

"List" = 1-3 words

"State" = short statement/ phrase/ clause

UNIVERSITY HOSPITAL, GEELONG  
FELLOWSHIP WRITTEN EXAMINATION

WEEK 5– TRIAL SHORT ANSWER QUESTIONS Suggested answers  
**PLEASE LET TOM KNOW OF ANY ERRORS/ OTHER OPTIONS FOR ANSWERS**  
**Please do not simply change this document - it is not the master copy !**

**Question 1 (20 marks) 9 minutes**

A 35 year old female factory worker is brought to hospital after skin exposure to a chemical spill at a local petrochemical plant. Hazchem information has identified the substance involved as an organophosphate.

- a. State the toxic mechanism/s of this poisoning. (3 marks)
- **Irreversible inhibition of Acetylcholinesterase enzymes**
  - **Increases Ach at both cholinergic nicotinic and muscarinic receptors**
- ∴ both autonomic and skeletal muscle stimulation*
- **Usually formulated with a hydrocarbon- inhalation frequently causes HA & dizziness**
  - **Chemical pneumonitis if hydrocarbon solvent aspirated**
- b. List three (3) potential **non life threatening** clinical effects that would suggest acute intoxication in this patient.(3 marks)
- Muscarinic:
- **Ds**
  - **Urination**
  - **Miosis**
  - **Bronchorrhoea**
  - **Emesis**
  - **Lacrimation**
- Nicotinic:
- **Salivation**
  - **Fasciculation**
  - **Agitation**
  - **Tremor**
  - **Weakness**
  - **HT**
- c. List three (3) potential early, **life threatening** clinical effects of acute intoxication with an organophosphate. (3 marks)
- **Bradycardia**
  - **Hypotension**
  - **Bronchospasm**
  - **Resp. muscle paralysis**
  - **Tachycardia**
  - **Seizures**
  - **Coma**
- d. State the decontamination required for this patient? (2 marks)
- **Remove clothes, soap, water**
  - **Resuscitation should not be delayed for decontamination**
- e. State the personal protective equipment that is required by staff who care for this patient. (1 mark)
- **Universal precautions only (More sophisticated PPE not required- most of the inhalational effects that are felt are related to the Hydrocarbon that is associated with the OP)**

The patient exhibits clinical features of a life threatening exposure. The patient undergoes appropriate decontamination and intubation.

- f. List two (2) management steps for this state. Provide details including route, dose and endpoints of treatment. (8 marks)

	Management (2 marks)	Route (2 marks)	Dose (2 marks)	Endpoint of treatment (2 marks)
1	Atropine	IV	Big 1.2mg every 5 min- double dose each interval	Cessation of salivation/ lacrimation- drying of secretions Resolution bradycardia HR > 80 Good air entry on auscultation
2	Pralidoxine	IV	2g followed by infusion (0.5g/hr)	> 24/24 if clinically well

## Question 2 (12 marks) 6 minutes

A 3 year old male presents to ED after refusing to weight bear on his right leg for the last 3 days.

a. List four (4) likely differential diagnoses for this presentation. (4 marks)

- **Toddlers #**
- **# elsewhere**
- **Foreign body/ lesion - foot**
- **Joint effusion/ viral/ transient synovitis**
- **Septic arthritis- hip or other**
- **Osteomyelitis**
- **Back trauma**
- **NAI- #/ sprain/ haematoma**
- **developmental dysplasia of hip**
- **abdominal pathology**

