of TCADs for depression
- Dehydration from inadequate fluid intake
- Alcohol use

b) Outline the cooling modalities you could employ to reduce this patient's core temperature (6 marks)

- Least to most invasive (ie in the order you would employ them in the clinical setting):
- Remove clothing
- Ice packs to groin/neck/axillae
- Spray mist and fan
- Cooling blankets
- Cooled IV replacement (with caution due to risk of high output failure)
- Intubate, paralyse (avoid shivering) and ventilate early if for full measures, high risk of seizures/aspiration and facilitates more invasive measures
- Cold water lavage –rectal, gastric or peritoneal lavage
- Cardiopulmonary bypass



**15 (10 marks)**

A 55 year old man is brought to the ED after being found collapsed at home. He has a medication alert bracelet indicating he has type 1 diabetes.

His observations are:

GCS 12, BP 90/60, HR 130, RR 30, Temperature 38 C

A photograph of the patients left thigh is shown below.



- a) Name 2 possible differential diagnoses for this patients presentation (2 marks)

*Necrotising fasciitis*

*Gas gangrene*

- b) List 3 potential complications this patient is currently at significant risk for. (3 marks)

*Loss of limb*

*Septic shock (already evident)*

*Multiorgan failure and death*

- c) Outline the 5 most urgent mortality reducing emergency room interventions that you would institute on his arrival in your emergency department. (5 marks)

- *RESUS –aggressive fluids/blood as reqd. Avoid vasopressors if possible as may worsen muscle ischaemia and necrosis*
- *Antibiotics –broadpectrum eg meropenem*
- *Surgical referral for urgent debridement =mainstay of rx*
- *Maintain euglycaemia*
- *Other supportive care/Mx complications/causes*

SAQ16. A 10 year old girl is brought to your emergency department with a sore arm after falling off a wall. On examination she has marked swelling and pain in the Right elbow and a graze on her left forehead.  
Her lateral elbow xray is shown below.



- a) List three features which are required to “clinically clear the neck” in the absence of radiological imaging. (3 marks)

GCS 15

No midline bony tenderness

No focal neurology

No distracting injury

No drug/alcohol intoxication (hopefully less likely in a child!)

Presence of head control and ROM

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- b) Name 2 potential neurological complications of this injury and how you would test for each. (4 marks)

- *Median nerve palsy- reduced sensation over the palm, reduced thumb opposition and wrist palmar flexion*
  - *Radial nerve – reduced sensation thumb, reduced wrist dorsiflexion*
  - *Ulnar nerve -*
- 

- c) Name 3 other possible complications of this patients elbow injury. (3 marks)

- *brachial artery injury/impingement with ischaemia to distal upper limb*
- *open injury with secondary infection (osteomyelitis/septic arthritis)*
- *functional impairment with decreased ROM at elbow joint*

**SAQ 17** (10 marks)

A 67 year old man presents to your emergency department complaining of a painful rash to his face which started 2 days ago. A photograph of the rash is shown below.



- a) Name the most likely diagnosis (1 mark)

*Herpes Zoster ophthalmicus*

- b) List 3 criteria which must be met to safely discharge this man home. (3 marks)

*Able to be adequately analgesed with oral medication*

*Mobilising safely independently*

*Able to manage self care*

*GCS 15 (no confusion)*

- c) Outline the salient points of your discharge management and advice for this patient (6 marks)

*Analgesia –dose and advice*

*Antiretroviral rx – dose duration*

*Advice re contagious issues avoidance of non immune chickenpox esp pregnant, immunosuppressed contacts*

*Eye care –f/up, patch, lubricant, risks*

**SAQ 18.** (10 marks)

A 38 yr old pregnant woman 35 weeks pregnant presents with visual disturbance and headache. Her Blood pressure is 165/100.

