SAQ trial exam 2016.1 ANSWERS First book

SAQ 1

Most important pathology	**Radiographic supporting features**
Left tension pneumothorax	Lung edge visible left upper lobe approx. 2cm in from chest wall
	Deep sulcus sign – basal air accumulation
	Mediastinal shift to right

2.

Insertion 32 Fr left ICC

3.

Pathology	**Radiographic supporting features**
Left pulmonary contusion	Alveolar (fluffy will do) infiltrate left lower zone

4.

- inadequately drained / recurrent tension pneumo

- blocked ETT

- ETT in right main bronchus / malpositioned tube

- pt-ventilator dysynchrony

- bronchospasm (asthma / anaphylaxis / aspiration)

- “over-ventilation” / dynamic hyper-inflation

5.

- large left sided acute subdural haemorrhage (1 mark)

- signs raised ICP (1 mark, plus 1 mark for each of below)

    - midline shift to right

    - loss of sulci left

    - cerebral oedema (loss grey-white differentiation left side)

    - compression left lateral ventricle

    - (accept subfalcine herniation)

6. (1 mark for each)

- immediate neurosurgical referral for surgery

- maintain MAP >75mmHg with IV fluid bolus N/S 1000mL then noradrenaline infusion if needed

- maintain O2 sats >90% (increase FiO2)

- NeuroICU measures

- Raised ICP strategy

- hyperventilate to get PCO2 30-35mmHg until operative management

- bolus osmotherapy (accept 3% saline 5mL/kg or mannitol 1g/kg)

- aim Na approx. 150mmmol/L

- normal glucose and temperature

Bold = essential to score > 0; points for strategies and/or details

SAQ 2

1.

Widened joint between base 1st and 2nd metatarsals (Lisfranc injury)

Comminuted fracture base 2nd metatarsal

Transverse fracture mid-shaft 2nd metatarsal

Lateral displacement/ dislocation of metatarsals 2-5

Fracture cuboid

2.

Analgesia – IV morphine 2.5 mg aliquots (or similar)

Short leg backslab

Elevate and ice

Orthopaedic referral for ORIF

3.

Complication	**Cardinal clinical finding**
Vascular injury	Loss of pulses – DP pulse
Compartment syndrome	Increasing pain, loss sensation and pulses (not accept just loss of pulse for this)

SAQ 3

1. Hyponatremia – moderately low; corrected for glu – 127 (1 mark)

- Likely GI losses or other cause (1 mark)

K 3.5 – corrected for pH => 2.5 (1 mark)

- GI losses likely (1 mark)

Hypochloremia - ??? (1 mark)

- Vomiting, electrical neutrality (1 mark)

Ionised Ca – severe hypocalcaemia (1 mark)

- Pancreatitis, renal failure, rhabdo a possibility (1 mark)

2. 1 mark for comment, 2 marks of differentials

High anion gap metabolic acidosis (1 mark)

- Ketones – DKA, alcoholic (1 mark)
- Lactate (type A or B with liver failure) (1 mark)

Inadequate respiratory compensation (expect CO2 to be lower) (1 mark)

- Decreased consciousness eg alcohol, head injury, other drugs (1 mark each)

Delta ratio (42-12)/(22-11) = v. high almost (1 mark)

No differential acceptable

Lactate high

- Type A hypoperfusion (1 mark)
- Type B – liver failure (1 mark)

Hyperglycaemia

- DKA (1 mark)

SAQ 4

1.

Urgent ENT notification for urgent theatre (1 mark)

Stop bleeding – adrenaline soaked gauze on end of Magill's forceps to tonsillar bed (1 mark)

Resuscitate

- 2 IV cannulae – largest possible (1 mark)
- Bolus N/S 20ml/kg acceptable but not essential
- Use O negative blood early – 10ml/kg boluses (1 mark)
- Aim for pulse <120, BP >90 (1 mark)

IV Abs – benpen 1.2g (1 mark) +/- metronidazole

2.

