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**University Hospital, Geelong  
Emergency Medicine  
Trial Fellowship Exam  
Short Answer Questions (SAQ)  
Week 15**

**DIRECTIONS TO CANDIDATE**

1. Answer each question in the space provided in this question paper.
2. Do not write your name on this question paper.
3. Enter your examination number in the space below.
4. Cross out any errors completely.
5. Do not begin the exam until instructed to do so.
6. Do not take examination paper or materials from this room.
7. The booklet binder may be removed during the exam.

**QUESTION & ANSWER  
BOOKLET**

**Question 1 (18 marks)**

- a. Complete the table to distinguish between the historical features of Guillain-Barré Syndrome and Multiple Sclerosis. (4 marks)

|                | Historical feature | Guillain-Barré Syndrome | Multiple sclerosis |
|----------------|--------------------|-------------------------|--------------------|
| 1.<br>(1 mark) |                    |                         |                    |
| 2.<br>(1 mark) |                    |                         |                    |
| 3.<br>(1 mark) |                    |                         |                    |
| 4.<br>(1 mark) |                    |                         |                    |

**Question 1 (continued)**

- b. Complete the table to distinguish between the examination features of Guillain-Barré Syndrome and Multiple Sclerosis. (4 marks)

|                        | <b>Examination feature</b> | <b>Guillain-Barré Syndrome</b> | <b>Multiple sclerosis</b> |
|------------------------|----------------------------|--------------------------------|---------------------------|
| <b>1.<br/>(1 mark)</b> |                            |                                |                           |
| <b>2.<br/>(1 mark)</b> |                            |                                |                           |
| <b>3.<br/>(1 mark)</b> |                            |                                |                           |
| <b>4.<br/>(1 mark)</b> |                            |                                |                           |

### Question 1 (continued)

- c. List the two (2) investigations of choice to assist with the diagnosis of Multiple Sclerosis. State two (2) diagnostic findings that are supportive of Multiple Sclerosis for each investigation. (6 marks)

Investigation of choice 1: \_\_\_\_\_

Supportive findings:

1. \_\_\_\_\_

2. \_\_\_\_\_

Investigation of choice 2: \_\_\_\_\_

Supportive findings:

1. \_\_\_\_\_

2. \_\_\_\_\_

- d. Assuming the diagnosis of Guillain-Barré Syndrome, which drug must not be given if intubation is required? State the reason why. (2 marks)

Drug: \_\_\_\_\_

Reason: \_\_\_\_\_

\_\_\_\_\_

- e. List the two (2) options for specific treatment of Guillain-Barré Syndrome. (2 marks)

1. \_\_\_\_\_

2. \_\_\_\_\_

## Question 2 (11 marks)

A 35 year old man is brought into your emergency department after an isolated injury to the left ankle sustained in a motor cycle accident.

His observations are:

|     |         |             |
|-----|---------|-------------|
| BP  | 160/ 50 | mmHg supine |
| HR  | 110     | bpm         |
| GCS | 15      |             |

**Two (2) of his ankle X-rays are shown in the props booklet- page 1 & 2**

a. State four (4) features shown on these xray that suggest a severe injury. (3 marks)

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

## Question 2 (continued)

He is delivered by ambulance and has received only penthrane enroute. He does not have intravenous access on arrival. He is extremely distressed with pain. He last ate 2 hours ago. His weight is 70 kg.

- b. List seven (7) analgesic options for this patient while he is in the emergency department. Include initial doses and routes where applicable. (7 marks)

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

6. \_\_\_\_\_

7. \_\_\_\_\_

### Question 3 (12 marks)

A 65 year old female, non- English speaking, Italian lady presents with about 1 cup of haemoptysis.

You are unable to obtain any medical history.

Her observations are:

|     |        |      |
|-----|--------|------|
| BP  | 135/65 | mmHg |
| HR  | 80     | bpm  |
| GCS | 15     |      |

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

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

### Question 3 (continued)

- b. Other than a CXR, list three (3) key investigations that you would consider ordering in the emergency department for this patient. (3 marks)

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

A Chest X-ray shows unilateral changes.

She experiences a large volume haemoptysis (estimated blood loss 500 ml).

- c. State five (5) key steps in the treatment of this patient over the next 30 minutes. (6 marks)

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_



### Question 4 (17 marks)

A 64 year old man is being evaluated in your emergency department after an episode of chest pain which has now resolved. He has been given aspirin only en route to hospital. His observations are:

|               |        |          |
|---------------|--------|----------|
| BP            | 140/85 | mmHg     |
| RR            | 20     | bpm      |
| O2 saturation | 97%    | room air |

**An ECG is taken- refer to the props booklet- page 3 (labelled ECG 1).**

a. State four (4) abnormal findings shown in this ECG. (4 marks)

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

b. List four (4) likely causes for these findings. (4 marks)

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

### Question 4 (continued)

The patient becomes suddenly unwell. He is lightheaded with no chest pain. His BP is 70/50 mmHg. He is given a 500ml fluid bolus with no improvement.

**His ECG at this stage is shown in the props booklet- page 4 (labelled ECG 2).**

c. State five (5) abnormal findings shown in this ECG. (5 marks)

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

**Question 4 (continued)**

- d. List in order of escalation, your first two (2) choices of drug treatment for this patient. For each specify dose and route. (4 marks)

|                      | <b>Drug treatment<br/>(2 marks)</b> | <b>Dose and route<br/>(2 marks)</b> |
|----------------------|-------------------------------------|-------------------------------------|
| 1 <sup>st</sup> line |                                     |                                     |
| 2 <sup>nd</sup> line |                                     |                                     |

### Question 5 (14 marks)

Three (3) X-rays from three (3) different patients are shown in the props booklet- pages 5, 6 & 7.

- a. For X-ray 1, state where the foreign body lies. (1 mark) **Props booklet- Page 5**

---

- b. For X-ray 1, list two (2) options for the nature/composition of the foreign body. (2 marks) **Props booklet- Page 5**

1. \_\_\_\_\_

2. \_\_\_\_\_

- c. For X-ray 1, list two (2) factors that would mandate urgent removal of the foreign body. (2 marks) **Props booklet- Page 5**

1. \_\_\_\_\_

2. \_\_\_\_\_

- d. For X-ray 2, state where the foreign body lies. (1 mark) **Props booklet- Page 6**

---

- e. For X-ray 2, what is the nature/composition of the foreign body? (1 mark) **Props booklet- Page 6**

---

### Question 5 (continued)

- f. For X-ray 2, state your disposition. Provide two (2) points of justification for this choice. (3 marks) **Props booklet- Page 6**

Disposition: \_\_\_\_\_

Justification:

1. \_\_\_\_\_

2. \_\_\_\_\_

- g. For X-ray 3, state where the foreign body lies. (1 mark) **Props booklet- Page 7**

\_\_\_\_\_

- h. For X-ray 3, state your disposition. Provide two (2) points of justification for this choice. (3 marks) **Props booklet- Page 7**

Disposition: \_\_\_\_\_

Justification:

1. \_\_\_\_\_

2. \_\_\_\_\_

### Question 6 (12 marks)

A 45 year old man with type 1 diabetes mellitus is brought in by ambulance with an altered conscious state.

**Initial investigations are taken- refer to the props booklet- page 8.**

His observations are:

|                   |       |                      |
|-------------------|-------|----------------------|
| BP                | 90/70 | mmHg                 |
| HR                | 120   | bpm                  |
| Temperature       | 36.8  | °C                   |
| Oxygen saturation | 97%   | on 8L by Hudson mask |
| GCS               | 12    | E4, V3, M5           |

- a. Provide three (3) calculations to help you to interpret these results. (3 marks)

Derived value 1: \_\_\_\_\_

\_\_\_\_\_

Derived value 2: \_\_\_\_\_

\_\_\_\_\_

Derived value 3: \_\_\_\_\_

\_\_\_\_\_

- b. Provide a unifying explanation for this clinical picture based on these results. (3 marks)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Question 6 (continued)**

- c. Complete the following table demonstrating three (3) key specific treatment tasks in the first 2 hours of the emergency department stay. For each choice, state how you would achieve each of these tasks. (6 marks)

|   | <b>Key treatment task<br/>(3 marks)</b> | <b>How will you achieve the task?<br/>(3 marks)</b> |
|---|---|---|
| 1 |   |   |
| 2 |   |   |
| 3 |   |   |

### Question 7 (12 marks)

A 65 year old man presents with a left hand injury.

