

## SAQ 1 Answers

1.

Mediastinal haematoma – likely great vessel injury

Wide mediastinum

Loss of aortic knob / Loss aorto-pulmonary window

Depressed left main bronchus

Widened right paratracheal stripe

Left apical pleural cap

2.

Neurogenic shock from spine injury

3.

Cardiac contusion / pericardial tamponade

Retroperitoneal haemorrhage

4.

End-points – systolic BP above 100mmHg, cerebral perfusion (care to avoid hypertension in aortic injury)

IV N/S – 500mL-1000mL bolus repeat if necessary up to 2000mL

Metaraminol 0.5mg aliquots, noradrenaline/adrenaline infusion 5-40 mcg/min

## SAQ 2 Answers

1.

Category	Assessment Feature
Airway	stridor
	Hoarse voice
Respiratory	Hypoxia – sats <90%
	Tiring respiratory effort
Cardiovascular	Hypotension <80-90 systolic BP
	Poor mentation

2.

O2 via high flow non-rebreather (1 mark)

Adrenaline initial 150 – 200 mcg IM (10mcg/kg), repeat if necessary Q5 min

- If no response, aliquots IV 1mcg/kg (approx. 20mcg)
- Nebulised also an option 5mg nebs (not essential to answer)
- (2 marks total)

IV fluids N/S 20ml/kg bolus repeat if needed (1 mark)

End –points are – systolic BP greater than 90mmHg and normal mentation, also sats >90-92% and decreased work of breathing (2 marks)

### SAQ 3 Answers

1.

LBBB – left axis deviation, QRS broad approx. 160ms (2 marks)

STEMI equivalent Sgarbossa criteria

- Concordant ST elevation (I, avL)
- Excessively discordant ST elevation >5mm (V2 V3) (2 marks)

Hyperacute tall T waves anterior leads (V2-V4) (1 mark)

2.

STEMI equivalent, requires urgent re-perfusion

3.

Arrhythmias – tachy VT / VF, brady heart blocks

LVF / APO

Cardiogenic shock with hypotension and poor end-organ perfusion

4.

Availability of cath lab within 90 min door to balloon time (one category encompassing all excuses here)

Contra-indications to thrombolysis

Presence of shock/complications – cath lab only good option

Pt consent

Local protocols

Allergies

## SAQ 4 Answers

1.

Gather information (2 marks)

- Current processes
- Guidelines College
- Other hospitals

Liaise stakeholders (2 marks)

- ED consultants / nurses
- Cardiologists

Write protocol

Audit performance (1 mark)

Re-evaluate (1 mark)

2.

Prolonged or repetitive pain

Raised biomarkers

ECG changes – ST depression  $>0.5\text{mm}$  / TWI  $>2\text{mm}$

transient ST elevation

VT

Shock

Syncope

DM

Renal failure

PCI 6/12 or CABG ever

EF  $<40\%$

## SAQ 5 Answers

1.

Left hilar mass – rounded opacity left hilum

- Some patchy consolidation around this area

Confluent consolidation right upper lobe bordered by horizontal fissure

- Air bronchograms

Patchy consolidation right lower zone as well – right middle lobe as part of right cardiac border obscured

2.

Multi-lobar pneumonia

Left hilar mass likely malignancy

3.

O<sub>2</sub> – titrate to keep sats >92%

IV fluids – 500 – 1000mL stat aiming for pulse <100, BP >100

IV antibiotics for severe CAP

Either – ceftriaxone 1g and azithromycin 500mg

Or – amp/ben-pen, gentamicin 5 - 7mg/kg, azithromycin 500mg

## SAQ 6 Answers

1.

Abnormal vital signs (Fever, tachycardia, hypotension)

Disorientation

Inability to attend (concentration)

Signs of infection – eg crackles, tender abdomen

Neurological signs

-many other possibilities

2.

Failure to take medications

Similar presentation to previous exacerbations schizophrenia

Gradual deterioration

3.

Call security

Attempt verbal de-escalation

Oral sedation – diazepam 5mg

If not successful then

- Physical restraint – 5 point with security
- Chemical restraint – droperidol 5-10mg IM / IV

## SAQ 7 Answers

1.

