Admin SAQ's

SAQ 1

You have been asked by the Head of your Emergency Department to give a presentation on Access Block and the National Emergency Access Target (NEAT).

a. What is the definition of Access Block ? (2 Marks)

b. What is the National Emergency Access Target ? (2 Marks)

c. Outline potential solutions to improving Access Block & Overcrowding (6 Marks)

Answers

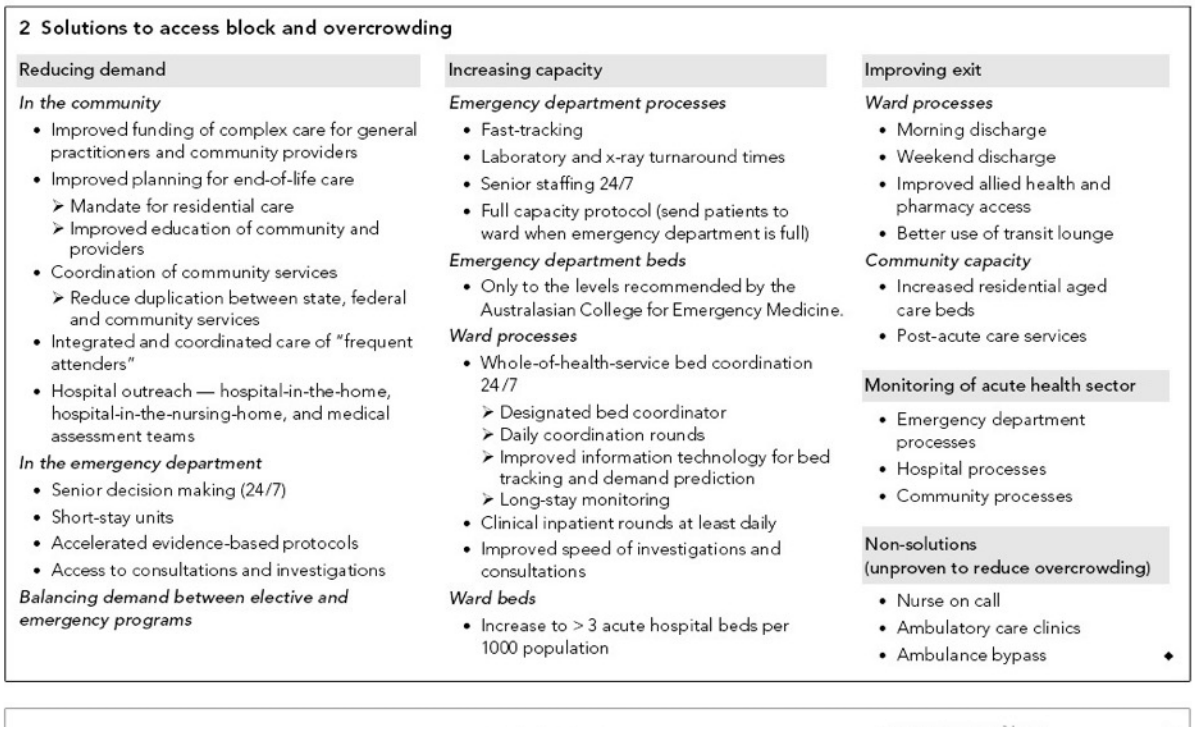
a) *This refers to the percentage of patients who were admitted or planned for admission but discharged from the emergency department (ED) without reaching an inpatient bed, transferred to another hospital for admission, or died in the ED whose total ED time exceeded 8 hours, during the 6 month time period. Taken from ACEM Policy on Standard Terminology P02v4 March 2009*

1 Mark for recognising proportion / percentage of patients who do not reaching in-patient bed
1 Mark for accurate time frame of exceeding 8 hours

b) *The National Emergency Access Target requires that by 2015, 90% of all patients presenting to a public hospital Emergency Departments will be admitted, transferred or discharged within four hours - Applies to all of Australia. Taken from WA Government Emergency Access Reform Web Site. NOTE - New Zealand Access Time Target is 95% within six hours.*

1 Mark for correct percentage of patients to be admitted.
1 Mark for correct time frame of within 4 hours.

c)



2 Solutions to access block and overcrowding

Reducing demand

In the community
- Improved funding of complex care for general practitioners and community providers
- Improved planning for end-of-life care
  - ➢ Mandate for residential care
  - ➢ Improved education of community and providers
- Coordination of community services
  - ➢ Reduce duplication between state, federal and community services
- Integrated and coordinated care of "frequent attenders"
- Hospital outreach — hospital-in-the-home, hospital-in-the-nursing-home, and medical assessment teams

In the emergency department
- Senior decision making (24/7)
- Short-stay units
- Accelerated evidence-based protocols
- Access to consultations and investigations

Balancing demand between elective and emergency programs

Increasing capacity

Emergency department processes
- Fast-tracking
- Laboratory and x-ray turnaround times
- Senior staffing 24/7
- Full capacity protocol (send patients to ward when emergency department is full)

Emergency department beds
- Only to the levels recommended by the Australasian College for Emergency Medicine.

