



AUSTRALASIAN COLLEGE
FOR EMERGENCY MEDICINE

2016.1B FELLOWSHIP CLINICAL EXAMINATION (OSCE)

STATION 9 CARE OF A CRITICALLY ILL NEONATE

1. STATION SUMMARY

1 month old critically unwell neonate who requires circulatory resuscitation and empiric antibiotics +/- antivirals. Resuscitation via IO. Despite adequate resus the neonate has a seizure requiring treatment, followed a few minutes later by another seizure. Intubation should be discussed.

Appropriate handover to an Intensivist at the end of the scenario.

2. CANDIDATE INSTRUCTIONS

It is 0930h on a weekend. You are in a small urban hospital. You lead a team of 2 ED nurses and an experienced registrar. Ambulance control ring to pre-notify you of a 1 month old Indigenous girl who has a 3 day history of being off her feeds. She is now lethargic, mottled and only responding to pain. Her vitals include T 35 C, HR 170/min and thready, RR 70/min, sats just show a poor trace. The patient has no IV access and is not intubated. Estimated time of arrival is 3 minutes.

Your tasks are to:

- Prepare your resuscitation team for this patient's arrival
- Receive clinical handover from the ambulance crew
- Lead your team in the ongoing assessment and management of the patient
- Refer the case to appropriate service(s) after your initial care

This OSCE will assess the following domains:

- Medical Expertise
- Teamwork and Collaboration
- Prioritisation and Decision Making

3. ROLE-PLAYER INSTRUCTIONS

1x ED Registrar with experience in paed procedures including intubation and vascular access

2x ED Nurses who are experienced and perform tasks as directed by the candidate

This paediatric scenario involves a manikin, standard paed airway and circulation equipment, and an iPad monitor for patient vitals. A white board will be used to record patient medications/orders, infusions, fluids etc. Each of these will be recorded by one of the nurse confederates.

Your role as registrar and nurses:

- You are a competent Emergency Department registrar and nurses with all paediatric resuscitation skills, although you haven't done an IO on a neonate before and might need a bit of instruction.
- If you are asked to put in Periph IVC AFTER resuscitation you get it straight in and can send off bloods.
- You are competent in performing a primary and secondary survey and will convey the findings to the candidate.
- Your role is important in moving the scenario in the correct direction in a timely manner
- You provide information to the candidate about examination findings
- You give prompts where appropriate about changes in patient condition.

However

- You will not show initiative or suggest solutions/problems e.g. If the BP is low you will merely state *'The BP is 70'* and try to avoid statements that tend to suggest that there is a problem needing fixing *'The BP is still low at 75, should we do something about that?'* or potential solutions *'Would you like to give some fluid for that?'*. This can be difficult as it is the opposite of good practice.
- If a candidate has mentioned a particular treatment/management earlier in the scenario which has not actually been delivered it is reasonable to give a reminder e.g. *'What did you say earlier about the BP?'* or *'Should we give the x now?'*

Summary:

1 month old critically unwell neonate who requires circulatory resuscitation and empiric antibiotics +/- antivirals. Resuscitation via IO. Despite adequate resus the neonate has a seizure requiring treatment, followed a few minutes later by another seizure. Intubation should be discussed. Appropriate handover to an Intensivist at the end of the scenario.

Stage 1: (approximately 0-3 minutes)

- The candidate will arrive and begin planning for the arrival and assign roles
- You can set up according to directions from the candidate
- You may ask the candidate *'What would you like me to do?'* if no tasks assigned
- Candidate may use whiteboard in room to determine any calculations
- Expectations that candidate will assign roles, prepare equipment, fluids, drugs, doses

Stage 2: (approximately 3-8 minutes)

Background Information for Handover to ED Team (by examiner as ambulance officer)

Abby is an Indigenous girl born at 36/40. She is now 4 weeks old. Her birth weight was 3 kg. She is breast fed and is gaining weight. For the past 3 days she has been off her feeds and is now not waking for feeds. Now she is lethargic, only responding to pain, mottled and shut down. Initial vital signs are HR 170/min and thready, RR 70/min, sats just show a poor trace. We've been unable to get IV access and she is not intubated. She has no drug allergies.

Mum is en route.

Candidate should prompt pt to go onto full monitoring.