Some of her investigation results are listed below:

<b>CBE</b>		<b>UA</b>	<b>LFT</b>	
Hb	8.1	Blood ++	Bil	12
Plt	50	Protein++++	AST	1000
WCC	5.1	Nitrates -	GGT	817

poikilocytes seen

- a) List the possible complications of her likely diagnosis. (4 marks)

*=HELLP syndrome  
Placental abruption  
Spontaneous splenic/hepatic haemorrhage  
Endorgan failure  
ICH  
IUFD  
Raised ICP/cerebral oedema/seizures*

- b) What is the definitive treatment for her primary pathological condition? (1 mark)

*Delivery of the fetus.*

- c) Outline the management priorities for her emergent management. (5 marks)

- *Control BP/reduce risk of seizures*

*MgSo4 IV bolus 4gm over 5 mins plus repeat 2 g, followed by 2gm/hour infusion*

*(monitor serum levels (2.0-3.0 mmol/L and clinically loss of reflexes and resp depression indicate toxicity)*

*if diastolic remains >105*

*Hydralazine (5-10mg over 2-4mins, followed by infusion 5-10mg/hr aiming for adequate perfusion of mother and fetus and improved mental status/ improved symptoms*

*Nimodipine/labetalol third line*

- *thrombocytopenic/coagulopathy (HELLP)*

*-platelets, FFP replacement as indicated, avoidance of central access in noncompressible sites*

- *analgesia*
- *explanation to patient/partner*
- *early involvement obstetrics/neonatology and ICU*
- *consider steroids for fetal lungs maturity in view of potential imminent delivery*

**SAQ 19:** (10 marks)

A 42 year old man has been found outside your emergency department fitting. He is dishevelled and smells strongly of alcohol.

- a) Name 4 possible underlying causes of this patient's presentation and how you would clinically prove/disprove the presence of each (6 marks)

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*Hypoglycaemia –confirmed by low BSL*

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*Subdural haematoma –evidence of head trauma on clinical examination  
-CT head required to confirm/exclude*

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*Alcohol withdrawal –absence of 1<sup>st</sup> 2 causes and low or negative BAL makes this more likely*

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*Underlying epilepsy –evidence of past history in notes, from family/LMO or evidence on antiepileptic medication (meds with patient)*

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- b) Outline steps you could take to gather collateral information to aid in your assessment of this patient. (4 marks)

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*Identify patient*

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*Old medical records/dc summaries if available*

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*Discuss with family members/NOK*

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*Discuss with Local GP or pharmacist*

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**SAQ 20:** (10 marks)

A 15 month child is brought to your emergency department by his parents, following a 3 day history of a viral illness with a maculopapular rash. On the day prior to presentation his parents report he had bouts of colic but had been eating and drinking and had been otherwise settled. On examination he looks unwell, has evidence of blood stained diarrhoea in his nappy and a capillary refill time of 3 seconds. As part of your assessment an abdominal xray is performed and is shown below.



a) What is the likely diagnosis? (2 marks)

*Intussusception ?secondary to HSP (note rash not classic)*

b) List 3 factors which may predispose to this condition. (3 marks)

*Viral illness*

*cystic fibrosis*

*benign or malignant bowel tumours*

*Meckel's*

*coagulopathies e.g HSP- causing haematomas*

*sutures and staples*

*inverted appendiceal stump*

*Male gender*

c) What are his estimated fluid requirements (showing calculations) for the next 24 hours? (5 marks)

*Estimated weight (age+4) x2 =10kg*

*Fluid requirements:*

*Replacement (including resus) + maintenance +ongoing losses*

*Resus if hypoperfused =20ml/kg bolus and repeat if required, Nsaline*

*Replacement based on estimated deficit % of body weight minus resus fluid, fluid?*

*Maintenance 4ml/kg/hr 1<sup>st</sup> 10kg (+2ml/kg/hr 2<sup>nd</sup> 10kg and 1ml/kg/hr 3<sup>rd</sup> 10kg), fluid??*

*Ongoing losses, monitor nappy weight for UO and any vomitus and replace 4 hourly the prior 4 hour amount, fluid?*

**SAQ 21:** (10 marks)

A 60 year old man comes to A&E with his sister. She says he has been withdrawn and quiet lately, and has been saying he wants to die.