**A photograph of the man is taken- refer to the props booklet- page 9.**

- a. List three (3) factors that are evident from this image, that would suggest a poor prognosis for successful reimplantation. (3 marks)

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

- b. List six (6) historical factors that would suggest a poor prognosis for successful reimplantation. (6 marks)

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

6. \_\_\_\_\_



**Question 7 (continued)**

- c. How you would store the amputated parts, pending a decision for potential reimplantation? List two (2) points in your answer. (2 marks)

1. \_\_\_\_\_

2. \_\_\_\_\_

- d. What is the most appropriate regional anaesthesia technique for this patient? (1 mark)

\_\_\_\_\_

### Question 8 (12 marks)

A 6 year old boy presents with a left supracondylar humeral fracture.

- a. State two (2) types of pain scoring systems that you could apply to this child. (2 marks)

1. \_\_\_\_\_

2. \_\_\_\_\_

- b. List two (2) reasons why a pain score is used. (2 marks)

1. \_\_\_\_\_

2. \_\_\_\_\_

- c. List four (4) indications for general anaesthetic, manipulation and plaster for this patient. (4 marks)

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

**Question 8 (continued)**

- d. List four (4) pieces of advice that you would give to this boy's parent if the patient is able to be discharged from the emergency department. (4 marks)

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

**Question 9 (12 marks)**

A 46 year man is brought to your emergency department with suspected alcohol withdrawal.

- a. List seven (7) of the 10 scale domains that form the Alcohol Withdrawal Assessment Scale. (7 marks)

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_

### Question 9 (continued)

A 35 year old male is identified as having “very severe” alcohol withdrawal.

- b. State five (5) key management steps for this patient over the next 1 hour. (5 marks)

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

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Emergency Medicine  
Trial Fellowship Exam  
Short Answer Questions (SAQ)  
Week 15**

**PROP BOOKLET**

University Hospital, Geelong- Fellowship Exam Short Answer Questions  
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Question 2

Xray 1

(2nd xray is shown on the following page)



**Question 2**

**Xray 2**

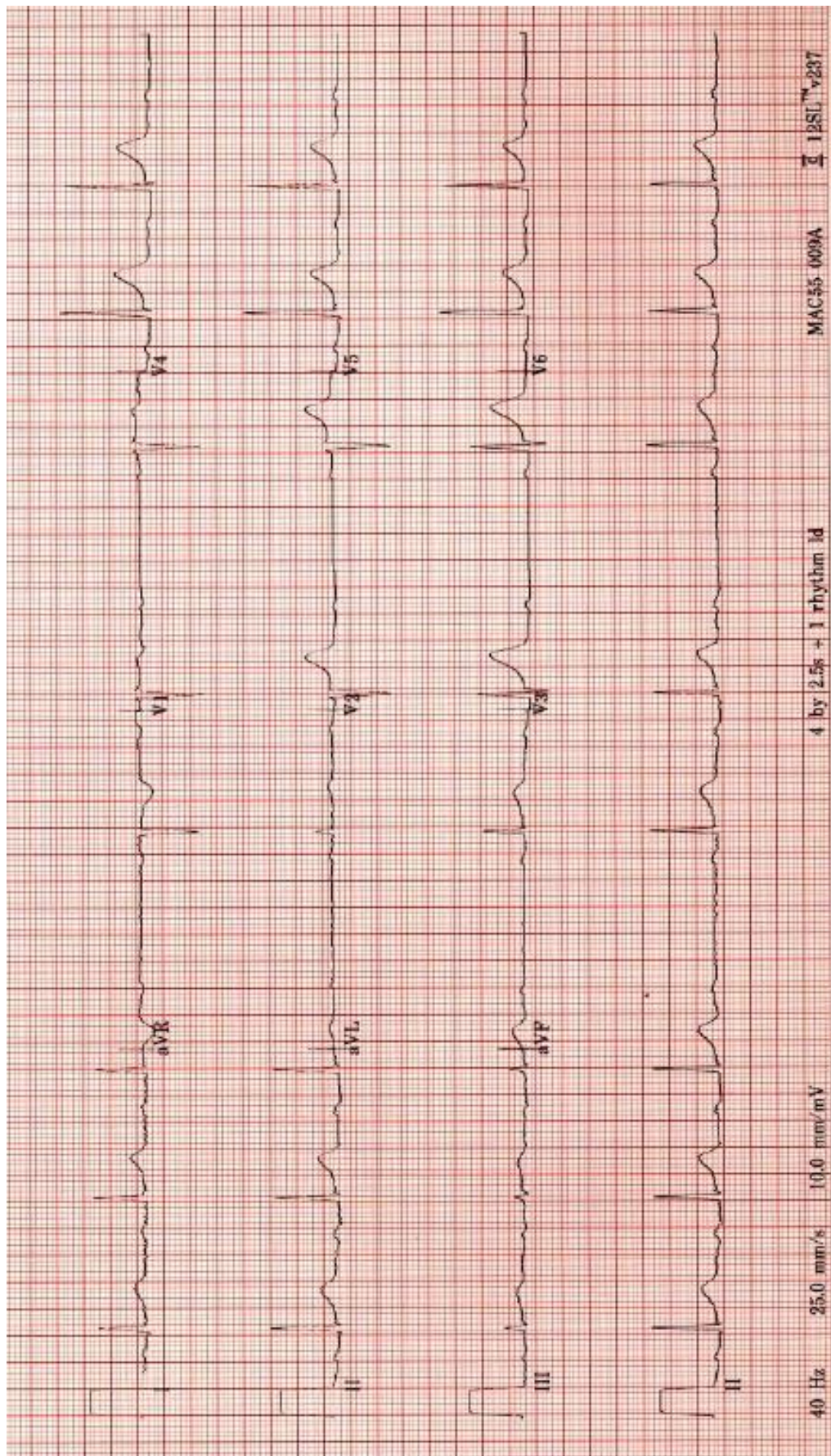
**(1st xray is shown on the previous page)**





**Question 4**

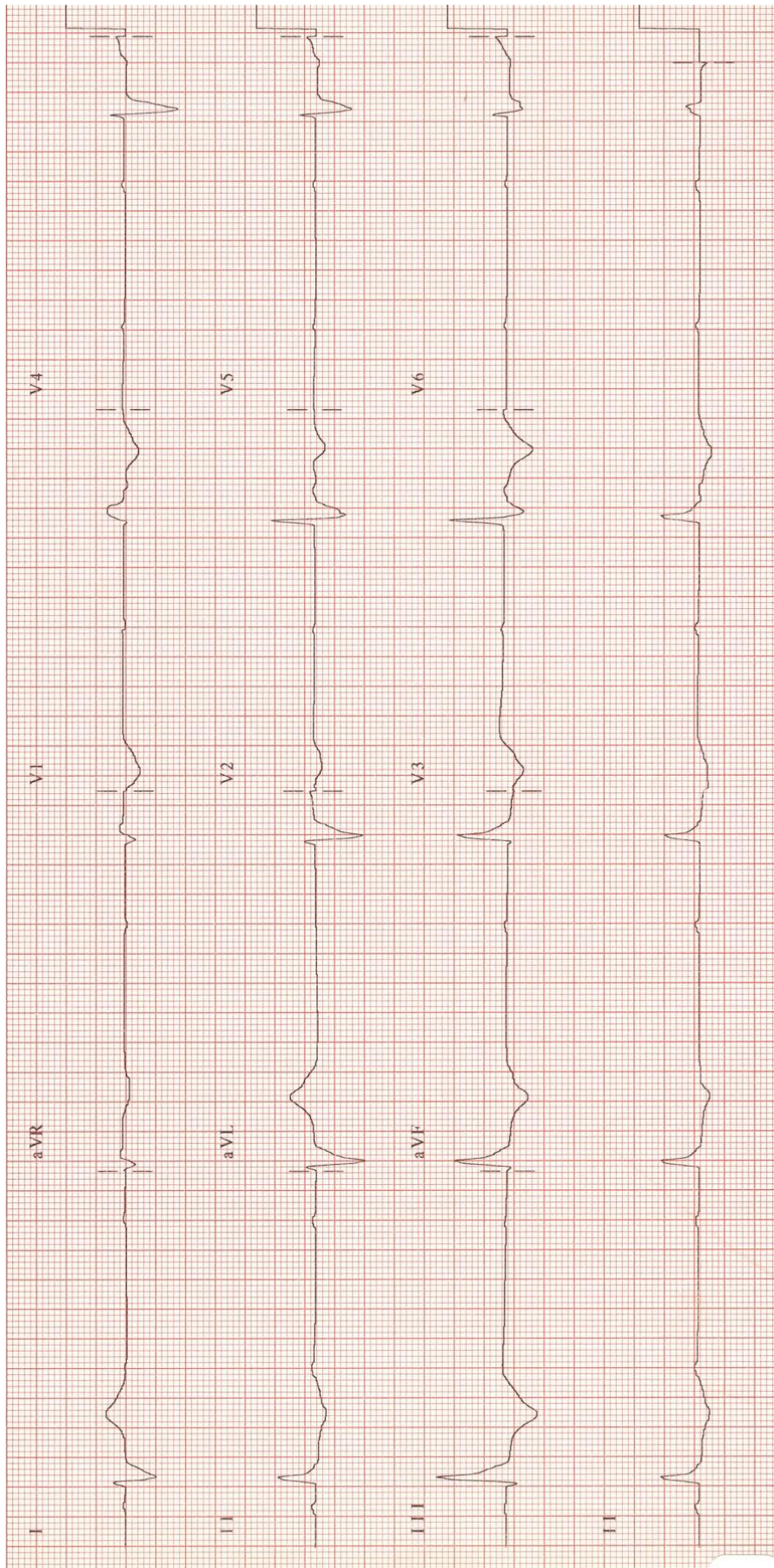
**ECG 1 (2<sup>nd</sup> ECG is shown on the following page)**