Head injury with LOC / anticipated LOC

Profound shock

Respiratory failure from chest injury

High spinal cord injury – ineffective ventilation

Severe pain / agitation

2.

CPR

Bilateral chest decompression

Intubation with 100% O<sub>2</sub>

Blood administration

Application of pelvic binder

3.

Blood products only (aim 1:1 – 1:2 packed cells : FFP if available)

Goals – systolic BP 80mmHg, radial pulse

Minimise crystalloid

## SAQ 8 Answers

1.

High anion gap metabolic acidosis

- AG 29
- Due to DKA (high BSL) with contributions from renal failure and lactic acidosis

Concomitant metabolic alkalosis due to vomiting

= resultant normal pH

Hyperkalaemia due to renal failure

High lactate – likely type A from shock, but component type B from renal failure

High creat – renal failure (pre-renal with illness, CRF from DM)

Na low, but when corrected for BSL is upper normal – 144-145

2.

Insulin infusion Actrapid 5U/hr – end-point resolution of ketosis

IV fluids – N/S (bolus acceptable 1000mL stat) initially 1 litre over 1 hour then replace losses plus maintenance over 24-48hrs, add 5% dextrose when BSL falls to 12-15, maintain BP >100mmHg and cerebral perfusion

K replacement – will fall with insulin – add 40mmol/L to infusion when K falls to 4.5 – 5.0 only if passing urine (care with chronic renal failure)

Treat cause (eg sepsis, abdominal pathology)



## SAQ 9 Answers

1.

Alert Caucasian child

Widespread rash – face, ears, neck torso

- Erythematous
- Macular
- Areas confluence
- Less prevalent dorsum of right hand pictured
- Circumoral sparing – pallor
- Dry lips/tongue/mucous membranes

No conjunctivitis

2.

Measles

Other viral illness eg rubella

Urticarial – allergy, other

Drug rash

Scarlet fever

Erythema multiforme

Kawasaki disease

3.

Measles PCR – nasopharyngeal swab

Tests for Strep

- throat swab culture
- blood for ASOT / anti DNAase B

inflammatory markers if Kawasaki disease suspected – CRP, ESR

## SAQ 10 Answers

1.

Blocked shunt – hydrocephalus

Fractured shunt – hydrocephalus

Meningo-encephalitis

Wound infection

2.

<b>Investigation</b>	<b>Abnormality</b>
CT head	Hydrocephalus
Shunt series x-ray	Fractured shunt
LP / shunt tap	Raised WCC – meningo-encephalitis

## SAQ 11 Answers

1.

Hypertension >140/90 mmHg or rise >30/15 mmHg from baseline

Significant peripheral oedema

Hyper-reflexia

Tender hepatomegaly

Papilloedema

2.

Urate – elevated

Urea/creat – acute renal failure

Platelets – low in HELLP

LFTS – raised in HELLP

Coags – DIC

CTG monitoring – all patients to determine fetal distress / viability

Hb – low in haemolysis in HELLP

Urine protein

3.

Seizure management – O<sub>2</sub>, positioning etc

Magnesium 20mmol slow push then 5mmol/hr – end point hypo-reflexia

Seizure termination with midazolam/diazepam 2.5 – 5mg

BP management – Mg as above – then other – hydralazine 5-10mg IV, aim BP <140/90

Arrange Obstetric review for delivery

## SAQ 12 Answers

1.

Medial malleolar fracture tibia

Weber B fibula fracture – at level of syndesmosis (2 marks)

Lateral talar displacement

“posterior malleolar fracture” posterior tibia

Interpretation – unstable ankle fracture requiring ORIF

2.

Analgesia – morphine 2.5mg aliquots

Plaster under procedural sedation

- Short leg backslab

Elevation limb - pillow

Orthopaedic admission for ORIF

## SAQ 13 Answers

1.