- a) Give 6 important factors you would consider in assessing his risk of suicide. (6 marks)

*Sex –increased risk for males*  
*Age –older patients are generally higher risk*  
*Depression- H/O*  
*Previous attempt at suicide*  
*Excessive alcohol/drugs*  
*Rational thinking loss*  
*Separated/divorced/widowed*  
*Organised/serious attempt*  
*No social support*  
*Suicide intent for the future*

- b) Outline 4 key factors you would consider in determining if this patient required inpatient or outpatient management of his depression. (4 marks)

Indications for inpt management include:

High level of ongoing suicidality with definite or preconceived plans for method.  
Lack of social support  
Previous high lethality suicide attempts  
Presence of psychotic features  
Inability to manage self care due to severe depression



**SAQ 22:** (10 marks)

A 28 year old man has been out kite surfing and was thrown into the water at high speed. He is brought in on a spinal board with C-spine protection. He was intubated and ventilated for retrieval and a morphine and midazolam infusion is being used for sedation. He has had no paralysing agents since he was intubated 3 hours earlier. His observations on arrival are pulse 65 bpm and BP 90/60. He is peripherally warm and well perfused. Assessment performed indicates an isolated injury as shown on the lateral Cervical spine xray below.



a) List three concerning abnormalities on this xray. (3 marks)

- *# body C4*
- *loss of space C3-4*
- *Prevertebral soft tissue swelling*
- *Burst fracture*

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b) What is the likely diagnosis? (2 marks)

*Unstable C4 fracture with spinal cord injury and spinal shock*

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c) Name 5 other features of examination which would support this diagnosis. (5 marks)

*Hypotension and bradycardia*

*Priapism*

*Pink, well perfused peripheries,*

*Flaccid paralysis below level C4,*

*Loss of sensation*

*Very weak respiratory effort or evidence respiratory failure*

*Loss of anal sphincter tone*

*Evidence urinary retention*

**SAQ 23** (10 marks)

A 35 year old male attends your department. His partner is HIV positive and is currently being treated for pulmonary Tuberculosis. The results of a blood gas performed on 15 L/min O<sub>2</sub> via mask and his CXR are shown below.

pH 7.44  
pCO<sub>2</sub> 30mmHg  
pO<sub>2</sub> 124mmHg  
Bicarb 22 mmol/L  
B.E. -1



a) List the concerning features of the CXR. (2 marks)

*Marked consolidation left upper lobe,  
No clear evidence cavitation*

b) Excluding TB give 2 differentials diagnoses of this presentation. (2 Marks)

*Left upper lobe pneumonia  
Aspergillosis  
Pneumocystis  
Psitticosis  
Pneumonitis- viral*

c) Detail the top 3 management priorities for this patient in the emergency department. (6 marks)

- Isolation to protect staff and other patients/negative pressure room, mask in place until this has occurred*
- Ab therapy to cover for standard and HIV related respiratory infection, with early thoracic consult regarding further Ix/Mx possible TB. Give detail of ab therapy you would use.*
- Explanation to patient and partner*
- Supportive therapy, maintain hydration, oxygenation, treat complications*

**SAQ 24:** (10 marks)

A previously well 2 year old boy presents acutely unwell with tachypnoea and abdominal pain. VBG results are shown below.

PH 7.20  
PCO2 25  
BIC 10  
BASE EXCESS -16.4  
K 4.5  
NA 138  
CL 96

- a) List the further investigations you request at this time with justification for each. (7 marks)

*BSL –r/o hypoglycaemia*

*Hb –may be significantly lowered if intrabdominal haemorrhage*

*WBC –nonspecific –but high elevation in infection/inflammatory conditions and abnormal cell lines if underlying/undiagnosed leukaemia etc*

*Cr/Urea –rule in/out acute renal failure*

*LFTs –elevated in some tox (eg paracetamol) or primary liver diagnoses eg.*

*Consider tox screens as guided by full Hx/exam for eg serum iron/salicylate/paracetamol levels*

*UA –glucose/protein to support DKA, blood if renal trauma, nitrites, wbc if Urosepsis*

*CXR –free gas if intrabdominal perf, pneumonia as a cause*

*FAST scan at bedside –looking for intrabdominal fluid ?blood ?ascites secondary to liver failure, and to r/o cardiac tamponade as a potential obscure cause of hypoperfusion*

*Further investigations as guided by Full Hx/Ax and other results may include:*

*CT abdomen, formal USS abdomen, air insufflation enema if intussusception, formal skeletal survey if NAI suspected*

- b) What are the 3 most concerning potential diagnoses for this child. (3 marks)

*DKA*

*Intrabdominal surgical emergency eg*

*Toxicological eg Iron Overdose*

*NAI with intrabdominal injury*

*Sepsis eg urosepsis, pneumonia*

**SAQ 25:** (10 marks)

A 24 year old sub-mariner is brought to your emergency department after he made a rapid ascent from 30 meters during naval exercises off the coast. He is complaining of extreme vertigo and was dyspnoeic shortly after the rescue.

