



NEST-ED Clinical Scenarios

Newborn Essential Solutions and Technologies-Education –
Clinical Scenarios, October 2020

**FACILITATING THE CLINICAL USE OF TECHNOLOGIES
FOR NEWBORN CARE IN LOW-RESOURCE SETTINGS**

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Newborn Essential Solutions and Technologies–Education Clinical Scenarios

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The authors have made every effort to check the accuracy of all information. As knowledge base continues to expand, readers are advised to check current product information provided by the manufacturer of each device, instrument, or piece of equipment to verify recommendations for use and/or operating instructions.

In addition, all forms, instructions, checklists, guidelines, and examples are intended as training resources to meet national and local health care settings' needs and requirements.

CLINICAL SCENARIO

Phototherapy & Lightmeter 1

NAME: _____ DATE: _____

PURPOSE: Teaching / Practice
 Test Result: Pass / Fail / Retest

Scenario Overview

A 7-day old baby weighing 1.3 kg is jaundiced. The participant should assess the baby and the severity of jaundice using a Kramer chart, commence phototherapy, monitor the baby during therapy, and stop treatment when appropriate.

Reminder to Facilitator

Facilitator team to decide what is essential for participants' understanding; we suggest facilitator team underline or mark these essential items in the **INFORMATION/RESULT** column before beginning the session to ensure these are highlighted in that section.

ALWAYS REMEMBER THE CANDIDATE SHOULD START WITH THE 4 Ss

Safety of the staff and patient

Setting for the environment and patient

Stimulate the patient for response

Shout for help

Begin Scenario

SETTING THE SCENE: A 2-day old baby weighing 1.4 kg appears to be jaundiced. **WHAT DO YOU DO?**

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
1	Observe safety	Gloves/sharps	
2	(Setting) place the baby on a bed/resuscitation couch and stimulate	The baby is alert and able to suck but is obviously jaundiced	
3	Call for help	No need for help at present	
4	Open the airway (neutral position) and Look, Listen and Feel for breathing	<ul style="list-style-type: none">The airway is clearThe breathing is regular and normal rate	
5	Check for other signs of respiratory distress: Head nodding Crackles Grunting Nasal flaring Cyanosis Respiratory rate Pulse oximetry Indrawing / acidotic breathing	Normal, the baby is not pale	
6	Disability	The baby is active and sucking	
7	Please assess the level of jaundice There is no transcutaneous bilirubinometer or bilispec, what do you do?	<ul style="list-style-type: none">Compare with levels on the Kramer's scale wall chart: use the right graph for the age in days and the gestational age (i.e., premature)The baby's face and trunk are yellow	
8	Please explain to the mother what you plan to do and why	Tell mother: <ul style="list-style-type: none">Baby is jaundiced and blue light on the skin will help clear the jaundiceIt is not painful	

continue to the following page 

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
9	Now please set up the phototherapy device How high above the cot should the phototherapy lights be placed?	This distance should not be greater than 50 cm (20 in) and can be less (down to 10 cm) provided the infant's temperature is monitored	
10	Please turn the phototherapy lights on You have a radiance reader, what should it read?	Reading should be in the range of 460-490 nm	
11	Please prepare the baby to be put under the phototherapy lights	<ul style="list-style-type: none"> • Ensure baby will remain warm • Place eye protective bandage on baby • Undress baby leaving only a nappy on • Place baby under the lights 	
12	What advice will you give the mother?	Tell mother to continue feeding and can remove baby from under the lights to do so	
13	What will you ask the mother and what will you look for during an examination?	<ul style="list-style-type: none"> • Is the baby feeding well? • Is the baby floppy or active? • Is the cord clean, any discharge, any smell or redness? • Any pallor, respiratory difficulties? 	
14	The baby appears active and pink and mother says is on NG feeds. Now, how often will you check on the baby?	4 hourly	
15	At the 4-hour check the baby does not look more yellow. When will you recheck bilirubin?	After 12 hours	
16	What side effects will you look out for?	<ul style="list-style-type: none"> • Dehydration • Bronzed skin appearance • Abnormal movements • Hypocalcaemia (rare and reversible) 	
17	When will you stop the phototherapy?	When the bilirubin level is within the normal range for age and gestation	
18	After stopping phototherapy, will you recheck the bilirubin?	Yes, after 12 hours	

THANK YOU

i REMIND PARTICIPANTS:

- One must first assess the baby's ABCD. (any problem identified must be dealt with before continuing)
- Any jaundice on day one needs urgent investigation and treatment
- ABO or Rhesus incompatibility may cause haemolysis and rapid
- Take the temperature, if above or below normal consider sepsis and look for focus of infection, do FBC, Hb, LP, and blood culture if possible, consider antibiotics

DISCUSS RISK FACTORS FOR THE DEVELOPMENT OF SEVERE HYPERBILIRUBINEMIA AND KERNICTERUS, SUCH AS:

- Isoimmune haemolytic disease
- Glucose-6-phosphate deficiency
- Asphyxia
- Significant lethargy
- Temperature instability
- Sepsis
- Acidosis
- Hypoalbuminemia (< 3 g/dL)

! INFECTION PREVENTION AND CONTROL

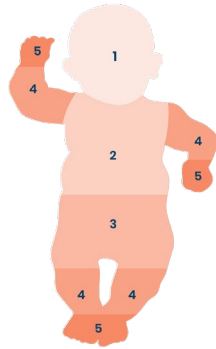
Be sure to wash your hands thoroughly and to put on gloves before handling the baby or any equipment. After every use, remember to disinfect all consumables and equipment before using them again.

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i REFERENCE LEVELS FOR WHEN TO START PHOTOTHERAPY:

Kramer's Scale

1	4 - 6 mg/dL
2	8 - 10 mg/dL
3	12 - 14 mg/dL
4	15 - 18 mg/dL
5	15 - 20 mg/dL



Day of life	Healthy term baby		Preterm < 35 weeks, LBW	
	mg/dl	mmol/L	mg/dl	mmol/L
Day 1	Treat any visible jaundice with phototherapy			
Day 2	15	260	10	170
Day 3	18	310	15	260
Day 4	20	340	17	290

⚠ For the VLBW start phototherapy when the total serum bilirubin level is greater than 5 times the birth weight. Thus, in a 1-kg infant, phototherapy is started at a bilirubin level of 5 mg/dL; in a 2-kg infant, phototherapy is started at a bilirubin level of 10 mg/dL and so on.

i REFERENCES:

- Maisel MJ, McDonagh AD. Phototherapy for Neonatal Jaundice. *N Engl J Med.* 2008;358:920-928. Phototherapy for Jaundice: Background, Indications, Contraindications, <https://emedicine.medscape.com/article/1894477-overview>, May 2018
- Maisels MJ, Bhutani VK, Bogen D, Newman TB, Stark AR, Watchko JF. Hyperbilirubinemia in the Newborn Infant ≥ 35 Weeks' Gestation: An Update With Clarifications *Pediatrics* Oct 2009, 124 (4) 1193-1198. How is phototherapy administered for the treatment of neonatal, <https://www.medscape.com/.../how-is-phototherapy-administered-for-the-treatment-of...>, 27 Dec 201

Scenario end

CLINICAL SCENARIO

Phototherapy & Lightmeter 2

NAME: _____ DATE: _____

PURPOSE: Teaching / Practice
 Test Result: Pass / Fail / Retest

Scenario Overview

A 1-day old baby weighing 3 kg is jaundiced. The participant should assess the baby, identify anaemia and hypoglycaemia, investigate the cause, and treat (includes IV glucose, compatible blood transfusion, and phototherapy). Complications of treatment should be understood. Kernicterus is discussed.

Reminder to Facilitator

Facilitator team to decide what is essential for participants' understanding; we suggest facilitator team underline or mark these essential items in the **INFORMATION/RESULT** column before beginning the session to ensure these are highlighted in that section.

ALWAYS REMEMBER THE CANDIDATE SHOULD START WITH THE 4 Ss

Safety of the staff and patient

Setting for the environment and patient

Stimulate the patient for response

Shout for help

Begin Scenario

SETTING THE SCENE: A 1-day old baby weighing 3 kg appears to be jaundiced. **WHAT DO YOU DO?**

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
1	Observe safety	Gloves/sharps	
2	(Setting) place the baby on a bed/resuscitation couch and stimulate	The baby is drowsy and unable to suck but is obviously jaundiced	
3	Call for help	Help is on the way	
4	Open the airway (neutral position) and Look, Listen and Feel for breathing	<ul style="list-style-type: none">The airway is clearThe breathing is regular, RR is 80 b/minHR is 200 bpm	
5	Check for other signs of respiratory distress: Head nodding Crackles Grunting Nasal flaring Cyanosis Respiratory rate Pulse oximetry Indrawing / acidotic breathing	<ul style="list-style-type: none">No indrawing, no head nodding, no cyanosis, no cracklesThe baby is extremely paleGive O₂ 1 L/min	
6	Please check circulation and cord	<ul style="list-style-type: none">The pulse is rapid and weak, the hands are cold, capillary refill cannot be measured as baby is too paleThe cord tie has not slippedGroup and Xmatch Gp 0 Rhesus neg bloodGive 5 mL/kg packed cells and reviewCheck mother's blood groupConsider FBC, B culture, VDRL	
7	Please explain to the mother what you plan to do and why	Tell mother: <ul style="list-style-type: none">The baby is pale and needs a blood transfusionBaby is jaundiced and blue light on the skin will help clear the jaundice. It is not painful	

continue to the following page 

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
8	Disability	<ul style="list-style-type: none"> • AVPU = P • Do blood glucose = 2 mmol/L • Give IV 10% glucose 2 mL/kg 	
9	<p>Please do a full exam to look for any reasons for jaundice</p> <p>Consider Rhesus or ABO incompatibility, what do you do?</p>	<ul style="list-style-type: none"> • Check the cord for infection • Check temperature • Do appropriate tests 	
10	<p>Please assess the level of jaundice</p> <p>The baby is jaundiced on the face, what do you treat?</p>	<ul style="list-style-type: none"> • Severity of jaundice is assessed by Kramer's scale, S Bilirubin or transcutaneous bilirubinometer • Day-one jaundice needs urgent treatment • Considerable risk of kernicterus and permanent brain damage 	
11	Please explain to the mother what you plan to do and why	<p>Tell mother:</p> <ul style="list-style-type: none"> • Baby is jaundiced and blue light on the skin will help clear the jaundice • It is not painful 	
12	<p>Now please set up the phototherapy device</p> <p>How high above the cot should the phototherapy lights be placed?</p>	This distance should not be greater than 50 cm (20 in) and can be less (down to 10 cm) provided the infant's temperature is monitored	
13	<p>Please turn the phototherapy lights on</p> <p>You have a radiance reader, what should it read?</p>	Reading should be in the range of 460-490 nm	
14	Please prepare the baby to be put under the phototherapy lights	<ul style="list-style-type: none"> • Ensure baby will remain warm • Place eye protective bandage on baby • Undress baby leaving only a nappy on • Place baby under the lights 	
15	Why must the eyes be covered?	The light can damage the eyes	
16	What advice will you give the mother?	Tell mother to continue feeding and can remove baby from under the lights to do so	
17	How often will you check on the baby?	4 hourly	
18	How often will you recheck the bilirubin level and the Hb?	If bilirubin appears to be rising rapidly check after 4 hours, otherwise check every 12 hours until stable	
19	What else do you check?	Blood glucose	
20	The baby is not sucking. What do you do?	Place an NGT for expressed milk or an IV for 10% glucose (2 mL/kg 10%)	
21	At the 4-hour check the baby does not look more yellow. When will you recheck bilirubin?	After 12 hours	
22	What side effects will you look out for?	<ul style="list-style-type: none"> • Dehydration • Bronzed skin appearance • Abnormal movements • Hypocalcaemia (rare and reversible) 	
23	When will you stop the phototherapy?	When the bilirubin level is within the normal range for age and gestation	
24	After stopping phototherapy, will you recheck the bilirubin?	Yes, after 12 hours	