Difficulty	**Solution**
Difficult laryngoscopy due to blood	Use 2 suction devices
Haemodynamic collapse on induction	Extra bolus fluid/blood prior to induction
Hypoxia during apnoea due to aspiration	BVM ventilation through induction to minimise apnoea

There will be other acceptable alternatives, but don't be too soft

SAQ 5

1.

Past history of psychiatric disorder

Current presentation similar to previous psych presentations

Normal vitals

No acute drug intoxication / normal physical examination

Auditory hallucinations

Collateral history suggestive of slow onset deterioration

No medical symptoms / complaints

2.

Understands current condition

Understands treatment options

Understands possible outcomes of each treatment option

(some assessment of judgement)

3.

Verbal de-escalation

Oral sedation – eg diazepam 10mg po

Show of force

Physical restraint

Parenteral chemical restraint – eg droperidol 10mg IM

SAQ 6

1.

Complete heart block (1 mark)

Broad complex QRS – ventricular escape [bigeminy] (1 mark)

Vent rate approx. 40/min (1 mark)

Atrial rate approx. 100/min (1 mark)

AV dissociation (1 mark)

2.

Aiming for BP>90 systolic, pulse >50/min (1 mark)

Trial atropine 1mg aliquots to 3mg (1 mark)

Electrical pacing (2 marks)

- Sedation midazolam 1mg aliquots until light sedation
- Pace 60/min

Chemical pacing – isoprenaline infusion / adrenaline infusion with appropriate doses (1 mark)

Correct reversible causes – eg hyperK, reperfusion if STEMI becomes apparent on return sinus rhythm (1 mark)

Fluid bolus acceptable 500ml N/S, repeat if needed depending on volume assessment (1 mark)

SAQ 7

1.

Bite site assessment (1)

Lymphadenopathy (1)

Evidence of bleeding / coagulopathy eg bleeding gums (1)

Evidence of neurotoxicity – peripheral weakness, cranial nerves (max 2 marks for this stuff)

Respiratory assessment – eg PEFR (a mark on its own)

2.

Coag

CK

(no other answers)

3.

12 hours observation (essential to pass)

Normal examination for neurotoxicity

Normal 12 hour coags

Normal 12 hour CK

Parental considerations addressed including access back to hospital if needed (max 2 marks for reasonable responses in this domain)

SAQ 8

1.

Research current performance numbers – time to PCI, time to ECG, time to senior review etc

Research benchmarks – ACEM

Research other department processes

Engage stakeholders – ED, cardiology, ambulance

Facilitate meeting

Educate staff about changes

Implement changes

Audit processes

2.

Ambulance pre-notification to cardiologist / ED

Immediate ECG on arrival for all chest pain patients

Immediate senior doctor review of all ECGs for chest pain

Single number / point of contact for interventional cardiologist

Minimise transfers – eg stay on ambulance trolley

Have transfer packs already made up and ready to use

Early notification wardsmen

SAQ 9

Cause	Cardinal finding
sepsis	Abnormal vitals – fever, tachycardia
Breast milk jaundice	Well child, onset day 3-4
hypothyroidism	Abnormal TFTs
Haematoma breakdown	Large cephalhaematoma from birth
Congenital biliary atresia	Conjugated hyperbilirubinemia, pale urine/dark stools, day 1 jaundice
Haemolysis eg ABO incompatibility	Anaemia, raised LDH, day 1 jaundice

SAQ trial exam 2016.1 ANSWERS Second book

SAQ 10

1.

***Left upper zone cavitating lesion (1 mark)

- ***Fluid level (1 mark)

***Surrounding left upper zone consolidation (1 mark)

Air bronchograms (1 mark)

Relevant negatives

- No mediastinal lymphadenopathy (1 mark)
- Solitary area of pathology (1 mark)
- No effusion (1 mark)

*** = critical findings

2.

Strep pneumoniae

Staph aureus

Klebsiella pneumoniae

TB

Fungal – cryptococcus

3.

Malignancy

Granuloma – eg Wegener's

Infarct

Bronchogenic cyst

4.