Ward processes
- Whole-of-health-service bed coordination 24/7
  - ➢ Designated bed coordinator
  - ➢ Daily coordination rounds
  - ➢ Improved information technology for bed tracking and demand prediction
  - ➢ Long-stay monitoring
- Clinical inpatient rounds at least daily
- Improved speed of investigations and consultations

Ward beds
- Increase to > 3 acute hospital beds per 1000 population

Improving exit

Ward processes
- Morning discharge
- Weekend discharge
- Improved allied health and pharmacy access
- Better use of transit lounge

Community capacity
- Increased residential aged care beds
- Post-acute care services

Monitoring of acute health sector
- Emergency department processes
- Hospital processes
- Community processes

Non-solutions (unproven to reduce overcrowding)
- Nurse on call
- Ambulatory care clinics
- Ambulance bypass

1 Mark per entry to maximum of 6 marks- a maximum of 3 marks can be given for Emergency Department specific strategies i.e. for full marks must include minimum of 3 hospital or community based strategies. Table taken from Cameron PA, Joseph AP, McCarthy SM. Access block can be managed. MJA 190;7:364-368. April 2009.

SAQ 2

1. You are about to see a 4 year old child in ED. Name 3 people considered to have parental responsibility (3 marks)

2. Name 3 subsets of emergency department patients who might not be able to consent (3 marks)

3. You are dealing with a hypotensive 6 year old child who was involved in an accident. Pt has free fluid in the abdomen on FAST scan. You need to urgently transfuse the child but parents are Jehovah witnesses and are opposing transfusion. Name 2 immediate steps you would take in this situation (2 marks)

4. What is the legal age of consent in Australia? (1 mark)

5. What is the single most important factor that prevents a medical practitioner from legal hassle in an emergency situation? (1mark)

(No answers available)

SAQ 3

1. Name a few types of consent in the ED (2 marks)

2. Name 2 situations when you would seek a written consent from your patient in the ED (2 marks)

3. You are going to perform a chest drain on a conscious patient. He is a 60 year old man with history of COPD who has 50% pneumothorax. His vitals - pulse 90, BP 140/80 mmHg, RR 28, Sats 93 % on 2L NP Oxygen. Take us through the process of obtaining consent from your patient (6 marks)

(No answer available)

SAQ 4

1a) Define triage (3 marks)

b) What are the underlying principles of triage? (2 marks)

c) Populate the following table with the correct values (5 marks)

ATS Category	Max waiting time	ACEM target % seen in time
ATS 1		
ATS 2		
ATS 3		
ATS 4		
ATS 5		

Answers

a)

Answer must include: a process for sorting patients based on the urgency of need for medical care (3 marks)

b)

Answer must include equity (or justice/fairness) and efficiency (2 marks)

May also mention ongoing process, doing the greatest good for the greatest number, fairness/appropriateness of treat those in greatest need ahead of those who arrived before them.

c)

ATS Category	Max waiting time	ACEM target % seen in time
ATS 1	immediate	100%
ATS 2	10 minutes	80%
ATS 3	30 minutes	75%
ATS 4	60 minutes	70%
ATS 5	120 minutes	70%

