



OSCE 32

Candidate Instructions

This is a **7 minute** station.

You are the emergency consultant at a non-major referral hospital.

A junior registrar in Training Stage 1 would like to discuss a case they saw yesterday of a 42 year old female who presented with a severe sudden headache.

Your tasks are to:

- Discuss which investigations are appropriate for patients who present with severe onset headache
- Interpret further investigations when provided
- Discuss further management as required

This OSCE will assess the following domains:

- Medical Expertise – 80%
 - Investigation (40%)
 - Management (40%)
- Scholarship and Teaching – 20%



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Examiner Instructions

This is a **7 minute** station.

This is a discussion of a case seen previously by a junior registrar of a 42 year old female who presented with a severe sudden headache found to have a subarachnoid haemorrhage. They would like to discuss the investigations and management options for SAH.

Further case details are provided during the station as necessary. A previously well female with no past medical history or regular medications, had onset of a severe headache whilst jogging. She is now feeling nauseated and has neck stiffness but otherwise okay. After going to CT scan the patient deteriorates and drops her GCS to 5.

What is expected of the candidate in general terms:

- Interpret the CT scan done on the patient and identify subarachnoid haemorrhage
- Outline to junior doctor how to investigate SAH
- Be able to discuss a plan on investigation dependent on time of presentation

It is expected that candidates:

1. Interpret the CT scan and identify the SAH
2. Elaborate on the investigation options for SAH particularly CTB & LP
3. Know specific differences regarding management of patients with SAH

See **Candidate Instructions for full tasks / domain information provided to candidate.*



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Role-player Instructions

- **Gender:** Any
- **Age range:** Any
- **Role to be played by:** FACEM

You are playing the role of a junior registrar in Training Stage 1, at a non-major referral hospital.

Yesterday you saw a 42 year old female who presented with a severe sudden headache.

You would like to discuss the investigations and management options for SAH with the emergency consultant (the candidate).

Role-player script provided on next page.



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Role-player Script

Part 1 (0 – 3 mins): Investigation Rationale

Opening statement:

“Hi I am [Name]. I have some questions about the case from yesterday. Could we please discuss the investigation options for sudden severe headaches?”

The clinical history and her CT prop suggest a SAH and therefore the investigation options / rationale should be directed towards investigation of a SAH.

They could include:

- CT brain (Non contrast)
- CT angio / Circle of Willis
- Lumbar puncture
- MRI / MRA

Some candidates may want additional clinical information although this should be kept as brief as possible.

- Previously well female with no past medical history or regular medications
- Onset of severe headache while jogging
- Felt nauseated with a stiff neck on arrival

Non-contrast CT is the initial investigation of choice with sensitivity declining hours post onset of headache.

The sensitivity of modern head CT for detecting SAH is highest in the first 6 hours after SAH (nearly 100 percent when interpreted by expert reviewers), and then progressively declines over time to approximately 58 percent at day 5.

If there is high suspicion and / or delay to 6 hrs then a lumbar puncture should be performed looking for RBCs, xanthochromia (if RBCs are present) and opening pressure. Xanthochromia is highly sensitive when done greater than 12 hours after onset of headache > 95% - hence argument to delay LP.

Alternatives = CTA instead although not sensitive for bleed, and baseline incidence of aneurysms in population that will never cause SAH, MRA / MRI although studies not conclusive yet. Has a role in patients on anticoagulants or those that you cannot LP.

- If candidate asks for your level of experience, say:
“I’m a junior registrar in Training Stage 1. I have my primary exam coming up.”
- If candidate asks about prior knowledge, say:
“I would really like to hear your point of view and rationale.”



- If the candidate mentions CT but nothing regarding timing and sensitivity, ask:
"Does timing of the CT matter?"
- If they do not mention an LP, ask:
"What is the role of LP in this situation?"
 - If necessary, ask:
"What are you looking for on LP?"
 - Or timing of LP:
"When would you normally do an LP?"
- If they do not mention CTA, ask:
"Are there any other tests I could do?"
- If not enough detail provided regarding the investigation, ask:
"You mentioned X, could you elaborate on that?"

