

**Answers book**  
**PAH SAQ Trial exam 2017.2**

**Guide for marking**

- Answers are a rough guide only
- They have not been prepared with the same rigorous oversight as the questions
- There will be many acceptable answers that have not been included in the answer template
- Use your judgement to identify pass/fail criteria and critical errors of omission or commission
- pass mark is given after question number

First book – 86/126

Second book – 89/126

Third book – 79/114

Total – 254/366

**Q1 (8/12)**

1.

Large right pleural effusion

2.

homogenous opacification right middle and lower zone

loss right hemidiaphragm

rim of opacity around periphery of pleural cavity c/w fluid

3.

parapneumonic effusion

malignancy

PE

Hydrothorax from massive ascites

4.

<b>Investigation</b>	<b>Justification</b>
Pleural fluid culture	Identify organism and target antibiotic Rx
Pleural fluid biochem – LDH, protein	Will differentiate transudate vs exudate (Light's criteria)
Pleural fluid cytology	Will identify malignancy
CT scan	Look for malignancy, esp after effusion drained
CTPA	Diagnose PE

Many others may be acceptable as long as they are reasonably justifiable  
Justification must be good

**Q2 (8/12)**

1.

unilateral throbbing headache  
presence of visual aura  
past Hx migraine  
gradual onset

2.

Paracetamol 1g po  
Ibuprofen 400mg po  
Sumatriptan 6mg sc  
Metoclopramide 10mg po/IV/IM  
Chlorpromazine 25mg IV  
Dihydroergotamine 0.25 – 1mg IV

3.

Amitriptyline  
Propranolol  
Pizotifen  
Valproate  
Topiramate  
Verapamil

### **Q3 (9/13)**

1.

Pain – muscles / joints “the bends”

Lymphedema

Pulmonary DCS – cough, haemoptysis, dyspnea, chest pain

Neurological DCS – spinal cord syndromes or pretty much any neurological symptom

Vestibular symptoms – vertigo, hearing loss

Fatigue

2.

Pneumothorax/mediastinum

Middle ear pathologies

Sinus pain

Arterial gas embolism esp cerebral

Tooth pain

Abdominal cramps

3.

100% O<sub>2</sub>

IV fluids – 1L N/S

Organize hyperbaric treatment

#### Q4 (10/15)

1.

HCO<sub>3</sub> – high anion gap metabolic acidosis due to renal failure, probably also lactate and ketones

Formula: anion gap = Na – (HCO<sub>3</sub> + Cl)

Glucose – due to HHS, as a result of poor glycaemic control in the context of sepsis

Na – dilutional due to hyperglycaemia, corrects to 139 – normal

Formula: corrected Na = Na + (glucose-5)/3

K – elevated due to intracellular shift from likely acidaemia, and also renal failure

Urea, creat – renal failure, intrinsic as ratio <100, probably due to ATN and maybe pyelonephritis

2.

Ca gluconate 30ml 10%

HCO<sub>3</sub> 50mmol (to treat hyper K)

fluid bolus – 500-1000mL N/S aiming for BP >100mmHg and good perfusion

insulin infusion – start at 5U/hr

IV abs – eg ceftriaxone 1g

Also accept other hyperK Rx – salbutamol 5mg neb, resonium 30g po

DVT prophylaxis – any standard regime is fine eg heparin / dalteparin

**Q5 (10/14)**

1.

Complete heart block  
AV nodal escape

2.

AV dissociation  
Narrow complex QRS  
P rate approx. 80, QRS rate approx. 35

3.

Hyperkalaemia  
Cardiac ischaemia  
Drugs eg beta-blockers  
Cardiac fibrosis  
Infiltrative diseases

4.

Explanation/consent  
Pad position – AP or anterior apex/base  
Sedation eg midazolam 1mg boluses  
Select energy level – titrate to capture  
Ensure electrical and mechanical capture

## Q6 (14/20)

1.

Duration of immersion

Duration of ALS

Initial rhythm

Delay to BLS

Need for circulatory support post ROSC

GCS on arrival to ED

Many others acceptable also

2.

Pulmonary: Chemical Pneumonitis, Atelectasis from surfactant loss, ARDS

Hypothermia

Hyponatremia

Hypoglycaemia

Cerebral: Seizures, Hypoxia, Persistent coma

3.

Adrenaline

Paralysis – most agents acceptable

Sedation of some sort

Glucose eg 5% dextrose

Normal saline

Midazolam

4.

BVM

Ventilator

Monitor

Airway equipment in case of extubation

O2 cylinders

Suction

Many others OK

**Q7 (9/13)**

1.

