



AUSTRALASIAN COLLEGE
FOR EMERGENCY MEDICINE

2016.1B FELLOWSHIP CLINICAL EXAMINATION (OSCE)

STATION 6 TEACHING SESSION

1. STATION SUMMARY

Consultant teaching intern about hyponatraemia.

2. CANDIDATE INSTRUCTIONS

You are the consultant on duty in a regional emergency department. It has been a steady morning and things are progressing well.

A local GP has referred 73 year-old, Mrs Costatini, to your emergency department with a sodium of 117 mmol/L. The referral letter and the blood results are available for your review.

The intern is about to see her, and comes to you beforehand requesting information about hyponatraemia and how to assess and investigate a patient with a low sodium.

Your tasks are to:

- Teach the intern about the topic
- Answer any questions the intern may have

You will not be asked to assess the patient yourself, nor initiate or discuss management.

This OSCE will assess the following domains:

- Medical Expertise
- Scholarship & Teaching

3. ROLE-PLAYER INSTRUCTIONS

You are an intern halfway through your ten-week emergency department term at a regional hospital. You've been enjoying it, and you've been finding the work challenging but satisfying. The consultants are supportive and have a regular teaching program that you enthusiastically attend. Of the terms you've done so far (general medicine and orthopaedics), this is your favourite; you are even pondering if a career in emergency medicine might be worth pursuing.

You are in your early 20s and have a range of hobbies outside of medicine. However, whilst you are bright and keen, in this scenario you display little initiative.

You are about to see Mrs Costatini, a 73 year-old female who has been referred to the ED by her GP with a sodium of 117mmol/L. Blood tests have been sent and the results are with you. The patient had normal initial observations and was talking to the nursing staff and was being helped to undress when you grabbed the letter and results. The letter also suggests that she has a heavy smoking history. She is on no medications.

You have never seen anyone with significant hyponatraemia before and don't really know what to do or where to start. You decide to ask the Consultant about how to approach the assessment of the patient – history and examination is the focus.

0 – Approximately 6 Minutes:

As the Candidate comes into the room, the opening remark should be:

'Hi Doctor, Mrs Costatini's looking well right now, I'm just about to go see her. I'm looking at her biochemistry and it's quite abnormal. Look, I've never really understood low sodium ...could you talk me through the bloods and give me some guidance on hyponatraemia and what I should be doing to assess and investigate it?' You should hand the candidate the results and the Dr letter as you say this.

The candidate should engage you in a friendly, conversational manner and you should respond to teaching points appropriately but in non-committal ways...you really don't know much about this topic at all.

The candidate may check for your level of understanding of the topic before starting any teaching. If asked *'Can you tell me what you know about hyponatraemia?'* or similar, your response should be along the lines of *'I don't know much about it at all...'*

General Aim

The candidate should effectively categorise and explain the different causes of hyponatraemia, along with the clinical features and investigations which may help differentiate between them (refer to flow chart):

1. Extracellular fluid increased
 - Urinary Na <20mmol/L: liver failure, cirrhosis, CCF, nephrotic syndrome – and proceeds to describe the clinical features that support each diagnosis
 - Urinary Na > 20mmol/L: renal failure, cerebral salt wasting, drugs
2. Normal extracellular fluid
 - Water intoxication, intake related, SIADH (drugs, CNS, malignancy – small cell lung carcinoma) – and proceeds to describe the clinical features that support each diagnosis
3. Extracellular fluid decreased
 - Urinary Na <20mmol/L: Pre-renal: Na loss in excess of water – diarrhoea, sweat, vomiting, burns, bowel obstruction, heat exposure – and proceeds to describe the clinical features that support each diagnosis
 - Urinary Na > 20mmol/L: salt and water lost through kidneys + diuresis (renal failure, osmotic diuresis, thiazides) – and proceeds to describe the clinical features that support each diagnosis
4. Factitious
 - Hyperglycaemia, hyperlipidaemia, hyperproteinaemia – and proceeds to describe the clinical features and investigations that support each diagnosis

During the scenario appropriate general responses to correct teaching points (if the candidate checks for understanding) could be:

- 'I see'
- 'Yes, I understand'
- 'That makes sense'

A clear explanation of the following key points of assessment is essential if the candidate is to pass the station – therefore, the following prompts should be utilised if they are not adequately explained. Note: The aim is to minimise interruptions to the candidate's flow or 'order' - thus you should learn the below in 'chunks' so you know what is important in each area and can ask for clarification at the end of any section.