THANK YOU

continue to the following page 

i REMIND PARTICIPANTS:

- One must first assess the baby's ABCD. (any problem identified must be dealt with before continuing)
- Any jaundice on day one needs urgent investigation and treatment
- ABO or Rhesus incompatibility may cause haemolysis and rapid
- Take the temperature, if above or below normal consider sepsis and look for focus of infection, do FBC, Hb, LP, and blood culture if possible, consider antibiotics

DISCUSS RISK FACTORS FOR THE DEVELOPMENT OF SEVERE HYPERBILIRUBINEMIA AND KERNICTERUS, SUCH AS:

- Isoimmune haemolytic disease
- Temperature instability
- Glucose-6-phosphate deficiency
- Sepsis
- Asphyxia
- Acidosis
- Significant lethargy
- Hypoalbuminemia (< 3 g/dL)

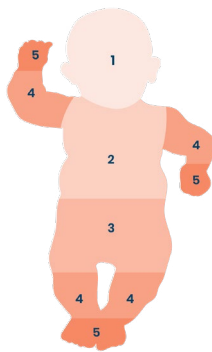
! INFECTION PREVENTION AND CONTROL

Be sure to wash your hands thoroughly and to put on gloves before handling the baby or any equipment. After every use, remember to disinfect all consumables and equipment before using them again.

i REFERENCE LEVELS FOR WHEN TO START PHOTOTHERAPY:

Kramer's Scale

1	4 - 6 mg/dL
2	8 - 10 mg/dL
3	12 - 14 mg/dL
4	15 - 18 mg/dL
5	15 - 20 mg/dL



Day of life	Healthy term baby		Preterm < 35 weeks, LBW	
	mg/dl	mmol/L	mg/dl	mmol/L
Day 1	Treat any visible jaundice with phototherapy			
Day 2	15	260	10	170
Day 3	18	310	15	260
Day 4	20	340	17	290

! For the VLBW start phototherapy when the total serum bilirubin level is greater than 5 times the birth weight. Thus, in a 1-kg infant, phototherapy is started at a bilirubin level of 5 mg/dL; in a 2-kg infant, phototherapy is started at a bilirubin level of 10 mg/dL and so on.

i REFERENCES:

- Maisel MJ, McDonagh AD. Phototherapy for Neonatal Jaundice. *N Engl J Med.* 2008;358:920-928. Phototherapy for Jaundice: Background, Indications, Contraindications, <https://emedicine.medscape.com/article/1894477-overview>, May 2018
- Maisels MJ, Bhutani VK, Bogen D, Newman TB, Stark AR, Watchko JF. Hyperbilirubinemia in the Newborn Infant ≥ 35 Weeks' Gestation: An Update With Clarifications *Pediatrics* Oct 2009, 124 (4) 1193-1198. How is phototherapy administered for the treatment of neonatal, <https://www.medscape.com/.../how-is-phototherapy-administered-for-the-treatment-of-...>, 27 Dec 201

Scenario end

CLINICAL SCENARIO

Phototherapy & Lightmeter 3

NAME: _____ DATE: _____

PURPOSE: Teaching / Practice
 Test Result: Pass / Fail / Retest

Scenario Overview

A 3-day old baby weighing 1.3 kg is drowsy and jaundiced. The participant should assess the baby and the severity of jaundice, check the blood glucose, provide phototherapy, and monitor during treatment. Underlying causes of jaundice should be investigated.

Reminder to Facilitator

Facilitator team to decide what is essential for participants' understanding; we suggest facilitator team underline or mark these essential items in the **INFORMATION/RESULT** column before beginning the session to ensure these are highlighted in that section.

ALWAYS REMEMBER THE CANDIDATE SHOULD START WITH THE 4 Ss

Safety of the staff and patient

Setting for the environment and patient

Stimulate the patient for response

Shout for help

Begin Scenario

SETTING THE SCENE: A 3-day old baby weighing 1.4 kg appears to be jaundiced. **WHAT DO YOU DO?**

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
1	Observe safety	Gloves/sharps	
2	(Setting) place the baby on a bed/resuscitation couch and stimulate	The baby is drowsy, able to suck but is obviously jaundiced	
3	Call for help	Help is on the way	
4	Open the airway (neutral position) and Look, Listen and Feel for breathing	<ul style="list-style-type: none"> The airway is clear The breathing is regular, RR is 76 b/min HR is 170 bpm 	
5	Check for other signs of respiratory distress: Head nodding Crackles Grunting Nasal flaring Cyanosis Respiratory rate Pulse oximetry Indrawing / acidotic breathing	<ul style="list-style-type: none"> Some indrawing, no head nodding, no cyanosis, no crackles SpO₂ is 93% The baby is extremely pale Give O₂ 1 L/min 	
6	Please check circulation and mother's blood group	<ul style="list-style-type: none"> The pulse is regular not weak, the hands are cool Capillary refill is 2 seconds No pallor 	
7	Disability	<ul style="list-style-type: none"> AVPU = V Check blood glucose = 7 mmol/L 	
8	Please assess the level of jaundice	<ul style="list-style-type: none"> Use bilirubin levels or compare with levels on the Kramer's scale wall chart: use the right graph for the age in days and the gestational age (i.e., premature) The baby's face and trunk are yellow 	

continue to the following page 

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
9	Please explain to the mother what you plan to do and why	Tell mother: <ul style="list-style-type: none"> Baby is jaundiced and blue light on the skin will help clear the jaundice It is not painful 	
10	Now please set up the phototherapy device How high above the cot should the phototherapy lights be placed?	This distance should not be greater than 50 cm (20 in) and can be less (down to 10 cm) provided the infant's temperature is monitored	
11	The baby has cool peripheries and the pulse is weak. What do you do next?	<ul style="list-style-type: none"> Look for the cause of the jaundice Take the temperature and vital signs Check the cord for infection: is it clean, any discharge, any smell or redness? Any pallor, respiratory difficulties? 	
12	There is no pallor, the cord is clean, temp is 35.6°C. RR is 80 b/min and there is indrawing What investigations should you do?	<ul style="list-style-type: none"> Blood culture FBC Us & Es Blood glucose 	
13	What treatment should be commenced?	<ul style="list-style-type: none"> IV antibiotics (Pen & Gent) Consider NGT or IV if not sucking well) May have septicaemia 	
14	Please turn the phototherapy lights on You have a radiance reader, what should it read?	Reading should be in the range of 460-490 nm	
15	Please prepare the baby to be put under the phototherapy lights	<ul style="list-style-type: none"> Ensure baby will remain warm Place eye protective bandage on baby Undress baby leaving only a nappy on Place baby under the lights 	
16	What advice will you give the mother?	Tell mother to continue feeding and can remove baby from under the lights to do so	
17	What will you ask the mother and what will you look for during an examination?	<ul style="list-style-type: none"> Is the baby feeding well? Is the baby floppy or active? Is the cord clean, any discharge, any smell or redness? Any pallor, respiratory difficulties? 	
18	The baby appears active and not pale; mother says he is feeding well How often will you check on the baby?	4 hourly	
19	At the 4-hour check the baby does not look more yellow. When will you recheck bilirubin?	After 12 hours	
20	What side effects will you look out for?	<ul style="list-style-type: none"> Dehydration Bronzed skin appearance Abnormal movements Hypocalcaemia (rare and reversible) 	
21	When will you stop the phototherapy?	When the bilirubin level is within the normal range for age and gestation	
22	After stopping phototherapy, will you recheck the bilirubin?	Yes, after 12 hours	

THANK YOU

continue to the following page 

i REMIND PARTICIPANTS:

- One must first assess the baby's ABCD. (any problem identified must be dealt with before continuing)
- Any jaundice on day one needs urgent investigation and treatment
- ABO or Rhesus incompatibility may cause haemolysis and rapid
- Take the temperature, if above or below normal consider sepsis and look for focus of infection, do FBC, Hb, LP, and blood culture if possible, consider antibiotics

DISCUSS RISK FACTORS FOR THE DEVELOPMENT OF SEVERE HYPERBILIRUBINEMIA AND KERNICTERUS, SUCH AS:

- Isoimmune haemolytic disease
- Temperature instability
- Glucose-6-phosphate deficiency
- Sepsis
- Asphyxia
- Acidosis
- Significant lethargy
- Hypoalbuminemia (< 3 g/dL)

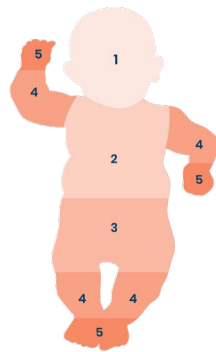
! INFECTION PREVENTION AND CONTROL

Be sure to wash your hands thoroughly and to put on gloves before handling the baby or any equipment. After every use, remember to disinfect all consumables and equipment before using them again.

i REFERENCE LEVELS FOR WHEN TO START PHOTOTHERAPY:

Kramer's Scale

1	4 - 6 mg/dL
2	8 - 10 mg/dL
3	12 - 14 mg/dL
4	15 - 18 mg/dL
5	15 - 20 mg/dL



Day of life	Healthy term baby		Preterm < 35 weeks, LBW	
	mg/dl	mmol/L	mg/dl	mmol/L
Day 1	Treat any visible jaundice with phototherapy			
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Day 4	20	340	17	290

! For the VLBW start phototherapy when the total serum bilirubin level is greater than 5 times the birth weight. Thus, in a 1-kg infant, phototherapy is started at a bilirubin level of 5 mg/dL; in a 2-kg infant, phototherapy is started at a bilirubin level of 10 mg/dL and so on.

i REFERENCES:

- Maisel MJ, McDonagh AD. Phototherapy for Neonatal Jaundice. *N Engl J Med.* 2008;358:920-928. Phototherapy for Jaundice: Background, Indications, Contraindications, <https://emedicine.medscape.com/article/1894477-overview>, May 2018
- Maisels MJ, Bhutani VK, Bogen D, Newman TB, Stark AR, Watchko JF. Hyperbilirubinemia in the Newborn Infant \geq 35 Weeks' Gestation: An Update With Clarifications *Pediatrics* Oct 2009, 124 (4) 1193-1198. How is phototherapy administered for the treatment of neonatal, <https://www.medscape.com/.../how-is-phototherapy-administered-for-the-treatment-of-...>, 27 Dec 201

Scenario end

CLINICAL SCENARIO

Glucometer 1

NAME: _____ DATE: _____

PURPOSE: Teaching / Practice
 Test Result: Pass / Fail / Retest

Scenario Overview

A sleepy 7-day old baby is brought into outpatients. The participant should assess the baby, check blood glucose using a glucometer, treat and monitor appropriately, and know the complications of a heel prick.