- a) What are the possible aetiologies of his symptoms in this setting? (5 marks)
- *Descent barotrauma:*  
*barotitis middle ear +/- drum rupture*  
*inner ear barotrauma*
  - *Ascent barotrauma:*  
*Pneumothorax*  
*Air in middle ear (under pressure)*
  - *DCS: type 2 (Likely vestibular)*
- b) Outline the key points of assessment which would be most discriminatory in enabling you to distinguish between the aetiologies you are considering. (5 marks)

History

*dive, depth, length, events etc...*  
*recent flights since dive*

EXAM

*Otoscopy –may show bleeding/drum rupture, but wont exclude DCS*

*Neuro exam –focal CNS signs, nystagmus, ataxia*  
*Sharpened rhombergs*

Ix

*CXR –pneumothorax*

*?CNS imaging or straight to HB chamber*

**SAQ 26:** (10 marks)

A 3 year old boy presents with acute onset of wheeze and cough. On examination he is pale, respiratory rate 50 breaths/minute, blood pressure 90/60, pulse rate 180 bpm and oxygen saturation on room air of 92%.

a) Tabulate the normal range of vital signs with age (6 marks)

Age	Heart rate bpm	Blood pressure (SBP mmHg)	Respiratory rate Breaths/min
<1	110-160	70-90	30-40
2-5	95-140	80-100	25-30
5-12	80-120	90-110	20-25
>12	60-100	100-120	15-20

b) List the differential diagnoses you would consider in this child. (4 marks)

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*Foreign body airway/lungs*

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*Acute asthma*

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*Anaphylaxis*

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*Trauma incl NAI*

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*Toxicological cause eg*

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*Acute resp infection eg pneumonia/bronchiolitis etc..*

**SAQ 27:** (10 marks)

A 52 year old man is brought to your emergency department via ambulance after he lost control of his motorcycle at 80 km per hour on a bend and was flung several metres onto a bitumen road. He was wearing a helmet and full protective leathers. His presentation is complicated by the pre-existing history of a mitral valve replacement and ongoing warfarin therapy. His INR was 3.1 when checked by his LMO last week.

On assessment he complains primarily of abdominal and back pain and tenderness. He is currently haemodynamically stable, GCS 15 and early bedside investigations including CXR, pelvic Xray and fast scan reveal no concerning injuries.

- a) List the pertinent risks and benefits to consider when determining whether reversal of this mans anticoagulation should occur. (6 marks)

RISKS:	BENEFITS:
Depending on MVR type –metallic or older types significant risk of clotting/embolic complications on reversal (cf porcine valves minimal risk)  Eg risk of valve clotting, CVA, mesenteric ischaemia 2ndry to embolus	Prevent ICH, other life threatening haemorrhage eg intrabdominal, retroperitoneal 9significant risk as high risk mechanism and clinically has pain etc)
Infection risks/fluid overload...standard risks of blood products	Avoid potential need for significant transfusion and complications of same

- b) What agents would you use and in what doses if you decided to reverse his anticoagulation. (4 marks)

- *FFP 150-300ml IV initially*
  - *Prothrombinex 25-50 IU/kg IV*
  - *Vitamin K dose 5-10mg IV*
  - *Recheck INR and review need for further doses reversal*
-

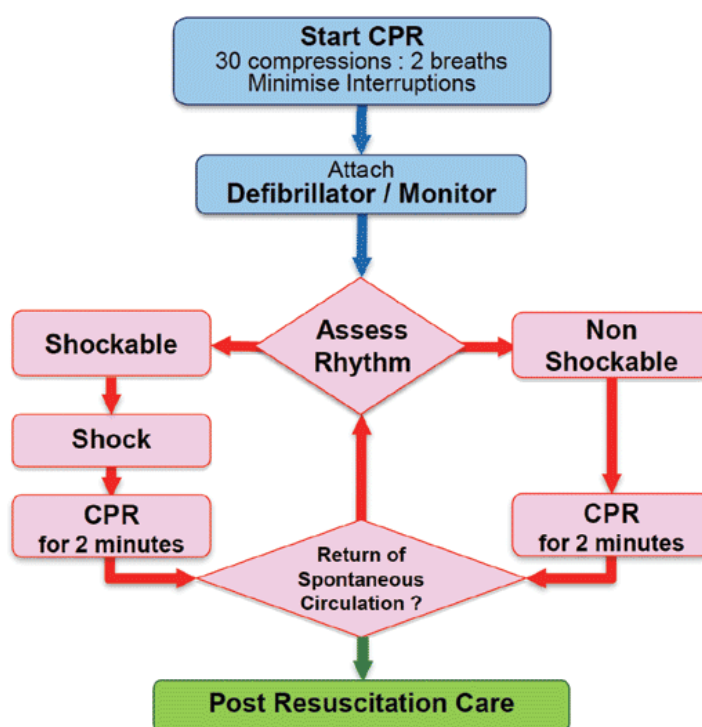
**SAQ 28:** (10 marks)