Interpretation of blood results: Candidate may make the following comments

- Significant hyponatraemia
- Normal Glucose (hyperglycaemia can cause hypoNa+)
- Normal renal function: Nephrotic syndrome unlikely
- Normal HCO₃. K+ and glucose making adrenocortical insufficiency less likely

The candidates will have a range of approaches. Some may cover history aspects first in terms of conditions that predispose to hyponatraemia. If they are spending too long on this and not getting onto volume status, then say 'The letter says she doesn't have much past history....'

Presence of symptoms

The role-player should prompt the candidate to should prompt the candidate to evaluate for the presence of symptoms of hyponatraemia (and their time course) such as nausea, anorexia, lethargy, altered mentation, seizures. Absent symptoms suggest a spurious cause, mild symptoms suggest a slow onset making some causes more likely than others.

Assessing volume/'fluid status': Hypovolaemic, Euvolaemic, hypervolaemic can be of help, however the patient is unlikely to be significantly hypovolaemic or hypervolaemic given the information currently available

- Hypovolaemic
 - Fluid losses: GIT, sweating, 3rd space losses, burns
 - Renal losses: Diuretics (osmotic), renal disease, Addison's disease (adrenocortical deficiency), ketones

If necessary, ask 'What do I think of if they seem hypovolaemic?'

- Hypervolaemic
 - CCF, Cirrhosis/liver failure, Nephrotic syndrome

If necessary, ask 'What causes would oedema or hypervolaemia suggest?'

- Euvolaemia
 - Commonest type is hypotonic (exclude hypertonic hyperNa+ due to high glucose) – although rarely this severe
 - Causes include (the bold ones are essential)

- **Drugs:** Thiazides, **SSRI's**, psychoactive drugs (TCA's, phenothiazines, ecstasy)

If they don't discuss drug causes at some stage say 'Are there any medications that could cause this?'

- **SIADH:**

- **Lung** (pneumonia, cancer, COPD, PPV etc.),
- **Brain** (infection, trauma, tumour, stroke, SDH) – neurological features are usually obvious
- Cancer – ectopic ADH (lung, pancreas, other)

If necessary, ask 'What sort of things cause SIADH?'

- **Endocrine: Hypothyroidism, Addison's** (adrenocorticoid defic)

(There is no prompt here because they get a reminder when you ask about what blood tests may be needed)

- Excess water intake: Psychogenic polydipsia
- Iatrogenic: Hypotonic IV fluid, post op fluid (ADH release), bladder irrigation

If they have missed something important paraphrase what they have mentioned already and ask if there are other causes to think of.

At the end of this section ask *'How do you tell if SIADH is the diagnosis?'*

- They should outline the diagnostic criteria for SIADH: Hypotonic hypoNa+/ Euvolaemia/Normal thyroid and adrenal function/no hepatic, renal, or cardiac failure/Urine inappropriately concentrated (> 100-200 mOsm)/Urine sodium inappropriately high (> 20 mmol/L)/not on diuretics.

They may focus on the urinary results. Don't spend too long here, there is a 2nd chance for the other information to come out when they discuss necessary investigations.

Investigations:

Note: This should occur by the **5 minute mark**.

If they do not open the topic then say *'OK, I feel happier about the history and examination. Can you just take me through the tests I might need to do?'*

Candidates should be able to pretty efficiently detail the tests and rationale as much should have been covered already.

They should describe the need to do

- Urine chemistry
 - Urine sodium and urine osmolality

If they have not explained the rationale for this test, ask *'How do the urine results help?'*

- Blood tests
 - UEG/LFT: Recheck Na+, renal function/albumin, LFT's (?cirrhosis)
 - FBE: Infection, malignancy etc.
 - TFT (exclude hypothyroidism)
 - Cortisol level (exclude Addison's)

If they have not mentioned Hypothyroidism or Addison's before then ask *'Why are we testing that?'*

Ask *'Are there other blood tests I might need to do?'* if any are missed.

- Radiology
 - CXR: Cancer, infection, CCF, other pathology
 - CT chest may be indicated depending on CXR etc.
 - CT head indicated if no other cause found

Ask *'Is there any other imaging that might be needed?'* if they don't mention CT head.

