2016.2 PAH Answer book

Q1

1.

Smoking

Hypertension

Alcohol abuse

Family Hx

2.

WFNS

1 – GCS 15

2 – GCS 13-14 no focal deficitis

3 – GCS 13-14 + focal deficits

4 – GCS 7-12

5 – GCS 3-6

3.

SAH related

- Hydrocephalus
- Re-bleed
- Seizure
- (vasospasm not likely this early)

Non-SAH related

- Opiate toxicity
- CO2 narcosis from opiates
- Hypoxia from pulmonary oedema

4.

Intubate – protect airway, control O2 and CO2

CT scan – exclude hydrocephalus and rebleed

Discuss with Neurosurgeons – facilitate definitive management, or EVD if needed

BP management – limit rebleed / complications while maintaining adequate CPP, aim systolic 160-200 probably acceptable

nimodipine infusion – prevent vasospasm

Minimise raised ICP / neuroprotective measures– head up, remove obstructions to venous return from head (eg ties), Na high normal range, CO2 35-40mmHg, normal temp and glucose

Q2

1.

Pathological process	**Explanation**
Severe Acute respiratory acidosis	raised pCO2 with very low pH 6.88
Chronic resp acidosis with metabolic compensation	HCO3 is raised at 44 more than would be expected for a purely acute process (expect about HCO3 of 34) ie raise of 1 mmol/L for every raise in 10mmHg of CO2

2.

Pathological process	**Formula**
Raised A-a gradient / relative hypoxia	A-a gradient = PAO2 – PaO2 PACO2 = FiO2 (760 – PH2O) – PaCO2/0.8

3.

- intubate

- hyperventilate to decrease CO2

- reduce FiO2

- IV Abs – ceftriaxone 1g / azithromycin 500mg (accept ben/pen and azithro)

- IV fluids – 500-1000mL bolus repeat if needed aiming for systolic BP >100mmHg

Q3

1.

Stridor

Loss of voice/Hoarse voice/Odynophagia

Marked Lip swelling

Obvious oral cavity/oropharyngeal swelling

Burnt nasal hair

2.

Hypoxia from burns

Toxic from combustion – CO or cyanide

Trauma from associated injury

Heat Stroke

3.

36%

4.

Parkland formula – 4ml/kg * %BSA

4 * 36 * 100 = 14400 mL

Half over first 8hrs, half over next 16hrs

Q4

1.

No midline tenderness

No neurological abnormalities

No distracting injury

Not intoxicated

No altered consciousness

2.

Soft tissue swelling in front of C6/7

Antero-superior corner fracture C7

Disruption of posterior spinal line

Widening between spinous processes C6 – C7

3.

Unstable fracture cervical spine with posterior ligamentous disruption

4.

Upper limb action	**Nerve root supply**
Elbow flexion	C5/6
Elbow extension	C7/8
Wrist extension	C6/7
Finger abduction	T1

Q5

1.

Other ED directors

Ambulance Directors

Neurology

Radiology and Interventional Radiology

Intensive Care

2.

Current ACEM Guideline/Policy Statement

Regional practice

Other college statements (ie RACP - neurologists)

Recent peer-reviewed RCTs/ similar journal articles for clot retrieval

3.

Clinical stroke syndrome with NIHSS >2

Time point (accept anything up to 8 hours)

Patient Consent

Major vessel occlusion on CT (A) – up to first division of major named cerebral arteries

Age >18

No contraindications – pretty much any of the standard things here.

Q6

1. Focal symptoms – suggest infective focus

Degree of illness – ie severity of symptoms, complications (fluid loss)

Last chemotherapy – helps to predict complications (ie neutropaenia)

Underlying disease and therapeutic intent

Presence of in-dwelling lines/devices

Co-morbidities – particularly cardiac (chemo), immunomodifiers (DM)

Others likely reasonable

2. Vital signs – to stratify severity of illness

Focal findings – to guide therapy

Complications of lines – ie infected ports

3. Allergies – will direct against use of specific drugs

Past micro results/resistance – initial cover should be extended to cover these

Presence of in-dwelling catheters/lines – ensure include staph cover + MRSA

Local Protocols/biogram – ie resistant organisms (VRE/ESBL)

Comorbidities ie renal failure – may require dose modification +/- alternate agent

Q7

1.