A 35 year old man is flown in by air ambulance after being found unconscious in a remote area of bushland in winter. He is in asystole and the ambulance officers are currently performing CPR. His temperature is 28.6° C.

- a) Please outline in table form the current advanced life support algorithm for asystolic arrest? (6 marks)



## Advanced Life Support for Adults



### During CPR

Airway adjuncts (LMA / ETT)  
Oxygen  
Waveform capnography  
IV / IO access  
Plan actions before interrupting compressions  
(e.g. charge manual defibrillator)  
Drugs  
Shockable  
\* Adrenaline 1 mg after 2<sup>nd</sup> shock  
(then every 2<sup>nd</sup> cycle)  
\* Amiodarone 300 mg after 3<sup>rd</sup> shock  
Non Shockable  
\* Adrenaline 1 mg immediately  
(then every 2<sup>nd</sup> cycle)

### Consider and Correct

Hypoxia  
Hypovolaemia  
Hyper / hypokalaemia / metabolic disorders  
Hypothermia / hyperthermia  
Tension pneumothorax  
Tamponade  
Toxins  
Thrombosis (pulmonary / coronary)

### Post Resuscitation Care

Re-evaluate ABCDE  
12 lead ECG  
Treat precipitating causes  
Re-evaluate oxygenation and ventilation  
Temperature control (cool)

December 2010

- b) What are the major modifications to this algorithm in the case of significant (environmental) hypothermia? (4 marks)

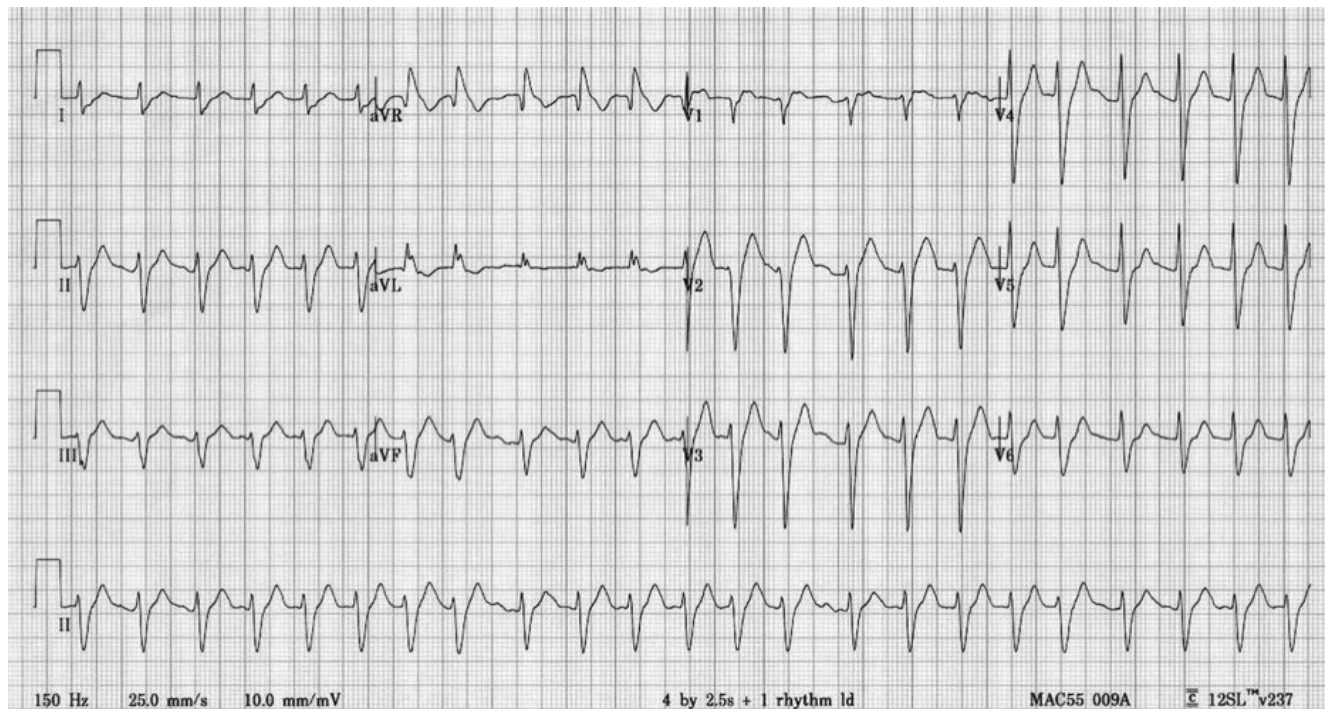
- *Start and continue ALS until patient is rewarmed (Temp  $\geq 32^{\circ}\text{C}$ ) unless other obvious lethal injuries present*
- *Withhold drugs until temp  $\geq 30^{\circ}\text{C}$  then double interval between giving drugs until temp  $\geq 32^{\circ}\text{C}$*
- *Can defibrillate initially 3 x if in VF/VT but then cease (as no effect) until temp  $\geq 30^{\circ}\text{C}$*
- *Main therapy is re-warming*