Reminder to Facilitator

Facilitator team to decide what is essential for participants' understanding; we suggest facilitator team underline or mark these essential items in the **INFORMATION/RESULT** column before beginning the session to ensure these are highlighted in that section.

ALWAYS REMEMBER THE CANDIDATE SHOULD START WITH THE 4 Ss

Safety of the staff and patient

Setting for the environment and patient

Stimulate the patient for response

Shout for help

Begin Scenario

SETTING THE SCENE: You are asked to see a baby aged 7-days in outpatients' because he is very sleepy. **WHAT DO YOU DO?**

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
1	Observe the baby in his mother's arms	The infant is very drowsy	
2	Ask the mother to stimulate the baby	The baby makes a weak cry but does not open his eyes and seems floppy	
3	(Setting) take the baby to a resuscitation area of the ward and stimulate the baby	The baby makes no response	
4	Call for help	Help is on the way	
5	Look in the mouth to check for obstruction	There is nothing in the mouth	
6	Open the airway (neutral position) and Look, Listen and Feel for breathing	The baby is breathing; the breathing is not noisy	
7	Check for other signs of respiratory distress: Head nodding Crackles Grunting Nasal flaring Cyanosis Respiratory rate Pulse oximetry Indrawing / acidotic breathing	<ul style="list-style-type: none">• There are no signs of respiratory distress• RR is 48 b/min• There is no pulse oximeter	
8	Assess large pulse, warmth of hand	<ul style="list-style-type: none">• There is a fast pulse, PR = 150 bpm• The baby's colour is good, his hands are warm	

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#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
9	Check for other signs of circulation: Pallor Peripheral pulse Cold hands Capillary refill time	<ul style="list-style-type: none"> • There is no palmar pallor • The peripheral pulse is easy to feel • The capillary refill time is 1 second 	
10	Coma convulsions: establish level of consciousness (AVPU)	<ul style="list-style-type: none"> • Baby makes no response to his mother's voice and makes a weak cry to a painful stimulus • AVPU = P 	
11	What do you do now?	<ul style="list-style-type: none"> • Establish IV access • Measure weight: weight is 3.0 kg • Take bloods: blood sugar, MPs (blood culture, FBC, U&Es, if possible) 	
12	What do you need to be able to measure the blood glucose?	<ul style="list-style-type: none"> • Gloves • Alcohol • Cotton swab • New lancet • Glucometer • Glucometer strips 	
13	Before pricking the baby, what do you check concerning the glucometer?	<ul style="list-style-type: none"> • Check that the strips are in date • Switch the glucometer on and put a strip into the strip slot on one end of the glucometer • The screen should light up with text 	
14	Where on the baby will you take the blood sample?	Outer side of the heel of the foot	
15	Please show me how you measure the blood glucose	<ul style="list-style-type: none"> • Put on gloves • Clean the skin to be punctured with an alcohol swab, let the skin dry • If not already done, insert glucometer strip into glucometer and ensure it is turned on • Prick the swabbed outer edge of the heel • Collect the blood drop on the tip of the glucometer strip • Apply pressure to stop the bleeding • Read the result 	
16	The reading is glucose 1 mmol/L. What do you do?	The baby weighs 3.0 kg and needs an IV bolus of 2 mL/kg 10% glucose	
17	What do you do now?	<ul style="list-style-type: none"> • Dispose of used glucose stick and wash hands • In the patient's notes document: the date, time, and blood glucose result, and, if appropriate, how much 10% glucose has been given 	
18	What do you do next?	Full history and examination	
19	When will you recheck the glucose?	After 15 minutes <ul style="list-style-type: none"> • Glucose is now 10 mmol/L – This is OK 	
21	Now, when will you recheck the glucose?	Every 4 hours	
22	This baby has just had his glucose checked What complications should you look for?	<ul style="list-style-type: none"> • Bruising • Bleeding • Infection • (nerve, bone injury) 	
23	Please show me how to clean the glucometer	Wipe down the glucometer with 70% alcohol (be careful not to drip alcohol in the glucometer strip reading slot)	

continue to the following page 

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
24	Please show me how to calibrate this glucometer	<ul style="list-style-type: none"> Collect glucometer calibration strip (provided within set of glucometer strips) Insert glucometer calibration strip into glucometer The glucometer will automatically read this strip and calibrate itself 	
25	The glucometer does not come on What do you do?	Change the batteries or recharge the device	
26	You use the glucometer and it records a blood glucose of 24 mmol/L, but the baby looks very well to you What do you do?	<ul style="list-style-type: none"> Check the date of the glucose strips Check that the tube of unused strips if kept tightly shut between use Consider recleaning the patient's skin and retaking the measurement 	
27	What do you do if the reading is surprisingly low?	<ul style="list-style-type: none"> Check the date of the glucose strips Repeat the test 	

THANK YOU

⚠ INFECTION PREVENTION AND CONTROL

Be sure to wash your hands thoroughly and to put on gloves before handling the baby or any equipment. After every use, remember to disinfect all consumables and equipment before using them again.

Scenario end

CLINICAL SCENARIO

Glucometer 2

NAME: _____ DATE: _____

PURPOSE: Teaching / Practice
 Test Result: Pass / Fail / Retest

Scenario Overview

A 3-day old baby in the nursery has just had a seizure. The participant should assess the baby, do a blood glucose test using a glucometer, and on finding a bulging fontanelle consider an LP.

Reminder to Facilitator

Facilitator team to decide what is essential for participants' understanding; we suggest facilitator team underline or mark these essential items in the **INFORMATION/RESULT** column before beginning the session to ensure these are highlighted in that section.

ALWAYS REMEMBER THE CANDIDATE SHOULD START WITH THE 4 Ss

Safety of the staff and patient

Setting for the environment and patient

Stimulate the patient for response

Shout for help

Begin Scenario

SETTING THE SCENE: You are asked to see a 3-day old baby girl in the nursery who has had a seizure. **WHAT DO YOU DO?**

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
1	Observe the baby in the warming cot	The infant is very drowsy	
2	Stimulate the baby	The baby makes no cry, does not open her eyes, and seems floppy	
3	(Setting) take the baby to a radiant heater and stimulate the baby	The baby makes no response	
4	Call for help	Help is on the way	
5	Look in the mouth to check for obstruction	There is nothing in the mouth	
6	Open the airway (neutral position) and Look, Listen and Feel for breathing	The baby is breathing; the breathing is not noisy	
7	Check for other signs of respiratory distress: Head nodding Crackles Grunting Nasal flaring Cyanosis Respiratory rate Pulse oximetry Indrawing / acidotic breathing	<ul style="list-style-type: none">• There are no signs of respiratory distress• RR is 60 b/min• SpO₂ = 93%	
8	Assess large pulse, warmth of hand	<ul style="list-style-type: none">• There is a fast pulse, PR = 150 bpm• The hand is hot	

continue to the following page 

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
9	Check for other signs of circulation: Pallor Peripheral pulse Cold hands Capillary refill time	<ul style="list-style-type: none"> • There is no palmar pallor • The peripheral pulse is easy to feel • The capillary refill time is 2 seconds 	
10	Coma convulsions: establish level of consciousness (AVPU)	<ul style="list-style-type: none"> • She makes no response to her mother's voice nor to a painful stimulus • AVPU = U 	
11	What do you do now?	<ul style="list-style-type: none"> • Establish IV access • Measure weight: weight is 2.5 kg • Take bloods: blood sugar, MPs (blood culture, FBC, U&Es, if possible) 	
12	What do you need to be able to measure the blood glucose?	<ul style="list-style-type: none"> • Gloves • Alcohol • Cotton swab • New lancet • Glucometer • Glucometer strips 	
13	Before pricking the baby, what do you check concerning the glucometer?	<ul style="list-style-type: none"> • Check that the strips are in date • Switch the glucometer on and put a strip into the strip slot on one end of the glucometer • The screen should light up with text 	
14	Where on the baby will you take the blood sample?	Outer side of the heel of the foot	
15	Please show me how you measure the blood glucose	<ul style="list-style-type: none"> • Put on gloves • Clean the skin to be punctured with an alcohol swab, let the skin dry • If not already done, insert glucometer strip into glucometer and ensure it is turned on • Prick the swabbed outer edge of the heel • Collect the blood drop on the tip of the glucometer strip • Apply pressure to stop the bleeding • Read the result 	
16	The reading is glucose 2 mmol/L. What do you do?	The baby weighs 2.5 kg and needs an IV bolus of 2 mL/kg 10% glucose	
17	What do you do now?	<ul style="list-style-type: none"> • Dispose of used glucose stick and wash hands • In the patient's notes document: the date, time, and blood glucose result, and, if appropriate, how much 10% glucose has been given 	
18	What do you do next?	Full history and examination	
19	On full examination you find the baby has a full fontanelle and an axillary temperature of 38°C. On re-listening to the chest, there are fine crepitations in the lungs What does this baby need?	This baby needs a lumbar puncture and IV antibiotics	
20	What do you do next?	<ul style="list-style-type: none"> • Check glucose • Glucose is now 5 mmol/L – This is OK • Put the baby on IV maintenance fluids of 10% glucose 	
21	When will you recheck the glucose?	Every 4 hours	
22	This baby has just had her glucose checked What complications should you look for?	<ul style="list-style-type: none"> • Bruising • Bleeding • Infection • (nerve, bone injury) 	

continue to the following page 

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
23	Please show me how to clean the glucometer	Wipe down the glucometer with 70% alcohol (be careful not to drip alcohol in the glucometer strip reading slot)	
24	Please show me how to calibrate this glucometer	<ul style="list-style-type: none"> Collect glucometer calibration strip (provided within set of glucometer strips) Insert glucometer calibration strip into glucometer The glucometer will automatically read this strip and calibrate itself 	
25	The glucometer does not come on What do you do?	Change the batteries or recharge the device	
26	You use the glucometer and it records a blood glucose of 30 mmol/L, but the baby looks very well to you What do you do?	<ul style="list-style-type: none"> Check the date of the glucose strips Check that the tube of unused strips is kept tightly shut between use Consider recleaning the patient's skin and retaking the measurement 	
27	What do you do if the reading is surprisingly low?	<ul style="list-style-type: none"> Check the date of the glucose strips Repeat the test 	

THANK YOU

INFECTION PREVENTION AND CONTROL

Be sure to wash your hands thoroughly and to put on gloves before handling the baby or any equipment. After every use, remember to disinfect all consumables and equipment before using them again.

Scenario end

CLINICAL SCENARIO

Glucometer 3

NAME: _____ DATE: _____

PURPOSE: Teaching / Practice
 Test Result: Pass / Fail / Retest

Scenario Overview

A 4.5 kg baby born by caesarean section to a diabetic mother is brought to the nursery. The participant should assess the baby, do a blood glucose test, and clean the glucometer after use. A glucose monitoring plan is discussed.

Reminder to Facilitator

Facilitator team to decide what is essential for participants' understanding; we suggest facilitator team underline or mark these essential items in the **INFORMATION/RESULT** column before beginning the session to ensure these are highlighted in that section.