Rhythm irregularly irregular – atrial fibrillation

Ventricular rate variable – approx. 200-250/min – very fast

Left ward axis of broad complexes

2 types QRS complex – narrow and broad (mostly) – represent different pathways of activation of ventricles – narrow through AV node, broad through accessory pathway

Hence AF with rapid ventricular response in pt with accessory pathway (WPW)

Delta wave seen best in V4

2.

Pt needs emergent cardioversion

- Consent / explanation
- Small aliquots of sedation (eg midazolam 1mg boluses titrated to light sedation) 2 marks
- DC cardioversion synchronized 200J
- Optimise electrolytes – K, Mg

## SAQ 14 Answers

<b>Diagnosis</b>	<b>Cardinal Examination Finding</b>
Sepsis	fever
	Focal signs infection eg crackles, cellulitis, fontanelle
Cardiac failure/ congenital heart disease	Heart murmur, hepatomegaly
	Cyanosis not responding to O2
Abdominal catastrophe	Tender abdomen, abdominal distension
	Inguinal hernia
NAI	Multiple bruises, burns
	Retinal haemorrhages
Metabolic	Virilisation, syndromic appearance
	Hyperpigmentation, hepatosplenomegaly

## SAQ 15 Answers

1.

Erythema under mandible

- Extends to anterior chest wall

Swelling below mandible on the right side

2.

Ludwig's angina (submandibular abscess)

Cellulitis extending to anterior chest wall

3.

Analgesia – IV morphine 2.5mg aliquots (or similar)

IV antibiotics – ampicillin 1g, metronidazole 500mg

IV fluids – bolus N/S 1000mL aiming for pulse <100

Airway management – fibre-optic intubation in theatre anaesthetics

Imaging – CT neck/chest to look for abscess

ENT surgical referral for drainage collections

## SAQ 16 Answers

1.

Time ingestion

Formulation - SR

Ingested dose

Self-decontamination ie vomiting since ingestion

Other co-ingestants

Co-morbidities that will impact ability to compensate

2.

IV fluids – 1000 mL N/S stat, repeat as required up to 2-3L (1 mark)

Inotropes – adrenaline infusion 5-40mcg/min via (1 mark)

Ca gluconate initial 30mL 10% IV aiming for ionised Ca 2.0 (1 mark)

Atropine 1mg IV repeat to 3mg

Insulin / dextrose – 50U bolus insulin then 50U/hr, dex 50mL 50% bolus then 50ml 50%/hr via CVL (1 mark)

Early intubation (1 mark)

Administration of charcoal 1g/kg when intubated (not before) (1 mark)

(consideration of electrical pacing if still not achieving adequate perfusion) (1 mark)

ICU referral (1 mark)

End points (2 marks)

- haemodynamic – pulse >50/min, MAP >65mmHg
- ionised Ca – 2.0mmol/L



## SAQ 17 Answers

1.

Haemorrhagic stroke / ICH

Hypoglycaemia

Migraine

Todd's paresis

Intracranial tumour

Intracranial abscess

2.

BSL – exclude hypoglycaemia

CT head – for haemorrhage

ECG – for AF

3.

NIHSS  $\leq 4$  or  $\geq 24$

Resolving signs

Evidence of active bleeding or acute trauma

Systolic BP  $>180$ mmHg, diastolic  $>110$ mmHg

## SAQ 18 Answers

### 1. Actions to accommodate inbound patient:

- Expedite admissions
- Expedite / sit out discharges or low acuity patients
- Plan to move patient direct to OT for management
- Move patients to short stay (if available)

### 2. Hospital exec:

- Over census
- Open decommissioned / non-staffed / unfunded bed spaces
- Utilise other treatment areas – day procedure, recovery, transit lounge, radiology holding area
- Immediate audit of bed stock – identify empty beds not previously identified

### 3. Avoidance of similar issues:

Strategy	Details (2 specific points)
Maximise weekend discharges	Friday multi disciplinary meets to plan discharges; Post take consultant WR for all teams
Extended hours hospital avoidance strategies	Hospital in the home programs; RAFC outreach programs; Acute community based psychiatric teams; Day hospital; Step down facilities
Optimise week:weekend bed utilisation	Long stay admissions planned for early in the week; Bed utilisation predictive tools
Early escalation strategies	Anticipate excess load with triggers at ambulance, ED and hospital levels; Load sharing with adjacent towns

## SAQ 19 Answers

1.