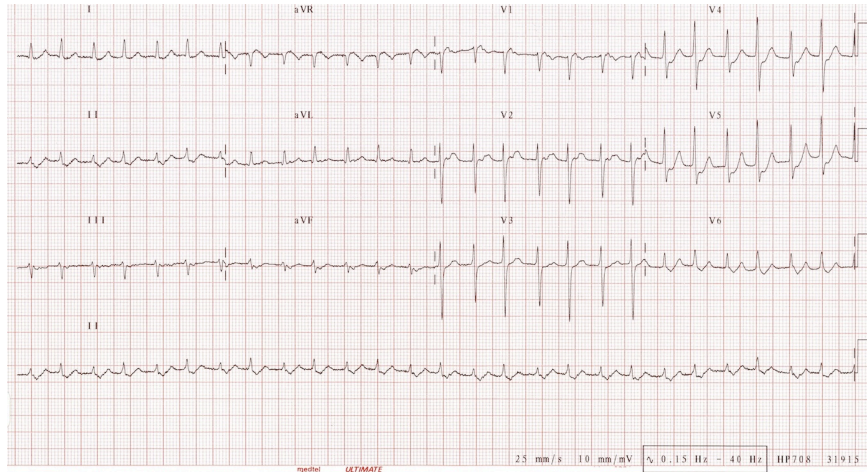
b. List four (4) investigations that you may perform in the emergency department. Provide one (1) justification for each choice. (8 marks)

*NB: "in the emergency department"- ie not bone scan*

<b>Investigation (4 marks)</b>	<b>Justification (4 marks)</b>
<b>Tib/fib XR</b>	<b>Demonstrate spiral fracture distal tibia, although not always seen on initial films, initial Ix of choice for developmental dysplasia</b>
<b>Foot Xray</b>	<b>Occult #</b>
<b>Joint Ultrasound (esp hip)</b>	<b>Looking for effusion and guide potential aspiration if systemically unwell and septic joint suspected</b>
<b>FBE</b>	<b>WCC &gt; 15 and &gt; 75% neutrophils +/-or L shift increase likelihood septic arthritis and warrants admission</b>
<b>CRP</b>	<b>Elevation supports diagnosis of infections/inflammation (Marker of potential bacterial sepsis) e.g. septic joint, can be used to monitor response to treatment</b>
<b>Blood cultures</b>	<b>Indicated early in management if febrile to identify organism and guide antibiotic treatment</b>

### Question 3 (13 marks) 6 minutes

An 80 year old female presents to ED with palpitations and shortness of breath. She has undergone coronary artery bypass grafting 2 weeks earlier.



- a. State five (5) significant abnormalities shown on this ECG. (5 marks)
- Rate ~ 160
  - NCT- no p waves
  - Electrical alternans
  - STE 1mm aVR
  - STD 1mm II, 0.5 mm aVF, 2mm V2, 3mm V5, 1mm V6
- b. List four (4) likely causes for her symptoms in the setting of this ECG. (4 marks)
- Pericardial effusion- secondary to post operative haemorrhage- most likely given alternans
  - CCF
  - PE
  - ACS
  - Dissection down graft
  - Anaemia
  - Bronchospasm-  $\beta$ blocker induced
  - Post op pneumonia/ atelectasis
- c. List four (4) investigations that you would perform to assist with your diagnosis. (4 marks)
- ECHO- urgent, bedside
  - CXR (may identify large pneumothorax or large pleural effusion)
  - FBE
  - CTPA (high sensitivity and specificity for PE, plus may aid in alternative diagnosis)
  - HS trops (myocardial ischaemia or myocarditis)
  - U+E (severe uraemia)

### Question 4 (12 marks) 6 minutes

A 72 year old male presents to ED with epistaxis. He is taking warfarin and atenolol for atrial fibrillation. He has 2 large bore IV access in situ and non-invasive monitoring applied. His vital signs on presentation are: BP 70/30 PR 50 RR 16 Temp 37°C GCS 15

- a. List four (4) key steps in your management in the ED. Provide one (1) detail for each step. (8 marks)