At Approximately 6 Minutes:

Ask the candidate: *'Sorry, I have lost track of what you have been telling me – can you summarise what you have said so far?'*

If the candidate has completed the above and there is spare time, then you should ask *'What do you think the most likely causes might be in this woman?'*

- Given that the patient is probably euvolaemic, is 73, with a significant smoking history, no other medical history and on no medications a small cell lung carcinoma causing SIADH is relatively likely. If this is normal, then a CT chest may be required.

There are a number of ways the OSCE could go:

1. The candidate may know little about hyponatraemia and its causes or may make errors
 - The role of prompts is to give the candidate an opportunity to best display their knowledge
 - The prompt should not 'hint' at the answer e.g. Do not say '*Should a CXR be ordered?*' but ask '*What imaging is needed?*'
 - You may need to ask for clarification if it is not clear what the candidate has said, or the information is incomplete
 - You may need to do this for answers which appeared to be both correct or incorrect
 - The aim is to have them make clear what they said or meant – correct or incorrect (note: resisting the desire to give a hint can be a challenge)
 - If they make a clearly incorrect statement then 'repeat' or paraphrase it back to them – they will confirm or correct their mistake, you must then move on
2. The candidate goes into excessive detail beyond that indicated in a short clinical teaching session
 - In this instance you will need to deliver prompts to "pull the candidate back" so that the OSCE can be completed in the timeframe
 - Such prompts could include:
 - '*Sorry, I'm not following...could you keep it more simple please?*'
 - Some candidates may have great knowledge with much to teach and are doing so effectively but not in the necessary time frame. They need to be 'moved through' the elements of the OSCE to get the mark they deserve
3. The candidate gets it right:
 - It should be a straightforward clinical teaching session that follows the principles of "Teaching on the Run". Examiners are left satisfied that a meaningful teaching episode has taken place.
 - The teaching episode should be structured, have clearly defined goals, the candidate should regularly check for understanding, and should summarise the learning episode at the end (or ask you, the intern, to repeat back the key learning items)
 - The content is correct, well defined (i.e. the candidate does not go into excessive detail) and delivered in an understandable manner to the intern.

4. EXAMINER INSTRUCTIONS

This OSCE assesses the candidate's

- Knowledge and understanding of the assessment of hyponatraemia in a clinical setting
- Ability to teach the intern an effective and practical approach to the above in a brief episode utilising "teaching on the run" principles or similar

This OSCE will assess the following domains:

- Medical Expertise
- Scholarship & Teaching

A good candidate will enter the room, calmly engage with the intern, have a structured approach to the topic and how to teach, deliver the correct relevant content, regularly check for understanding, summarise and ask for any additional questions. They will demonstrate an understanding of the more likely causes in this patient.

A minimally competent candidate will enter the room, start the teaching episode without a well developed structure or plan, deliver content slightly out of context and in too much or too little detail, not check for understanding, require some prompting and not really leave anyone clear (including the intern) and fully confident about what was taught. They will demonstrate only some understanding of the more likely causes in this patient.

A failing candidate will enter the room, have no structure to the topic, little approach as to how to teach, will deliver jumbled and even incorrect information, will require significant prompting or disregard prompts from the examiner, and will fail to complete the tasks. They will demonstrate little understanding of the more likely causes in this patient.

As the 73 year-old patient has a smoking history of 50-pack years, a chest x-ray should be considered to specifically look for a lung malignancy. This is the most likely underlying diagnosis: a small cell lung carcinoma causing SIADH. This may come up spontaneously, or as a consequence of the examiner's question at approximately 6 minutes.



Referral Letter

To:

The Admitting Officer
Emergency Department

Dear Doctor

Thank you for seeing Mrs Maria Costatini, a 73 year-old woman patient of mine. She has a sodium of 117.
Blood results attached.

She is usually well and is on no medication. She has smoked heavily in the past.

Regards

Dr Charles Geepi

[DICTATED BUT NOT SIGNED]

Biochemistry

TEST TYPE	VALUE	UNITS	REF. RANGE
Na	117	mmol/L	135-145
K	4.2	mmol/L	3.5-5.2
Cl	91	mmol/L	95-110
HCO ₃	22	mmol/L	22-32
Urea	5.1	mmol/L	2.7-7.8
Creatinine	63	μmol/L	45-90
eGFR	92	mL/min/1.73m ²	>90
Anion Gap	17	mmol/L	8-18
Glucose	5.6	mmol/L	<7

Examiner Mark Sheet

CONFIDENTIAL Examiner Rating: OSCE 6



EXAMINER 1
barcode

CANDIDATE barcode

EXAMINER 2
barcode

COMPONENT ASSESSMENT

For each Domain below, select the **ONE** option that best represents the candidate's level of performance. The option "**Minimum level of competency displayed**" represents the level of safe independent practice as a **junior FACEM** in Australasia.