ALWAYS REMEMBER THE CANDIDATE SHOULD START WITH THE 4 Ss

Safety of the staff and patient

Setting for the environment and patient

Stimulate the patient for response

Shout for help

Begin Scenario

SETTING THE SCENE: A 4.5 kg baby is brought to the nursery for observation. He was born by LSCS to a diabetic mother, you are asked to examine him. **WHAT DO YOU DO?**

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
1	Observe the baby lying in the cot	The infant is very pink and looks very large compared to the other babies on the ward	
2	Stimulate the baby	The baby is active and opens his eyes	
3	(Setting) the baby seems settled in the cot	The baby makes no response	
4	Call for help	No help is needed	
5	Look in the mouth to check for obstruction	There is nothing in the mouth	
6	Open the airway (neutral position) and Look, Listen and Feel for breathing	The baby is breathing; the breathing is not noisy	
7	Check for other signs of respiratory distress: Head nodding Crackles Grunting Nasal flaring Cyanosis Respiratory rate Pulse oximetry Indrawing / acidotic breathing	<ul style="list-style-type: none">• There are no signs of respiratory distress• RR is 45 b/min• SpO₂ = 94%	
8	Assess large pulse, warmth of hand	<ul style="list-style-type: none">• PR = 140 bpm• The hand is warm	

continue to the following page 

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
9	Check for other signs of circulation: Pallor Peripheral pulse Cold hands Capillary refill time	<ul style="list-style-type: none"> • There is no palmar pallor • The peripheral pulse is easy to feel • The capillary refill time is 1 second 	
10	Coma convulsions: establish level of consciousness (AVPU)	<ul style="list-style-type: none"> • She makes no response to her mother's voice nor to a painful stimulus • AVPU = A 	
11	What do you do now?	<ul style="list-style-type: none"> • Establish IV access • Measure weight: weight is 4.5 kg • Take bloods: blood sugar, MPs (blood culture, FBC, U&Es, if possible) 	
12	What do you need to be able to measure the blood glucose?	<ul style="list-style-type: none"> • Gloves • Alcohol • Cotton swab • New lancet • Glucometer • Glucometer strips 	
13	Before pricking the baby, what do you check concerning the glucometer?	<ul style="list-style-type: none"> • Check that the strips are in date • Switch the glucometer on and put a strip into the strip slot on one end of the glucometer • The screen should light up with text 	
14	Where on the baby will you take the blood sample?	Outer side of the heel of the foot	
15	Please show me how you measure the blood glucose	<ul style="list-style-type: none"> • Put on gloves • Clean the skin to be punctured with an alcohol swab, let the skin dry • If not already done, insert glucometer strip into glucometer and ensure it is turned on • Prick the swabbed outer edge of the heel • Collect the blood drop on the tip of the glucometer strip • Apply pressure to stop the bleeding • Read the result 	
16	The reading is glucose 3 mmol/L. What do you do?	<ul style="list-style-type: none"> • The baby weighs 4.5 kg and is well • Encourage frequent breast feeds 	
17	What do you do now?	<ul style="list-style-type: none"> • Dispose of used glucose stick and wash hands • In the patient's notes document: the date, time, and blood glucose result 	
18	What do you do next?	Full history and examination	
19	When will you recheck the glucose?	After 2 hours <ul style="list-style-type: none"> • Glucose is now 4 mmol/L – This is OK • Encourage breast feeding 	
20	On full examination of this child of a diabetic mother what are you looking for?	Look for other problems that infants of diabetic mothers can have such as infection, polycythaemia, jaundice	
21	When will you recheck the glucose?	4 hourly for 24 hours	
22	If the baby remains well with normal blood sugars, what will you do?	Check blood glucose every 8 hours for next 24 hours, and if remains well, give the baby to mother after 48 hours	
23	This baby has just had his glucose checked What complications should you look for?	<ul style="list-style-type: none"> • Bruising • Bleeding • Infection • (nerve, bone injury) 	

continue to the following page 

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
24	Please show me how to clean the glucometer	Wipe down the glucometer with 70% alcohol (be careful not to drip alcohol in the glucometer strip reading slot)	
25	Please show me how to calibrate this glucometer	<ul style="list-style-type: none"> Collect glucometer calibration strip (provided within set of glucometer strips) Insert glucometer calibration strip into glucometer The glucometer will automatically read this strip and calibrate itself 	
26	The glucometer does not come on What do you do?	Change the batteries or recharge the device	
27	You use the glucometer and it records a blood glucose of unrecordable, but the baby looks very well to you What do you do?	<ul style="list-style-type: none"> Check the date of the glucose strips Check that the tube of unused strips is kept tightly shut between use Consider recleaning the patient's skin and retaking the measurement 	
28	What do you do if the reading is surprisingly low?	<ul style="list-style-type: none"> Check the date of the glucose strips Repeat the test 	

THANK YOU

INFECTION PREVENTION AND CONTROL

Be sure to wash your hands thoroughly and to put on gloves before handling the baby or any equipment. After every use, remember to disinfect all consumables and equipment before using them again.

Scenario end

CLINICAL SCENARIO

CPAP 1A

NAME: _____ DATE: _____

PURPOSE: Teaching / Practice
 Test Result: Pass / Fail / Retest

Scenario Overview

The scenario is set in the labour ward where a premature baby has just been born. Participants should assess the baby, determine the need for any immediate resuscitation, and commence CPAP.

Reminder to Facilitator

Facilitator team to decide what is essential for participants' understanding; we suggest facilitator team underline or mark these essential items in the **INFORMATION/RESULT** column before beginning the session to ensure these are highlighted in that section.

ALWAYS REMEMBER THE CANDIDATE SHOULD START WITH THE 4 Ss

Safety of the staff and patient

Setting for the environment and patient

Stimulate the patient for response

Shout for help

Begin Scenario

SETTING THE SCENE: You are called to the labour ward where a teenage mother has delivered a preterm baby. She does not know the date of her last menstrual period. When you arrive you find a small, very premature looking baby boy under the radiant heater. He was born 20 minutes ago. He has been dried and wrapped in a warm cloth. He appears pink and active. **WHAT DO YOU DO?**

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
1	Observe baby	Baby is under the radiant heater and obviously preterm. He is moving normally, and his mouth and nose are clear	
2	The setting is alright as he can be kept warm and observed when stimulated	The baby makes normal movements in response to gentle stimulation	
3	Call for help	Help is on the way	
4	Open the airway (neutral position) and Look, Listen and Feel for breathing Suction the mouth and nares	<ul style="list-style-type: none">The airway is clearThe breathing is regular and 65 b/min	
5	Check for other signs of respiratory distress: Head nodding Crackles Grunting Nasal flaring Cyanosis Respiratory rate Pulse oximetry Indrawing / acidotic breathing	The baby is pink in colour, has mild indrawing but no other signs of respiratory distress. The chest is clear on auscultation: <ul style="list-style-type: none">RR is 65 b/minSpO₂ = 93%	
6	Check the circulation	The baby's colour is good, his hands are warm, the cord is well tied	
7	Disability	The baby is a little floppy but responsive to stimulation	
8	Full examination and Ballard score	Reveals a healthy premature baby of 31 weeks gestation	

continue to the following page 

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
9	Weight What should you now do?	<ul style="list-style-type: none"> The baby weighs 1.2 kg Set up and put the baby on CPAP 	
10	What equipment do you need to set up CPAP?	<ul style="list-style-type: none"> CPAP machine Power cable Inspiratory tubing Expiratory tubing CPAP prongs Connectors Oxygen tubing Oxygen source 	
11	Please show me how you fill the collection bottle	Fill to 6 cm depth with clean water	
12	Now attach all the tubing to the CPAP machine	<ul style="list-style-type: none"> Connect the inspiratory tubing to the Patient Port Connect the expiratory tubing to the Bottle Port Connect the CPAP prongs between the inspiratory and expiratory tubing 	
13	Then what do you do?	<ul style="list-style-type: none"> Turn on the CPAP device Open the oxygen flow meter Connect the oxygen source to the CPAP with oxygen tubing 	
14	How do you test that the system is working?	Test for bubbling by pinching closed the nasal prongs	

YOU COULD ASK ANOTHER PARTICIPANT TO TAKE OVER NOW

15	Please prepare the equipment you need to put the baby on CPAP	<ul style="list-style-type: none"> Gloves Tape Suction catheter Syringe - 2 mL Correctly sized CPAP prongs Hat or length of stockinette (if hat is not available) Orogastric (OG) tube size F5 	
16	Now what do you do?	Insert an orogastric tube	
17	Please show me how you do this	<ul style="list-style-type: none"> Measure from the middle of the mouth to the ear and then to the lower end of the sternum Mark this distance with a small amount of tape Gently insert the OG tube in the mouth to this length Tape the OG tube to the chin to keep in place 	
18	What is the correct size of CPAP prong?	Prongs should completely fill the patient's nostrils	
19	Now show me what you need to put the baby on CPAP	<ul style="list-style-type: none"> Appropriately sized CPAP prongs Hat 2 mL syringe filled with normal saline Hat clips OR 2 rubber bands & 4 safety pins 	
20	What comes next?	<ul style="list-style-type: none"> Turn on the CPAP device and connect oxygen source Place hat on patient Set a starting pressure level of 6 cm water, total flow of 6 L/min, and oxygen concentration (FiO₂) of 50% 	
21	How do you decide the oxygen flow to choose? Please connect the tubing and check that it is working well	<ul style="list-style-type: none"> By using FiO₂ and total flow as shown on the oxygen blending table printed on top of the CPAP machine Set total flow of 6 L/min. Set oxygen flow on both oxygen source and CPAP oxygen flowmeter Connect correctly sized CPAP prongs to the inspiratory and expiratory tubing Retest the bubbling by pinching the nasal prongs shut The water within the water bottle should bubble 	

continue to the following page 

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
22	Please show me how you insert the prongs and how deep they should be?	<ul style="list-style-type: none"> Place a drop of saline within each nostril using the syringe filled with saline Gently insert prongs into the nostrils with the writing on the prongs facing upwards Insert until the line on the nasal prongs is just visible. This will leave 1 mm of space between the prongs and the nasal septum 	
23	Please connect the tubing to the hat	<ul style="list-style-type: none"> Insert two safety pins on each side of the head in the brim of the hat Pins should open away from the baby's face and should go only through the folded brim of the hat; pins should never touch the patient's skin Hold the inspiratory tubing in place between the two safety pins Wrap the rubber bands around the safety pins on either side of the tubing to secure Repeat for the expiratory tubing on the other side of the patient's face 	
24	What 2 quick checks should you now do?	<ul style="list-style-type: none"> That the prongs are still within the nose and at the correct distance from the nasal septum That the water in the bottle bubbles 	
25	The water does not bubble. Now what should you do?	<ul style="list-style-type: none"> Check the tubing for leaks or kinks Check prongs are correct size 	
26	Well done! The baby is now settled on CPAP and the water is bubbling nicely. When is the next check you will do and what will you check?	<ul style="list-style-type: none"> After 15 minutes Vital signs – RR, HR, O₂ sats, Temperature Work of breathing (indrawing, colour, restlessness, grunting) Nasal blockages Abdominal distension 	
27	The baby is sleeping, HR 155 bpm, RR 60 b/min, SpO ₂ 95%, T = 36.8 °C. There is no indrawing, no grunting, and the baby is pink in colour. The water in the bottle is bubbling nicely and the baby's abdomen is flat. When will you review the baby again?	Monitor the patient every 4 hours	

THANK YOU

i REMIND PARTICIPANTS:

- Premature babies benefit from CPAP as it helps to treat or prevent Respiratory Distress Syndrome (RDS).
- How CPAP works:** CPAP devices use a pump to provide air or a mixture of air and oxygen at a continuous positive pressure. This pressure keeps airway spaces open and increases alveolar recruitment throughout respiration in a spontaneously breathing infant. This improves oxygenation and reduces work of breathing.