Invite interest from stakeholders

Gather information about requirements for M+M meetings eg medico-legal / college statements / other hospitals

Establish committee

Terms of reference

Reporting lines

Frequency of meetings

Roles

2.

Representations with 24/48hr

Deaths within 48hrs of discharge

Deaths within 24hrs of admission

Unplanned admissions to ICU from ward within 24h of admission

Complaints (pts/GPs/ Inpatient teams)

Missed pathology/radiology

Meetings with inpatient teams eg ICU

Audits of KPIs eg time to cath lab for STEMIs

Others probably ok

Q8

1.

Hx of choking episode

Hx of playing with something in mouth

Ex

Focal wheeze, monophonic

Focal crackles

Unilateral hyperinflation

2.

Differential diagnosis	Clinical assessment features
asthma	Prolonged expiratory phase Generalised polyphonic wheeze Hx asthma
Viral pneumonitis	Viral prodrome – cough, rhinorrhea fevers

3.

Pneumonia

Abscess

Distal collapse

bronchiectasis

Q9

1. Space – resus areas for mother and child

Equipment: neonatal resus equipment

Personnel: Brief and prepare teams for mother (ED – doctor/nurse, outside ED – midwife) and baby (ED – Doctor/ nurse, +/-paediatrician)

2.

Establish IV access

Ensure singleton pregnancy – if not known from antenatal USS, palpate abdomen to exclude second fetus

Administer oxytocic agent – IM oxytocin 10mg or ergometrin 250mcg

Uterine massage

Apply gentle cord traction (down and back) whilst supporting uterus with other hand

Inspect delivered placenta for completeness to exclude RPOC

3.

Newborn Heart Rate	Management
<60/min	Start Compressions (3) to ventilations (1)
60-100/min	Ventilate with PPV (PEEP)
>100/min	No immediate action required; assess other components (tone, response)

Q10

1.

Pathological process	Radiological evidence
Right large haemothorax	Veiled opacification of right hemithorax Substantial rim of blood around outside of lung edge
Left hemi-diaphragm rupture	Stomach clearly evident superiorly displaced in thorax Loss of diaphragmatic outline
Left lung contusion (also accept haemothorax)	Opacification of visible left lung in upper zone

2.

Moderate/large amount of fluid in Morrison's pouch – intraperitoneal blood

3.

- Start with O negative blood

- activate MTP aiming for 1:1:1 packed rbc:FFP:platelets

- target systolic 80mmHg, cerebral perfusion defined by mentation, radial pulse palpable

4.

Right ICC to drain blood

Left ICC to drain blood, decompress left hemithorax

Insertion NGT to decompress stomach

Urgently to OT for control of intra-abdominal bleeding and correction of diaphragm rupture

Q11

1.

Main Pathology:

Inferolateral STEMI

Supportive Findings:

STE in inferior leads (II, III, aVF with STE III>II suggestive of proximal RCA)

STE in lateral leads V4-6

Q wave in III

ST depression in I and aVL (reciprocal change)

2.

Main Complication:

Monomorphic VT

Supportive Features:

Wide complex tachycardia, regular, rate 200/min

Fusion beat

QRS concordance

AV dissociation

Will accept capture beat (2^{nd} last one)

3.

Analgesia: titrated opiates (cautious GTN probably ok)

Aspirin 300mg

Other antiplatelet drug (clopidogrel or ticagrelor)

Heparin (any type, appropriate dose)

Cardiology referral for PCI

4.

Amiodarone 5mg/kg

Lignocaine 1-2mg/kg

Q12

1.

RUL opacification

Cavitating lesion with air-fluid level

RUL collapse - Tracheal deviation and R hemithorax volume loss with elevation of horizontal fissure

Opacification of superomedial segments of RML consistent with mass or consolidation

Small left basal effusion

2.

Neoplastic: Primary Lung (Bronch. Carcinoma, SCLC, NSCLC, carcinoid), Secondary mets

Lung abscess - Bacterial Infection: Klebsiella, Pneumococcus, Staph.