Inferiorly displaced left orbital floor fracture

Fluid (blood) in left maxillary sinus

Inferior rectus is displaced in to fracture segment – will accept entrapped

2.

<b>Examination component</b>	<b>Pathology</b>
Visual acuity	Any significant eye pathology eg vitreous haemorrhage
Eye movements – diplopia on upward gaze	Inferior rectus entrapment
Sensation left midface	Infra-orbital nerve injury
Nasal septum inspection	Septal haematoma
Cervical spine assessment	C-spine fracture
Neurological assessment	Intracranial haemorrhage



**Q8 (9/13)**

1.

Proximal ulna fracture  
Dislocated radial head (anterior)  
Enlarged anterior fat pad

2.

Monteggia fracture / dislocation

3.

IV morphine – 1.5mg aliquots (approx.)  
Fentanyl – IN 35mcg (approx.), IV 25mcg boluses (approx.)  
Lots of other options – accept ketamine, oral analgesia ; paracetamol, ibuprofen

Must have one parenteral opiate though

4.

<b>Nerve</b>	<b>Motor</b>	<b>Sensory</b>
<b>radial</b>	Wrist extension, finger extension	Dorsum 1 <sup>st</sup> webspace
<b>median</b>	LOAF muscles – lateral 2 lumbricals, opponens pollicis, abductor pollicis brevis, flexor pollicis brevis	Lateral palm, including lateral half of ring finger
<b>ulnar</b>	interossei	Medial palm including medial half of ring finger

## **Q9 (9/14)**

1.

### Locations

Clear beds – admit any suitable patients to wards

Move stable, ambulant patients to alternate area

Decant Resus areas

Notify waiting room of anticipated surge/mass casualty and offer alternate treatment options

Establish specific triage area

### Personnel

All ED staff to stay on shift

Call-in all available staff

Establish teams

Notify surgical/orthopaedic teams

Ensure radiology

### Equipment

Ensure adequate stocks of:

Analgesia

Splints/Plaster

Ventilators

2.

Lack of access to radiology

Staff fatigue

Access to OT

ICU bed availability

Exhausted blood bank supply

Stock shortages – splints, drugs, antibiotics

Some others

## Q10 (16/23)

1.

Pubic diastasis

Widened R Sacro-Iliac Joint

Widened L Sacro-Iliac Joint

2.

Injury classification: APC 3 (Rt) ; technically bilat but Rt-side distracted

3.

Pelvic binder application

End-point – closure of diastasis

4.

Sacral plexus – LL neurology – anything really but motor/reflexes as best sign

Bladder – Haematuria

Bowel – PR bleeding/bony fragment on PR exam

Urethra – perineal haematoma, blood at meatus, inability to pass urine

Major vessels – internal iliacs or other pelvic vessels – haemorrhagic shock

5.

Finding: negative Morrison's/RUQ view

Clinical implications – Laparotomy unlikely to be of any direct benefit – needs management of pelvic bleeding

6.

Platelets >50

Fibrinogen >1.0

Ionised Ca >1.1

INR <1.5

pH <7.2

7.

Coagulopathy

Hypocalcaemia

Volume Overload

Hypothermia

Metabolic alkalosis

Hyperkalaemia

TRALI

**Q11 (9/12)**

1. Bilateral crackles  
Raised JVP  
Hepatomegaly  
Tachycardia  
Hypertension  
Hypoxia
  
  2. Hypertension  
Cardiac Ischaemia  
Renal failure  
Non-compliance with fluid restriction / medications  
Intercurrent illness  
Stress (ie takotsubo cardiomyopathy)
  
  3. GTN infusion  
5-100mcg/min (IV infusion 50mg in 50ml)  
Target end points – reduction in pre-load – systolic BP reduction to something reasonable ie 30% reduction or Clinical end point – decreased work of breathing or subjective dyspnoea, decreased tachypnoea, improved oxygenation etc
- CPAP/BiPAP  
Details: 5-10cm H2O PEEP/EPAP, IPAP less important here  
Clinical end-points as above, improved O2, decreased work, decreased RR or decreased BP

## Q12 (10/15)

1.

Drug Use  
Recent trauma  
Immunosuppression  
Abrupt onset  
Hx malignancy  
Weight loss  
Visual hallucinations  
(Many others)

2.

BSL	exclude hypo/hyperglycaemia as cause of agitation
CT head	exclude mass lesion/bleed
CXR	exclude pneumonia
Urine Drug Screen	look for substance induced MH disturbance
Thyroid Function tests	exclude thyrotoxicosis
Electrolytes	exclude renal injury / hyponatremia as cause

3.