! INFECTION PREVENTION AND CONTROL

Be sure to wash your hands thoroughly and to put on gloves before handling the baby or any equipment. After every use, remember to disinfect all consumables and equipment before using them again.

Scenario end

CPAP 1B

NAME: _____ DATE: _____

PURPOSE: Teaching / Practice
 Test Result: Pass / Fail / Retest

Scenario Overview

The scenario is set in the labour ward where a premature baby has just been born. Participants should assess the baby, determine the need for any immediate resuscitation, and commence CPAP.

Reminder to Facilitator

Facilitator team to decide what is essential for participants' understanding; we suggest facilitator team underline or mark these essential items in the **INFORMATION/RESULT** column before beginning the session to ensure these are highlighted in that section.

ALWAYS REMEMBER THE CANDIDATE SHOULD START WITH THE 4 Ss

- Safety** of the staff and patient
- Setting** for the environment and patient
- Stimulate** the patient for response
- Shout** for help

Begin Scenario

SETTING THE SCENE: The same baby who was put on CPAP 3 hours ago is now doing well. (Note: this scene is continued from the end of scenario 1A.) **WHAT DO YOU DO NEXT?**

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
1	Observe baby	4 hourly monitoring to include: <ul style="list-style-type: none"> • Vital signs – RR, HR, O₂ sats, Temperature • Work of breathing (indrawing, colour restlessness, grunting) • Nasal blockages • Abdominal distension 	
2	What else should you do and check now?	Check prongs, tubing, and hat: <ul style="list-style-type: none"> • Check that prongs are not against nasal septum and check for skin compromise • Check that tubing is not kinked or misplaced • Check that hat is not loose; if it is loose, replace with new hat • Put a drop of saline to each nostril Check water level: <ul style="list-style-type: none"> • If water level is below decided treatment level, add water into bottle cap hole using a syringe or OG tube 	
3	When you check the baby after about 12 hours on CPAP the SpO ₂ = 89%, the RR = 70 b/min, HR = 170 bpm. The baby has more indrawing of the chest. What do you do?	<ul style="list-style-type: none"> • Check tubing for any kinking or leaks • Check prongs are well fitted and properly placed • Check water level in bottle is correct and bubbling 	
4	These are all fine. Are there any complications to exclude?	Listen to the chest to make sure there is no pneumothorax	

continue to the following page 

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
5	Now what do you do?	<ul style="list-style-type: none"> Increase the flow by 0.5 L/min and the pressure by 1 cm of water increments with a review 15 minutes after each adjustment Both total and oxygen flow may need to be adjusted depending on the clinical response 	
6	<p>After making 2 increases in flow and pressure (flow is now 7 L/min and pressure is 8 cm, the baby settles and vital signs return to normal. The SpO₂ = 93%).</p> <p>How long will you keep the baby on CPAP?</p>	12 hours	
7	<p>All the vital signs at every 4 hourly monitoring have been normal for 12 hours</p> <p>Now what do you do?</p>	Reduce the O ₂ flow by 0.5 L/min but maintain the pressure and review after 15 minutes	

INSTRUCTIONS FOR FACILITATOR:

Look at TRY algorithm together and ask participant to explain it to you.

DIRECTIONS FOR CANDIDATE :

Please show me on the TRY algorithm wall chart what you are doing.

8	<p>Now pressure is down to 5 cm and flow is 0.5 L/min</p> <p>Please show me how you remove the baby from CPAP</p>	<ul style="list-style-type: none"> Gently pull the prongs out of the nose and remove the hat, prongs, and inspiratory and expiratory tubing Turn off CPAP and dispose of water within pressure regulating water bottle 	
9	What do you clean and how?	<ul style="list-style-type: none"> Follow protocols for cleaning tubing, if reusing, prongs, and inspiratory and expiratory tubing Using a cotton swab or gauze soaked in 70% alcohol, disinfect the oxygen flowmeter regulator valves 	

THANK YOU

INFECTION PREVENTION AND CONTROL

Be sure to wash your hands thoroughly and to put on gloves before handling the baby or any equipment. After every use, remember to disinfect all consumables and equipment before using them again.

Scenario end

CLINICAL SCENARIO

CPAP 2

NAME: _____ DATE: _____

PURPOSE: Teaching / Practice
 Test Result: Pass / Fail / Retest

Scenario Overview

A 2 day old, 2 kg baby has fast breathing. The participant should assess the baby, give oxygen, and when this is inadequate, commence CPAP. The baby needs to be monitored and the device should be checked before weaning from CPAP and the equipment is cleaned.

Reminder to Facilitator

Facilitator team to decide what is essential for participants' understanding; we suggest facilitator team underline or mark these essential items in the **INFORMATION/RESULT** column before beginning the session to ensure these are highlighted in that section.

ALWAYS REMEMBER THE CANDIDATE SHOULD START WITH THE 4 Ss

Safety of the staff and patient

Setting for the environment and patient

Stimulate the patient for response

Shout for help

Begin Scenario

SETTING THE SCENE: A 2 kg baby aged 2 days is in the nursery and mother is worried because the baby is breathing fast and is rather listless **WHAT DO YOU DO?**

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
1	Observe baby	Baby looks small in size, is lethargic and not very active	
2	Place baby under a radiant heater (setting) where they can be kept warm and observe responsiveness (stimulate)	The baby makes some movements in response to gentle stimulation	
3	Call for help	Help is on the way	
4	Open the airway (neutral position) and Look, Listen, and Feel for breathing Suction the mouth and nose	<ul style="list-style-type: none">The mouth and nose are full of watery secretionsThe baby is breathing fast	
5	Check for other signs of respiratory distress: Head nodding Crackles Grunting Nasal flaring Cyanosis Respiratory rate Pulse oximetry Indrawing / acidotic breathing What will you do next?	The baby has marked chest indrawing and its colour is grey. It is difficult to make out breath sounds but there may be some fine crepitations: <ul style="list-style-type: none">RR is 75 b/minSpO₂ = 87% Put baby on oxygen 1 L/min while setting up CPAP	
6	The baby does not improve, and you decide to put the baby on CPAP What equipment do you need to set up CPAP?	<ul style="list-style-type: none">CPAP machinePower cableInspiratory tubingExpiratory tubingCPAP prongsConnectorsOxygen tubingOxygen source	
7	Please show me how you fill the collection bottle	Fill to 6 cm depth with clean water	

continue to the following page 

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
8	Now attach all the tubing to the CPAP machine	<ul style="list-style-type: none"> Connect the inspiratory tubing to the Patient Port Connect the expiratory tubing to the Bottle Port Connect the CPAP prongs between the inspiratory and expiratory tubing 	
9	Then what do you do?	<ul style="list-style-type: none"> Turn on the CPAP device Open the oxygen flow meter Connect the oxygen source to the CPAP with oxygen tubing 	
10	How do you test that the system is working?	Test for bubbling by pinching closed the nasal prongs	

YOU COULD ASK ANOTHER PARTICIPANT TO TAKE OVER NOW

11	Please prepare the equipment you need to put the baby on CPAP	<ul style="list-style-type: none"> Gloves Tape Suction catheter Syringe - 2 mL Correctly sized CPAP prongs Hat or length of stockinette (if hat is not available) Orogastric (OG) tube size F5 	
12	Now what do you do?	Insert an orogastric tube	
13	Please show me how you do this	<ul style="list-style-type: none"> Measure from the middle of the mouth to the ear and then to the lower end of the sternum Mark this distance with a small amount of tape Gently insert the OG tube in the mouth to this length Tape the OG tube to the chin to keep in place 	
14	What is the correct size of CPAP prong?	Prongs should completely fill the patient's nostrils	
15	Now show me what you need to put the baby on CPAP	<ul style="list-style-type: none"> Appropriately sized CPAP prongs Hat 2 mL syringe filled with normal saline Hat clips OR 2 rubber bands & 4 safety pins 	
16	What comes next?	<ul style="list-style-type: none"> Turn on the CPAP device and connect oxygen source Place hat on patient Set a starting pressure level of 6 cm water, total flow of 6 L/min, and oxygen concentration (FiO₂) of 50% 	
17	How do you decide the oxygen flow to choose? Please connect the tubing and check that it is working well	<ul style="list-style-type: none"> By using FiO₂ and total flow as shown on the oxygen blending table printed on top of the CPAP machine Set total flow of 6 L/min. Set oxygen flow on both oxygen source and CPAP oxygen flowmeter Connect correctly sized CPAP prongs to the inspiratory and expiratory tubing Retest the bubbling by pinching the nasal prongs shut The water within the water bottle should bubble 	
18	Please show me how you insert the prongs and how deep they should be	<ul style="list-style-type: none"> Place a drop of saline within each nostril using the syringe filled with saline Gently insert prongs into the nostrils with the writing on the prongs facing upwards Insert until the line on the nasal prongs is just visible. This will leave 1 mm of space between the prongs and the nasal septum 	

continue to the following page 

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
19	Please connect the tubing to the hat	<ul style="list-style-type: none"> • Insert two safety pins on each side of the head in the brim of the hat • Pins should open away from the baby's face and should go only through the folded brim of the hat; pins should never touch the patient's skin • Hold the inspiratory tubing in place between the two safety pins • Wrap the rubber bands around the safety pins on either side of the tubing to secure • Repeat for the expiratory tubing on the other side of the patient's face 	
20	What 2 quick checks should you do now?	<ul style="list-style-type: none"> • That the prongs are still within the nose and at the correct distance from the nasal septum • That the water in the bottle bubbles 	
21	The water does not bubble. Now what should you do?	<ul style="list-style-type: none"> • Check the tubing for leaks or kinks • Check prongs are correct size 	
22	Well done! The baby is now settled on CPAP and the water is bubbling nicely. When is the next check you will do and what will you check?	<ul style="list-style-type: none"> • After 15 minutes • Vital signs – RR, HR, O₂ sats, Temperature • Work of breathing (indrawing, colour, restlessness, grunting) • Nasal blockages • Abdominal distension 	
23	The baby is restless, HR 185 b/min, RR 80 b/min, SpO ₂ 89%, T = 38.7°C. There is indrawing and grunting and the baby remains grey in colour. The baby's abdomen is flat. What do you do?	<ul style="list-style-type: none"> • Check that the water in the bottle is bubbling and at the correct height • Check that no tubing is kinked, and the nostrils are not blocked 	
24	These are all fine. Are there any complications to exclude?	Listen to the chest to make sure there is no pneumothorax	
25	Now what do you do?	<ul style="list-style-type: none"> • Increase the flow by 0.5 L/min and the pressure by 1 cm of water increments with a review 15 minutes after each adjustment • Both total and oxygen flow may need to be adjusted depending on the clinical response 	
26	After making 2 increases in flow and pressure (flow is now 6.5 L/min and pressure is 7 cm, the baby settles and vital signs return to normal. The SpO ₂ = 93%). How long will you keep the baby on CPAP?	12 hours	
27	How often will you monitor this baby? What will you check?	<p>4 hourly monitoring to include:</p> <ul style="list-style-type: none"> • Vital signs – RR, HR, O₂ sats, Temperature • Work of breathing (indrawing, colour, restlessness, grunting) • Nasal blockages • Abdominal distension 	

continue to the following page 

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
28	What else should you do and check now?	Check prongs, tubing, and hat: <ul style="list-style-type: none"> • Check that prongs are not against nasal septum and check for skin compromise • Check that tubing is not kinked or misplaced • Check that hat is not loose; if it is loose, replace with new hat • Put a drop of saline to each nostril Check water level: <ul style="list-style-type: none"> • If water level is below decided treatment level, add water into bottle cap hole using a syringe or OG tube 	