Treatment/ supportive care	Detail
<ul style="list-style-type: none"> <li>Control bleeding- direct measures</li> </ul>	<ul style="list-style-type: none"> <li>↓ ongoing losses</li> <li>Sit upright/pressure/ ice to suck/ cophenylcaine/ suction clots/ cautery/pack</li> </ul>
<ul style="list-style-type: none"> <li>Stat fluids</li> </ul>	<ul style="list-style-type: none"> <li>1L NS</li> <li>Aim for normovolaemic resuscitation</li> </ul>
<ul style="list-style-type: none"> <li>Reverse warfarin</li> </ul>	<ul style="list-style-type: none"> <li>FFP 4 Units /Prothrombinex 50 IU/kg /Vit K10mg IV</li> </ul>
<ul style="list-style-type: none"> <li>Volume resuscitation</li> </ul>	<ul style="list-style-type: none"> <li>1000ml normal saline intravenous</li> <li>Early blood products</li> <li>Activation massive transfusion protocol as hemorrhagic shock</li> <li>Endpoints: SBP &gt; 90, MAP 65, UO &gt; 0.5ml/kg/hr</li> </ul>
<ul style="list-style-type: none"> <li>ENT referral</li> </ul>	<ul style="list-style-type: none"> <li>ENT admission with urgent consult to critical care area e.g. HDU/ICU</li> <li>may need endoscopic surgical ligation or embolisation</li> </ul>

The bleeding persists despite your management above. You suspect a posterior site for the bleeding.

- b. State two (2) options for control of bleeding in the Emergency Department. List one (1) important pro for each option. (4 marks)

Option (2 marks)	Pro (2 marks)
<ul style="list-style-type: none"> <li>Double balloon catheter (Brighton balloon/ Rapid Rhino/Epistat)</li> </ul>	<ul style="list-style-type: none"> <li>most effective</li> <li>easy to insert and inflate</li> <li>bilateral if ongoing bleeding</li> </ul>
<ul style="list-style-type: none"> <li>Tranexamic acid 1g/10mins then 1g/8hrs</li> </ul>	<ul style="list-style-type: none"> <li>potent competitive inhibitor of plasminogen activator therefore may prevent clot disintegration</li> </ul>
<ul style="list-style-type: none"> <li>Foley Catheter</li> </ul>	<ul style="list-style-type: none"> <li>pressure necrosis if left for prolonged time</li> <li>intolerable to pt</li> </ul>

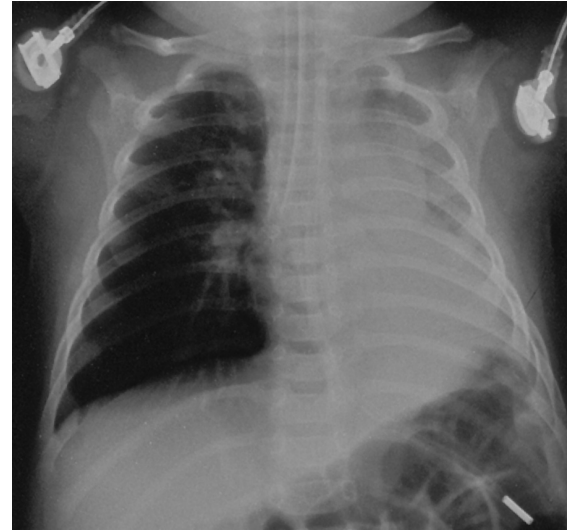
This resource is produced for the use of University Hospital, Geelong Emergency staff for preparation for the Emergency Medicine Fellowship written exam. All care has been taken to ensure accurate and up to date content. Please contact me with any suggestions, concerns or questions.

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## Question 5 (13 marks) 6 minutes

A 5 year old male presents to ED after an episode of near drowning. He is intubated on arrival and the Xray opposite is taken soon after intubation. His weight is 20 kg.

- a. State four (4) abnormal findings in this CXR. (4 marks)
- **RMB ETT**
  - **Opacification L lung**
  - **NGT stomach**
  - **Absent L hemidiaphragm**
  - **Crowding of ribs on L**
  - **(?) bilateral mid clavicle callous**



His weight is 20 kg.