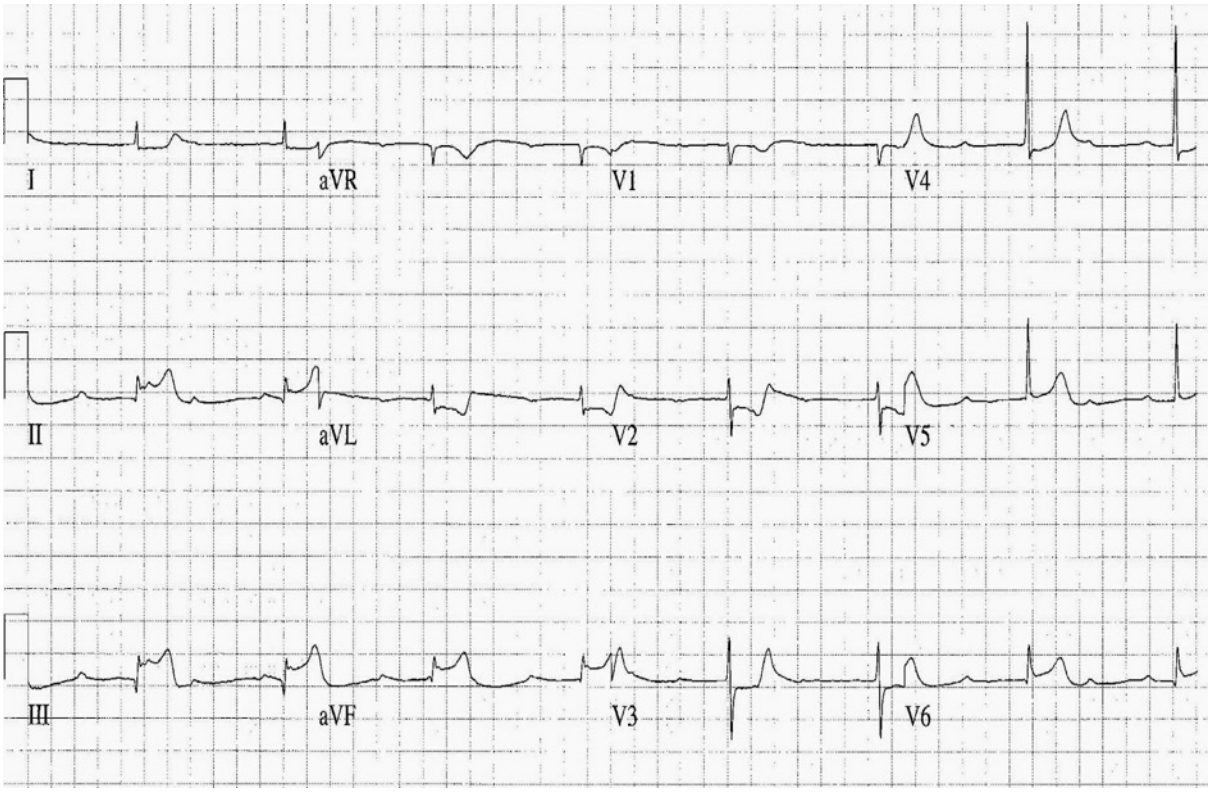
Cardiology SAQ's

SAQ 1

A 60 year old male presents to you Emergency Department complaining of chest pain for the last 2 hours. He has no known medication history and does not take any regular medications.

His ECG on arrival is below.

a. **What is your interpretation of his ECG ? (3 Marks)**



b. **b. The patient's blood pressure is 80mmHg. Outline the key steps in managing his hypotension. (4 Marks)**

c. **The cardiology team have advised you to commence the patient on a vasoactive agent to improve his blood pressure. List 3 appropriate inotropes / vasopressors and their dosing below. (3 Marks)**

Answers

a)

Inferior STEMI - 1 Mark
Complete heart block - 1 Mark
1 Mark for any of:
Possible RV involvement (STE III>II)
Possible posterior involvement (Flat ST depression V2-3)
Bradycardia

b. *Main priority revascularisation - angioplasty / thrombolysis - 1 Mark*

Cautious fluid bolus -must acknowledge risk of pulm odema or use bolus <500ml - 1 Mark
1 Mark each for any two of:
Atropine - likely to be inefffective
Avoid / cease GTN
Transcutaneous pacing
Inotropes as listed below only
IABP - only acceptable if preceded by revascularisation

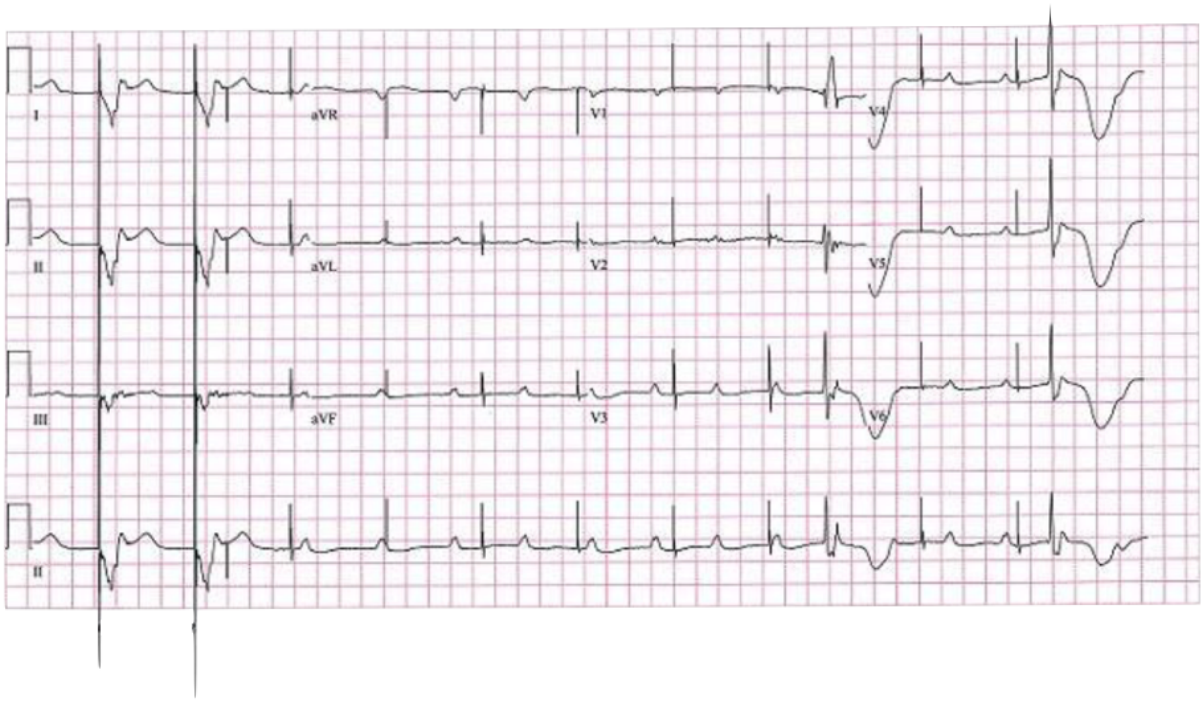
c.