TB, other granulomatous diseases

Vasculitis eg Wegener's

3.

Sputum Culture: high yield for bacterial causes

TB stains, smears on sputum and cultures: positive smear indicates infectivity, culture excludes disease (takes 4-6 weeks)

Sputum microscopy for malignant cells

CT Chest: can support specific diagnoses based on appearance, indicate complications (ie metastases), and can indicate suitability for invasive tests (ie transbronchial biopsy)

Blood Culture: can provide sensitivity data for directing antimicrobial therapy in bacterial causes

Q13

1.

Small bowel obstruction

2.

Dilated loops of bowel

Many air/fluid levels

Small bowel – plicae circulares, central location, no large bowel gas

3.

Adhesions – abdominal wall scars from previous surgeries

Inguinal herniae – presence of inguinal hernia on examination

4.

Metabolic complication	**Cause**
Metabolic alkalosis	Loss of HCl through vomiting
hyponatremia	3rd spacing in to gut
Lactic acidosis	From hypoperfusion due to dehydration through 3rd space losses in to gut

Probably many others here acceptable

Q14

1.

Ice gargles

Hydrogen peroxide gargles

Co-phenylcaine spray

Adrenaline soaked gauze on Magill's forceps

Intubation and packing

2.

- Hypoxia post induction / difficulty pre-oxygenation / aspiration lung injury
  - 15LO2 via NRB plus nasal prongs at max, sit up until stops breathing, 2 suckers, apnoeic intubation as fast as possible (use of NIV would be incorrect given blood)

- hypotension post induction
  - 2 IV access, adequate fluid load 20mL/kg N/S pre-induction, have O negative blood ready for use

- difficult laryngoscopy due to blood
  - use 2 suckers, extra assistant, have backup airway equipment ready esp LMA

- Scared child / unco-operative child
  - Have parents with child for support, also dedicated nurse for family / child support

- IV access
  - Have dedicated nurse to help with this, use IO if patient not able to be cannulated

- Difficult BVM due to blood
  - Early change to LMA, aim to have apnoeic intubation

Q15

1.

Long QT – risk of Torsades de Pointes

Q waves – evidence of previous MI with structural disease, risk of VT

"tri-fascicular block" / bifascicular block with 1st degree HB – risk of complete HB

Pre-excitation / delta waves – WPW syndrome

RBBB with ST elevation V1-3 – Brugada syndrome, risk VT/VF

Negative T waves V1-2, epsilon waves – ARVD – risk VT/VF

Broad QRS >120ms – risk of VT due to structural disease

(others may be acceptable but must correlate with stem – ie normal vital signs)

2.

CXR – SOB with focal examination findings eg crackles

FBC – any clinical finding suggests anaemia, but will not accept "baseline" or look for anaemia

Electrolytes – lots of possible answers but must be JUSTIFICATION

CT head – focal neurological abnormalities / head trauma from fall / headache / anti-coagulation

Q16

1. Agents – type of iron tablets (elemental iron varies)

Dose – ingested dose, single ingestion vs staggered

Time of Ingestion – determine time of peak toxicity

Clinical Course - ?any GI symptoms yet to suggest significant toxicity

Patient Factors – PMHx – determine cardiorespiratory reserve

Co-ingestion - ?other expected toxidromes

2. History: (large ingested dose >120mg/kg), gut dysfunction early – V&D, GIT bleed)

Examination: Shock (accept hypotension), Altered Mental State

Investigations: Serum iron levels high (>90) , HAGMA

3. Whole bowel irrigation

Endoscopy

4. Desferrioxamine

Q17

1.

Anterior dislocation of right humeral head

Inferior dislocation of right humeral head

Hill-Sach's fracture

Greater tubercle diplaced laterally

2.

Kocher's

Milch

Hippocratic

Spaso

Stimson

Scapular rotation

3.

anything reasonable, as long as it includes analgesia and sedation and in safe doses

Q18

1.

- swollen left first MTP joint

- erythema over first MTP joint extending to dorsum foot

2.

Joint aspirate for M/C/S and cell count

3.