- b. List the initial ventilator settings that you would commence. (5 marks)

<b>Mode</b>	<b>SIMV</b>
<b>Tidal volume</b>	<b>120-200ml</b>
<b>Respiratory rate</b>	<b>16</b>
<b>I:E</b>	<b>1:1 (1.4:1)</b>
<b>PEEP</b>	<b>Start 5cm increase to 10-15 as tolerated</b>

45 minutes after instituting these settings, his Peak Inspiratory pressures are 50 cm H<sub>2</sub>O.

- c. State four (4) steps that you would perform to rectify this problem. (4 marks)
- **Remove from ventilator → BVM**
  - **Check tube- depth**
  - **Check tube - patency- suction tube/ check filter**
  - **↓ RR**
  - **↑ I:E**
  - **Bronchodilators if evidence bronchospasm**
  - **Exclude PTX- clinical/US / CXR**
  - **Reduce PEEP**
  - **Consider further or first dose paralysis e.g. rocuronium 0.6mg/kg, or increase sedation**

"DOPES"- Disconnect + displaced ETT, obstruction, pneumothorax + paralysis, equipment failure, suction + sedation + breath stacking

## Question 6 (12 marks) 6 minutes

A 35 year old female presents to ED with a suspected red back spider bite.

- a. List three (3) clinical features that you may expect with this bite. (3 marks)
- **Absence of bite mark**
  - **Local severe pain < 1/24**
  - **Piloerection at site < 1/24**
  - **Sweating at site/unrelated site/ generalise/ profuse < 1/24**
  - **Erythema (minimal) at site < 1/24**
  - **Distant/ random pains**
  - **LN pains**
  - **Muscle fasciculations**
  - **Shivering**
  - **N/V**
  - **Restlessness**
  - **Lymphangitis**
  - **Tachycardia, HT**
- b. State three (3) current controversies in the management of a red back spider bite. (3 marks)
- **Role of AV at all vs symptomatic Rx** (see RAVE II below)
  - **Route of AV- IM vs IV** (may be viewed as not controversial anymore)
  - **Role of AV in delayed presentation**
  - **Role of repeated AV dose**

Following your review, the features are more suggestive of Funnel Web spider bite.

- c. List three (3) clinical features that you may expect with this bite. (3 marks)
- **Witnessed big black spider with huge fangs**
  - **Fang marks at bite site**
  - **Rapid onset**
  - **Pain- immediate**
  - **Erythema- immediate**
  - **General:**
    - HA
    - Vomiting
    - Abdo pain
  - **Autonomic:**
    - Sweating
    - Salivation
  - **Lacrimation**
  - **Piloerection**
  - **Mydriasis**
  - **CVS:**
    - HT/Hypotension
    - Tachycardia/ bradycardia
    - APO
  - **Neurological:**
    - Paraesthesia (local/distant/perioral)
  - **NM paralysis**
    - Muscle fasciculations
    - Coma
- d. List three (3) agents that you may use for supportive care or specific treatment of a suspected severe Funnel Web spider bite. (3 marks)
- **Pressure bandage with immobilisation**
  - **Oxygen**
  - **Atropine**
  - **Antivenom-** (systemic envenoming -> 2 ampoules CSL funnel web spider antivenom, severe envenoming/cardiac arrest -> 4 ampoules IV)
  - **Antiemetic**
  - **Analgesia**
  - **Tetanus prophylaxis**
  - **AntiHt**
  - **Fluids- in shock- careful**