	Agent	Dose
1.	*Dopamine*	*3-5 mcg/kg/min to maximum of 20-50 mcg/kg/min*
2.	*Dobutamine*	*2-5 mcg/kg/min to maximum of 20 mcg/kg/min*
3.	*Noradrenaline*	*2 mcg/min up titrate to response*

1/2 Mark for each correctly completed box.
Taken from Tintinalli's Emergency Medicine 7th Edition Chapter 54 Table 54-5 Pg 388 with Milrinone excluded.
Consistent with management advice in Dunn Emergency Medicine Manual 5th Edition Vol 1 Chpt 28 Pg 440

SAQ 2

A 16 year old boy with a congenital heart problem presents to ED with episodes of syncope. This is his ECG.



a) Describe the ECG (5 marks)

b) Name 5 possible causes for this ECG (5 marks)

Answer

a) Paced rhythm rate 75 bpm

Loss of capture

Period of ventricular standstill

Occasional ventricular ectopic/escape beats

P waves rate 75 – 100 bpm, complete heart block

b) Lead breakage or displacement causing pacemaker failure

Fibrosis causing pacemaker failure

Electrolyte abnormality

Toxicological causes – Ca channel/B blocker/digoxin toxicity

Failure to capture/needs check of threshold for capture

SAQ 3

A 67 year old male was 6 weeks post an inferior myocardial infarction. He presents to ED with 'light headedness' worse on exertion

He has been started on a 'whole lot' of new medications since his heart attack and felels they may not be helping.

Vital signs are:

Temp 37.0 deg c

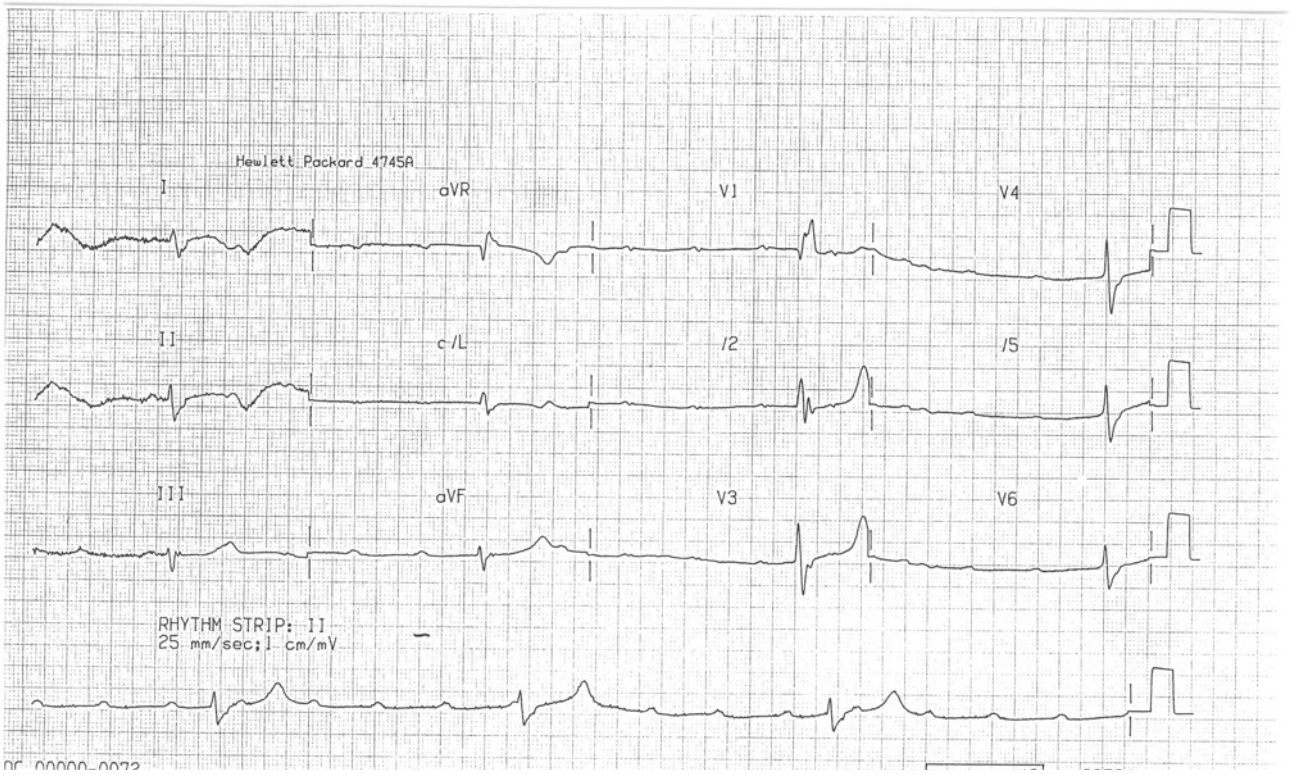
BP 100/55 mmHg

RR 16/min

$Sa0_2$ 97% on air

GCS 15

The following ECG is performed:



a) Outline 4 important features of his ECG

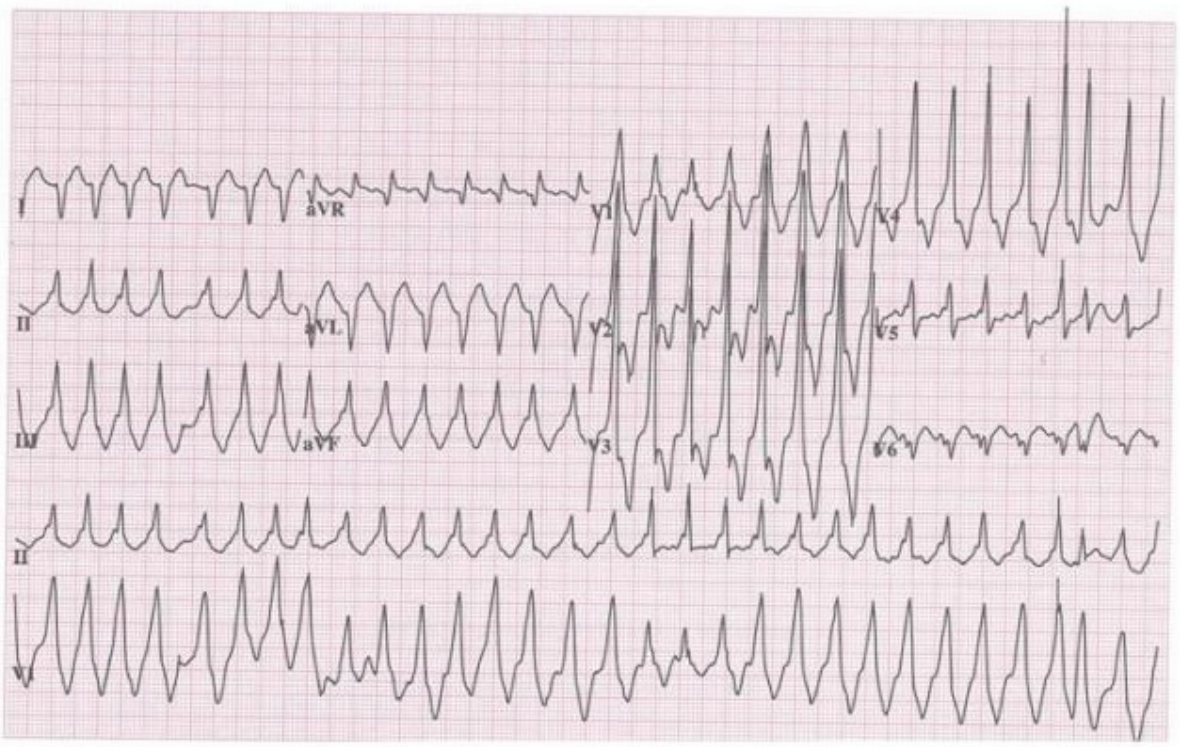
b) Outline you interpretation

c) Outline treatment options

(No answer available)

SAQ 4

A 35 year old woman presents with palpitations and shortness of breath. On arrival her BP is 70/40. An ECG is taken.



a) What are 5 important features of the ECG

b) List three possible differential diagnoses

c) List important steps in your immediate management

Answer

a) Rate @ 240, Rhythm irregular (AF),rightward access, Delta waves, / fusion beats in severalleads esp lead 2 and V1

b) AF RBBB, WPW with aberrancy, VT, Torsades.

c) Resus with full monitoring, supplemetal O2, iV access, fluid bolus, synchronised DC cardioversion 100J with sedation and analgesia

Metabolic and Endocrine SAQ's

SAQ 1

A 48 year old haemodialysis patient presents to ED complaining of shortness of breath, muscle weakness and nausea

Vital signs are:

Temp 37.2 deg c
BP 100/50 mmHg
RR 20/min
$Sa0_2$ 94% on air
GCS 15
Weight 76kg

The following ECG is obtained (see next page):

a. What is the most likely diagnosis?

b. List 5 potential causes of this condition in this patient

c. List 5 potential treatments for this condition in this patient

Answers

a. Moderate/severe hyperkalaemia

b. Missed dialysis,
drugs (k^+ supplements/sparing diuretics,digoxin
rhabdomyolysis, immobility
hyperthermia, environmental
GI tract bleeding

c. CaCL 10% 5mls +/-repeat
Salbutamol nebulized repeat hourly if required
NaHCO3 1meg/kg
Glucose/insulin (50ml of 50% /IV 10IU)
Haemodialysis
Digoxin antibodies if on dig

Obstetrics and Gynaecology SAQ's

SAQ 1

A 14 year old woman is brought in by ambulance distressed and combative. She tells the nurse she has been sexually assaulted by a male relative but doesn't want to involve the police or her family to be informed.

1. List four potential medical complications (other than HIV) of sexual assault and any prophylactic treatments available that you will need to discuss with her.