First aid – copious wound irrigation  
Remove from clinical duties  
Report to infection control/similar  
Test source and victim for HepB/HepC/HIV  
HepB immunisation (passive) if victim not immunised  
Antibiotics if suspect deep structures involved (Augmentin) – human bite  
Incident report completed for QI / review restraint procedures

**Q13 (8/10)**

1. Hypochloreaemic Metabolic alkalosis –  $\text{HCO}_3^-$  51 (1 mark)  
Respiratory compensation – Expected  $\text{CO}_2$  is  $0.7 \times 51 + 20 = 55$  (2 marks)  
HAGMA – anion gap is  $138 - 69 + 51 = 18$  (2 marks)
2. Pyloric stenosis – confirmed by USS identification of hypertrophic pylorus
3. 0.9% saline + 5% dextrose (or other safe alternative)  
Maintenance is 20mls/hr  
Deficit is 500mls over 24 hrs = 21mls/hr

**Q14 (11/15)**

<b>DIFFERENTIAL</b>	<b>FBE finding</b>	<b>One other KEY Investigation Finding (can be on blood film)</b>
Iron Deficiency or anything similar (ie GIT bleed/bowel malignancy)	Microcytosis/ Other cell lines preserved	Iron studies Reticulocytosis
Leukaemia	Other cell lines involved – pancytopenia	Blasts on film
Aplastic Anaemia/ myelofibrosis	Pancytopenia	Blasts not present/ no reticulocytosis
CRF/EPO deficiency	Normocytosis/ Other cell lines normal	CRF on U&Es
Vitamin Deficiency – B12/Folate	Macrocytosis	Deficiency B12/Folate levels
Haemolysis	Isolated anaemia	Schistocytes, unconjugated hyperbilirubinaemia, raised LDH, low haptoglobin

## Q15 (9/12)

1. Signs of life-threatening asthma:
  - Drowsiness
  - Collapse
  - Refractory Hypoxia
  - Bradycardia
  - Apnoea
  - Silent Chest
  - Poor resp effort
  - Investigative findings –relative hypercapnoea

There are likely many more....

2. Hypoxia/ Pre-oxygenation: HFNC 15lpm throughout, consider BiPAP as pre-ox strategy, avoid apnoea, induce sitting up

High-pressure ventilation: manual ventilation, increased pressure limits to maintain PPlat <30cmH2O

Cardiovascular collapse with raised thoracic pressures: Fluid bolus, start adrenaline

Dynamic Hyperinflation: Slow bag – 4-6/min, disconnect from ventilator



**Q16 (10/14)**

1.

Proximal fracture tibia minimally displaced

Proximal fibula fracture

Mid-shaft tibia+fibula fractures

- Comminuted
- Laterally angulated
- Slightly shortened
- Mildly laterally displaced

2.

Altered sensation below injury

Pale foot

Loss DP pulse

Tense muscle compartments

Cool foot

3.

Elevation

Remove any external compression (splints/slabs/bandages)

Analgesia

Immediate orthopaedic attendance for fasciotomy

**Q17 (9/13)**

1.

<b>ISSUE</b>	<b>POSSIBLE CONTRIBUTOR</b>	<b>STRATEGIES</b>
<b>SYSTEM LEVEL</b>	Inadequate staffing at senior level Inadequate rostering within department areas	Review adequacy of staff mix to ensure adequate senior supervision
		Ensure senior staff rostered to/responsible for ambulatory care area
<b>PROCESS LEVEL</b>	Xray reporting delays No notification of abnormal imaging to clinical staff Lack of senior review of patient/imaging prior to discharge	Ask radiology to look at reporting times Single point contact (ED Consultant) for abnormal imaging
		Mandate all imaging/patients of junior staff discussed and reviewed prior to discharge at reg/consultant level.
<b>INDIVIDUAL LEVEL</b>	Lack of understanding/skill in xray interpretation Poor patient communication skills	Look at resident education program – common missed injuries
		Observed practice encounters with juniors; consider workshops on communication skills

2. Apologise and acknowledge inadequacy of initial care  
 Expedite rapid return and assessment – advise patient to return to ED; arrange senior review on arrival  
 Provide necessary clinical care – re-image/reduce/immobilise and analgesia  
 Pledge to investigate and feedback  
 Document all interactions

**Q18 (8/12)**

1.

Bilateral symmetrical infiltrates

Alveolar infiltrates with some confluent/round lesions

2.