	<b>Red back spider</b>	<b>Funnel web spider</b>
<b>Urgency of treatment</b>	<b>Non urgent</b> <b>(Severe envenomation is unlikely in &lt; 3/24)</b>	<b>Urgent</b> <b>(death may occur in &lt; 1/24)</b>
<b>Application of ice</b>	<b>May ↓ symptoms</b>	<b>Not recommended</b>
<b>Pressure immobilisation</b>	<b>Not recommended</b>	<b>Indicated, may be lifesaving</b>
<b>Indications for antivenom</b>	<b>Now controversial:</b> <b>Previously:</b> <b>1. Severe pain- local or regional</b> <b>2. Systemic symptoms or signs of envenomation</b>	<b>1. Systemic envenomation</b> <b>2. any other symptoms:</b> <ul style="list-style-type: none"> <li>• Perioral tingling</li> <li>• Muscle fasciculation</li> <li>• Excessive salivation/lacrimation</li> <li>• Piloerection</li> <li>• Tachy/ HT</li> <li>• Nausea</li> <li>• SOB</li> <li>• ↓ GCS</li> <li>•</li> </ul>
<b>Premedication prior to antivenom</b>	<b>Not recommended</b> <b>(Only if Equine allergy)</b>	<b>+/-</b>
<b>Route of antivenom administration</b>	<b>IM or IV</b>	<b>IV</b>
<b>Initial dose of antivenom</b>	<b>2 ampoules</b>	<b>2 ampoules if moderate</b> <b>4 ampoules if severe</b>
<b>Interval to repeat antivenom</b>	<b>2/24</b>	<b>30-60 minutely</b>
<b>Disposition if antivenom given</b>	<b>D/c @ 2/24 if symptoms resolved</b>	<b>ICU</b>

## RAVE & RAVE II

- **Background-** Case experience suggests RBS AV appears to be effective in acute and delayed presentations. “Everyone” has seen/heard of delayed symptoms being Rx effectively within a short time following AV administration
- **RAVE:**
  - **IM efficacy = IV efficacy**
  - **IM administration was found to be associated with zero serum concentration of AV**
  - **∴ raised the Q: is the AV better than placebo?**
- **RAVE:**
  - **AV had minimal/ if any benefit over placebo wrt ↓ pain and systemic effects**
  - **It seems that RBS symptoms wear off rapidly in ~ 20% of cases (<2/24) with no Rx**
  - **3.5% hypersensitivity reactions following AV**
- **On the strength of these studies, routine use of RBS AV is not recommended**

QJIM. 2008 Jul;101(7):557-65. doi: 10.1093/qjmed/hcn048. Epub 2008 Apr 8.

### A randomised controlled trial of intramuscular vs. intravenous antivenom for latrodectism—the RAVE study.

Isbister GK<sup>1</sup>, Brown SG, Miller M, Tanelk A, Macdonald E, Stokes B, Ellis R, Nagree Y, Wilkes GJ, James R, Short A, Holdgate A.

⊕ Author information

#### Abstract

**BACKGROUND:** Widow spider-bite causes latrodectism and is associated with significant morbidity worldwide. Antivenom is given by both the intravenous (IV) and intramuscular (IM) routes and it is unclear which is more effective.

**AIM:** To compare the effectiveness of IV vs. IM redback spider antivenom.

**DESIGN:** Randomized controlled trial.

**METHODS:** Patients with latrodectism were given either IV or IM antivenom according to a randomized double-dummy, double-blind protocol. The first antivenom treatment was followed by another identical treatment after two hours if required. The primary outcome was a clinically significant reduction in pain two hours after the last treatment. A fully Bayesian analysis was used to estimate the probability of the desired treatment effect, predetermined as an absolute difference of 20%.

**RESULTS:** We randomly allocated 126 patients to receive antivenom IV (64) and IM (62). After antivenom treatment pain improved in 40/64(62%) in the IV group vs. 33/62(53%) in the IM group (+9%; 95% Credible Interval [CrI]: -8% to +26%). The probability of a difference greater than zero (IV superior) was 85% but the probability of a difference >20% was only 10%. In 55 patients with systemic effects, these improved in 58% after IV antivenom vs. 65% after IM antivenom (-8%; 95% CrI: -32% to +17%). Twenty-four hours after antivenom pain had improved in 84% in the IV group vs. 71% in the IM group (+13%; 95% CrI: -2% to +27%). A meta-analysis including data from a previous trial found no difference in the primary outcome between IV and IM administration.