2. List three factors you would take into consideration when considering HIV post-exposure prophylaxsis.

3. Give three examples of strategies to preserve potential forensic evidence.

4. List four factors that influence your decision to involve her family or the police.

Answers

1)

STIs - antibiotics - for trichomoniasis (metronidazole), chlamydia (azithromycin or doxycycline), gonorrhoea

Pregnancy - morning after pill

Hepatitis vaccination status - immunoglobulin +/- vaccination

HIV - post exposure prophylaxsis regime

tetanus vaccination booster for injury

2.

population rates

known infected perpetrator

concurrent STI infection

injury secondary to assault

type of sexual assault - oral/vaginal/anal

3.

don't wash/PU/eat/drink

keep clothes

reduce delay to collection

Collect first urine sample

4. (No answer available)

Respiratory SAQ's

SAQ 1

A 23-year-old man with known asthma is brought to ED by ambulance with an acute exacerbation.

a) What features on history would concern you that his attack might be severe

b) What features on examination would suggest he had a severe exacerbation

c) Clinical examination confirms he has a severe episode. List and justify the investigations you would perform

d) List your immediate treatment priorities

Answer

a. Known brittle, ICU admissions, Frequent steroid courses, significant co-morbidities, known poor compliance

b. Altered LOC, reduced RR, accessory muscle use, quiet chest, signs pneumothorax, signs coinfection, cardiovascular compromise

c. CXR, coinfection/pneumothorax, ABG evidence of resp failure (acidosis with normocarbia -hypercarbia)

d. Supplemental O_2 if Sat <93%

   Optimise patient position

   Bronchodilator therapy

   Salbutamol continuous nebs, IV boluses and/or infusion

   Ipratroprium bromide nebs

Resuscitation SAQ's

SAQ 1

a. Name composition of normal saline and Ringer's lactate (2)

b. What are the targets to titrate fluid therapy (4)

c. What are the complications of fluid therapy (4)

Answers

1.

Normal Saline – Sodium 154 mmol,CL 154, K+ 0, Ca++ 0

Hartmann's – Sodium 131mmol, Chloride 111mmol, K+ 5mmol, Ca++ 2 mmol, Lactate 29mmol

2. Any 4 from the following -

Physiological – SBP 90, MAP > 65mmHg, HR <100

Perfusion – UOP > 0.5ml/kg/hour, Lactate <2mmol, resolving base deficit, Cap refill < 4s

Invasive measurement – CI >2.5 L/min/m2, PAOP > 15 mmHg.

3. Any 4 from the following -

Hypothermia after large volumes of fluid therapy

Coagulopathy due to dilution

Tissue oedema – limb and abdominal compartment syndrome

Pulmonary oedema

Hyperchloraemic acidosis with NS

Anaphylaxis to synthetic colloids /blood transfusion

SAQ 2

1) List 4 indications for endotracheal intubation (4 marks)

2) List 2 indications for non-invasive ventilation (1 marks)

3) List 4 contra-indications to NIV (2 marks)

4) What is the mechanism of action of NIV? (3 marks)

Answers

1) List 4 indications for endotracheal intubation (4 marks)

To create and airway

To maintain an airway

To protect an airway

To provide for mechanical ventilation

From Cameron, Textbook Adult Emergency Medicine 2009, p 20

2) List 2 indications for non-invasive ventilation (1 mark – 0.5 each)

Acute pulmonary oedema

Respiratory failure (will accept COPD as alternative)

Cameron, p21

3) List 4 contra-indications to NIV (2 marks – 0.5 each)

Coma

Combative patient

Inability to tolerate tight-fitting mask

Lack of trained staff to institute and monitor NIV

4) What is the mechanism of action of NIV? (3 marks)

Controlled FiO2 at set positive pressure –

Recruits alveoli that were closed improving VQ match

Increases pulmonary compliance, decreasing work of breathing

SAQ 3

A 72 year old diabetic female is brought to your Emergency Department by ambulance. She complains of feel generally unwell for the last 2 days with abdominal pain, cough and fevers.

Vitals signs:	Pulse	121
	BP	89/58
	RR	28
	Sats	89% Room Air
	Temp	39.8 ^{o}C

a. List the key steps in this patients management ? (3 Marks)

b. List your resuscitation goals for the first 6 hours ? (4 Marks)

c. The patient requires inotropic haemodynamic support. Which inotrope should be used ? (1 Mark)

d. The patient is intubated for respiratory failure. List the four key components of your ventilation strategy for this patient ? (2 Marks)

Answers

a)

Resuscitation - 1/2 Mark

Screening / diagnosis e.g. blood cultures / biochemistry etc. - 1/2 Mark

Antibiotics - broad spectrum cover required - 1 Mark

1/2 Mark each for any two of:

- *Source Control*
- *Monitoring*
- *Disposition*
- *Boundary of Care*

b)

1 Mark each up to 4 marks from:

- *CVP 8-12 mmHg*
- *MAP >65 mmHg*
- *Urine output >0.5ml/kg/hr*
- *Central venous sats >70% or mixed venous sats >65%*
- *Lactate clearance*

c)

Noradrenaline - 1 Mark

d)

1/2 Mark for each of :

- *Tidal volume 6ml/kg*
- *Plateau pressure <30 cm H_2O*

PEEP Titrated to FiO_2 Minimum 5 cm H_2O - Maximum 24 cm H_20

FiO_2 Titrated to Sats 88-95% or PaO_2 55-80 mmHg

Answers taken from Surviving Sepsis Campaign International Guideline for Management of Severe Sepsis and Septic Shock 2012 and ARDSnet NIH NHLBI ARDS Clinical Network Mechanical Ventilation Protocol Summary