Differential diagnosis	**Supportive features**
1. Septic joint	cell count – greater than 50 000
	Organisms on Gram stain / also accept “no crystals”
2. gout	Cell count generally less than 50 000
	Negatively bi-refringent crystals

4.

Septic joint

- Washout in theatre by orthopaedic surgeon
- IV antibioitcs – flucloxacillin 1g QID

Gout

- Prednisone 50mg od 3-5 days
- NSAIDs eg ibuprofen 400mg tds
- Colchicine 500mcg QID, max 6mg

Q19

1.

Non-Accidental Injury – signs of trauma – bruising, swelling,

Sepsis – fever, poor perfusion, focal signs infection

Occult trauma – corneal abrasions/ skin tourniquet

Surgical – herniae, abdominal findings – distension, bilious vomiting

Congenital cardiac – cyanosis, sweating while feeding, heart sounds

Colic / reflux – observe reflux

2.

History of depression

Prior post-partum depression

History of other mental illness – bipolar

Recent stressors – pregnancy complications, job issues, health problems

Baby has health problems or special needs

Feeding difficulties

Relationship issues

Lack of supports

Unwanted pregnancy

3.

Psychosis

Admission of thoughts of infanticide/harm

Thoughts of self-harm

Any suicidality (any other SADPERSONS type stuff)

Poor social supports

4.

Identify reasons for wanting to leave – ie other children, engagements – offer assistance (ie social work)

Offer to find support person (ie partner, friend)

Ensure she understands the seriousness of the situation including your concerns about her mental health and how this may impact her child

Explain the benefits from staying in hospital (allows longer observation of child, interactions (feeding, sleep etc), may allow rest and 'break-the-cycle')

5.

- has a mental health disorder

- no less restrictive means of management

6.

Droperidol 10mg

Midazolam 5-10mg

Others possible as long as safe

Q20

1.

CPR ratio of compressions:breaths	15:2
Energy dose for defibrillation	4J/kg
Dose of adrenaline	10mcg/kg
Timing of adrenaline	After 2nd shock then every 2nd cycle
Dose of amiodarone	5mg/kg
Timing of amiodarone	After 3rd shock

2.

Hypoxia

Hypovolemia

Hyper/hypokalaemia

Hypo/hyperthermia

Tension pneumothorax

Tamponade

Toxins

Thrombosis (cardiac / pulmonary)

Q21

1. IV drug abuse

Immunosuppression (diabetes, alcoholism, HIV)

Overlying infection from pressure sores (ie spinal injury)

Recent instrumentation/spinal surgery/LP/Spinal anaesthetic

2. Vital signs - for systemic complications (septicaemia)

Assess for spinal cord compression – motor and sensory

Assess for cauda equine syndrome – above and also perianal tone / sensation

Signs of focal complicating collections – ie secondary abscess sites splenic/paraspinal abscess

3.

TEST	JUSTIFICATION
CRP	More sensitive than WCC early in disease evolution
Blood Culture	Identifies causative organism – guides directed therapy
MRI	Confirms site and extent, confirms co-existant osteomyelitis, identifies multi-level disease

4. Gentamicin (5mg/kg) + Vancomycin 25mg/kg (not accepting 1gm but some variation likely ok here ie 1.5gm or above

Q22

1.

Left small VUJ ureteric stone

Mild hydroureter / hydronephrosis

2.

Fat stranding around left kidney

Enlarged left renal pelvis / ureter

Small stone at left VUJ / bladder wall

3.

Investigation	**Justification**
Urine dipstick or M/C/S	Exclude urinary infection which would require urgent stent
Urea / creat	Exclude significant renal impairment especially in someone with chronic renal failure (as a complication)

4.

Pain well controlled

No urinary infection

Tolerating oral intake

Follow up arranged

(probably also renal function acceptable)

Q23

1.

Complete heart block

AV dissociation

QRS rate approx. 40/min

QRS duration 120ms (broad) with RBBB pattern [need both for this mark]

- (this will represent left bundle escape focus, or junctional escape with pre-existing RBBB)

2.