**DISCUSSION:** The difference between IV and IM routes of administration of widow spider antivenom is, at best, small and does not justify routinely choosing one route over the other. Furthermore, antivenom may provide no benefit over placebo.

## Randomized Controlled Trial of Intravenous Antivenom Versus Placebo for Latrodectism: The Second Redback Antivenom Evaluation (RAVE-II) Study

Geoffrey K. Isbister, FACEM, MD\*; Colin B. Page, MBChB, FACEM; Nicholas A. Buckley, FRACP, MD; Daniel M. Fatovich, MBBS, FACEM; Ovidiu Pascu, MBBS, FACEM; Stephen P. J. MacDonald, MBChB, FACEM; Leonie A. Calver; Simon G. A. Brown, FACEM, PhD; on behalf of the RAVE Investigators

\*Corresponding Author. E-mail: [geoff.isbister@gmail.com](mailto:geoff.isbister@gmail.com).

**Study objective:** Latrodectism is the most important spider envenomation syndrome worldwide. There remains considerable controversy over antivenom treatment. We aimed to investigate whether antivenom resulted in resolution of pain and systemic effects in patients with latrodectism who received standardized analgesia.

**Methods:** In a multicenter randomized placebo-controlled trial of redback spider antivenom for latrodectism, 224 patients (>7 years) with a redback spider bite and severe pain, with or without systemic effects, were randomized to receive normal saline solution (placebo) or antivenom after receiving standardized analgesia. The primary outcome was a clinically significant reduction in pain 2 hours after trial medication compared with baseline. A second primary outcome for the subgroup with systemic features of envenomation was resolution of systemic features at 2 hours. Secondary outcomes were improved pain at 4 and 24 hours, resolution of systemic features at 4 hours, administration of opioid analgesics or unblinded antivenom after 2 hours, and adverse reactions.

**Results:** Two hours after treatment, 26 of 112 patients (23%) from the placebo arm had a clinically significant improvement in pain versus 38 of 112 (34%) from the antivenom arm (difference in favor of antivenom 10.7%; 95% confidence interval -1.1% to 22.6%;  $P=$ .10). Systemic effects resolved after 2 hours in 9 of 41 patients (22%) in the placebo arm and 9 of 35 (26%) in the antivenom arm (difference 3.8%; 95% confidence interval -15% to 23%;  $P=$ .79). There was no significant difference in any secondary outcome between antivenom and placebo. Acute systemic hypersensitivity reactions occurred in 4 of 112 patients (3.6%) receiving antivenom.

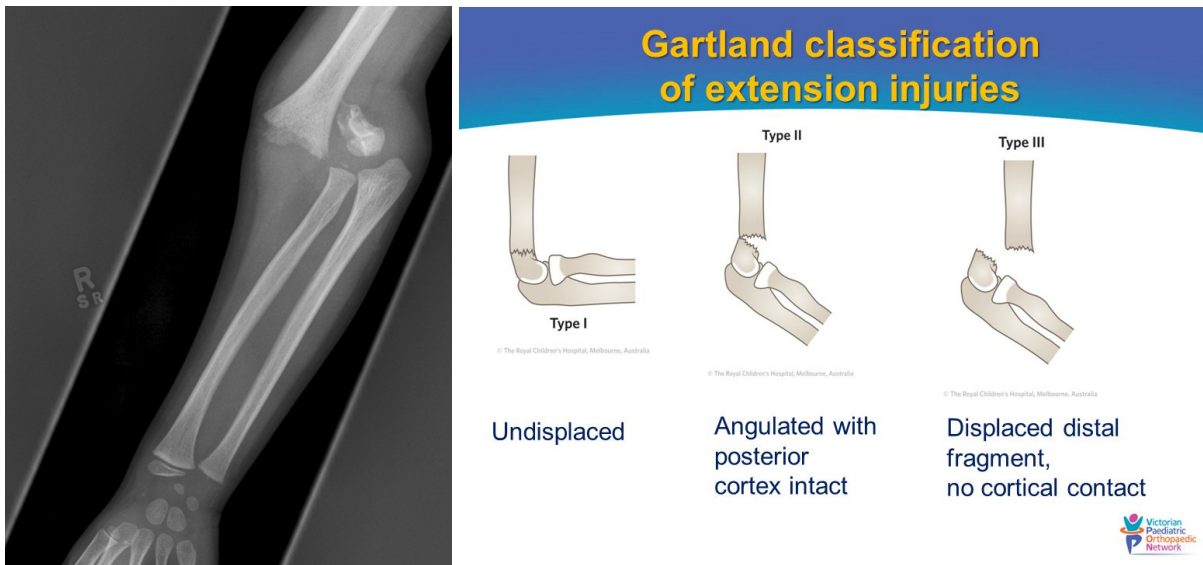
**Conclusion:** The addition of antivenom to standardized analgesia in patients with latrodectism did not significantly improve pain or systemic effects. [Ann Emerg Med. 2014;64:620-628.]