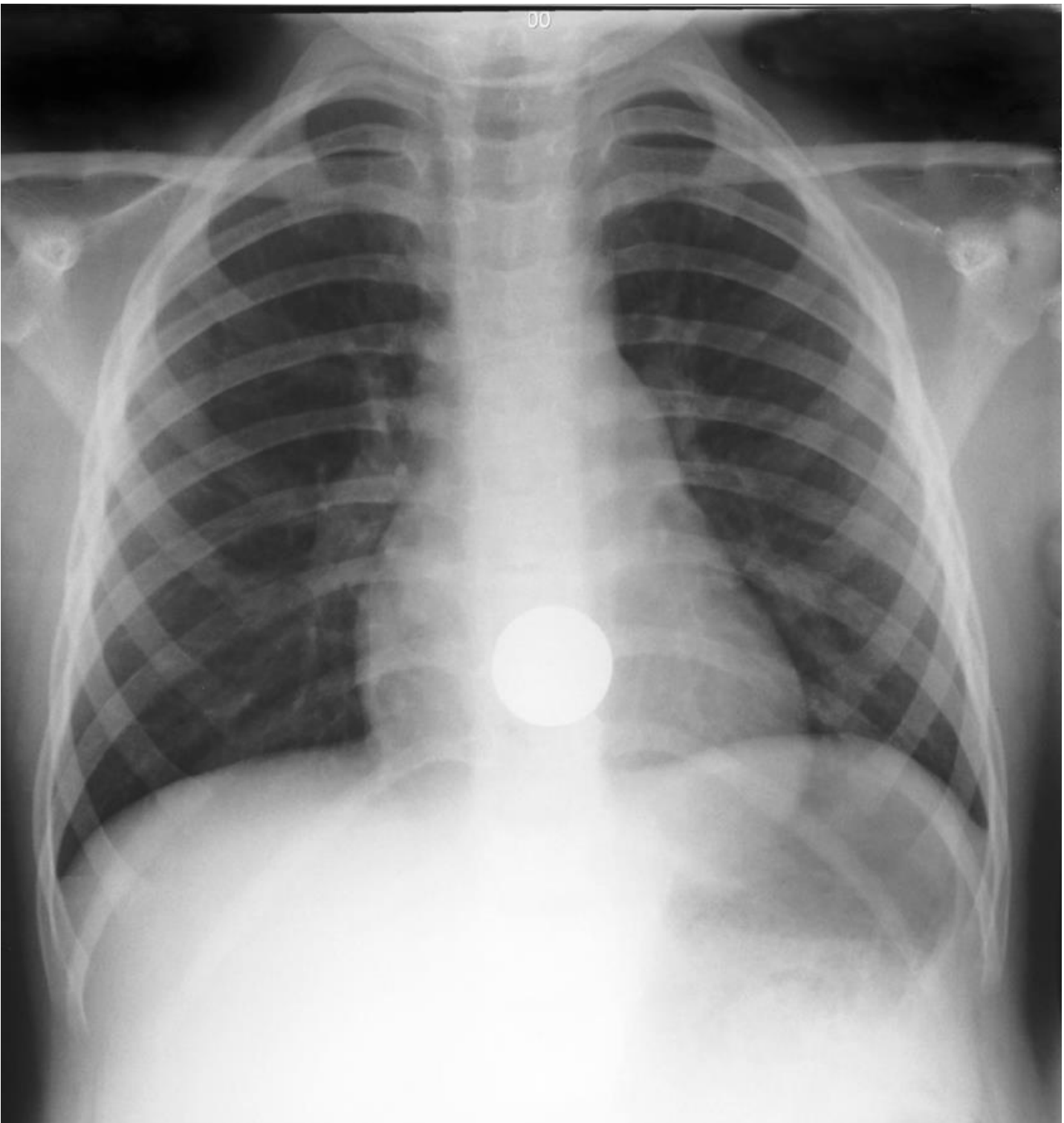


**Question 4**

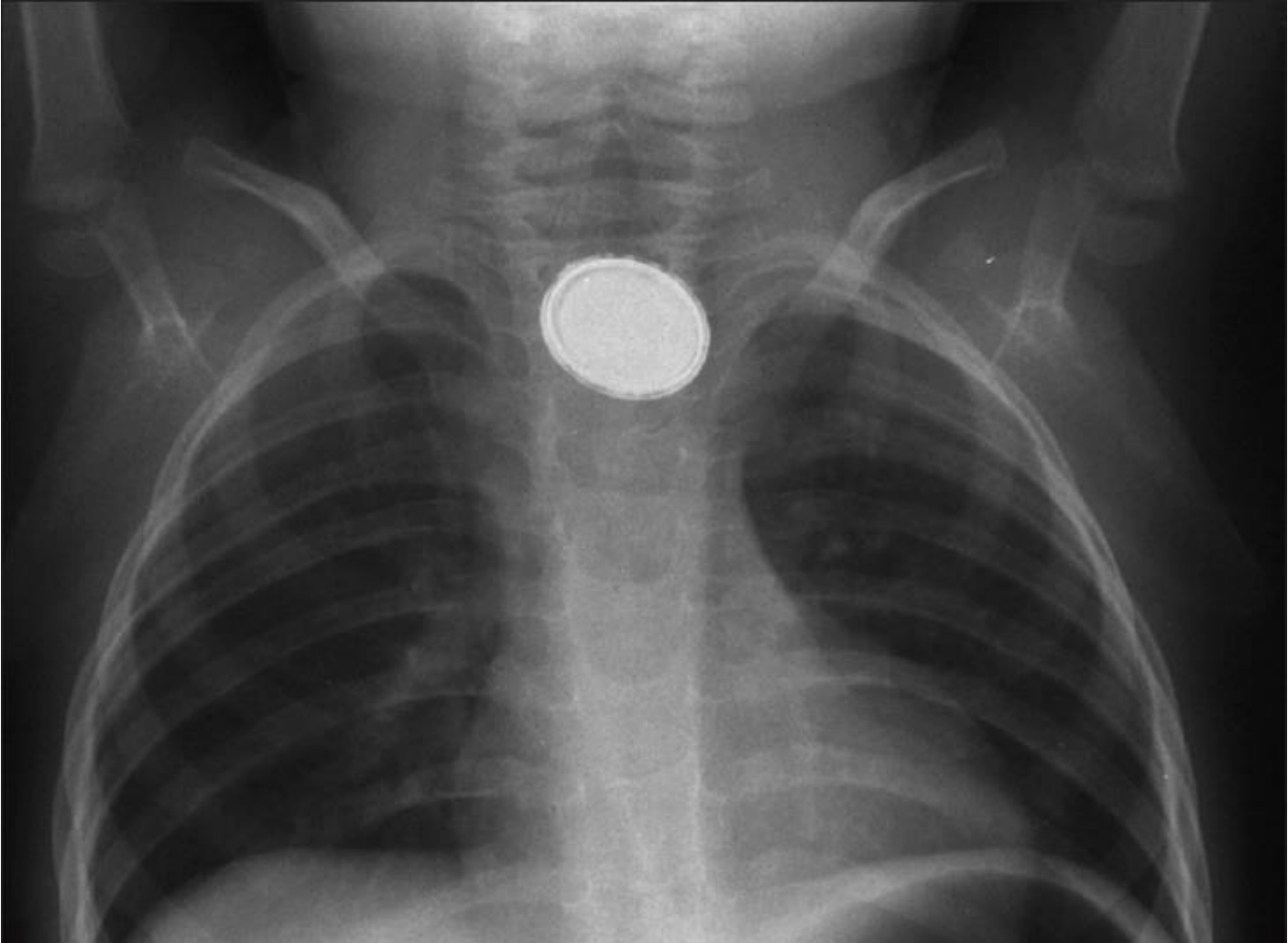
**ECG 2 (1st ECG is shown on the previous page)**