No effusions

Normal heart size

3.

Mycoplasma pneumoniae (many others)

Mycobacterium tuberculosis

Aspergillus

Influenza

4.

Pulmonary haemorrhage eg Wegener's granulomatosis

Lymphangitis carcinomatosa

Pulmonary oedema

Leucostasis eg acute leukaemia

Alveolar proteinosis

**Q19 (9/14)**

1.
  - i. – Fever for > 5 days
  - ii. – Bilateral conjunctival injection
  - iii. – Mucous membrane changes (cracked lips, red pharynx, 'strawberry' tongue)
  - iv. – Extremity changes: erythema palms/soles, edema hands/feet, desquamation
  - v. – Cervical lymphadenopathy
  
2.
  - i. – Measles
  - ii. – Other Viral exanthem
  - iii. – Staph infection (Toxic shock syndrome, Scalded skin syndrome)
  - iv. – Strep infection (Toxic shock syndrome, Scarlet fever)
  - v. – Erythema Multiforme
  - vi. - Stevens-Johnsons
  - vii. – Drug reaction
  - viii. – EBV
  - ix. - Leptospirosis
  
4.
  - i. – Coronary artery aneurysms
  - ii. – Myocardial infarction
  - iii. – Arrhythmias
  - iv. – Cardiac failure/ impaired LV function
  - v. – Myocarditis
  - vi. – Pericarditis
  - vii. – Pericardial effusions
  - viii. – Valve dysfunction

**Q20 (9/13)**

1.

Due to inflammatory state/sepsis with raised globulins to fight infection at the expense of albumin production (negative acute phase reaction)

Jaundice due to biliary obstruction

Ductal enzymes higher than hepatocellular c/w biliary obstruction

2.

Cholangitis with biliary obstruction

3.

Radiol Ix	Advantages	Disadvantages
CT	<ul style="list-style-type: none"><li>• Specific and sensitive for CBD dilation/ obstruction/ cause/level (cholangitis)</li><li>• Good sensitivity for cholecystitis (wall thickening, peri-cholecystic fluid)</li><li>• Assesses pancreas/head of pancreas well (if obstruction)</li><li>• Identifies other pathology (intra abdominal, renal, pneumonia)</li></ul> Must 1 <sup>st</sup> point to get > 1 for this box	<ul style="list-style-type: none"><li>• Not as sensitive/specific for gallstones as US</li><li>• Contrast</li><li>• Radiation</li></ul> Must mention 1 <sup>st</sup> point to get > 1 mark
USS	<ul style="list-style-type: none"><li>• Sensitive + Specific for gallstones/ cholecystitis (investigation of choice)</li><li>• Sensitive for biliary duct dilation (cholangitis)</li></ul>	<ul style="list-style-type: none"><li>• May not define level/cause of obstruction if duct distension/ cholangitis esp if distal</li><li>• Limited diagnosis other intra-abdominal pathology</li><li>• Operator dependent/ habitus</li></ul> Must mention 1 <sup>st</sup> point to get > 1 mark this box

**Q21 (12/16)**

1.

<b>Assessment Aim</b>	<b>Supportive historical or examination features</b>
<i>Labour established</i>	<i>Presence of pelvic pressure / low back pain Regular contractions / strength of contractions / palpable uterine activity on examination</i>
<i>Rupture membranes</i>	<i>Loss of fluid, blood or mucous PV – suggesting PROM Sterile speculum examination- state of cervix (dilatation) / membranes (?ruptured)</i>
<i>Stage of labour</i>	<i>Cervix length/effacement, dilatation on PV</i>
<i>Foetal well-being</i>	<i>Foetal surveillance – FHR / CTG</i>
<i>Mother well-being</i>	<i>Vital signs – BP – pre-eclampsia</i>
<i>Risk factors for pre-term labour</i>	<i>Previous pre-term labour - details History of pregnancy thus far – assisted reproduction, polyhydramnios / oligohydramnios, short cervical length (risks for pre-term labour) Medical history – recent / current UTI (risks for pre-term labour)</i>

*Also accept one answer that assesses for non-pregnancy causes eg appendicitis*

2.

<b>Treatment and reason for treatment</b>	<b>Clinical indication</b>
<i>Antenatal corticosteroids Betamethasone 11.4mg IMI</i>	<i>For foetal lung maturity if gestation &lt;34/40</i>
<i>Nifedipine 20mg po</i>	<i>Tocolysis in pre-term labour where foetus at risk due to prematurity</i>
<i>Magnesium sulphate 4g IV over 20min / then 1g / hour</i>	<i>For foetal neuroprotection in pre-term babies</i>
<i>IV antibiotics – ampicillin, gentamicin, metronidazole</i>	<i>If chorio-amnionitis established</i>

## Q22 (6/8)

1.