Ischaemia

Electrolyte eg hyperkalaemia

Drugs eg beta blockers

Degenerative disease conducting system

Infiltrative disorders eg sarcoidosis

3.

Hypotension

Impaired mentation

Chest pain

(anything else that fits with end organ hypoperfusion)

4.

Isoprenaline

Adrenaline

Dopamine

Dobutmaine

Q24

1.

None of the following

- focal features at onset or during the seizure
- Duration of more than 15 minutes
- Recurrence within the same febrile illness
- Incomplete recovery within 1 hour.

2.

Investigation	**Justification**
No investigation	- Well child, simple febrile convulsion - Clear source of fever on investigation that does not require investigation eg cellulitis - immunised
Urine bag specimen	- all girls <2 yrs - will only exclude UTI, positive specimen requires clean catch
Urine supra-pubic aspiration or catheter specimen	- for those children with positive urine bag specimens or some other Hx to suggest UTI (eg recurrent UTIs
Blood culture	- for unwell children with suspicion of bacterial illness to direct Ab therapy
Chest x-ray	- only for children with clinical signs of pneumonia - crackles, tachypnoea, decreased O2 sats
Lumbar puncture	- for unwell children with suspicion of meningitis (or unwell with previous Ab Rx) - meningism
Full blood count	- for unwell children - WBC count has some correlation with likelihood of bacterial illness

Q25

1.

Wide symphysis pubis

Left SI joint completely disrupted

Fractured left superior and inferior pubic rami

2.

Grade 3 AP compression fracture

3.

Management step	**Rationale**
Apply pelvic binder	Attempt to close pelvic ring to minimise haemorrhage
IV morphine 2.5mg aliquots	Very painful injury - Analgesia will facilitate ongoing management and agitation
Intubation / ventilation	Will allow control of patient to facilitate angiography
Blood product resuscitation	Use massive transfusion protocol with ratios 1:1:1 packed cells:FFP:platelets Allow permissive hypotension to minimise ongoing blood loss

Q26

Diagnosis	History/ Exam	Investigations
ITP	Recent viral illness Otherwise well child Normal vitals/perfusion on exam	Key is ISOLATED thrombocytopaenia 60% have detectable anti-platelet antibodies (anti-glycoprotein IgG)
HUS	Recent gastrointestinal illness (5-10d before onset of rash (Shiga. E.Coli) – bloody diarrhoea is hallmark but not required Oligo/anuria or haematuria Abdominal pain is common Hypertension Can have focal neurology	Investigations will show HAEMOLYSIS: - Anaemia - Elevated LDH - Decreased Haptoglobin - Schistocytes on film - Elevated creatinine
DIC (meningococcaemia)	Rapid onset of severe illness Febrile Signs of distributive shock (ALOC, vital sign derangement) Ecchymoses with poor perfusion/mottling	Signs of DIC: Prolonged PT Decreased fibrinogen Elevated D-Dimer Other tests for Menigococcaemia: Blood Culture PCR testing

There may be other acceptable reponses – ie acute leukaemia – this would have corresponding answers of constitutional symptoms – bone pain/fever/lethargy/nightsweats/splenomegaly and lab findings of leucocytosis/anaemia/blasts/elevated LDH but not usually evidence of haemolysis (ie no decrease in haptoglobin/ presence of schistocytes)

Q27

1.

Non-massive ingestions - <4hrs post ingestion

Massive (>30gm) – AC indicated up to 24hrs

2.

Repeat paracetamol at another 4 hrs (10hrs) – must be BELOW line and FALLING (indicates non-toxic ingestion) **1 mark**

OTHERWISE IF TOXIC INGESTION,

Has completed NAC therapy AND **1 mark**

ALT <50 and Paracetamol <10 prior to completion **1 mark**

3.

- INR > 3.0 at 48 hours or > 4.5 at any time
- oliguria or creatinine > 200 mmol/L
- persistent acidosis (pH < 7.3) or arterial lactate > 3 mmol/L
- systolic hypotension with BP <80 mmHg, despite resuscitation
- hypoglycaemia
- severe thrombocytopenia
- encephalopathy of any degree, or ALOC (GCS < 15) in the absence of sedatives.