**THE BABY WHO WAS PUT ON CPAP 24 HRS AGO IS DOING WELL.
HOW DO YOU DECIDE WHAT TO DO NEXT?**

29	All the vital signs at every 4 hourly monitoring have been normal for 24 hours Now what do you do?	Reduce the O ₂ flow by 0.5 L/min but maintain the pressure and review after 15 minutes	
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INSTRUCTIONS FOR FACILITATOR:

Look at TRY algorithm together and ask participant to explain it to you

DIRECTIONS FOR CANDIDATE :

Please show me on the TRY algorithm wall chart what you are doing

30	Now pressure is down to 5 cm and flow is 0.5 L/min Please show me how you remove the baby from CPAP	<ul style="list-style-type: none"> • Gently pull the prongs out of the nose and remove the hat, prongs, and inspiratory and expiratory tubing • Turn off CPAP and dispose of water within pressure regulating water bottle 	
31	What do you clean and how?	<ul style="list-style-type: none"> • Follow protocols for cleaning tubing, if reusing, prongs, and inspiratory and expiratory tubing • Using a cotton swab or gauze soaked in 70% alcohol, disinfect the oxygen flowmeter regulator valves 	

THANK YOU

i REMIND PARTICIPANTS:

- Premature babies benefit from CPAP as it helps to treat or prevent Respiratory Distress Syndrome (RDS).
- **How CPAP works:** CPAP devices use a pump to provide air or a mixture of air and oxygen at a continuous positive pressure. This pressure keeps airway spaces open and increases alveolar recruitment throughout respiration in a spontaneously breathing infant. This improves oxygenation and reduces work of breathing.

! INFECTION PREVENTION AND CONTROL

Be sure to wash your hands thoroughly and to put on gloves before handling the baby or any equipment. After every use, remember to disinfect all consumables and equipment before using them again.

Scenario end

CLINICAL SCENARIO

Oxygen Concentrator & Flow Splitter 1

NAME: _____ DATE: _____

PURPOSE: Teaching / Practice
 Test Result: Pass / Fail / Retest

Scenario Overview

A 4-day old, 2.7 kg baby in the nursery has fast breathing and difficulty sucking. The participant should assess the baby and give oxygen, then wean from oxygen as appropriate and finally clean the equipment.

Reminder to Facilitator

Facilitator team to decide what is essential for participants' understanding; we suggest facilitator team underline or mark these essential items in the **INFORMATION/RESULT** column before beginning the session to ensure these are highlighted in that section.

ALWAYS REMEMBER THE CANDIDATE SHOULD START WITH THE 4 Ss

Safety of the staff and patient

Setting for the environment and patient

Stimulate the patient for response

Shout for help

Begin Scenario

SETTING THE SCENE: A 2.7 kg baby aged 4 days is in the nursery, and the mother is worried because the baby is breathing fast and having difficulty sucking. He feels hot. **WHAT DO YOU DO?**

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
1	Observe baby	Baby looks small in size, is breathing fast	
2	Baby is with mother in Kangaroo Mother Care. To examine him properly he needs to be placed on a surface (setting) where he can be kept warm and observe responsiveness (stimulate)	The baby makes some movements in response to gentle stimulation	
3	Call for help	Help is on the way	
4	Open the airway (neutral position) and Look, Listen, and Feel for breathing	<ul style="list-style-type: none">The mouth and nose are clearThe baby is breathing fast	
5	Check for other signs of respiratory distress: Head nodding Crackles Grunting Nasal flaring Cyanosis Respiratory rate Pulse oximetry Indrawing / acidotic breathing What is the normal range of SpO ₂ ?	The baby's colour is grey. There is marked chest indrawing and on auscultation both lungs are full of crepitations: <ul style="list-style-type: none">RR is 80 b/minSpO₂ = 88% SpO ₂ of more than 95% is considered normal range	
6	How much oxygen do you give the baby?	0.5 L/min	
7	Please get the oxygen concentrator ready to give oxygen to the baby	<ul style="list-style-type: none">Plug oxygen concentrator's power cable into wall and turn on power at socketSet the flow to 0.5 L/minTurn it on and wait for the indicator light to turn greenCheck that no alarms sound on the machine	

continue to the following page 

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
8	How will you give oxygen to the baby? Please show me how you apply the prongs	<ul style="list-style-type: none"> Through correct sized nasal prongs Correct size is chosen and taped into place Tubing is kept out of baby's grasp 	
9	The baby is now receiving 0.5 L/min oxygen. What do you do?	Recheck the SpO ₂ after 10 minutes	
10	The SpO ₂ is now 85%. What do you do now?	Increase the oxygen to 1 L/min	
11	The SpO ₂ is now stable at 93%. What do you do next?	Document in the notes the date, time, what you have done, and the pre and post oxygen SpO ₂	
12	How often will you monitor the baby and what will you do?	<p>Monitor according to clinical condition OR at least every 4 hours:</p> <ul style="list-style-type: none"> Vital signs – RR, HR, BP (if possible), Temperature Work of breathing (indrawing, colour, restlessness, grunting) and chest auscultation 	
13	The baby has been on O ₂ for 24 hours and is stable, the work of breathing is less, and SpO ₂ has remained at 93% for 12 hours Now what do you do?	<ul style="list-style-type: none"> Reduce oxygen flow by 0.5 L/min, rechecking saturations and clinical conditions after 15 minutes If saturations and condition remain stable, continue reducing oxygen flow by 0.5 L/min, rechecking SpO₂ 15 minutes after each reduction As saturations and clinical condition are stable, remove patient from oxygen 	
14	What do you do next and in what order?	<ul style="list-style-type: none"> Remove nasal prongs from oxygen port Document your actions and the SpO₂ 	
15	How do you clean the nasal prongs and tubing?	<ul style="list-style-type: none"> If reusing, follow hospital protocol for disinfection and drying of tubing If not reusing, discard appropriately 	
16	What do you do with the oxygen concentrator?	<ul style="list-style-type: none"> Always turn off and unplug before cleaning Disinfect the oxygen flowmeter controls using gauze and alcohol 	
17	Please show me what needs regular cleaning on the oxygen concentrator	<ul style="list-style-type: none"> The housing should be cleaned according to ward guidelines for disinfecting surfaces Flowmeter controls and LEDs should be cleaned using alcohol after every use 	
18	How do you clean the gross particle filter?	<p>Gross particle filter, to clean:</p> <ul style="list-style-type: none"> Pull gently from the back of the oxygen concentrator Replace with spare filter Put dirty filter in cool, soapy water and swirl gently to remove debris Remove from soapy water and place in shaded area until completely dry Do not squeeze, do not use when wet Store as spare filter until next cleaning is needed 	

continue to the following page 

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
19	Please show me how you would clean the bacterial filter	<p>Bacterial filter, this is internal to the machine and is made of filter papers or a thick white felt filter:</p> <ul style="list-style-type: none"> • Do not wash this filter in water • Remove it and shake it outside to get rid of the dust in it until the colour has lightened • Replace or set as a spare filter 	
20	How often should filters be cleaned?	<ul style="list-style-type: none"> • Internal and external filters should be checked weekly, with cleaning provided every two weeks or more frequently as needed • Never place a wet filter in an oxygen concentrator 	

THANK YOU

 REMIND PARTICIPANTS:

- Nearly all sick infants benefit from oxygen, especially those with respiratory distress.
- Hypoxia contributes to both morbidity and mortality

 INFECTION PREVENTION AND CONTROL

Be sure to wash your hands thoroughly and to put on gloves before handling the baby or any equipment. After every use, remember to disinfect all consumables and equipment before using them again.

Scenario end

CLINICAL SCENARIO

Oxygen Concentrator & Flow Splitter 2

NAME: _____ DATE: _____

PURPOSE: Teaching / Practice
 Test Result: Pass / Fail / Retest

Scenario Overview

A 3-day old baby in the nursery is breathing very fast. The participant should assess the baby and give oxygen via a flow splitter. Problems with oxygen flow are managed, then the baby is weaned from oxygen and the equipment cleaned after use.

Reminder to Facilitator

Facilitator team to decide what is essential for participants' understanding; we suggest facilitator team underline or mark these essential items in the **INFORMATION/RESULT** column before beginning the session to ensure these are highlighted in that section.

ALWAYS REMEMBER THE CANDIDATE SHOULD START WITH THE 4 Ss

Safety of the staff and patient

Setting for the environment and patient

Stimulate the patient for response

Shout for help

Begin Scenario

SETTING THE SCENE: A 3 kg baby boy aged 2 days is in the nursery and the mother is worried because the baby is breathing fast. **WHAT DO YOU DO?**

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
1	Observe baby	Baby looks term and is breathing fast	
2	Baby is with mother in Kangaroo Mother Care. To examine him properly he needs to be placed on a surface (setting) where he can be kept warm and observe responsiveness (stimulate)	The baby responds to gentle stimulation	
3	Call for help	Help is on the way	
4	Open the airway (neutral position) and Look, Listen, and Feel for breathing	<ul style="list-style-type: none">The mouth and nose are clearThe baby is breathing fast	
5	Check for other signs of respiratory distress: Head nodding Crackles Grunting Nasal flaring Cyanosis Respiratory rate Pulse oximetry Indrawing / acidotic breathing What is the normal range of SpO ₂ ?	The baby's colour is grey. There is marked chest indrawing and on auscultation both lungs are full of crepitations: <ul style="list-style-type: none">RR is 70 b/minSpO₂ = 90% SpO ₂ of more than 95% is considered normal range	
6	How much oxygen do you give this baby?	0.5 L/min	
7	All concentrators are in use, what can you do?	Use a flow splitter	
8	How much oxygen can each baby receive from this flow splitter?	Max 2 L/min	