O2 to keep sats >90% (1 mark)

IV fluid bolus – N/S 1000mL repeat if required (1 mark)

Haemodynamic end-points: pulse <100, BP >100 (1 mark)

IV Abs – pip/taz 4.5g OR (ceftriaxone 1g plus metronidazole 500mg) (1 mark)

IV noradrenaline infusion if hypotensive despite IV fluids – 5-40mcg/min as required (1 mark)

5.

***Aseptic preparation

***Head down

Local anaesthetic to site

***Use of USS guided technique where possible

Insert needle to IJV

Pass wire

Dilate vein

Insert central line

Flush all lumens

Secure to skin

SAQ 11

1.

Sigmoid volvulus (1 mark)

- Massively dilated loop sigmoid colon (1 mark)
- Axis to LIF (1 mark)
- No rectal gas, proximal dilated large colon (1 mark for either part of this)

2.

- per rectal deflation – rectal tube or sigmoidoscope

- laparotomy

- percutaneous deflation

3.

Pt wishes if competent

Advanced health care directive

Substitute decision maker if pt incompetent

Pt's quality of life

Potential reversibility of condition

Nature of intervention required

(some other stuff likely to be OK)

SAQ 12

1.

Cerebral oedema / decreased GCS

Seizure

Pulmonary oedema

Rhabdomyolysis

Hyperkalaemia

Liver failure

Cardiogenic shock / cardiomyopathy

2.

Diagnosis	**Assessment feature**
sepsis	Meningism, blood cultures
Drug intoxication eg sympathomimetic toxictity	Dilated pupils, IV track marks
Thyroid storm	Raised TFTs

Other answers likely to be acceptable

SAQ 13

1.

Infero-lateral **STEMI (1 mark)**

- **ST elevation II, III, aVF also V5,6 (1 mark)**
- **Reciprocal depression aVL, V1 and V2 (1 mark)**
- STE III > II suggestive of RV MI (1 mark)

RBBB (1 mark)

– broad complex QRS with RSR in V1, normal axis (1 mark)

Q waves in anterior leads V1-3 (1 mark)

- suggestive of old anterior MI (1 mark)

Bold to score => 0;

2.

Aspirin 300mg po

Clopidogrel 300mg / ticagrelor 180mg

Heparin 4000-5000U depending on weight

IV opiate appropriate dose – titrated to pain

IV Tenecteplase – weight based dose if no C/I to thrombolysis

Acknowledgment of RV specific strategies

SAQ 14

1.

Topic	Details
Compression : ventilation rate	15:2
Adrenaline dose	10mcg/kg
Adrenaline timing (non-shockable rhythm)	Immediately then every second cycle
Amiodarone dose	5mg/kg
Amiodarone timing	After 3rd shock
Energy setting for defibrillation	4J/kg

2.

Hypoxia

Hypothermia / hyperthermia

Hypovolaemia

Hyper/hypokalaemia

Toxins

Thrombosis

Tension PTX

Tamponade

SAQ 15

1.

Galeazzi fracture (1 mark)

Radial fracture (1 mark)

- Transverse (1)
- Displaced medially (1)
- Displaced dorsally (1)
- Shortened (1)
- Volar / anterior angulation (1)

Distal radio-ulnar dislocation (1)

- Dorsal displacement ulna (1)

NOT QUALITY OF XR or MISSING ELBOW as that is not an abnomality

2.

Analgesia – IV morphine 2.5mg aliquots

Backslab long arm

Elevation arm

Orthopaedic referral for ORIF (must specify admission / ORIF, not just “ortho referral”)

Qualified reduction in ED – if NV involvement

SAQ 16

1.

Sinus rhythm

75/min

Normal axis

2.

Long QT 500-520ms; K ch blockade

3.