Left scalp haematoma

Left extradural haematoma (2 marks for the details)

- Acute (hyperdense)
- Swirl sign (decreased density in dense area indicative of rapid bleeding)

Left parietal contusion

Midline shift to right

Loss of sulci due to mass effect

2.

Intubate (1 mark)

- With appropriate doses (1 mark)

Facilitate urgent neurosurgery (1 mark)

End points (3 marks)

- MAP >75mmHg
- O2 sats >90%
- CO2 35-40mmHg

Secondary measures (max 3 marks this group)

- Normothermia
- Normoglycaemia
- Head up
- Na high normal

## SAQ 20 Answers

1.

Hyponatremia, hypochloraemia – likely GI losses, other possibilities (1 mark)

High anion gap metabolic acidosis (1 mark)

- Renal failure
- Possible lactate from hypoperfusion ( 1 mark total DDX)

Renal failure – urea/creat suggestive pre-renal – hypoperfusion (1 mark)

Low albumin / normal total protein – acute phase response sepsis (1 mark)

High bilirubin predominantly conjugated – biliary obstruction (1 mark)

LFTS obstructive pattern (GGT and ALP) (1 mark)

2.

Ascending cholangitis with biliary obstruction

Sepsis

End-organ hypoperfusion / shock / dehydration

## SAQ 21 Answers

1.

Intussusception

- Dilated transverse colon with crescent side RUQ (intussusceptum)
- Small bowel gas present centrally

2.

Air enema

Surgical management

3.

IV fluid bolus N/S 20ml/kg

Analgesia – morphine 0.05 - 0.1mg/kg IV (or something else acceptable)

Urgent arrangement of definitive management

4.

Bowel obstruction

Perforation

Intestinal ischaemia

Haemorrhage / GI bleeding

## SAQ 22 Answers

1.

Trauma – head injury

Intoxication – eg alcohol

Metabolic – hypoglycaemia

Hypoxia – respiratory disease eg pneumonia

Hypercapnoea

CNS infection – encephalitis

Other possibilities

2.

<b>Body system</b>	<b>Effects</b>	
Cardiovascular	hypotension	
	Heart rhythm abnormality	Atrial fibrillation
	Hypoventilation	
Respiratory	Hypoventilation	
Renal	diuresis	
Metabolic	hypoglycaemia	

3.

<b>Method</b>	<b>Clinical Triggers</b>
Passive external – blankets, warm air	All hypothermic patients, <35 degrees
Warm IV fluids	All hypothermic patients, <35 degrees
Warm bladder lavage	Where IDC is indicated, symptomatic hypothermia
Gastric lavage - warm	Intubated patients only
Pleural lavage	Cardiac arrest
Bypass / ECMO	Cardiac arrest

## SAQ 23 Answers

1.

Tension pneumothorax (must be tension)

Blocked ETT

Malpositioned ETT – ie right main bronchus intubation

Awake pt – ventilator asynchrony

Ventilator malfunction

bronchospasm

2.

Disconnect from ventilator – remove machine as possible source

Examine for tension pneumothorax

Chest Xray for tube position / pneumothorax

Pass suction catheter down ETT

Sedate and paralyse pt

3.

<b>Change in ventilator setting</b>	<b>Potential adverse effect</b>
Increase PEEP	Hypotension, may decrease tidal volume
Increase pressure limit	Risk barotrauma eg pneumothorax, ARDS
Increase I time / decrease I:E ratio	Potential worsen hypercapnoea if bronchospasm

NOT ACCEPT – increase TV (this is not being reached), increase RR (unlikely to improve oxygenation)



## SAQ 24 Answers

1.

CT angiogram

- Preferable study, contra-indicated with allergy to contrast, inability to tolerate CT or relative C/I in renal failure

Echo

- Only use if unable to perform CT for above reasons
- TTE not very sensitive, TOE better, less available

2.