**Question 5      Xray 1 (2<sup>nd</sup> Xray is shown on the following page)**



**Question 5      Xray 2 (1st Xray is shown on the previous page)**





**Question 5 Xray 3 (1st and 2<sup>nd</sup> Xray are shown on the previous pages)**



## Question 6

|                           |      |            |           |
|---------------------------|------|------------|-----------|
| FIO <sub>2</sub>          | 0.50 |            |           |
| pH                        | 7.05 |            | 7.35-7.45 |
| pCO <sub>2</sub>          | 66   | mmHg       | 35-45     |
| pO <sub>2</sub>           | 247  | mmHg       | 80-95     |
| Bicarbonate               | 18   | mmol/L     | 22-28     |
| Base excess               | -14  |            | -3 - +3   |
| O <sub>2</sub> saturation | 99   | %          | > 95      |
|                           |      |            |           |
| Na <sup>+</sup>           | 131  | mmol/L     | 134-146   |
| K <sup>+</sup>            | 5.0  | mmol/L     | 3.4-5     |
| Cl <sup>-</sup>           | 92   | mmol/L     | 98-106    |
| Urea                      | 15   | mmol/L     | 3-8       |
| Creatinine                | 227  | micromol/L | 45-90     |
| Glucose                   | 50.9 | mmol/L     | 3.5-5.5   |



**Question 7**



"List" = 1-3 words

"State" = short statement/ phrase/ clause

**UNIVERSITY HOSPITAL, GEELONG**  
**FELLOWSHIP WRITTEN EXAMINATION**

**WEEK 15– 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 (18 marks)**

- a. Complete the table to **distinguish** between the clinical features of Guillain-Barré Syndrome and Multiple Sclerosis. (4 marks)

| History            | Guillain-Barré Syndrome                                   | Multiple sclerosis   |
|--------------------|---|--|
| Age at onset       |   | Typical onset : 20-40 yr old                                 |
| Onset              | Insidious<br>Post infection/ Sx/ Immunisation/ malignancy | Episodic, relapsing, remitting                               |
| Distribution       | Ascending motor paralysis<br>Glove & stocking loss        | Random, eyes often 1 <sup>st</sup>                           |
| Limb pain          | Passive movement/ calf pain common                        | Electric shock sensations in legs, worse with neck flexion   |
| Visual disturbance | Ophthalmoplegia rare                                      | Optic neuritis<br>Painful eye movements<br>VA/ field defects |
| Cerebral Fx        |   | Intellectual demise<br>Seizures                              |
| Natural course     | > 90% recovery  | Stabilise & improve<br>Progressive                           |
| Sex                |   | Female : male 2:1  |

- b. Complete the table to distinguish between the examination features of Guillain-Barré Syndrome and Multiple Sclerosis. (4 marks)

| Examination            | Guillain-Barré Syndrome                       | Multiple sclerosis                  |
|------------------------|---|-------------------------------------|
| CN                     | 50% facial n or bulbar                        | Common, esp eyes ION, RAPD          |
| Cerebellar signs       | Rare  | May be present                      |
| Gait                   | weakness                                      | Spastic                             |
| Tone                   | ↓   | ↑ , clonus                          |
| Reflexes               | ↓ / flaccid (LMN)                             | ↑ (UMN)                             |
| Autonomic              | Common  | Rare- sensory - Bladder dysfunction |
| Respiratory compromise | ↓ FEV1<br>Respiratory support may be required | Rare                                |

- c. List the two (2) investigations of choice to assist with the diagnosis of Multiple Sclerosis. State two (2) diagnostic findings that are supportive of Multiple Sclerosis for each investigation. (6 marks)

Investigation of choice 1: **CSF examination**

Supportive findings:

- (90%) < 10 cells/ml- T lymphocyte predominance
- Normal protein
- Iggy (↑ in 80%)
  - Oligoclonal bands (85-90% of clinical MS)

Investigation of choice 2: **MRI Brain**

Supportive findings:

- Subcortical and periventricular plaques (50%)
- Enhancement indicates activity/ resolves with remission

- d. Assuming the diagnosis of Guillain-Barré Syndrome, which drug must not be given if intubation is required? (2 marks)

- Sux

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- **Precipitation of life threatening hyperkalaemia** (absolutely contraindicated in patients with GBS. There have been a number of case reports of severe hyperkalaemia, life threatening arrhythmias, and cardiac arrest after its administration in GBS)
- e. List the two (2) options for treatment of Guillain-Barré Syndrome. (2 marks)
- **IV Immunoglobulin**
  - **Plasmaphoresis (usually not both together, it's an either/ or)**

## Guillain Barre Syndrome

- Commonest cause of rapid onset paralysis in previously healthy person.
- Both sexes. All ages
- Acute polyneuropathy 1-4 weeks post:
  - 70% post viral URTI/ gastro
  - Post operative
  - Post immunisation
  - Intercurrent malignancy
- Pathology → neuronitis with myelin destruction and ∴ Wallerian degeneration of neurones

### Clinical features

#### Sensory

- Initial paraesthesia in hands and feet → minor glove and stocking loss (sensory neuropathy is usually minimal)
- Posterior column vibration/ proprioception > spinothalamic

#### Motor

- Progressive ascending motor weakness affecting > 1 limb → distal mm weakness without atrophy (25% prox > distal)
- Areflexia/ marked hyporeflexia
- Limb pain on passive movement/ calf pain
- CN in ~ 50% → usually facial nn or bulbar (all except I, II, VIII, extra ocular mm rarely involved)
  - Miller Fischer variant has predominant CN involvement

#### Other

- No fever/ neck stiffness, normal mental state
- Autonomic dysfunction
  - Bad prognostic indicator
  - Very sensitive to cardiac drugs → may arrest on intubation
  - Ileus, retention, assoc. SIADH

### Investigations

#### Dx

- CSF protein ↑ in 90% > 0.4g/l
- CSF count normal
- FET → monitor progress

#### Tx

- ABG
- RFT
- Exclude other causes

### Management

- CVS, Resp support
- SUXAMETHONIUM ASSOCIATED WITH SUDDEN DEATH
- Nutrition → enteral, parenteral
- Plasmaphoresis
  - Superior to supportive alone
  - Best if commenced < 7 days after onset
  - ↑ speed of recovery
  - No change to ultimate mortality
- Immunoglobulin Rx
  - Probably as useful as plasmaphoresis

#### Prognosis

- Good → most full recovery
- Worse prognosis if :
  - autonomic involvement

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Week 15

- deficit not ↓ in 3/52

- 2% mortality → resp. failure
- 10% major residual deficit

**DDx of acute ascending motor paralysis**

- Rhabdomyolysis
- Tick/snake bite
- Diphtheria/ polio/ botulism
- PAN

**DDX autonomic neuropathy**

- DM
- ETOH
- Amyloid

# University Hospital, Geelong- Fellowship Exam Short Answer Questions

## Week 15

### Multiple sclerosis

- Commonest chronic neurological condition
- Onset 30- 40's, 60% F
- 20% asymptomatic through life
- Higher incidence in Tas, lower as go north in Aus
- Pathology → Extensive white matter plaques, loss of oligodendrocytes, axonal sparing  
Conduction disturbed by fever, stress, electrolyte imbalance (loss of suppressor T cells b4 attacks)