Cardiac drugs	• Amiodarone • Sotalol • Disopyramide • Dofetilide • Procainamide • Quinidine
Antidepressants	• Selective serotonin re-uptake inhibitors: citalopram, escitalopram, fluoxetine • Moclobemide • Tricyclic antidepressants* • Lithium
Antipsychotics	• Amisulpride • Chlorpromazine • Haloperidol • Ziprasidone • Thioridazine
Antihistamines	• Loratadine • Astemizole • Diphenhydramine
Antimicrobials	• Ciprofloxacin, moxifloxacin, sparfloxacin • Clarithromycin, erythromycin • Fluconazole, voriconazole • Pentamidine
Other drugs	• Chloroquine • Cisapride • Dolesatron • Methadone • Arsenic

*The QT prolongation with tricyclic antidepressants is usually from QRS widening without actual lengthening of the JT interval (QT interval minus the QRS duration).

4.

Serotonin toxicity evidenced by:

hyperthermia, dilated pupils, tremor, hyperreflexia in lower limbs more than upper limbs, ocular clonus, ankle/finger clonus, tachycardia, seizures

SAQ 17

1.

Irregular pupil due to synechiae

Peri-limbic conjunctival injection

Small hypopyon

Cloudy cornea (esp inferior half)

2.

Anterior uveitis / iritis

3.

Ophthalmological consultation

Prednisone drop ?corticosteroid drops

Mydriatic installation eg homatropine / cyclopentolate

4.

Crohn's disease

SLE

Sarcoidosis

Ank spond

*(others)

SAQ 18

1.

Midazolam 5mg aliquots IV

Phenytoin 15mg/kg IV over 30 min

Levitiracetam 1-2g IV

Valproate 800-1200mg

Phenobarbitone 10mg/kg

(only one mark for benzos)

2.

Metabolic – hypoglycaemia, hyponatremia

Head injury (of any type)

Encephalitis / meningitis (will not accept “sepsis”)

Drug intoxication eg amphetamines

Intracranial SOL – malignancy

Eclampsia

Intracranial haemorrhage spontaneous eg SAH

Primary epilepsy

3.

Hypoxic brain injury / cerebral oedema

Intracranial haemorrhage

Pulmonary oedema

Rhabdomyolysis / renal failure

Non-head trauma – eg spine fractures

(others will be acceptable)

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SAQ 19

1. Biliary – gallstones – cholecystitis/choledocolithiasis/ pancreatitis (1 mark)
   Infectious – viral hepatitis (1 mark)
   Toxic – Paracetamol or other hepatotoxic drugs (1 mark)
   Sepsis from another focus
   Intra-uterine foetal demise
   Splenic artery aneurysm

2. Proteinuria >1+ on random (1 mark)
   Peripheral oedema (1 mark)
   Signs of impaired cerebral perfusion - any of Hyperreflexia/Visual Disturbance/Mental Status Changes/ clonus (1 mark)
   Headaches
   Vomiting (1 mark)
   Acute Renal Failure with Oliguria (1 mark)
   Elevated urate
   Pulmonary Oedema
   Evidence of Haemolysis (LDH, schistocytes, decreased haptoglobin) (1 mark)

3. Placental Abruption (1 mark)
   Acute Renal Failure (1 mark)
   Subcapsular Liver Haematoma (1 mark)
   *****Seizures (1 mark) essential to score >= 0**
   Intrauterine Fetal Demise (1 mark)

4. Left lateral position – IVC in pregnancy (1 mark)
   Supportive care – O2 (1 mark)
   Terminate Seizure – midazolam 2.5 - 5mg (1 mark)
   Magnesium 4-6gm loading dose – end point seizure cessation (1 mark) essential

5. Priorities:
   a) Prevent further seizures: Magnesium Infusion 1-2 gm/hr
   b) Control Blood Pressure: Hydralazine 5-10mg IV or Labetalol 40mg IV best options (avoid oral drugs ie nifedipine and avoid SNP as only 28 weeks)
   c) Urgent Obstetric review for consideration of delivery
   d) Betamethasone for lung maturation 12.4gm IMI

SAQ 20:

Something along the lines of (any 3 of)

1.

Any 3 of:

Cauda Equina Syndrome:

Hx: Low back pain, trauma.

Exam: areflexia, saddle anaesthesia, decreased anal tone, urinary retention etc.