Urgent cardiothoracic surgical consult for operative repair (1 mark)

BP control

- Aim systolic BP 100-110mmHg (1 mark)
- Metoprolol IV 2mg aliquots until BP target or HR 60 (1 mark)
- Then vasodilatation – eg GTN infusion, SNP or hydralazine (1 mark)

Analgesia

- Morphine 2.5 mg aliquots (1 mark)

3.

Pericardial tamponade

Stroke

Severe AR

MI

(other vital organ ischaemia due to dissected branch)

## SAQ 25 Answers

1.

Swollen anterior fat pad (sail sign)

Swollen posterior fat pad

Undisplaced radial head fracture anterior aspect radial head

2.

Missed fracture

Minimal clinical significance as this injury is treated conservatively and with early mobilisation

3.

Apologise for situation

Explain clinical significance

Facilitate formal complaint if patient wishes

Arrange appropriate clinical care – follow up orthopaedics, analgesia, sling, physio

Investigate missed fracture – systems, staff, processes

Notify staff involved

Education where required

Processes to be adjusted where needed eg senior staff supervision / Xray checks

(other steps likely to be acceptable)

## SAQ 26 Answers

1.

Pacing spikes – ventricular pacing rate about 70 (1 mark)

Very broad QRS, almost sine wave (1 mark)

Tall/broad T waves (1 mark)

Consistent with *severe* (1 mark) hyperkalaemia in a paced pt (1 mark)

2.

Treat hyperK

- Ca gluconate 10% 20-30mL
- Insulin 10U actrapid / dextrose 50mL 50%
- Na HCO<sub>3</sub> - 100mmol
- Salbutamol nebs 5mg
- (resonium 30g)
- Diuretics frusemide (reasonable dose)
- Consider for dialysis if unable to achieve diuresis

## SAQ 27 Answers

1.

Pericardial effusion (blood)

[pericardial tamponade is NOT demonstrated per se]

2.

Pt to be intubated

Non-sterile procedure / PPE

Incision – need location and extent

Division of chest wall with appropriate scissors / gigli saw

Rib spreaders

identification of pericardium and phrenic nerve

incision pericardium to release tamponade

repair myocardial laceration if possible

(will accept either clam-shell or left lateral thoracotomy – details will need to match chosen technique)

## SAQ 28 Answers

1.

Normal xray

- Pseudosubluxation C2/3 and C3/4
- Normal Swischuk line

2.

Neurological abnormalities

Inability to move neck

Severe prolonged pain despite analgesia and time

3.

Multiple vomits

Failure to return to GCS 15 at 2 hours

Signs of skull vault fracture (including large boggy haematoma)

Signs BOS fracture

Focal neurological abnormalities

Anterograde amnesia

## SAQ 29 Answers

1.

<b>Diagnosis</b>	<b>Cardinal examination finding</b>
Retinal detachment	Retinal curtain on fundoscopy
Retinal arterial occlusion / CRAO	Pale retina, possible embolus observed / arteriolar cut off
CRVO	"blood and thunder retina"
Optic neuritis (eg MS, GCA)	RAPD / papillitis
Vitreous haemorrhage	Inability to visualise retina, blood posterior chamber

2.

<b>Investigation</b>	<b>Justification</b>
ECG	Look for AF as embolic source for CRAO
BSL	Diabetic patients get vitreous haemorrhage
MRI	For MS if considering in optic neuritis
ESR	Raised in GCA

Others possible here

## SAQ 30 Answers

1.

Emphysematous pyelonephritis

- Enlarged left kidney
- Air in kidney
- Surrounding fat stranding

2.

Analgesia – fentanyl 25mcg boluses (1 mark)

IV fluid – normal saline 1000mL bolus (1 mark)

- End points systolic BP >100mmHg
- Pulse <100 (1 mark)
- Repeat if needed

Early CVL – noradrenaline 1-40mcg/min with above goals, begin when CVP approaching 12cmH<sub>2</sub>O (2 marks)

IV Abs(1 mark)

- Many options OK but must cover gram negs well
- Eg amp and gent / pip-taz with doses

Management of BSLs with insulin sliding scale (1 mark)

Urgent urological referral, may need nephrectomy (1 mark)