### Clinical features

- Episodic attacks of focal neurological deficit → sensory, motor or sphincter
- Predilection for spinal cord, brain, optic nerves
- Over 2- 14/ 7 then remission
- ~ ½ present as single sign or symptom
- Common → limb weakness, optic neuritis (pain wit eye movements, ↓ VA), sensory symptoms, diplopia
  - Spinal cord** → **commonest manifestation**
    - limb weakness in 40%, UMN signs (spastic gait, ↑ tone, clonus, ↑ reflexes), post column loss
    - painful spasms
    - bladder dysfunction, constipation
    - Lhermitte's sign → painful electric shocks down legs ↑ by neck flexion
  - Optic neuritis** → 40% at some stage, presenting symptom in 20%  
**Significant pain with eye movement is present in nearly every case of demyelinating optic neuropathy**
    - VA over days, central scotoma, usually unilateral
    - disturbed colour perception early sign
    - visual field defects
    - pain on eye movement
    - Ex: 50% papillitis on fundoscopy, relative afferent pupillary defect
    - 40% go onto MS
    - 1/3 completely recover, partially, not at all
    - Uhthoff's phenomenon → ↓ vision dt exercise, hot meal/ bath
  - Brainstem** → common
    - Diplopia, III, IV, VI CN lesions
    - Internuclear ophthalmoplegia almost Dx of MS or SLE  
Abno of MLF → ipsilateral adduction inability, contralateral lat. gaze nystagmus
    - Bell's palsy
    - Vestibular neuronitis → vertigo, vomiting, nystagmus
    - Cerebellar signs
  - Cerebral** → Intellectual demise
    - Depression
    - Seizures ~ 5%
    - Rare → dysphasia, hemiparesis, homonymous hemianopia

### Diagnosis

- Involvement of different parts of nervous system, 2 separate occasions, lasting > 24/24 or slow progression over 6/12
- Requires 2 anatomically separate lesions
- Delayed visual/ auditory/ somatosensory evoked potentials
- LP → 90% < 10 cells/ml, mainly T lymphocytes, ↑ IgG, protein normal
- MRI → detects demyelinated areas, subcortical and periventricular plaques visualised in 50%  
Enhancement indicates activity of disease

### DDx

#### Eye

Retinal a/v occlusion  
Optic nerve glioma  
Methanol ingestion

#### HIV

Posterior fossa SOL  
SLE  
Sarcoid

#### SC disease

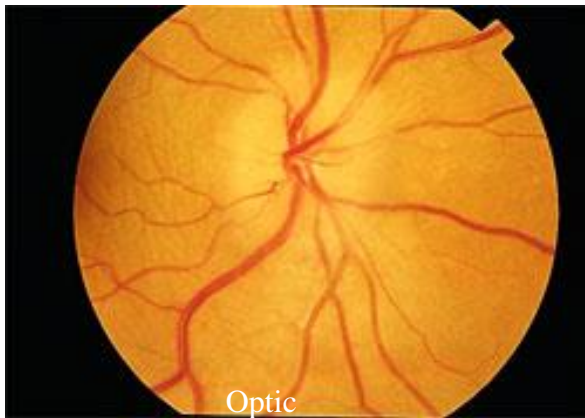
Cx spondylosis  
Subacute degeneration  
Hereditary ataxias  
SC compression

#### Cerbral

## Mx

- Acute → high dose methyl pred, ACTH 80U, PNL
- Prevent relapses → Azathioprine, cylophosphamide, interferon, plasmaphoresis
- Symptomatic → baclofen for spasms, carbamazepine for pain, urinary catheter, bowel training

## Optic neuritis



- Mono-ocular vision changes, especially in a young female should prompt you to thinking about this condition.
- Optic neuritis (**decreased visual acuity, relative afferent pupillary afferent defect**) can easily be mistaken for papilledema (**visual acuity and pupillary reflexes are normal**)
- Making the diagnosis can be difficult in that the majority of patients may actually have a normal fundoscopic exam but give a classic history for "retrobulbar neuritis" (**vision changes and pain especially with eye movement**).
- The clinical presentation of demyelinating optic neuropathy varies.
- Patients frequently present to the ED with an acute loss of vision.
- The natural history of MS-related vision loss is rapidly progressive acuity loss for a period of 10 days, which then stabilises and improves.
- Additional ocular signs include eye pain, tenderness of the globe, dyschromatopsia, decreased brightness sense, decreased colour perception, a relative afferent pupillary defect, assorted visual field defects (altitudinal and central/cecocentral), phosphenes upon eye movement and optic disc swelling with or without vitreous cells. Often, the optic nerve is normal in appearance and the dysfunction is considered retrobulbar.
- Demyelinating optic neuropathy can damage the fibers in both the visual and pupillary pathways. This damage interrupts nerve impulses within the pathways, producing decreased vision as well as an afferent pupillary defect.
- Systemic signs and symptoms may include headache, nausea, Uhthoff's sign (decreased vision with or without limb weakness following exposure to increased temperatures i.e., a bath or exercise), Romberg's sign (patient falls when they close their eyes), Pulfrich's stereo phenomenon (beer barrel appearance to the environment) and fever.
- As recorded in the three-year follow-up of patients Rx with intravenous methylprednisolone followed by oral corticosteroid regimens reduced the two-year rate of development of clinical MS, particularly in patients with signal abnormalities consistent with demyelination on MRI of the brain at the time of study entry. Serious side effects of glucocorticoid therapy are infrequent. Therefore, outpatient administration of high-dose intravenous glucocorticoids may be recommended.

### Clinical Pearls

- A number of other types of demyelinating disorders have been associated with ON.  
They are:
  - acute transverse myelitis
  - Guillain-Barré syndrome
  - Devic's neuromyelitis optical
  - Charcot-Marie-Tooth syndrome
  - multifocal demyelinating neuropathy
  - acute disseminated encephalomyelitis.
- Diseases such as syphilis, toxoplasmosis, histoplasmosis, tuberculosis, hepatitis, rubella, human immunodeficiency virus (HIV), Lyme borreliosis, familial Mediterranean fever, Epstein-Barr virus, herpes zoster ophthalmicus, paranasal sinus disorder, sarcoidosis, systemic lupus erythematosus, Bechet's

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disease, and diabetes may cause optic neuropathy and should be considered before prematurely diagnosing demyelinating optic neuropathy.

- In cases of optic neuropathy presumably secondary to demyelinating disease, MRI can assist in systemic diagnosis by identifying both old and acute demyelinating plaques within periventricular white matter.
- Significant pain with eye movement is present in nearly every case of demyelinating optic neuropathy.
- As the visual dysfunction is due to autoimmune destruction of myelin and not direct inflammation of the optic nerve tissue, this disease entity is best termed demyelinating optic neuropathy.



## Question 2 (11 marks)

A 35 year old man is brought into your emergency department after an isolated injury to the left ankle sustained in a motor cycle accident. His obs are: BP 160/50 mmHg supine HR 110/min GCS 15



- a. State (4) features shown on this xray that suggest a severe injury. (4 marks)

- **Complete # through the neck of talus**
- **Severe comminution of talus**
- **Separation of the major fragments > 1 cm**
- **Marked anterior displacement of distal fragment**

*NB: not dislocation/ subluxation as ankle joint is intact*

He is delivered by ambulance and has received only penthrane enroute. He does not have intravenous access on arrival. He is extremely distressed with pain. He last ate 2 hours ago. His weight is 70 kg.

- b. List seven (7) analgesic options for this patient while he is in the emergency department. Include doses and routes where applicable. Include initial doses and route where appropriate. (7 marks)

- **Initial options:**
  - **IM ketamine 3-5 mg/kg**
  - **IN fentanyl 1 mcg/kg**
  - **N2O**
- **IV morphine- 5-10mg**
- **Sedation for reduction:**
  - **IV ketamine 1-1.5 mg/ kg**
  - **IV midazolam 3-5 mg**
- **Reduction/ immobilisation**
- **Elevation**
- **Ankle block 10-20ml x 0.5% plain bupivacaine**
- **PCA**
- **Oral oxycodone/paracetamol**

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### Question 3 (12 marks)

A 65 year old female, non- English speaking, Italian lady presents with about 1 cup of haemoptysis. You are unable to obtain any medical history. Her observations are: BP 135/65 mmHg HR 80/min GCS 15

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

- TB
- PE
- Pneumonia - severe with infarction
- Lung Ca- primary/ secondary
- Pulmonary abscess
- Coagulopathy/ over anticoagulation
- Thrombocytopaenia
- Pulmonary contusion
- Inhaled FB

b. Other than a CXR, list three (3) key investigations that you would consider ordering in the emergency department. (3 marks)

*NB: list only- no qualification needed*

- INR
- Sputum- AFB, MCS
- CT Chest
- CTPA
- ECG, FBE, UE, LFT, Quanteferon Gold, ECHO

A Chest Xray shows unilateral changes.