Please see page 621 for the Editor's Capsule Summary of this article.



## Question 7 (12 marks) 6 minutes

A 3 year old boy presents with right elbow pain following a fall from monkey bars.



- a. State four (4) abnormal findings shown on this Xray. (4 marks)
- **Supracondylar # R humerus- Gartland III**
  - **Off ended/ 100% displaced**
  - **Posterior displacement**
  - **Marked soft tissue swelling**
- b. Assuming that there is neurovascular compromise, list five (5) steps to correct this problem. (5 marks)
- **Explain to pt (consent if possible/ not required)**
  - **Analgesia**
  - **Procedural sedation**
  - **Traction and extension until radial pulse palpable**
  - **Immobilise in full extension**
- NB: Repeat Xray doesn't really "correct this problem" but it is a step you would probably preform*
- c. Other than pain list three (3) complications of this injury in the first 1 week post injury. (3 marks)
- **Median n neuropraxia (must mention n- specifics of anterior interosseous branch not req)**
  - **Wound infection**
  - **Ischaemic digits**
  - **Compartment syndrome**

## Question 7 (12 marks) 6 minutes

A 25 year old male presents to ED after a 2 day illness of fever and vomiting. Some of his blood tests taken soon after arrival are shown.

FIO <sub>2</sub>	0.4	
pH	7.80	(7.35-7.45)
PCO <sub>2</sub>	15mmHg(35-45)	
PO <sub>2</sub>	192mmHg	(75-100)
HCO <sub>3</sub>	23mmHg(22-33)	
Base excess	10.1	(-3.0 - +3.0)
O <sub>2</sub> sat	99.7%	(95-98%)
Na <sup>+</sup>	119mmol/L	(135-145)
K <sup>+</sup>	2.5mmol/L	(3.2-4.5)
Cl <sup>-</sup>	65mmol/L	(100-110)
Urea	10.3mmol/L	(3.0-8.0)
Creatinine	0.187mmol/L	(0.07-0.12)
Glucose	4.5mmol/L	(3.0-7.8)

- a. List two (2) calculations to help you to interpret these results. (2 marks)

Derived values:

- **Expected HCO<sub>3</sub> = 20 in acute process and 14 in chronic process**  
**Acute ↓ HCO<sub>3</sub>- 2 in 10 min every 10 mmHg ↓ PCO<sub>2</sub>.**  
 Minimum of 18 ∴ < 18 highly suggestive of metabolic acidosis  
 (pCO<sub>2</sub> values cannot be negative)  
**Chronic ↓ HCO<sub>3</sub>- 5 if sustained for 2-3 days**
- **A-a gradient = 90= Increased A-a gradient**
- **AG = 119 -65 -23 = 119 - 88 = 31 therefore HAGMA**