Part 2 (3 mins – 4 mins): CT Interpretation

"So, we decided to order a CT brain. This is one slice from the patient's scan. Can you please take me through it?"

[ACTION: Hand CT prop to candidate]

- If they ask for your interpretation:
"I'm really not sure, could you just take me through it?"

CT Findings:

- There is large volume of the acute subarachnoid haemorrhage which is seen bilaterally in the sylvian fissures and overlying the right cerebral convexity.
- There is intraventricular blood which is seen layering within the dilated Left occipital horn of the lateral ventricles.
- Grey-white differentiation appears to be preserved.

Should ideally take a moment to identify some basic landmarks on the CT e.g. explain that this is a cross-sectional scan, like looking from the feet up. Identify left / right. It is a non-contrast scan through the lateral ventricles (above the brainstem, no cerebellum visible).

Part 3 (4 mins – 7 mins): Management of SAH

“Quite soon after the scan, her GCS dropped to 5. What’s your approach to managing someone like that?”

- Airway control – low GCS = inability to protect own airway, risk for aspiration
- Neuroprotective measures – especially avoidance of hypoxia, low/normal CO₂
- Urgent neurosurgical input
- Treat & prevent hypotension / hypertension (See below)
- Prevent raised ICP: Head in neutral to 30 degrees head up position.
Avoid neck constrictions (C-spine collars. Inline stabilisation, tight ETT ties)
- If signs of raised ICP, consider osmotherapy e.g. hypertonic saline.
- If mentions BP control but does not say target, say:

“What BP should we aim for?”

- If details regarding intubation are not outlined adequately prompt:

“Is there anything special about how we intubate someone like this?”

Preparation:

- Adequate preoxygenation to prevent hypoxia
- Neuroprotective drugs to ensure sympatholysis such as:
Induction: High dose fentanyl/propofol. (Candidates may discuss ketamine historically been contraindicated but no evidence of causing more harm)
Paralysis: Most will choose rocuronium although suxamethonium is acceptable even though it can theoretically cause raised ICP.

At the **6 minute mark**, say:

“Ok, so once she’s intubated, what are the next priorities for someone like this?”

- The reason she’s dropped her GCS is because of the hydrocephalus, so the most urgent intervention is going to be an external ventricular drain (EVD).
- The next most important goal of SAH management is the prevention of rebleeding by early repair of the unsecured aneurysm with surgical clipping or endovascular coiling.
- She also needs cerebral angiography if not done at time of CT for surgical planning.
- Manage BP. For most patients with acute SAH, the goal is to maintain systolic blood pressure (SBP) <160 mmHg or mean arterial pressure (MAP) <110 mmHg as recommended by guidelines. It is reasonable to use premorbid baseline blood pressure to refine these targets. Hypotension should be avoided.
- Treat for vasospasm. Nimodipine 60 mg 4 hourly (Start in first 96 hours to prevent vasospasm) NG, for improvement of neurological outcomes.
- Reversal of any anticoagulants
- Prevent any secondary brain injury (normothermia, normoglycaemia)
- Anticonvulsants



- If mentions neurosurgery but does not provide details, ask:
“What will the neurosurgeons actually do?”
- If a particular answer is lacking details, ask:
“You mentioned X, could you elaborate on this?”
- If not all aspects are covered, ask:
“Are there any other factors / issues I should consider?”



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Role-player Script Summary

Part 1 (0 – 3 mins): Investigation Rationale

"Hi I am [Name]. I have some questions about the case from yesterday. Could we please discuss the investigation options for sudden severe headaches?"

- If candidate asks for your level of experience, say:
"I'm a junior registrar in Training Stage 1. I have my primary exam coming up."
- If candidate asks about prior knowledge, say:
"I would really like to hear your point of view and rationale."
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Part 2 (3 mins – 4 mins): CT Interpretation

"So, we decided to order a CT brain. This is one slice from the patient's scan. Can you please take me through it?"

[ACTION: Hand CT prop to candidate]

- If they ask for your interpretation:
"I'm really not sure, could you just take me through it?"