SAQ 4

A55 year old woman presents by ambulance. This is her appearance upon arrival in ED

a) List three differential diagnoses

b) List 5 features of her medical history that are particularly important to enquire about

c) State your first 5 management steps

Answer

a) Angioedema, Anaphylaxis, Trauma (haematoma)

b) Allergy history, medication history, family history of similar events, previous episodes and how managed

c) Resus with full monitoring, Adrenaline neb(5mg) and/or IM (.3-.5mg), urgent airway call (anaesthetics/ICU), difficult airway and surgical airway kit at bedside, optimise current airway by positioning, IV access, supplemental O_2 if hypoxia

Toxicology SAQ's

SAQ 1

A 40 yr old female is brought to your Emergency Department following a 2.5g propranolol overdose taken 3 hours ago.

Vital signs:

Pulse 45
BP 82/45
RR 16
Temp 36.8 ^{o}C

GCS 13 (E=3, V=4, M=6)
BSL 6.7 mmol/L

a. Outline a step-wise approach to the patient's bradycardia & hypotension? (4 Marks)
1 Mark each up to 4 marks for each of in a logical order, note HDI may be appropriately commenced very early in the algorithm without penalty

Fluid bolus 10-20 ml/kg
Atropine 100-300mcg iv repeat if response
Isoprenaline infusion
Adrenaline infusion
High Dose Insulin Infusion
Intra-lipid - on toxicology advice only
Pacing - External
Pacing - Transvenous
ECMO

b. Clinical toxicology have been consulted and advised you to commence HDI therapy. How is HDI administered ? (4 Marks)

1 Mark for each of:

Loading dose of glucose 25g (50ml of 50% dextrose) iv bolus
Loading dose of insulin 1IU/kg iv bolus
Infusion of glucose 25g (50ml of 50% dextrose) per hour
Infusion of insulin 0.5IU/kg per hour, may up titrate to effect

c. What are the potential complications associated with HDI therapy ? (2 Marks)
1 Mark for each of:

Hypoglycaemia
Hypokalaemia

Answers taken from Murray et al. Toxicology Handbook 2nd Edition. Section 3.15 Beta-blocker pg 168-170. Section 4.14 Insulin (high-dose) pg398-399.

SAQ 2

The triage nurse rings you regarding a 32 year old with diabetes and bipolar disorder who is a frequent presenter to your emergency department. She often presents with disruptive behaviour but the nurse is concerned that today she appears disorientated, ataxic and complains of nausea and vomiting for the last two weeks.

Temp 37.4
HR 110
BP 90/60
RR 22
sats 97% OA

Her lithium level is 3 mmol/L

1. List four potential causes you would consider in this patient that may have resulted in lithium toxicity?

2. A urine bHCG confirms pregnancy, and a UTI. List four antiboitics used to treat UTI and discuss why you would or would not use them in pregnancy.

3. Your 4th year student asks you about the role of charcoal in lithium overdose. You explain that charcoal does not bind lithium. Name 3 classes of drugs seen in overdose that are not bound by charcoal and give two examples of each.

4. What alternative enhanced elimination technique may have a role in lithium toxicity?

5. Name 3 toxicokinetic or toxicodynamic features of a drug that make it amenable or appropriate to this method of enhanced elimination, and 2 other drugs toxicities where the method plays a role.

6. You find on questioning that it is likely she is 16/40 pregnant, homeless and with no regular medical care. List and expand briefly on 4 issues that should be discussed with this woman, include other services that may need to be involved.

Answer

1) pre-renal impairment: dehydration
pregnancy with hyperemesis
UTI
lithium induced nephrogenic diabetes insipidus
DKA/HHS
drug interaction with impaired renal excretion - NSAIDs
hyponatraemia
acute overdose in the setting of chronic ingestion

2) Safe
nitrofurantoin (avoid after 36/40)
amoxycillin (may be resistent, depends on local sens but safe in preg)
trimethoprim (after the first trimester, folic acid antagonist may increase neural tube defects in first trimester)
cephalexin (broad spectrum but safe in pregnancy)
Less optimal
tetracyclines - tooth discolouration
norfloxacin - renal abnormalities
ciprofloxacin - avoid in pregnancy

3) toxic alcohols - methanol, ethylene glycol, isopropyl glycol, ethanol
heavy metals - iron, lead, potassium, mercury, arsenic, cyanide
acids/alkali

4) haemodialysis

5) small Vd
low protein binding
small moelcular weight
life threatening
no effective antidote

carbemazepine
toxic alcohols
sodium valproate
theophylline
phenobarbitone
salicyclate
potassium

6) Pregnancy medical care - obstetric physician input given ongoing need for diabetes control and likely lithium requirement during pregnancy - lithium being teratogenic (tricuspid valve abnormalities)
Tie in with GP
Psychiatric care and support during pregnancy - tie in with maternal mental health
Maternity care, including scans
Social supports - social worker involvement
Pregnancy advice - safe behaviours/listeria avoidance/drugs in pregnancy/smoking/alcohol

SAQ 3

A 17 year old woman presented to ED after taking an overdose. She weights 50kg and has taken 60 tablets of 300mg aspirin.