Cord Compression:

Hx cancer, trauma, IV Drug Use
Exam: hyperreflexia, thoracic back pain, spinal level

Guillain Barre Syndrome:
Hx: Ascending weakness, recent GIT illness
Exam: Areflexia, minimal sensory change

Multiple Sclerosis:
Hx MS, other focal neurology (?Optic neuritis)
Exam: UMN signs, incomplete neurology

Transverse Myelitis:
Hx: post viral illness
Exam: Spinal Level

Functional:
Inconsistent Hx and exam

3. At least:
   ***Patient has decision making capacity (1 mark)
   AND
   ***Is able to make an informed decision without undue influence/ must be freely given (1 mark)
   Also accept:
   Detail around 'informed': (1 mark)
   - Rationale for procedure
   - Risks of procedure
   - Risks of not having procedure done
   - Any alternatives

SAQ 21:

Variable	**Formula Used**	**Result** ***Not required for marks as this is not a maths test***	**Clinical Implication in this case**
Expected CO2	1.5 x HCO3 + 8	*24.5*	Severe Respiratory acidosis is present
A-a gradient	Alveolar O2 = 713x 1 – 60/0.8	*Alveolar = 640 gradient = 440.*	Marked A-a gradient – implies ineffective gas transfer – shunt/V/Q mismatch
Anion Gap	Na – (Cl + HCO3)	*28*	HAGMA present (likely ketones given lactate not too high, could be renal failure or toxic alcohols)
Delta Gap	Change in AG/ change in HCO3	*28-12/24-11 = 16/13 = 1*	Pure HAGMA
Corrected Na+	Na + (Gluc-5)/3	*125 + 10 = 135*	No hyponatraemia present

1 mark total for formula and result, 1 mark for clinical implication

2. Goals:
   Achieve synchrony – sedate further +/- drug paralyse patient (2 marks)
   Improve Ventilation – increase RR to 16-20 (1 mark)
   Improve Oxygenation –
   increase PEEP to 10-15cm H20 (1 mark)
   Tidal volume to 480-500mls (6mls/kg) (1 mark)

SAQ 22:

1. Hospital Exec – they need to know and will help facilitate flow
   Pre-hospital – Ambulance – diversion of non tertiary patients to alternate centres
   ED groups: Senior Nursing/Triage/Resus – for surge preparedness/capacity issues
   ED Medical Staff – ensure all available staff on duty to meet surge demand

Inpatient Units: Infectious Diseases, Intensive Care, Infection Control – likely to be highly involved in managing these patients post-ED
Services: Pathology, Blood Bank - likely surge in workload and testing, need for additional PPE in testing

2. Minimise Handling – triage straight to negative pressure/isolation room
   Appropriate Location – each patient needs isolation with individual toilet
   Meticulous PPE to avoid exposure risks
   Minimise invasive Procedures – minimise testing to avoid exposure risk

3. Direct admission to ward for suitable patients
   Discharge of suitable patients home, to waiting room if suitable
   Use of alternate areas for ambulant patients (outpatients etc)
   Clear waiting room – provide reasonable alternatives to access care

SAQ 23:

1. Capture beats
   Fusion beats
   AV dissociation
   Extreme Axis (northwest)
   Absence of typical LBBB or RBBB morphology
   Very broad QRS
   Concordance – Pos or Neg
   RSR' with taller left rabbit ear
   Rate appropriate - >120, mostly 150-200
   Others – Josephson's sign/Brugada's sign are also ok if explained what they are.

2. Age >35
   Known Structural Heart Disease
   Known Ischaemic Heart Disease
   Prior MI
   Hx of CCF
   Known cardiomyopathy
   Family Hx of Sudden Cardiac Deat

3. Consent

Sedate – Fentanyl 50-100mcg + Midazolam 1-3mg
Synchronise
Shock – VT – 100Joules) – 200J is fine

SAQ 24:

1. Long QT

2. Left Ventricular Hypertrophy (S-L criteria); U waves; Sinus bradycardia (rate 54/min)

3. Many here –

   Mandatory:
   bHCG***
   BSL***
   Some sort of electrolytes for K and Mg – VBG not enough alone (no Mg)
   Others: FBE (anaemia), TFTs (hypothyroidism), urine (septic screen)
   NEVER PAY PHOSPHATE BECAUSE IT'S NEVER IMPORTANT

4. Have to be present:
   The patient must be lacking competence to reasonably refuse treatment/ lacking capacity

   As demonstrated by a lack of ability to communicate a choice, to understand the relevant information, to appreciate the situation and its consequences and to apply rational judgement to the available information.
   Under these conditions a patient can be kept for treatment and treated in line with best medical practice under a duty of care.
   This situation is dynamic.