Part 3 (4 mins – 7 mins): Management of SAH

“Quite soon after the scan, her GCS dropped to 5. What’s your approach to managing someone like that?”

- If mentions BP control but does not say target, say:
“What BP should we aim for?”
- If details regarding intubation are not outlined adequately prompt:
“Is there anything special about how we intubate someone like this?”

At the **6 minute mark**, ask:

“Ok, so once she’s intubated, what are the next priorities for someone like this?”

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“What will the neurosurgeons actually do?”
- If a particular answer is lacking details, ask:
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Props list

- CT scan (next page) – INSIDE ONLY

OSCE 32 – CT SCAN

(Inside Only)





Domain	Criteria	Marking rules to be 'at a minimum level of competence'/other comment	Criteria met / not met
Medical Expertise: Investigations (40%)	<u>Non-contrast CT</u> - Investigation of choice (Sensitivity declines hours post onset of headache). - If there is high suspicion or delay to 6 hrs then a lumbar puncture should be performed looking for xanthochromia/RBCs/opening pressure. <u>Lumbar Puncture</u> - Xanthochromia is highly sensitive when done greater than 12 hours after onset of headache > 95% - hence argument to delay LP. <u>Alternatives</u> - CTA instead although not as sensitive for bleed, MRA / MRI although studies not conclusive yet has a place in patients on anticoagulants or those that you cannot LP. <u>Correctly interpret CT scan results</u> - Acute subarachnoid haemorrhage along the bilateral sylvian fissures and overlying the right cerebral convexity - Intraventricular blood in the posterior horn Left side. - Hydrocephalus - Sulcal Effacement	- Identify CT/brain as first line and 3 of 4 of the following: - Decline in sensitivity of non-cont. CT with time. - Identify those presenting after 6 hrs will need further test if highly suspicious. - LP done > 12 h for xanthochromia if highly suspicious (LP earlier w/no RBC acceptable). - CTA if non-con CT positive or unable to LP. - Identify SAH on CT + one other finding.	
		Feedback Statements – Did the candidate adequately:	
		- Identify the role of neuroimaging. - Identify focused investigations that confirm time critical diagnoses. - Interpret the CT scan.	
Medical Expertise: Management (40%)	<u>General:</u> <u>Neuroprotective measures:</u> - BP control (SBP <160 or MAP <110) - premonitory BP may guide targets. - Prevent raised ICP (Head up/c-collar off) - Maintain normocarbida - Prevent hypoxia - Maintain normoglycaemia - Normothermia - Prevent seizures - Any other ICP lowering strategies (mannitol, etc..) <u>Intubation:</u> Prevent Hypoxia (Preoxygenate well). Induction Meds to cause sympatholysis: High dose fentanyl/propofol/ketamine (also acceptable.) Paralysis: Rocuronium preferred. <u>Post Intubation</u> EVD insertion. Definitive control of the aneurysm (clipping/coiling). CT angiography if not already done. Prevent vasospasm (Nimodipine). Reversal any anticoagulation.	Minimally Competent Criteria: - Mentions intubation prior to prompt. - Explains importance of neuroprotective drugs in intubation. - Neuroprotective measures – mention BP control with target and mention three other measures on left column. - Definitive Neurosurgical control of aneurysm.	
		Feedback Statements – Did the candidate adequately:	
		- Outline general neuroprotective measures. - Outline modification of intubation technique to minimise raising ICP. - Outline post-intubation care & management.	

Domain	Criteria	Marking rules to be 'at a minimum level of competence'/other comment	Criteria met / not met
Scholarship & Teaching (20%)	• Check for level of prior knowledge / understanding • Demonstrate a structured approach to the topic • Establish rapport • Make the learner feel safe and supported • Demonstrate well-paced communication • Use language appropriate for learner's level • Cover the topic in appropriate detail • Check understanding in learner (regularly and at conclusion) • Invite questions and clarify any areas of uncertainty • Summarise the session with appropriate emphasis of key elements	• Addresses 5 items from the list on the left	
		Feedback Statements – Did the candidate adequately:	
		• Use language appropriate for learner's level. • Cover the topic in appropriate detail. • Demonstrate a structured approach to teaching the topic.	