Vital signs
HR 110/min
RR 28/min
BP 100/60
Sats 100% room air
Temp 36.5

a) What features stratify her as high risk? 2 points

b) What investigations (apart from ecg and paracetamol level) would you request? 2 points

c) She deteriorates further and requires intubation? What are specific considerations when intubating patients having taken an OD of aspirin? 2 points

d) What are the indications for haemodialysis? 4 marks

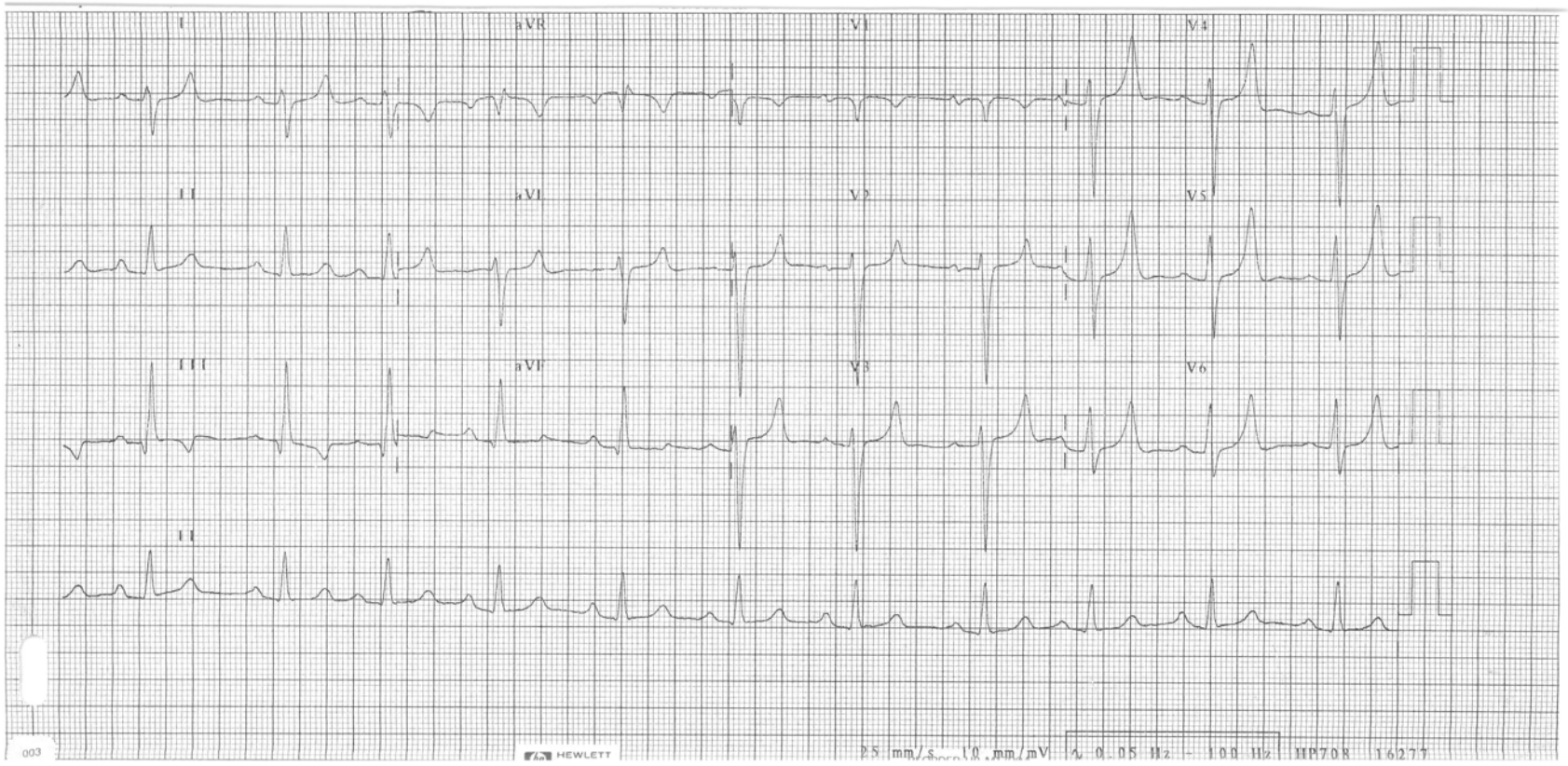
Answers

a) Dose > 300mg/kg
Tachypnoea

b) ABG
Salicylate level
BSL

c) Avoid acidosis – give Sodium Bicarbonate prior to intubation
Hyperventilate once intubated
Avoid long acting muscle relaxants to monitor for seizure activity

D) Unable to maintain urinary alkalinisation
Serum salicylate levels increasing (> 4.4 mmol/L) despite optimal medical treatment
Altered mental status, acidaemia, renal failure
Very high salicylate levels - Acute > 7.2mmol/L, Chronic > 4.4mmol/L


I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
II
003
HEWLETT
25 mm/s 10 mm/mV ~ 0.05 Hz - 100 Hz HP708 16277