$$PAO_2 = PiO_2 - (PACO_2/R)$$

$$PiO_2 = \begin{matrix} \text{(atmospheric pressure} & - & \text{partial pressure of water)} & \times & FiO_2 \\ 760 & - & 47 \text{ at sea level} & \times & \sim (0.21 = RA) \end{matrix}$$

$$PAO_2 = (FIO_2) (P_{atm} - 47 \text{ mm Hg}) - (P_aCO_2)/0.8$$

$$\text{Normal Aa Gradient} = 2.5 + (0.21) (\text{age in years}) \text{ OR } = \text{age} + 4/4$$

$$\text{Normal range: } \text{age}/4 \text{ (in erect position) or } 10 + (\text{age}/10)$$

R ~ with composition of diet

- b. Using the scenario and the derived values, define the primary abnormality/s. (2 marks)
- **Profound metabolic alkalosis** (base excess 10 means this is the primary disorder)
- c. Using the scenario and the derived values, define the secondary abnormality/s. (1 mark)
- **Respiratory alkalosis**
  - **High anion gap metabolic acidosis**
  - **Severe hyponatraemia and hypochloraemia, life threatening hypokalaemia**
- d. Provide a unifying explanation for these results. (2 marks)
- **Early Salicylate poisoning causing triple acid base disturbance**
  - **Significant electrolyte abnormalities due to prolonged vomiting**
  - **DDx: sepsis secondary to pulmonary infection with vomiting**

## Question 9 (20 marks) 9 minutes

A 35 year old male presents to ED with swelling to both his left knee and right elbow joints.

- a. List four (4) likely differential diagnoses for this presentation. (4 marks)
- **Haemarthrosis- Traumatic**
  - **Haemarthrosis- anticoagulation**
  - **Haemarthrosis- haemophilia**
  - **Septic arthritis: poly-articular septic arthritis**
  - **Viral arthritis e.g. Ross River Virus, parvovirus, rubella, HCV**
  - **Reiters- STI- Gonococcal**
  - **Serum sickness- recent abs/ infection**
  - **IVDU- septic arthritis from IE**
  - **Gout/ crystal arthropathy**
  - **RhA**
  - **Vasculitis**
  - **Malignancy e.g. leukaemia, neuroblastoma**
- b. List six (6) features on history that may assist with obtaining a diagnosis. (6 marks)
- **Trauma**
  - **Recent illness e.g. diarrhoea, tonsillitis, conjunctivitis, urethritis**
  - **PHx similar- known joint disease**
  - **PHx- Comorbidities e.g. inflammatory bowel disease** (usually mono arthritis large joint, peripheral arthritis usually reflects activity of bowel disease)
  - **Sexual Hx**
  - **IVDU**
  - **FHx- esp haemophilia**
  - **Meds**
- c. State two (2) reasons to perform a knee joint aspiration for this patient. (2 marks)
- **Diagnostic- unexplained joint effusion to differentiate septic joint from an inflammatory or bloody effusion by sending fluid for cytology, microbiology and biochemical testing e.g. > 50,000 WCC or presence of organism on gram stain warrants urgent washout and antibiotics to treat septic arthritis**
  - **Therapeutic- administration of intra-articular steroid, removal fluid or blood to provide symptomatic relief and increase mobility**
- d. List four (4) contraindications to performing a knee aspiration in this patient. (4 marks)
- **Overlying cellulitis**
  - **Coagulopathy (INR > 1.4)**
  - **Joint prosthesis**
  - **Acute #**
  - **Pt refusal**
  - **Uncooperative pt**
- e. List four (4) different diagnoses that you would consider if the patient was a 5 year old female. (4 marks)  
*NB: MUST be "different" !*
- **NAI**
  - **Juvenile chronic arthritis** (peak age 1-5yrs, pain surprisingly little cf other cause acute joint, can affect any joint, or multiple joints)
  - **Reactive - post infective (recent Gastro)**
  - **Vasculitis- HSP**
  - **Serum Sickness- eg ceclor**
  - **Leukaemia**