Primary Survey: feedback findings as they occur

- Estimated weight = 3-4 kg
- Airway OK and stable (cries to painful stimulus)
- Breathing fast but no respiratory distress. Provide high flow oxygen. Sats only show poor trace (pt too shut down) – better candidates will try central sats probe eg ear lobe
- Circulation is focus of concern. Capillary refill = 6 sec. BP 70/50., HR 170 Signs of hypovolaemia present. Establish access – IV attempts unsuccessful, must move to IO rapidly (candidate to direct insertion to Registrar). Take bloods for comprehensive panel, including FBC, biochem, BSL, CRP, BCs, VBG (not from IO as will clog machine), lactate, metabolic screen, coags, urine. Rapid infusion (manual push on IO - specific instruction from Candidate required re use of syringe to bolus fluid ie. nurse will need direction to ensure boluses effectively delivered (essential)) of warmed crystalloids initially 20 ml/kg. (60-80 mls) Reassess response. BP can go to 75/55, CRT = 4 sec. Should repeat bolus 20ml/kg . BP can go to 80/60, CRT = 3 sec. HR to 155 Sats now show 94% - only appear after 2nd fluid bolus as perfusion improving
- Empiric antibiotics: Cefotaxime 50 mg/kg IO + Amoxicillin 50 mg/kg IV/IO (or amp/gent) +/- Vancomycin 30 mg/kg IO if high risk MRSA (correct ABx essential, doses desirable, Vanc desirable)
- Consider empiric antivirals: acyclovir 10 mg/kg IO (desirable)
- BSL 8.1 (essential without prompt)
- E-FAST (optional). Registrar confederate will simulate this procedure if requested, and report a negative result.
- No focal neurological disability. Moves all limbs but only to painful stimuli
- Exposure and environmental control. Aim for normothermia. BSL maintenance.
 - Preliminary bedside imaging: CXR (CXR will be available in a few minutes – Ask ‘What does it show?’)

Stage 3: (approximately 8-12 minutes) (at this stage CRT 3, BP 80/60, HR 155, RR 70, sats 94%)

Secondary Survey: Sufficient exposure (must undress child) to allow more detailed examination. Look for rash, check umbilicus, bulging fontanelle, signs of NAI, signs of heart failure (diaphoresis, enlarged liver). Registrar can prompt ‘What do you think is going on?’ ‘What are you looking for?’ Registrar can state no rash, umbilicus looks normal, fontanelle sunken, no bruising, liver normal, chest clear as pt examined.

- **Candidates expected to discuss a differential diagnosis:** sepsis (chest, urine, CNS, skin), cardiac, trauma – particularly NAI, toxins, metabolic
- Recognising persistent shock despite fluid therapy
- **9-10 min:** despite resuscitation the infant has a seizure
Registrar announces abnormal movements of lip smacking and eye jerking. Expected management = cessation of seizure (BDZ e.g. midazolam 0.1-0.2 mg/kg IV/IO) (dose and med essential), maintain airway, check BSL (not expected to recheck if already done, but is an opportunity to redeem self if BSL not done. If missed a second time = serious omission). Seizure stops with treatment. Candidate should have some discussion as to whether to intubate or not (this discussion could occur now or after 2nd seizure). Both options ok as long as justified, although Registrar will try to block with ‘*patient’s breathing is OK, airway is patent*’ so conversation can be had with Intensivist. Aim for all candidates to have this conversation with the intensivist.

CXR can come up at this time if need a time filler.

Stage 4: (approximately 12-14 minutes)

- Further seizure at 12 min (Registrar announces abnormal movements of lip smacking and eye jerking) – need more BDZ + 2nd line agent added e.g. phenobarbitone, phenytoin or levetiracetam (Keppra) 20 mg/kg IO. Medication: essential; dose: desirable.
- Seizure ceases with second dose of BDZ

Stage 5: (approximately 14-17 minutes)

- Handover (at 14 min)
- Phone call from Paeds ICU specialist from receiving hospital should be concise and also discuss management to date and ongoing plan – need to image head (US fontanelles or CT). Discussion on whether pt needs intubating or not – Intensivist can ask what set up they would use
- Prompts from Intensivist *'Do you think they need intubating?'* *'What about for transport?'* *'What agents will you use?'* *'What tube size?'*
- *'If they get worse will you intubate them?'* *'What agents will you use?'* *'What tube size?'*

4. EXAMINER INSTRUCTIONS

Background Information for Handover to ED Team (by examiner as ambulance officer)

Abby is an Indigenous girl born at 36/40. She is now 4 weeks old. Her birth weight was 3 kg. She is breast fed and is gaining weight. For the past 3 days she has been off her feeds and is now not waking for feeds. Now she is lethargic, only responding to pain, mottled and shut down. Initial vital signs are HR 170/min and thready, RR 70/min, sats just show a poor trace. We've been unable to get IV access and she is not intubated. She has no drug allergies.