**SAQ 29:** (10 marks)

A 46 year old man is brought to your emergency department by ambulance following an overdose of unknown medications. He has had a brief generalized seizure en route. His observations on arrival and initial ECG are shown below.

GCS	12		
BP	85/60	mmHg	
Temperature	37.0	°C	
O <sub>2</sub> Saturation	100	%	on 8 L/min O <sub>2</sub>



- a) Give the most likely diagnosis and the abnormal ECG findings which support it. (5 marks)

*Na channel blocker overdose eg TCAD, dextropropoxyphene...*

*Positive r wave aVR, tachycardia (?AF as irreg??) QRS >100ms*

- b) Outline the key management priorities for this patient (5 marks)

*Resuscitation include Reversal of Na channel blockade:*

*IV access –Na bicarb 100mmol bolus, repeat till narrowed QRS*

*Intubate and hyperventilate –modified RSI with gentle handbagging to avoid worsening resp acidosis, drugs fentanyl/midaz and sux*

*20ml/kg crystalloid*

*Consider NAD only if BP not responding to above (bicarb and alkalinisation acts to reduce myocardial depression and peripheral vasodilatation caused by na channel blockade)*

*Supportive, complications, Rx coingestants: maintain/correct temp, BSL, electrolytes (esp k which may decrease secondary to alkalinisation)*

*Decontamination: once stable and secure airway can give NGT charcoal 50gm –not critical, TCAD rapidly absorbed, may help if coingestants*

*Psychiatric; detain/f/up when medically appropriate*

*Family explain/counsel*

*Disposition:ICU*

**SAQ 30:** (10 marks)

A 4 year old child presents to your emergency department having developed a limp over the last 4 hours. The child looks well, is afebrile, but refuses to place its left foot on the ground.

Question would ve been better focussing on historical features rather than exam as that's where the money is at.

**a) What diagnoses would you consider most likely in this child? (4 marks)**

A list of possible diagnoses, but which are most likely?? Lets discuss as a group:

Trauma	Juvenile arthritis
Infection –usually appear ill/febrile esp if OM/septic arthritis or cellulitis	Perthes
Tumour/leukaemia other malignancy	Leg length discrepancy
Serum sickness	RF
Transient synovitis	Haemophilia
	HSP

**b) What examination findings would you seek to aid in making a definitive diagnosis and to guide your investigation choice? (6 marks)**

*Which findings are most discriminatory ie help you differentiate between the possible causes?*

*Absence of fever/Systemically well infective causes unlikely (almost always have fever, localising signs)*

*Transient synovitis preferentially held in abdn and ext rotn, rom possible (cf septic arthritis)*

*Trauma NAI or other: evidence of bruising/abrasion, other injuries*

*Perthes; may have thigh muscle atrophy and limb shortening if severe/late, decreased hip abdn and int rotn reduced*