She experiences a large volume haemoptysis (estimated blood loss 500 ml).

c. List five (5) key steps in the treatment of this patient over the next 30 minutes. (6 marks)

*NB: 500ml is massive/ life threatening haemoptysis*

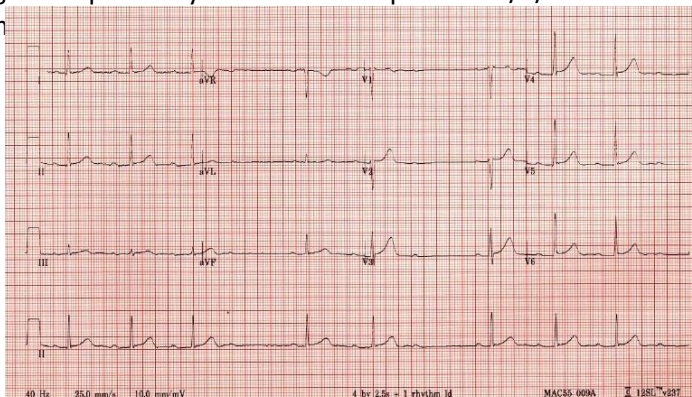
- **Communication- Interpreter- obtain focussed Hx/ explain to pt**
- **Nurse with affected side down - Preserve unaffected lung**
- **Ventilation support- Mainstem intubation or combitube/ dual lumen tube to non affected side only (anaesthetic assistance)**
- **Circulation- Volume replacement- blood- massive transfusion if indicated**
- **Reverse anticoagulation- FFP/ VitK/ Prothrombinex/ Tranaxemic acid**
- **Rx underlying conditions- Pneumonia IV abs/ PE- anticoagulation**
- **Isolation- If Tb expected**

*NB: Refer interventional XR- If bleeding persists will probably be after 30 min*

## Question 4 (17 marks)

A 64 year old man is being evaluated in your emergency department after an episode of chest pain which has now resolved. He is given aspirin only en route to hospital. 2010/1/6. His observations are:

BP 140/85 mmHg RR 20/m



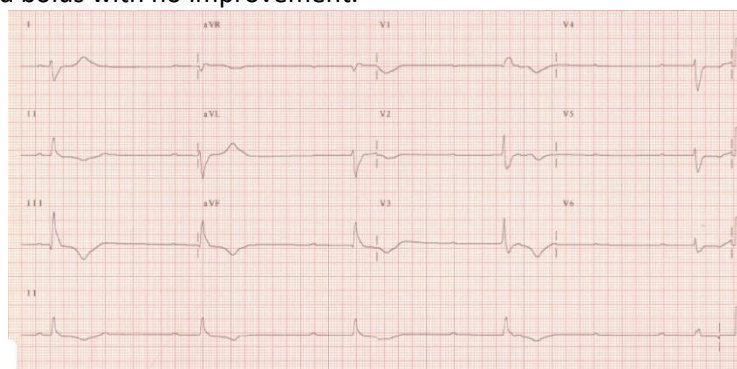
a. State four (4) abnormal findings shown in this ECG. (4 marks)

- **Bradycardia ~ 48 bpm**
- **Mobitz type 1 (Wenckebach) 2<sup>nd</sup> degree HB**
- **STE 1mm II, V2- V6**
- **Biphasic TW III Vi**

b. List four (4) likely causes for these findings. (4 marks)

- **Ischaemia**
- **Drugs- -ve chronotropes (BB, CCB, Digoxin)- therapeutic**
- **Drugs- OD eg same as above**
- **Cardiomyopathy**
- **Myocarditis**

The patient becomes suddenly unwell. He is lightheaded with no chest pain. His BP is 70/50 mmHg. He is given a 500ml fluid bolus with no improvement.



c. State five (5) abnormal findings shown in this ECG. (5 marks)

- **Rate 25-30**
- **CHB**
- **Ventricular/ Idioventricular escape or QRS prolongation**
- **RAD**
- **TWI II, III, V1-V3**

( For Q waves to be significant they need to be: > 40 msec & > 2 mm deep & > 25% depth of QRS)

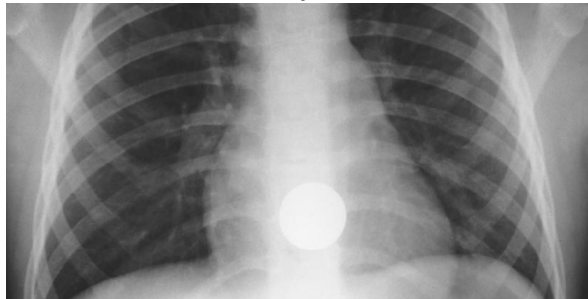
d. List in order of escalation, your choice of drug treatment for this patient. Specify dose and route. (4 marks)

|  | Drug treatment | Dose |
|--|----------------|------|
|--|----------------|------|

|                      |                            |   |
|----------------------|----------------------------|---|
| 1 <sup>st</sup> line | Isoprenaline or Adrenaline | Bolus 20-40 mcg IV Followed by infusion 0.5- 20 mcg/min |
| 2 <sup>nd</sup> line | Atropine                   | 300mcg-600mcg IV ( <i>rarely effective</i> )            |

## Question 5 (14 marks)

A series of three (3) Xrays from three (3) different patients are shown in the props booklet

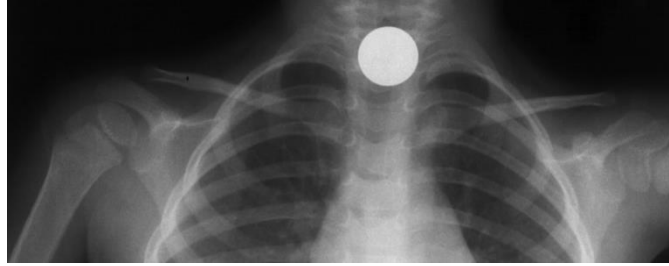


- For Xray 1, state where the foreign body lies. (1 mark)
  - Lower oesophagus at the gastro-oesophagus junction.**
- For Xray 1, list two (2) options for the nature/composition of the foreign body. (2 marks)
  - Coin**
  - Round metal object**
- List two (2) factors that would mandate urgent removal of the foreign body. (2 marks)
  - Excessive symptoms**
    - **Unable to swallow**
    - **Severe pain**
  - Complications**
    - **Haematemesis**
    - **Features of perforation**



- For Xray 2, where the foreign body lies. (1 mark)
  - Oesophagus- upper**
- For Xray 2, what is the nature/composition of the foreign body? (1 mark)
  - Button battery**
- For Xray 2, state your disposition. Provide two (2) points of justification for this choice. (2 marks)
  - Disposition: **Theatre - Admit Gastro/ ENT**
  - Justification: **Immediate removal required (MANDATORY) (< 2/24)**  
**Extensive surrounding tissue damage commences < 30 min**  
**Too large to allow wait and see if passage occurs spontaneously**
- For Xray 3, where does the foreign body lie? (1 mark)

- **Upper oesophagus**



h. For Xray 3, state your disposition. Provide two (2) points of justification for this choice. (3 marks)

Disposition: **Admit Gastro/ ENT**

Justification: **Too large to pass spontaneously**  
**Timing of removal depends on symptoms**

## Question 6 (12 marks)

A 45 year old man with type 1 diabetes mellitus is brought in by ambulance with an altered conscious state. His observations are: BP90/70 mmHg HR120 bpm Temperature 36.8 °C Oxygen saturation 97% on 8L by Hudson mask GCS12E4, V3, M5

|                           |      |            |           |
|---------------------------|------|------------|-----------|
| FIO <sub>2</sub>          | 0.50 |            |           |
| pH                        | 7.05 |            | 7.35-7.45 |
| pCO <sub>2</sub>          | 66   | mmHg       | 35-45     |
| pO <sub>2</sub>           | 247  | mmHg       | 80-95     |
| Bicarbonate               | 18   | mmol/L     | 22-28     |
| Base excess               | -14  |            | -3 - +3   |
| O <sub>2</sub> saturation | 99   | %          | > 95      |
| Na <sup>+</sup>           | 131  | mmol/L     | 134-146   |
| K <sup>+</sup>            | 5.0  | mmol/L     | 3.4-5     |
| Cl <sup>-</sup>           | 92   | mmol/L     | 98-106    |
| Urea                      | 15   | mmol/L     | 3-8       |
| Creatinine                | 227  | micromol/L | 45-90     |
| Glucose                   | 50.9 | mmol/L     | 3.5-5.5   |

a. Provide three (3) calculations to help you to interpret these results. (3 marks)

- Corrected Na** (Need to correct Na prior to AG calculation)
  - **True Na = measured Na+ + glucose- 10/3**  
**Or measured Na+ + glucose- 7/ 3.5**  
**Or measured Na+ + glucose/4**
- Anion Gap = 21 ∴ ↑**
- Delta gap Δ ratio: ~ 1.7 ∴ Pure HAGMA**
- Others:**
  - **Expected CO<sub>2</sub>**
  - **A-a gradient 274-247 = 27 ∴ normal for age**
  - **Se Osmo**

b. Provide a unifying explanation for this clinical picture based on these results. (3 marks)