continue to the following page 

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
9	Please set up the flow splitter	<ul style="list-style-type: none"> • Ensure oxygen splitter is secure and the flow regulators are easily adjustable • Make sure flow regulators are open • Connect oxygen splitter tubing from oxygen outlet source to oxygen splitter inlet port • Turn on oxygen at source with as high a flow as the concentrator can produce, the flowmeter beads on the oxygen splitter should pop up • Adjust each port regulator to the required flow rate • Make sure the flow has not changed in any of the other ports 	
10	There is no flow from all the ports of the flow splitter What do you do?	<ul style="list-style-type: none"> • Check that oxygen source is on and oxygen is flowing from the outlet port • Check that oxygen splitter tubing is secure 	
11	Now there is no flow from one port, but other ports are functioning What do you do?	<ul style="list-style-type: none"> • Remove visible debris from the outlet port that is blocked • Disinfect with alcohol after debris has been removed 	
12	The oxygen is now flowing in all ports. How will you give oxygen to the baby? Please show me how you apply the prongs	<ul style="list-style-type: none"> • Through correct sized nasal prongs • Correct size is chosen and taped into place • Tubing is kept out of baby's grasp 	
13	The baby is now receiving 0.5 L/min oxygen. What do you do?	Recheck the SpO ₂ after 10 minutes	
14	The SpO ₂ is now stable at 95%. What do you do next?	Document in the notes the date, time, what you have done, and the pre and post oxygen SpO ₂	
15	How often will you monitor the baby and what will you do?	<p>Monitor according to clinical condition OR at least every 4 hours:</p> <ul style="list-style-type: none"> • Vital signs – RR, HR, BP (if possible), Temperature • Work of breathing (indrawing, colour, restlessness, grunting) and chest auscultation 	
16	What else should you consider doing?	Administer nasal saline drops 4 hourly or more frequently if needed	
17	Shortly after attaching the baby to oxygen, the concentrator starts to alarm What do you do now?	<ul style="list-style-type: none"> • Check if the concentrator is still on • Check that all tubing to the baby and splitter is not kinked and all connections are airtight 	
18	The baby has been on O ₂ for 24 hours and is stable, the work of breathing is less, and SpO ₂ has remained at 95% for 12 hours Now what do you do?	As saturations and clinical condition are stable, remove patient from oxygen	
19	What do you do next and in what order?	<ul style="list-style-type: none"> • Remove nasal prongs from oxygen port • Document your actions and the SpO₂ 	
20	How do you clean the nasal prongs and tubing?	<ul style="list-style-type: none"> • If reusing, follow hospital protocol for disinfection and drying of tubing • If not reusing, discard appropriately 	
21	What do you do with the oxygen concentrator?	<ul style="list-style-type: none"> • Always turn off and unplug before cleaning • Disinfect the oxygen flowmeter controls using gauze and alcohol 	
22	Please show me what needs regular cleaning on the oxygen concentrator	<ul style="list-style-type: none"> • The housing should be cleaned according to ward guidelines for disinfecting surfaces • Flowmeter controls and LEDs should be cleaned using alcohol after every use 	

continue to the following page 

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
23	How do you clean the gross particle filter?	Gross particle filter, to clean: <ul style="list-style-type: none"> • Pull gently from the back of the oxygen concentrator • Replace with spare filter • Put dirty filter in cool, soapy water and swirl gently to remove debris • Remove from soapy water and place in shaded area until completely dry • Do not squeeze, do not use when wet • Store as spare filter until next cleaning is needed 	
24	Please show me how you would clean the bacterial filter	Bacterial filter, this is internal to the machine and is made of filter papers or a thick white felt filter: <ul style="list-style-type: none"> • Do not wash this filter in water • Remove it and shake it outside to get rid of the dust in it until the colour has lightened • Replace or set as a spare filter 	
25	How often should filters be cleaned?	<ul style="list-style-type: none"> • Internal and external filters should be checked weekly, with cleaning provided every two weeks or more frequently as needed • Never place a wet filter in an oxygen concentrator 	
26	Please show me how you would clean the flow splitter	Clean the dials and housing with 70% alcohol	

THANK YOU

i DISCUSS WITH PARTICIPANTS: IS OXYGEN HARMFUL TO BABIES?

If the oxygen saturations are not monitored appropriately or the flow rate is inadvertently changed there is a risk that the baby will receive too much oxygen. Whilst oxygen can be lifesaving, too much can cause problems especially in premature babies, including:

- **Retinopathy of prematurity:** in premature babies, high blood oxygen levels can result in development of abnormal blood vessels on the retina, causing potential visual impairment or even blindness
- **Chronic lung disease:** prolonged use of oxygen in premature babies causes lung fibrosis through inflammatory processes

! INFECTION PREVENTION AND CONTROL

Be sure to wash your hands thoroughly and to put on gloves before handling the baby or any equipment. After every use, remember to disinfect all consumables and equipment before using them again.

Scenario end

CLINICAL SCENARIO

Oxygen Concentrator & Flow Splitter 3A

NAME: _____ DATE: _____

PURPOSE: Teaching / Practice
 Test Result: Pass / Fail / Retest

Scenario Overview

A 10-day old baby weighing 3 kg has diarrhoea, fast breathing and difficulty breast feeding. The baby must be assessed, oxygen saturations measured, and oxygen given. When the oxygen saturations improve and the baby is stable for 24 hours, oxygen is weaned and finally removed. The nasal prongs and oxygen concentrator must be cleaned.

Reminder to Facilitator

Facilitator team to decide what is essential for participants' understanding; we suggest facilitator team underline or mark these essential items in the **INFORMATION/RESULT** column before beginning the session to ensure these are highlighted in that section.

ALWAYS REMEMBER THE CANDIDATE SHOULD START WITH THE 4 Ss

Safety of the staff and patient

Setting for the environment and patient

Stimulate the patient for response

Shout for help

Begin Scenario

SETTING THE SCENE: A 3 kg baby aged 10 days is in the nursery and the mother is worried because the baby is breathing fast and has diarrhoea. He is having difficulty sucking. **WHAT DO YOU DO?**

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
1	Observe baby	Baby looks term and is breathing fast	
2	Baby is with mother in Kangaroo Mother Care. To examine him properly he needs to be placed on a surface (setting) where he can be kept warm and observe responsiveness (stimulate)	The baby makes some movements in response to gentle stimulation	
3	Call for help	Help is on the way	
4	Open the airway (neutral position) and Look, Listen, and Feel for breathing	<ul style="list-style-type: none">The mouth and nose are clearThe baby is breathing fast	
5	Check for other signs of respiratory distress: Head nodding Crackles Grunting Nasal flaring Cyanosis Respiratory rate Pulse oximetry Indrawing / acidotic breathing This baby is sick and needs further evaluation, meanwhile please put the baby on oxygen	The baby's colour is pink. There is no chest indrawing and on auscultation both lungs are clear: <ul style="list-style-type: none">RR is 68 b/minSpO₂ = 90%	
6	How much oxygen do you give this baby?	0.5 L/min	
7	Please get the oxygen concentrator ready to give oxygen to the baby	<ul style="list-style-type: none">Plug oxygen concentrator's power cable into wall and turn on power at socketSet the flow to 0.5 L/minTurn it on and wait for the indicator light to turn greenCheck that no alarms sound on the machine	

continue to the following page 

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
8	How much oxygen can each baby receive from this flow splitter?	Max 2 L/min	
9	How will you give oxygen to the baby? Please show me how you apply the prongs	<ul style="list-style-type: none"> • Through correct sized nasal prongs • Correct size is chosen and taped into place • Tubings are kept out of baby's grasp 	
10	The baby is now receiving 0.5 L/min oxygen. What do you do?	Recheck the SpO ₂ after 10 minutes	
11	The SpO ₂ is now stable at 93%. Now what do you do?	Document in the notes the date, time, what you have done, and the pre and post oxygen SpO ₂	
12	How often will you monitor the baby and what will you do?	<p>Monitor according to clinical condition OR at least every 4 hours:</p> <ul style="list-style-type: none"> • Vital signs – RR, HR, BP (if possible), Temperature • Work of breathing (indrawing, colour, restlessness, grunting) and chest auscultation 	
13	What else should you consider doing?	Administer nasal saline drops 4 hourly or more frequently if needed	
14	The baby has been on O ₂ for 16 hours and is stable, the work of breathing is less, and SpO ₂ has remained at 94% for 12 hours Now what do you do?	<ul style="list-style-type: none"> • As saturations and clinical condition are stable, remove patient from oxygen • Recheck SpO₂ after 10 mins 	
15	What do you do next and in what order?	<ul style="list-style-type: none"> • Remove nasal prongs from oxygen port • Document your actions and the SpO₂ 	
16	How do you clean the nasal prongs and tubing?	<ul style="list-style-type: none"> • If reusing, follow hospital protocol for disinfection and drying of tubing • If not reusing, discard appropriately 	
17	What do you do with the oxygen concentrator?	<ul style="list-style-type: none"> • Always turn off and unplug before cleaning • Disinfect the oxygen flowmeter controls using gauze and alcohol 	
18	Please show me what needs regular cleaning on the oxygen concentrator	<ul style="list-style-type: none"> • The housing should be cleaned according to ward guidelines for disinfecting surfaces • Flowmeter controls and LEDs should be cleaned using alcohol after every use 	
19	How do you clean the gross particle filter?	<p>Gross particle filter, to clean:</p> <ul style="list-style-type: none"> • Pull gently from the back of the oxygen concentrator • Replace with spare filter • Put dirty filter in cool, soapy water and swirl gently to remove debris • Remove from soapy water and place in shaded area until completely dry • Do not squeeze, do not use when wet • Store as spare filter until next cleaning is needed 	
20	Please show me how you would clean the bacterial filter	<p>Bacterial filter, this is internal to the machine and is made of filter papers or a thick white felt filter:</p> <ul style="list-style-type: none"> • Do not wash this filter in water • Remove it and shake it outside to get rid of the dust in it until the colour has lightened • Replace or set as a spare filter 	

continue to the following page 

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
21	How often should filters be cleaned?	<ul style="list-style-type: none"> Internal and external filters should be checked weekly, with cleaning provided every two weeks or more frequently as needed Never place a wet filter in an oxygen concentrator 	

THANK YOU

i REMIND PARTICIPANTS:

- **How an oxygen concentrator works:** it concentrates 85 - 100% oxygen from room air using two sieve beds made of a substance that absorbs nitrogen
- **Where to place an oxygen concentrator:** the oxygen concentrator should be in a clear space close to the patient. The concentrator must be placed between 30 - 35 cm from the wall, to allow good ventilation and to not overheat

! INFECTION PREVENTION AND CONTROL

Be sure to wash your hands thoroughly and to put on gloves before handling the baby or any equipment. After every use, remember to disinfect all consumables and equipment before using them again.

Scenario end

CLINICAL SCENARIO

Oxygen Concentrator & Flow Splitter 3B

NAME: _____ DATE: _____

PURPOSE: Teaching / Practice
 Test Result: Pass / Fail / Retest

Scenario Overview

Another baby requires oxygen but there is no free oxygen concentrator. The participant should set up a flow splitter with the oxygen concentrator, deal with a blocked outlet oxygen port, give oxygen to and monitor the baby. When the concentrator alarms go off the participant should know why and clean the filters. When no longer required the concentrator and all tubing must be cleaned.

Reminder to Facilitator

Facilitator team to decide what is essential for participants' understanding; we suggest facilitator team underline or mark these essential items in the **INFORMATION/RESULT** column before beginning the session to ensure these are highlighted in that section.