Mum is en route.

Scenario Progress

Abby is in shock and requires urgent resuscitation. She requires oxygenation, IV access (attempts fail until an IO is inserted) with BSL measurement, fluid resuscitation, empiric antibiotics. Despite initial IO crystalloid resuscitation, her haemodynamic state fails to improve adequately. She has a seizure and despite treatment for this has another seizure a few minutes later. Intubation may be required.

Key Actions Expected from Candidate

Paed Resus team activation and preparation of receiving team in small urban ED. Role allocation. Anticipate needs. Prepare fluids, drugs, equipment. Pre-notification of other services: paediatrics, ICU, radiology, laboratory.

Primary Survey:

Structured, prioritised approach to unwell infant. Simultaneous management of clinical priorities (see below).

- Estimated weight = 3-4 kg
- Airway OK and stable
- Breathing fast but no respiratory distress. Provide high flow oxygen. Sats only show poor trace (pt too shut down) – better candidates will try central sats probe eg ear lobe
- Circulation is focus of concern. Capillary refill = 6 sec. BP 70/50. Signs of hypovolaemia present. Establish access – IV attempts unsuccessful, must move to IO rapidly (candidate to direct insertion). Take bloods for comprehensive panel, including FBC, biochem, BSL, CRP, BCs, VBG (not from IO as will clog machine), lactate, metabolic screen, coags, urine. Rapid infusion (**manual push on IO** - specific instruction from Candidate required regarding use of syringe to bolus fluid ie.i.e. nurse will need direction to ensure boluses effectively delivered) of warmed crystalloids initially 20 ml/kg. Est weight = 3-4 kg. Reassess response. BP can go to 75/55, CRT = 4 sec. Should repeat bolus 20ml/kg. BP can go to 80/60, CRT = 3 sec. Sats now show 94% - only appear after 2nd fluid bolus as perfusion improving
- Empiric antibiotics: Cefotaxime 50 mg/kg IO + Amoxicillin 50 mg/kg IV/IO (or amp/gent) +/- Vancomycin 30 mg/kg IO if high risk MRSA (must get first two ABx correct, doses desirable)
- Consider empiric antivirals: acyclovir 10 mg/kg IO (desirable)
- BSL 8.1 (ESSENTIAL WITHOUT PROMPTING)
- No focal neurological disability. Moves all limbs but only to painful stimuli
- Exposure and environmental control. Aim for normothermia. BSL maintenance.

Secondary Survey:

Sufficient exposure to allow more detailed examination (ESSENTIAL)

- Look for rash, check umbilicus, bulging fontanelle, signs of NAI, signs of heart failure (diaphoresis, enlarged liver).
- Registrar prompting 'What is going on? What are you looking for?'
- No rash, umbilicus ok, sunken fontanelle, no bruising

Preliminary bedside imaging: CXR (CXR will be available in a few minutes – normal mass mediastinum (thymus), nothing focal in the lung fields). (CXR can be time filler anytime in 8-12 minute period or after second seizure)

Candidates expected to discuss a differential diagnosis:

- Sepsis (chest, urine, CNS, skin), cardiac, trauma – particularly NAI, toxins, metabolic
- Recognising persistent shock despite fluid therapy
- ON monitor BP 80/60, HR 155, RR 70, sats 94% on J2 NRB.
- CRT still 3 seconds

Ongoing Scenario

- Despite resuscitation the infant has a seizure at around 9-10 min (confederate announces abnormal movements of lip smacking and eye jerking). Expected management = cessation of seizure (BDZ e.g. midazolam 0.1-0.2 mg/kg IV/IO), maintain airway, check BSL (BSL slightly elevated around 8). Seizure stops with treatment. Candidates should have some discussion as to whether to intubate or not (this discussion could occur now or after 2nd seizure). Both options ok as long as justified, although Registrar will block with “breathing OK, airway patent” so conversation can be had with INTensivist>
- Further seizure at 12 min (same abnormal movements as above) – need more BDZ + 2nd line agent added e.g. phenobarbitone, phenytoin or levetiracetam (Keppra) 20 mg/ kg IO. MEDICATIONS: ESSENTIAL; Doses: desirable.
- Candidate may well want to intubate pt at this stage – appropriate use of drugs (not worsening haemodynamic compromise) and ETT etc.