- **HAG Metabolic acidosis- Likely DKA**
- **1° respiratory acidosis- Likely hypoventilation**
- **Renal impairment- slightly increased Ur:Cr likely partly prerenal from dehydration**

c. Complete the following table demonstrating three (3) key specific treatment tasks in the first 2 hours of the emergency department stay. State how you would achieve each of these tasks.

|   | Key treatment task                         | How will you achieve the task?   |
|---|--|--|
| 1 | <b>Establish U/O/ correct hypovolaemia</b> | <b>Fluid</b><br><b>1 L NS Stat</b><br><b>~ 250 ml/hr for next 4/24</b><br><b>Monitor U/O with FBC (avoid IDC)</b><br><b>CVP monitoring</b> |
| 2 | <b>Correct hypoglycaemia</b>               | <b>Fluids</b><br><b>Insulin 0.1 U/kg/hr (max 15 U/hr)</b><br><b>Follow local protocol</b><br><b>3-5 U/hr</b>                               |
|   | <b>K balance</b>                           | <b>Replace K as glucose falls and K falls</b>  |
|   | <b>Airway protection</b>                   | <b>Careful observation given altered conscious state</b>   |

University Hospital, Geelong- Fellowship Exam Short Answer Questions  
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|  |                          |                  |
|--|--------------------------|------------------|
|  | <b>Treat precipitant</b> | <b>Eg Sepsis</b> |
|--|--------------------------|------------------|



# University Hospital, Geelong- Fellowship Exam Short Answer Questions

## Week 15

### Delta ratio

This Delta Ratio is sometimes useful in the assessment of metabolic acidosis. As this concept is related to the anion gap (AG) and buffering, it will be discussed here before a discussion of metabolic acidosis. The Delta Ratio is defined as:

$$\text{Delta ratio} = (\text{Increase in Anion Gap} / \text{Decrease in bicarbonate})$$

#### How is this useful?

In order to understand this, consider the following:

If one molecule of metabolic acid (HA) is added to the ECF and dissociates, the one  $\text{H}^+$  released will react with one molecule of  $\text{HCO}_3^-$  to produce  $\text{CO}_2$  and  $\text{H}_2\text{O}$ . This is the process of buffering. The net effect will be an increase in unmeasured anions by the one acid anion  $\text{A}^-$  (ie anion gap increases by one) and a decrease in the bicarbonate by one.

Now, if all the acid dissociated in the ECF and all the buffering was by bicarbonate, then the increase in the AG should be equal to the decrease in bicarbonate so the ratio between these two changes (which we call the delta ratio) should be equal to one. The delta ratio quantifies the relationship between the changes in these two quantities.

#### Example

If the AG was say 26 mmols/l (an increase of 14 from the average value of 12), it might be expected that the  $\text{HCO}_3^-$  would fall by the same amount from its usual value (ie 24 minus 14 = 10mmols/l). If the actual  $\text{HCO}_3^-$  value was different from this it would be indirect evidence of the presence of certain other acid-base disorders (see Guidelines below).

#### Problem

A problem though: the above assumptions about all buffering occurring in the ECF and being totally by bicarbonate are not correct. Fifty to sixty percent of the buffering for a metabolic acidosis occurs intracellularly. This amount of  $\text{H}^+$  from the metabolic acid (HA) does not react with extracellular  $\text{HCO}_3^-$  so the extracellular  $[\text{HCO}_3^-]$  will not fall as far as originally predicted. The acid anion (ie  $\text{A}^-$ ) however is charged and tends to stay extracellularly so the increase in the anion gap in the plasma will tend to be as much as predicted.

Overall, this significant intracellular buffering with extracellular retention of the unmeasured acid anion will cause the value of the delta ratio to be greater than one in a high AG metabolic acidosis.

**Caution:** Inaccuracies can occur for several reasons, for example:

- Calculation requires measurement of 4 electrolytes, each with a measurement error
- Changes are assessed against 'standard' normal values for both anion gap and bicarbonate concentration.

Sometimes these errors combine to produce quite an incorrect value for the ratio. As an example, patients with hypoalbuminaemia have a lower 'normal' value for anion gap so using the standard value of 12 to compare against must lead to an error. Do not overinterpret your result and look for supportive evidence especially if the diagnosis is unexpected.

#### Guidelines for Use of the Delta Ratio

Some general guidelines for use of the delta ratio when assessing metabolic acid-base disorders in provided in the table below.

Overall Advice: **Be very wary of over-interpretation** - Always check for other evidence to support the diagnosis as an unexpected value without any other evidence should always be treated with great caution.

| Delta Ratio | Assessment Guideline  |
|-------------|---|
| < 0.4       | Hyperchloraemic normal anion gap acidosis   |
| 0.4 - 0.8   | Consider combined high AG & normal AG acidosis BUT note that the ratio is often <1 in acidosis associated with renal failure  |
| 1 to 2      | Usual for uncomplicated high-AG acidosis<br>Lactic acidosis: average value 1.6<br>DKA more likely to have a ratio closer to 1 due to urine ketone loss (esp if patient not dehydrated)                                |
| > 2         | Suggests a pre-existing elevated $\text{HCO}_3^-$ level so consider: <ul style="list-style-type: none"><li>• a concurrent metabolic alkalosis, or</li><li>• a pre-existing compensated respiratory acidosis</li></ul> |

**Warning:** Be very wary of over-interpretation - Always check for other evidence to support the diagnosis as an unexpected value without any other evidence should always be treated with great caution.

#### A high ratio

A high delta ratio can occur in the situation where the patient had quite an elevated bicarbonate value at the onset of the metabolic acidosis. Such an elevated level could be due to a pre-existing metabolic alkalosis, or to compensation for a pre-existing respiratory acidosis (ie compensated chronic respiratory acidosis). With onset of a metabolic acidosis, using the 'standard' value of 24 mmol/l as the reference value for comparison when determining the 'decrease in bicarbonate' will result in an odd result.

#### A low ratio

A low ratio occurs with **hyperchloraemic (or normal anion gap) acidosis**. The reason here is that the acid involved is effectively hydrochloric acid (HCl) and the rise in plasma [chloride] is accounted for in the calculation of anion gap (ie chloride is a 'measured anion'). The result is that the 'rise in anion gap' (the numerator in the delta ratio calculation) does not occur but the 'decrease in bicarbonate' (the denominator) does rise in numerical value. The net of both these changes then is to cause a marked drop in delta ratio, commonly to < 0.4

## University Hospital, Geelong- Fellowship Exam Short Answer Questions

### Week 15

#### Lactic acidosis

In **lactic acidosis**, the average value of the delta ratio in patients has been found to be 1.6 due to intracellular buffering with extracellular retention of the anion. As a general rule, in uncomplicated lactic acidosis, the rise in the AG should always exceed the fall in bicarbonate level.

#### Diabetic ketoacidosis

The situation with a pure **diabetic ketoacidosis** is a special case as the urinary loss of ketones decreases the anion gap and this returns the delta ratio downwards towards one. A further complication is that these patients are often fluid resuscitated with 'normal saline' solution which results in an increase in plasma chloride and a decrease in anion gap and development of a 'hyperchloraemic normal anion gap acidosis' superimposed on the ketoacidosis. The result is a further drop in the delta ratio.

### Question 7 (12 marks)

A 65 year old man presents with a left hand injury.