Very poor
level of
competence
displayed

Well below
minimum
level of
competence
displayed

Below
minimum
level of
competence
displayed

Minimum
level of
competence
displayed

Above
minimum
level of
competence
displayed

High level of
competence
displayed

Very high
level of
competence
displayed

Please rate **ALL** the following domains:

Medical Expertise

☐
☐
☐
☐
☐
☐
☐

Scholarship and Teaching

☐
☐
☐
☐
☐
☐
☐

Detailed assessment criteria

Please use the following criteria to inform your ratings above

- | | |
|--------------------------|---|
| Medical Expertise | <ul style="list-style-type: none"> Identifies on the results (3/6 bold to pass) <ul style="list-style-type: none"> hyperglycaemia is not the cause features suggestive of renal disease, adrenocortical deficiency and hypovolaemia / hypervolaemia are absent calculates osmolality Identifies symptoms, severity, and rapidity of onset Explains the most common causes, and how to differentiate between them using history, clinical features and investigations: (2/3 bold to pass) <ul style="list-style-type: none"> Over-hydrated (ECF volume increased) <ul style="list-style-type: none"> Urinary Na <20mmol/L: liver failure, cirrhosis, CCF, nephrotic syndrome Urinary Na > 20mmol/L: renal failure, cerebral salt wasting, drugs Euvoalaemic <ul style="list-style-type: none"> Drugs: Thiazides, SSRI, TCA, Phenothiazines, Ecstasy, Carbamazepine SIADH: Lung (pneumonia, cancer, COPD, other), Brain (tumour, infection, stroke etc), malignancy (small cell lung carcinoma, other) Criteria for SIADH if prompted, (key aspects) Water intoxication (intake related), iatrogenic (IV fluid, irrigation) Endocrine: Hypothyroidism, hypoadrenalism Dehydrated <ul style="list-style-type: none"> Urinary Na <20mmol/L: Pre-renal: Na loss in excess of water – GIT (vomiting/diarrhea), sweat, burns, 3rd space losses Urinary Na > 20mmol/L: Renal salt and water loss: diuresis (renal failure, osmotic diuresis, thiazides) Hypertonic (hyperglycaemia) Pseudohyponatremia (hyperlipidaemia, hyperproteinaemia) Investigations (2 bold to pass) <ul style="list-style-type: none"> Measured blood osmolality Urine chemistry: Na+ / Osmolality + correct interpretation Bloods: , LFT, TFT, Cortisol Imaging: CXR, CT head, CT chest |
| Scholarship and Teaching | <ul style="list-style-type: none"> Follows the principles of effective and brief bedside teaching: Set, dialogue and closure Determines how much the intern knows about the topic – ie, checks for level of knowledge and understanding beforehand Provides structure to what is taught Appropriately emphasises common/serious causes Well-paced, not overly content-heavy and easy to understand Regularly checks for understanding as episode progresses Answers any questions that the intern has about the topic Summarises at the end of the episode and invites questions / checks understanding/reinforces key aspects 4/8 of the above to pass |



Examiner Mark Sheet (cont')

CONFIDENTIAL Examiner Rating: OSCE 6



INFORMATION

Station Summary: Consultant teaching intern about hyponatraemia.

EXAMINER NOTES (For examiner reference only)

OSCE 'incident reporting' notes: Please provide details if an issue occurs which may influence this candidate's exam outcome e.g. protocol breach, candidate illness etc.

GLOBAL RATING FOR STANDARD SETTING:

This scale is used in the standard setting process for the OSCE. Please rate the candidate's OVERALL performance in this OSCE. The rating should take into account the entirety of the OSCE, rather than just a sum or average of the individual domain scores. This element **MUST** be completed for the standard of the examination to be set.

	Well Below Standard	Below Standard	Just at Standard	Above Standard	Well Above Standard
In terms of a safely practising junior emergency physician , select the ONE option that best reflects the candidate's performance in this station:	☐	☐	☐	☐	☐

EXAMINER SIGNATURE:



OSCE 1

Page 2 of 2 (end of form)