
Station FOUR

Simulation: Seizure

1. Candidate instructions

This station is a Simulation Scenario.

You are the duty Consultant in a Tertiary level Emergency Department, it is 10am on a Monday morning. You are receiving handover when the Emergency buzzer sounds in one of the Resuscitation beds. One of the junior Registrars from overnight was escorting this patient to the CT scanner, but you have been given some preliminary information from the Nurse in Charge.

The patient:

24 year old previously healthy male on no regular medication. He was at a party on Saturday night with friends who reported he was drinking heavily, and they are unsure if he used any other substances. He slept all day yesterday and they assumed he was simply recovering, however became concerned this morning when he remained drowsy and seemed confused.

His vital signs taken on arrival are shown below:

- GCS 14
- HR 70
- BP 145/70
- Sats 99% on room air
- RR 16

The nurse tells you that he was assessed by the registrar and escorted to CT, she is unsure of any other findings. He has reportedly had a Seizure in the CT scanner and been brought back to Resus. He is not intubated.

Your tasks are to:

- Attend the Resuscitation room and manage the scenario as it unfolds

You will have 7 minutes for this task

There will be a Simulated patient in the room, as well as the treating Registrar. They are a relatively junior trainee, but are competent to perform clinical assessment and procedures including airway management. There is also an experienced and competent resuscitation Nurse.

This OSCE will assess the following domains:

- Medical Expertise 40%
 - Prioritisation and Decision making 20%
 - Teamwork and Collaboration 20%
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1. Role player instructions

Station Overview

Stage One (first 3 mins) - Handover and Airway management

'Hi thanks for coming. This is Bernard, he is 24 and was just brought in with altered conscious state after being intoxicated on Saturday. He has just had a 2 minute generalised tonic clonic seizure in the CT scanner and his GCS is now 3. I don't think he is protecting his airway'

More details below to give as asked by candidate. The candidate is expected to manage the airway in this section, and should be pushed towards intubation

Stage Two (3 mins) - Interpretation of results and discussion of management

At 3 mins candidate should be given CT result followed by VBG if not already asked for

- Expectation is that they will concisely interpret the key findings affecting the immediate management, but should be moved on if they are going into too much detail, initially by handing them the gas result

'We did manage to get the CT done before he Seized..'

'Ok. We have also taken a VBG'

'What should our next steps be in the management of this patient'

Stage Three (1 min) - Handover

- Handover to ICU consultant via a phone call

Nurse confederate to interrupt at 6 minutes:

'Excuse me I have the ICU consultant on the phone asking about this patient, would you please handover to him/her?'

The Nurse confederate can then also be the voice of the ICU consultant, who essentially should just need to listen to the handover, and prompt for more detail if required.

'Why did he have a seizure?' 'What did his investigations so far show?'

'What treatment has he had so far?'

At some point during scenario candidate should:

- Talk through intubation, needs to be Neuro protective
 - Interpret CT scan and VBG (briefly and concisely)
 - Discuss secondary prevention for brain injury and management of Severe Hyponatraemia
 - Handover to the ICU consultant
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Registrar

You are a competent Post Primary level Registrar who is capable of performing basic resuscitation procedures. If asked you are comfortable with airway management including intubation. You can relay the details of the case as above, but do not offer any suggestions on management or diagnosis. You will need to be guided by the candidate for drug choices etc.

You have assessed the patient and if asked for further details they are:

Bernard - 24 year old male Pmh - none Meds none Allergies nkda

Current smoker. Drinks heavily at the weekends, minimal during the week, no known alcoholism

Unsure about other drugs, friends think he smokes marijuana sometimes

History as above. No witnessed falls or known trauma, but **friends did notice some dried blood on** his pillow ?head injury. BSL normal. No signs of infection/meningitis.

Examination (before the CT) - GCS 14 confused. Pupils equal reactive 4mm

No significant head trauma, but small amount of dried blood in his hair

No focal neurology. No other injuries, other examination essentially normal

You have placed a C-spine collar and taken him for CT brain and C-spine. You have requested and sent bloods but haven't seen any results. An ECG has been performed which was normal (not available for candidate - there is already enough investigations to interpret!

During the CT scan he has suffered a generalised seizure, lasting approximately 2 minutes with spontaneous resolution. However his GCS has not picked back up (still 3) and he will need intubation. If there is any question about this you can give prompts such as:

'His breathing is very noisy'

'i dont think he is protecting his airway now, do we need to intubate him?'

if the candidate manages the airway appropriately without intubation eg LMA this is ok initially, but they are expected to talk through the intubation after the second seizure and may need prompting for this.

The intubation itself will be uncomplicated (and quick), but the induction is required to be neuroprotective. If asked there is no anticipated anatomical difficulty and the pre induction Obs are normal (as per stem). You have been bagging the patient with 15L since the seizure and therefore if a question of Pre-oxygenation comes up you can direct the candidate that this has been done. You are unsure when the patient last ate.