Acute STEMI

- Presence of ST elevation with reciprocal depression in I and aVL
- Q waves in V1 and V2
- STE III > II
  
- RWMA on echo would support STEMI

Acute pericarditis / myocarditis

- Widespread STE not conforming to one anatomical region
- Saddle shaped STE
  
- No RWMA, presence of pericardial effusion

**Q23 (5/10)**

1.

*Initial hyperventilation**Nausea**Vomiting**Tinnitus**Dehydration**Pyrexia**Confusion**Pulmonary oedema*

2.

<b>Management</b>	<b>Indication(s)</b>	<b>Dosing instructions</b>
<b>1. Decontamination</b>	Ingestion >150mg/kg within last 6hrs	50g oral charcoal (+/- repeat doses in large ingestions)
<b>2. Urinary alkalinisation</b>	Symptomatic patient	1-2mmol/kg bolus Na HCO <sub>3</sub> Then 25mmol/hr NaHCO <sub>3</sub> Aim urinary pH >7.5  (Need 2/3)
<b>3. Haemodialysis</b>	In severe toxicity: <ul style="list-style-type: none"><li>• Pre-existing renal/cardiac failure precluding urinary alkalinisation</li><li>• Pulmonary oedema</li><li>• Severe acidosis</li><li>• Elevated salicylate level &gt; 700mg/L or 5.1 mmol/L</li></ul> (Need 2/4)	



**Q24 (15/20)**

1.

*Hoarse voice / change in voice  
stridor  
Pain on swallowing  
Haemoptysis  
Subcutaneous emphysema*

2.

*expanding haematoma  
Carotid bruits  
Focal neurological signs  
Horner's syndrome  
Decreased consciousness*

3.

*CTA neck  
Fibre-optic nasendoscopy*

4.

*In ability to intubate - due to loss of usual landmarks / changes to anatomy*

*Conversion of partial to complete laryngo-tracheal disruption by blind passage of ETT and*

5.

*Arrest  
Hypoxia  
Tiring  
Loss consciousness*

6.

*Pre-oxygenate sitting up  
Have surgical airway kit ready  
Have a dedicated person for surgical airway eg surgeon  
Use of video laryngoscope  
Would accept avoidance of paralysis as well*

*Several other possibilities*

**Q25 (9/13)**

1.

Peri-orbital cellulitis

2.

Streptococcus

Haemophilus

Staphylococcus

3.

Orbital cellulitis / retro-orbital- pain on eye movement, ophthalmoplegia, loss of visual acuity, proptosis

Cavernous sinus thrombosis- headache, Ptosis, cranial nerve (3-6) palsy

Meningoencephalitis- meningism, headache, confusion, ALOC, seizures

Bacteraemia/septicemia- high grade fever, tachycardia, hypotension.

**Q26 (7/10)**

1.

History – gradual onset, constant pain, cloudy dialysate bags

Examination – generalized tenderness, signs of peritonism eg percussion tenderness, fever

Fluid WBC -  $>100 \times 10^6/L$ ,  $>50\%$  neutrophils

2.

Focal tenderness

Colicky pain

Sudden onset pain

Other features eg PR bleeding

Many others will be OK

3.

IP cephazolin 15mg/kg

IP gentamicin 0.6mg/kg up to 50mg

Analgesia – IV fentanyl 25mcg boluses

IP vancomycin 30mg/kg up to 2g if MRSA

**Q27 (7/10)**

1.

<b>Investigation</b>	<b>Justification</b>
BHCG	Exclude pregnancy as complicating factor / septic miscarriage
Endocervical swabs	PID- N. gonorrhoeae and C. Trachomatis
Urine PCR first pass	As above
US- exp transvaginal	Tubo-ovarian abscess
Extended serology	HIV, hepatitis, syphilis as con-infection sexually transmissible
LFTs	Fitz-Hugh-Curtis syndrome

CT Abdomen not acceptable, non-specific tests or examinations not acceptable.

2.

Ceftriaxone 2g od IV

Azithromycin 500mg od IV

Metronidazole 500mg bd IV

3.

1. Choice- the ability to maintain and communicate a choice.
2. Comprehension- the ability to understand the relevant information.
3. Belief- the ability to appreciate the situation and its consequences
4. Weighing- the ability to weight the information in a rational fashion.