SAQ 25:

1. 5 differentials:

Many here – must have in bold:

- Trauma – fractures – accidental and **NAI**
- Infection – psoas abscess, osteomyelitis
- Post infectious – Post- infectious arthritis (ie post salmonella, campylobacter)
- Inflammatory – **transient synovitis** (most likely)
- Primary Bone – Perthes, SUFE

- Neoplastic – primary bone, haem malignancy
- Abdominal path – appendicitis
- Neurologic – cord/demylenation

2.
- Could have any 4 of:
- **FBE**: for cell lines ?bone marrow process , WCC not particularly useful
- **CRP**: may take 24 to rise, non specific
- **ESR**: can also take hours to rise, usually elevated in Septic arthritis
- **Blood Culture**: too slow to (usually) aid in diagnosis
- **Xray**: low yield in absence of trauma – osteomyelitic changes too slow to be useful
- **USS**: demonstrates effusion, non specific (also seen in transient synovitis)
- **Hip Joint Aspirate**: usual comments re: interpretation of joint fluids in septic arthritis
- **Bone Scan**: Non-specific changes of inflammation
- **MRI**: logisitically difficult – requires GA.

3. Parental satisfaction with management and plan
   Clear discharge and follow up plan
   Child not requiring admission for any therapy/investigation
   Time of day and transport considerations
   Social concerns re: isolation/ ability to return if change in condition

4. List 5 factors that will determine whether you or not you will discharge this child.

SAQ 26:

1. Murmur of AR
   Signs of pericardial effusion
   Evidence of branch dissection
   - carotid/vertebral – neurology
   - blood pressure differential between arms (indicative of brachiocephalic or subclav involvement
   - spinal level from spinal infarct (ASA)

   Other – severe hypertension; other risks – Marfans syndrome etc
2. Needs to be:
   TTE
   Advantages: repeatable, dynamic, does not require patient to lie flat
   Disadvantages: intolerance (TOE) misses important areas (TTE)
   CT(A):
   Advantages: Gives definite diagnosis and aids in repair planning

Disadvantages: Contrast exposure in renal injury, requires supine patient

3. End points: BP – systolic <120, HR < 60 , pain under control
   Strategy:
   Analgesia: Fentanyl 25mcg IV titrated to comfort
   Chronotherapy: beta-blockers to slow rate (P/T): Metoprolol IV 2.5mg repeat to HR <60
   If HR <60, BP still >120, then
   Vasodilate:
   Sodium Nitroprusside 0.3-10mcg/kg/min OR
   Hydralazine 5mg IV titrated OR
   GTN infusion 5-50mcg/min

SAQ 27

1. Anything from CHALICE/PECARN or CATCH
   CHALICE:
   HISTORY: Witnessed LOC >5 mins, Amnesia >5mins, Abnormal Drowsiness, >2 vomits, Suspected NAI, Traumatic Seizure
   EXAM: GCS <14, suspected Skull injury, Signs of BOS#, Focal Neurology, Bruise>5cm
   MECHANISM: High Speed MVA, Fall >3m, Hit by projectile
   PECARN:
   CATCH: Similar – GCS <15 at 2hrs, Suspected Skull#, Worsening headache, Irritability are the HIGH risk features.

2. Identify yourself and role
   Ensure that all relevant communication is clear to ensure no mismatch in understanding
   Explain basis of clinical decision – NOT for CT – supported by decision rules
   Identify their concerns re: no CT – explore their concerns; attempt reassurance
   Offer alternate options – SSW for observation etc