Nurse

You are a competent resuscitation Nurse who can perform tasks appropriate to your training, as directed by the candidate but will not offer any suggestions on management. You are happy to give drugs for the intubation and can offer to do this if the candidate doesn't allocate you this role.

At 6 minutes you will interrupt with the ICU consultant phone call, and will also be the voice of the ICU consultant.

Examiner instructions

This station assesses the candidates ability to:

- Team lead a safe, neuroprotective intubation
- Interpret the results of this CT scan and VBG briefly
- Discuss management of acute subdural, secondary neuroprotection measures and Hyponatraemia
- Handover concisely to the ICU consultant

Stage One

- candidate receives handover and requests other key details, considering an appropriate **differential diagnosis**
- Manages the intubation with appropriate **induction drugs and doses** and awareness of the need to avoid hypotension and hypoxia.
- **Otherwise safe intubation** eg checks registrar airway competence, ensures full monitoring applied, suction, apnoic oxygenation, positioning (c-spine precautions maintained) etc

Stage Two

- CT - **Acute left Fronto-parietal Subdural haematoma**. Minimal midline shift.
 - VBG - **Severe Hyponatraemia**. Otherwise essentially unremarkable. Lactate in keeping with recent seizure.
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Management

Definitive management of Subdural

- Early Neurosurgical involvement - given small subdural and concurrent Hyponatraemia as another explanation for the seizure urgent Surgery may not be required - however should involve N'surg early - may consider ICP monitor etc

Secondary prevention

- **Avoid hypoxia** - sats 94-98% and appropriate ventilation strategy
 - **Normocapnoea** - 35-40 mmHg
 - **Avoid Hypotension** - appropriate MAP aim , CPP >60mmHg
 - Head up 30 degrees
 - Avoid tight tube ties
 - **Normothermia**
 - Normoglycaemia
 - **Appropriate sedation and analgesia** to avoid ICP spikes
 - Seizure prophylaxis - No evidence of benefit however consider given this scenario likely to be given, eg Levatiracetam 1G
 - Mannitol/Hypertonic saline not required here, same goes for overly aggressive hyperventilation
 - Other housekeeping - Invasive monitoring and access lines, DVT prophylaxis, ngd, idc, nutrition, cxr post intubation etc
 - Given the possible wound (blood on pillow) ADT and Antibiotics could get a mention, and often are given in this scenario, unlikely to have significant beneficial effect here
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Hyponatraemia

- Consider and Treat underlying cause. Investigations but in this case likely secondary to SdH
- **Fluid management**- normal saline replacement is appropriate if hypovolaemic otherwise fluid restrict

Acute hyponatraemia <48 hrs- can be safely corrected- but usually not possible to confirm it is acute

Na increase <10 mmol/L first 24 hours, then 8 per day - **Not too rapid due to risk of central pontine demyelination syndrome**

- Can calculate the amount needed to get to 125 by- $(125 - \text{Na}) \times (\text{body weight} \times 0.6)$ but shown to overshoot in one case series
- **Hypertonic saline**- 100mls 3% (50mmol) (via CVC) for severe hyponatraemia with acute cerebral symptoms- main risk is too rapid correction 1 bag over 10 mins, then second over 50 mins
- In this case should be given
- Other options- demeclocycline, tolvaptan

Stage Three

Appropriate concise handover to ICU

- **Overall Situation including acute subdural and Severe Hyponatraemia, with Seizure**
- **Intubation** for airway protection
- Management as discussed, and **need for ICU admission** for ongoing treatment

Key assessment criteria

Safe airway protection plan, with neuroprotective intubation. Good overall grasp of the issues in this case and understanding of the key management priorities. **Bold** criteria in each section.



Venous Blood Gas

PH - 7.37

CO₂ - 47.6

O₂ - 42.1

HCO₃ - 24.1

Na - 119

K - 4.2

Glucose - 6.7

Lac - 3.1



OSCE Station:

COMPONENT ASSESSMENT

For each domain below select the **ONE** option which best represents this candidates performance. The option '**Minimum level of competency displayed**' represents the minimum level of safe independent practice as a junior FACEM in Australasia.

A horizontal bar chart with seven bars of increasing length and decreasing height, colored in a gradient from light blue to dark blue. Each bar contains text describing a response category. The bars are arranged from left to right, representing the following categories: Very poor, Well below minimum standard, Below minimum standard, At minimum standard, Above minimum standard, High standard, and Very High standard.

Response Category
Very poor
Well below minimum standard
Below minimum standard
At minimum standard
Above minimum standard
High standard
Very High standard

Please rate all the following domains:

Medical Expertise							
Prioritisation and Decision making							
Teamwork and Collaboration							

EXAMINER'S COMMENTS

GLOBAL ASSESSMENT RATING

Please rate this candidate's OVERALL performance in this OSCE:

In terms of a **safely practising junior emergency physician** please select the ONE option which best reflects this candidate's performance in this station

**Well
Below
Standard**

☐

**Below
Standard**

☐

**Just at
Standard**

☐

**Above
Standard**

☐

**Well
Above
Standard**

☐