Handover (at approximately 14 minutes)

- Should be concise and also discuss ongoing plan – need to image head (US fontanelles or CT). Discussion on whether pt needs intubating or not – Intensivist can ask for set up if not already done (then all candidates can get ready and be judged on setup)
- Prompts from Intensivist *‘Do you think they need intubating?’ ‘What about for transport?’ ‘What agents will you use?’ ‘What tube size?’*
- *‘If they get worse will you intubate them?’ ‘What agents will you use?’ ‘What tube size?’*

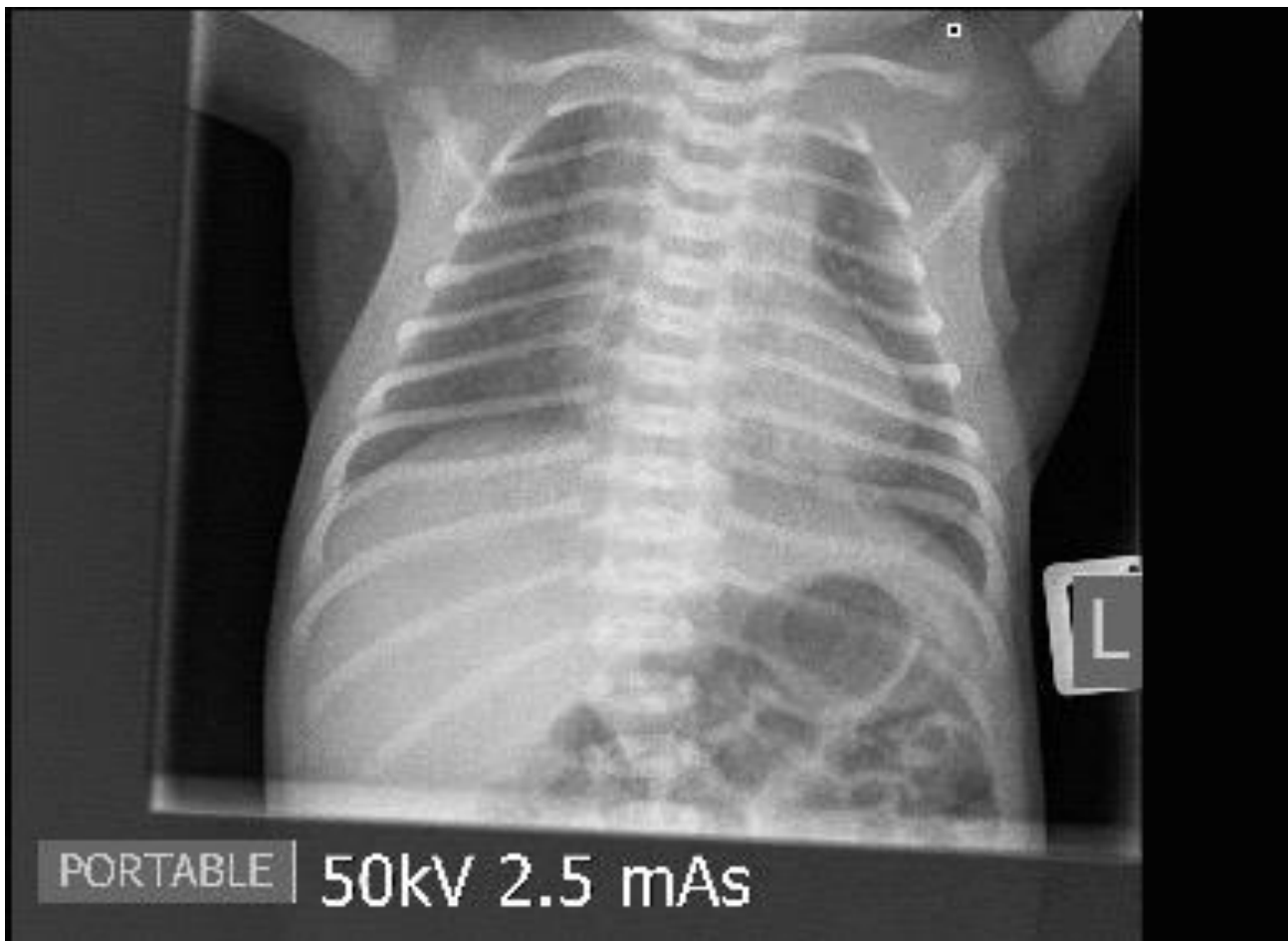
Key Assessment Issues:

Structured approach to unwell neonate, teamwork and leadership, effective communication, fluid resus and empiric antibiotics, management of seizure, decision making re whether to intubate (or not), adequate handover.

This OSCE will assess the following domains:

- Medical Expertise
- Teamwork and Collaboration
- Prioritisation and Decision Making

Chest Xray



Examiner Mark Sheet

CONFIDENTIAL Examiner Rating: OSCE 9

CANDIDATE barcode



EXAMINER 1
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 competency displayed	Well below minimum level of competency displayed	Below minimum level of competency displayed	Minimum level of competency displayed	Above minimum level of competency displayed	High level of competency displayed	Very high level of competency displayed
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Please rate **ALL** the following domains:

Medical Expertise	☐	☐	☐	☐	☐	☐	☐
Teamwork & Collaboration	☐	☐	☐	☐	☐	☐	☐
Prioritisation & Decision Making	☐	☐	☐	☐	☐	☐	☐

Detailed assessment criteria

Please use the following criteria to inform your ratings above (BOLD = ESSENTIAL)

Medical Expertise	- Identifies key issues and anticipated challenges prior to patient's arrival + prepares personnel and equipment - Leads / coordinates primary survey, secondary survey, clarifies findings - Appropriate direction of IO insertion - Appropriate fluid resuscitation via IO bolus 20 ml/kg 0.9% saline and repeat required, and understanding of need to push - Adequate differential diagnoses: sepsis (chest, urine, CNS, skin), cardiac, trauma – particularly NAI, toxins, metabolic - Recognises and treats likely sepsis with empiric IO antibiotics (e.g. Cefotaxime 50 mg/kg + Amoxycillin 50 mg/kg) +/- antivirals (acyclovir 10 mg/kg) - Mgt of seizures (e.g. Midazolam 0.15 mg/kg IO, 2nd line agents Phenobarbitone or Phenytoin or Levetiracetam/ Keppra all at 20 mg/kg IO) - Effective, safe drug doses – if performing RSI, avoiding agents that will compromise BP - High level interpretation of Ix: CXR - Understands importance of BSL and checks
Teamwork & Collaboration	- Demonstrates effective team leadership - Communicates / broadcasts clinical scenario, and priorities - Supports team members - Effective collaboration with other clinicians: ambulance, Intensivist – clear summary /handover with DD and Mx
Prioritisation & Decision Making	- Structured approach to unwell neonate assessment: Primary / Secondary Survey and prioritized attention to simultaneous clinical demands. - Appropriate role / task delegation to team members. - Discusses at consultant level the likely differentials and looks for them sepsis (chest, urine, CNS, skin), cardiac, trauma – particularly NAI, toxins, metabolic - Appropriate management of seizures - Consultant level discussion of whether to intubate: pros: secure & protect airway, safer for transport and ongoing investigation Cons: loss of current airway if can't intubate, haemodynamic instability – may worsen if particular induction drugs used in usual doses, won't see on-going seizure activity if paralysed - Situational awareness: of current and anticipated problems: clinical deterioration, patient transfer etc.

Page 1 of 2 (please turn over)



Examiner Mark Sheet (cont')

CONFIDENTIAL Examiner Rating: OSCE 9



INFORMATION

Station Summary: 1 month old critically unwell neonate who requires circulatory resuscitation and empiric antibiotics +/- antivirals. Resuscitation via IO. Despite adequate resus the neonate has a seizure requiring treatment, followed a few minutes later by another seizure. Intubation should be discussed.

Appropriate handover to an Intensivist at the end of the scenario.

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