- a. List two (2) factors that arise from this image, that would suggest a poor prognosis for successful reimplantation. (2 marks)
- **Site - through middle phalanx or DIP**
  - **Tendon avulsion**
  - **Maceration of edges**
  - **(Pale tip or avulsed parts not stored appropriately at present- clutching straws)**
- b. List six (6) historical factors that would suggest a poor prognosis for successful reimplantation. (6 marks)
- **Time of injury/ delay to repair Warm ischaemia > 6 bad and cold ischaemia time > 12 bad**
  - **Age**
  - **Smoking Hx**
  - **PVD**
  - **Diabetes**
  - **Steroid use**
  - **Delay/ incorrect cooling of amputated parts**
  - **Hypotension**
  - **Proximal injury to arm/forearm**
- Most important
- c. How would you store the amputated parts pending a decision for potential reimplantation? List two (2) points in your answer. (2 marks)
- **Double sealed bag (or bottom shelf fridge)**
  - **Ice slurry**
- d. What is the most appropriate regional anaesthesia technique for this patient? (1 mark)
- **Combined radial and median nn block**
  - **or US guided scalene block**
  - **or volar plate block**

*NB: Not ring block- may prang an artery*

University Hospital, Geelong- Fellowship Exam Short Answer Questions  
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## Amputations

### Care of amputated parts

Xray

Wash gross contamination with sterile N S → wrap in sterile gauze lightly soaked in NS

→ double plastic bag in ice/water

Or lower tray fridge

Aim to keep cool avoid freezing

### Care of stump

Remove any tourniquet applied by MAS

Direct pressure with sterile dressings - combine

No vascular clamping

Directed temporary tourniquet

- only if uncontrollable bleeding en route to theatre

### Time to reimplantation- ischaemia time

Warm 6-8 hrs

Cool 12 hrs (up to 24 hrs)

### Prognostic factors for favourable outcome

#### Amputated part factors

Clean cut vs crush/ shear/ degloving

Duration of time between injury and surgery

Minimal contamination/ infection

Minimal water/ shrinkage effect at edges

Site/ muscle content → wrist better than forearm → tendon

muscle

→ fingers do well if amputated distal to FDP or prox FDS

insertion (worst bet DIP & PIP)

→ worst if two level injury

#### Patient factors

Age → children do better

Pre existing health (DM, PVD, steroids do worse)

→ smokers poor success rate

### Relative contraindications to implantation

Long duration between time of injury → Sx (> 6/24 warm, > 12 cold ischemia time)

Crush with extensive STI

Peripheral vascular disease

Grossly contaminated/ infected wound

Devitalised tissue

Other life- threatening injuries which take precedence

Site of amputation in presence of significant neurological injury (eg BP disruption)

### Don't forget

IV Abs

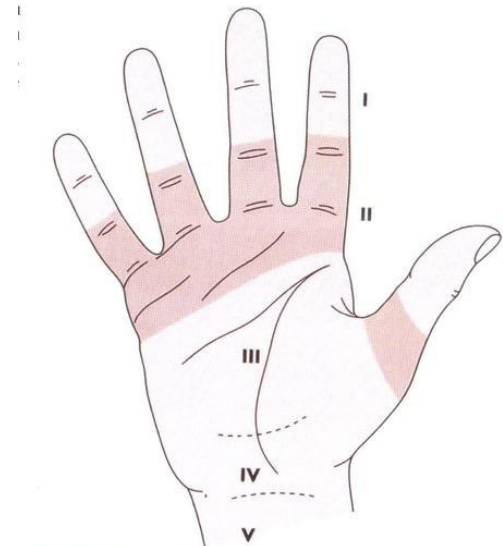
Tetanus prophylaxis- toxoid +/- TIG

Analgesia

Splint

Fast

Management of other injuries- Secondary survey



**28.13 The zones of injury** (I) Distal to the insertion of flexor digitorum superficialis. (II) Between the opening of the flexor sheath (the distal palmar crease) and the insertion of flexor superficialis. (III) Between the end of the carpal tunnel and the beginning of the flexor sheath. (IV) Within the carpal tunnel. (V) Proximal to the carpal tunnel.

## Question 8 (12 marks)

A 6 year old boy presents with a left supracondylar humeral fracture.

- a. List two (2) type of pain scoring systems that you could apply to this child. (2 marks)
- **Wong Baker Faces** (3- 18)
  - **FLACC** (2/12- 18)
  - **Visual analogue** (6-18)
- NB: Numerical (8+ yrs)*
- b. List two (2) reasons why a pain score is used. (2 marks)
- **Objective assessment of pain is poor**
  - **Allows assessment of efficacy of analgesia**
- c. List four (4) indications for GAMP in this patient. (4 marks)
- **Distal neuro compromise**
  - **Distal vascular compromise**
  - **Skin compromise**
  - **Capitellum posterior to anterior humeral line (dorsal angulation > 10°)**
  - **< 50% bony contact**
  - **Medial/lateral angulation Esp if > 10°**
  - **Anterior displacement**
- d. List four (4) pieces of advice that you would give to this boy's parent if the patient is able to be discharged from the emergency department. (4 marks)
- **Post sedation advice**
  - **Post POP advice**
    - **Indications to return for review**
  - **POP check plan**
  - **Analgesia advice**
  - **Follow up arrangements**

**Click on the image below to view the entire PDF (& print/save if necessary)**



## Question 9 (12 marks)

A 46 year man is brought to your emergency department with suspected alcohol withdrawal.

- a. List seven (7) of the 10 scale domains that form the Alcohol Withdrawal Assessment Scale (7 marks)
- **N&V**
  - **Tactile disturbance**
  - **Tremor**
  - **Paroxysmal sweating**
  - **Auditory disturbance**
  - **Visual disturbance**
  - **Anxiety**
  - **Agitation**
  - **Headache**
  - **Orientation and clouding of sensorium**

A 35 year old male is identified as having “very severe” alcohol withdrawal.

- b. State five (5) key management steps for this patient over the next 1 hour. (5 marks)
- **Non stimulating environment**
  - **Provide adequate hydration**
  - **Rx Thiamine & multivitamins**
  - **Rx hypoglycaemia**
  - **IV diazepam 5mg - repeat to 4x over 1<sup>st</sup> 30 min then 30 minutely as required**

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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November 2017



University Hospital, Geelong- Fellowship Exam Short Answer Questions  
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**CIWA-Ar (ALCOHOL WITHDRAWAL SCALE)**

**Nausea & vomiting** Ask "Do you feel sick to your stomach? Have you vomited?" Observation.

0 no nausea and no vomiting

1 mild nausea with no vomiting

2

3

4 intermittent nausea with dry heaves

5

6

7 constant nausea, frequent dry heaves and vomiting

**Tremor** Arms extended and fingers spread apart. Observation.

0 no tremor

1 not visible, but can be felt fingertip to fingertip

2

3

4 moderate, with patient's arms extended

5

6

7 Severe, even with arms not extended

**Paroxysmal sweats** Observation.

0 no sweat visible

1 barely perceptible sweating, palms moist

2

3

4 beads of sweat obvious on forehead

5

6

7 drenching sweats

**Anxiety** Ask "Do you feel nervous?" Observation.

0 no anxiety, at ease

1 mildly anxious

2

3

4 moderately anxious, or guarded, so anxiety is inferred

5

6

7 equivalent to acute panic states as seen in severe delirium or acute schizophrenic reactions

**Agitation** Observation.

0 normal activity

1 somewhat more than normal activity

2

3

4 moderately fidgety and restless

5

6

7 paces back and forth during most of the interview, or constantly thrashes about

**Tactile disturbances** Ask "Have you any itching, pins and needles sensations, any burning, any numbness or do you feel bugs crawling on or under your skin?" Observation.

0 none

1 very mild itching, pins and needles, burning or numbness

2 mild itching, pins and needles, burning or numbness

3 moderate itching, pins and needles, burning or numbness

4 moderately severe hallucinations

5 severe hallucinations

6 extremely severe hallucinations

7 continuous hallucinations

**Auditory disturbances** Ask "Are you more aware of sounds around you? Are they harsh? Do they frighten you? Are you hearing anything that is disturbing you? Are you hearing things you know are not there?" Observation.

0 not present

1 very mild harshness or ability to frighten

2 mild harshness or ability to frighten

3 moderate harshness or ability to frighten

4 moderately severe hallucinations

5 severe hallucinations

6 extremely severe hallucinations

7 continuous hallucinations

**Visual disturbances** Ask "Does the light appear to be too bright? Is its colour different? Does it hurt your eyes? Are you seeing anything that is disturbing you? Are you seeing things you know are not there?" Observation.

0 not present

1 very mild sensitivity

2 mild sensitivity

3 moderate sensitivity

4 moderately severe hallucinations

5 severe hallucinations

6 extremely severe hallucinations

7 continuous hallucinations

**Headache, fullness in head** Ask "Does your head feel different? Does it feel like there is a band around your head?" Do not rate for dizziness or lightheadedness. Otherwise, rate severity.

0 not present

1 very mild

2 mild

3 moderate

4 moderately severe

5 severe

6 very severe

7 extremely severe

**Orientation & clouding of sensorium** Ask "What day is this? Where are you? Who am I?"

0 orientated and can do serial additions

1 cannot do serial additions or is uncertain about the date

2 disorientated for date by no more than 2 calendar days

3 disorientated for date by more than 2 calendar days

4 disorientated for place and/or person

TOTAL CIWA-Ar SCORE

/67

Date:

Time (24hr):

Rater's initials:

(Max possible score is 67)