ALWAYS REMEMBER THE CANDIDATE SHOULD START WITH THE 4 Ss

Safety of the staff and patient

Setting for the environment and patient

Stimulate the patient for response

Shout for help

Begin Scenario

SETTING THE SCENE: Another baby requires oxygen but there is no free oxygen concentrator. **WHAT DO YOU DO?**

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
1	All concentrators are in use, what can you do?	Use a flow splitter	
2	How much oxygen can each baby receive from this flow splitter?	Max 2 L/min	
3	Please set up the flow splitter	<ul style="list-style-type: none">• Ensure oxygen splitter is secure and the flow regulators are easily adjustable• Make sure flow regulators are open• Connect oxygen splitter tubing from oxygen outlet source to oxygen splitter inlet port• Turn on oxygen at source with as high a flow as the concentrator can produce, the flowmeter beads on the oxygen splitter should pop up• Adjust each port regulator to the required flow rate• Make sure the flow has not changed in any of the other ports	
4	There is no flow from all the ports of the flow splitter What do you do?	<ul style="list-style-type: none">• Check that oxygen source is on and oxygen is flowing from the outlet port• Check that oxygen splitter tubing is secure	
5	Now there is no flow from one port, but other ports are functioning What do you do?	<ul style="list-style-type: none">• Remove visible debris from the outlet port that is blocked• Disinfect with alcohol after debris has been removed	
6	The oxygen is now flowing in all ports. How will you give oxygen to the baby? Please show me how you apply the prongs	<ul style="list-style-type: none">• Through correct sized nasal prongs• Correct size is chosen and taped into place• Tubing is kept out of baby's grasp	

continue to the following page 

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
7	Please get the oxygen concentrator ready to give oxygen to the baby	<ul style="list-style-type: none"> • Plug oxygen concentrator's power cable into wall and turn on power at socket • Set the flow to 0.5 L/min • Turn it on and wait for the indicator light to turn green • Check that no alarms sound on the machine 	
8	The baby is now receiving 0.5 L/min oxygen. What do you do?	Recheck the SpO ₂ after 10 minutes	
9	The SpO ₂ is now stable at 95%. What do you do next?	Document in the notes the date, time, what you have done, and the pre and post oxygen SpO ₂	
10	How often will you monitor the baby and what will you do?	<p>Monitor according to clinical condition OR at least every 4 hours:</p> <ul style="list-style-type: none"> • Vital signs – RR, HR, BP (if possible), Temperature • Work of breathing (indrawing, colour, restlessness, grunting) and chest auscultation 	
11	What else should you consider doing?	Administer nasal saline drops 4 hourly or more frequently if needed	
12	Shortly after attaching the baby to oxygen, the concentrator starts to alarm What do you do now?	<ul style="list-style-type: none"> • Check if the concentrator is still on • Check that all tubing to the baby and splitter is not kinked and all connections are airtight 	
13	The concentrator is on, but the low oxygen concentration alarm is displayed	<ul style="list-style-type: none"> • Check the filters for dust and debris and if present, replace the filters with spare, clean filters • Allow the machine to run for 10 minutes 	
14	The baby has been on O ₂ for 24 hours and is stable, the work of breathing is less, and SpO ₂ has remained at 95% for 12 hours Now what do you do?	As saturations and clinical condition are stable, remove patient from oxygen	
15	What do you do next and in what order?	<ul style="list-style-type: none"> • Remove nasal prongs from oxygen port • Document your actions and the SpO₂ 	
16	How do you clean the nasal prongs and tubing?	<ul style="list-style-type: none"> • If reusing, follow hospital protocol for disinfection and drying of tubing • If not reusing, discard appropriately 	
17	What do you do with the oxygen concentrator?	<ul style="list-style-type: none"> • Always turn off and unplug before cleaning • Disinfect the oxygen flowmeter controls using gauze and alcohol 	
18	Please show me what needs regular cleaning on the oxygen concentrator	<ul style="list-style-type: none"> • The housing should be cleaned according to ward guidelines for disinfecting surfaces • Flowmeter controls and LEDs should be cleaned using alcohol after every use 	
19	How do you clean the gross particle filter?	<p>Gross particle filter, to clean:</p> <ul style="list-style-type: none"> • Pull gently from the back of the oxygen concentrator • Replace with spare filter • Put dirty filter in cool, soapy water and swirl gently to remove debris • Remove from soapy water and place in shaded area until completely dry • Do not squeeze, do not use when wet • Store as spare filter until next cleaning is needed 	

continue to the following page 

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
20	Please show me how you would clean the bacterial filter	Bacterial filter, this is internal to the machine and is made of filter papers or a thick white felt filter: <ul style="list-style-type: none"> • Do not wash this filter in water • Remove it and shake it outside to get rid of the dust in it until the colour has lightened • Replace or set as a spare filter 	
21	How often should filters be cleaned?	<ul style="list-style-type: none"> • Internal and external filters should be checked weekly, with cleaning provided every two weeks or more frequently as needed • Never place a wet filter in an oxygen concentrator 	
22	Please show me how you would clean the flow splitter	Clean the dials and housing with 70% alcohol	

THANK YOU

i DISCUSS WITH PARTICIPANTS: IS OXYGEN HARMFUL TO BABIES?

If the oxygen saturations are not monitored appropriately or the flow rate is inadvertently changed there is a risk that the baby will receive too much oxygen. Whilst oxygen can be lifesaving, too much can cause problems especially in premature babies, including:

- **Retinopathy of prematurity:** in premature babies, high blood oxygen levels can result in development of abnormal blood vessels on the retina, causing potential visual impairment or even blindness
- **Chronic lung disease:** prolonged use of oxygen in premature babies causes lung fibrosis through inflammatory processes

! INFECTION PREVENTION AND CONTROL

Be sure to wash your hands thoroughly and to put on gloves before handling the baby or any equipment. After every use, remember to disinfect all consumables and equipment before using them again.

Scenario end

CLINICAL SCENARIO

Suction Pump 1

NAME: _____ DATE: _____

PURPOSE: Teaching / Practice
 Test Result: Pass / Fail / Retest

Scenario Overview

The participant is asked to help a student nurse who is worried about a 6-hour old baby with secretions. The participant should assess the baby, and prepare and provide suction, as well as know the right pressure and possible complications. Finally, the tubing is disposed of and device cleaned.

Reminder to Facilitator

Facilitator team to decide what is essential for participants' understanding; we suggest facilitator team underline or mark these essential items in the **INFORMATION/RESULT** column before beginning the session to ensure these are highlighted in that section.

ALWAYS REMEMBER THE CANDIDATE SHOULD START WITH THE 4 Ss

Safety of the staff and patient

Setting for the environment and patient

Stimulate the patient for response

Shout for help

Begin Scenario

SETTING THE SCENE: A preterm baby in the nursery is seen by a student nurse who finds that the nose and mouth are full of secretions. The baby was born 6 hours ago by normal vaginal delivery without any problems. The student nurse is worried that the baby seems to be choking and having difficulty breathing. **WHAT DO YOU DO?**

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
1	Observe baby	Baby is in a warming cot and obviously preterm. He is moving normally but his mouth and nose are full of frothy mucus	
2	The setting is alright as he can be kept warm and observed when stimulated	The baby makes normal movements in response to gentle stimulation	
3	Call for help	Help is on the way	
4	Open the airway (neutral position) and Look, Listen and Feel for breathing What do you do now?	<ul style="list-style-type: none">The airway is full of mucusThe baby is breathing rapidly but regularlySuction the mouth and nares	
5	What equipment do you need for suctioning?	<ul style="list-style-type: none">Suction pump with collection reservoir attachedEnsure there is a filter in the pump and that a long enough suction tube is attached to the outlet to reach the patient comfortablySuction catheter (size F6 or F8) and/or Yankauer suckerWater in a small containerGloves	
6	When you turn the suction pump on it does not work What do you do?	<ul style="list-style-type: none">Make sure it is plugged into the wall and switched on at the wallPress the power switch at the back of the machine to 'on'Make sure the power cable is pushed well into the socket on the back of the suction machine	

continue to the following page 

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
7	Show me the different sorts of suction catheters	<ul style="list-style-type: none"> • Yankauer sucker: can remove thick mucus and particles • Suction catheter: usually size F6 for preterm and F8 for term babies 	
8	What pressure should the suction pump be set to?	Start at about 60 mmHg. Do not go above 100 mmHg	
9	Please show me how will you introduce the sucker	<ul style="list-style-type: none"> • Choose the correct size (F6) catheter or Yankauer • Show that it is placed in the mouth or nose with the tubing pinched, which is released when the sucker tip is in the correct place to suction 	
10	Please show me where you will suction How long will you suction for?	<ul style="list-style-type: none"> • Suction each nostril and then the mouth • Suction only as far as can be seen and only for as long as it takes to clear the airways (10 seconds) 	
11	What happens if you suck too deep or too long?	<ul style="list-style-type: none"> • The baby's heart rate drops • Bleeding can occur • Damage can be done to the soft tissues at the back of the throat 	
12	Please show me how you remove the suction catheter from the mouth	Pinch the tubing to stop the suction tip from sticking on everything as you pull it gently out of the mouth	
13	Now the airway is clear, what do you do next? Check for other signs of respiratory distress: Head nodding Crackles Grunting Nasal flaring Cyanosis Respiratory rate Pulse oximetry Indrawing / acidotic breathing	<p>The baby is pink in colour, has mild indrawing, but no other signs of respiratory distress. The chest is difficult to auscultate because of the noises from the nose and mouth:</p> <ul style="list-style-type: none"> • RR is 65 b/min • HR is 150 bpm • SpO₂ = 95% 	
14	What do you do now?	<ul style="list-style-type: none"> • Place the baby comfortably into the warmer crib • Check after 15 minutes that secretions have not built up again 	
15	Next, what do you do?	<ul style="list-style-type: none"> • Recheck the SpO₂ after 10-15 minutes • SpO₂ = 92% • Document the readings and actions in the notes 	
16	What do you do with the suction catheter?	<p>To clean the suction catheter:</p> <ul style="list-style-type: none"> • Use the water in the small container, and then put it in an antiseptic solution to sterilise • Or, discard it safely 	
17	Please show me how you put away the suction pump	<ul style="list-style-type: none"> • Switch the power off at the wall and on the suction pump • Empty and clean the collection bottle and replace on the suction pump • Put the suction pump where it is always kept in the department unless the baby needs such frequent suctioning that it should stay near the baby's cot 	

THANK YOU

i REMIND PARTICIPANTS:

All suctioning must be done **gently**, not too vigorously nor for too long.

! INFECTION PREVENTION AND CONTROL

Be sure to wash your hands thoroughly and to put on gloves before handling the baby or any equipment. After every use, remember to disinfect all consumables and equipment before using them again.

Scenario end

CLINICAL SCENARIO

Suction Pump 2

NAME: _____ DATE: _____

PURPOSE: Teaching / Practice
 Test Result: Pass / Fail / Retest

Scenario Overview

In the nursery a 2.3 kg baby has been vomiting. The participant should assess the baby, prepare and provide appropriate suction, understand the right pressure and possible complications, as well as clean and dispose of tubing.

Reminder to Facilitator

Facilitator team to decide what is essential for participants' understanding; we suggest facilitator team underline or mark these essential items in the **INFORMATION/RESULT** column before beginning the session to ensure these are highlighted in that section.

ALWAYS REMEMBER THE CANDIDATE SHOULD START WITH THE 4 Ss

Safety of the staff and patient

Setting for the environment and patient

Stimulate the patient for response

Shout for help

Begin Scenario

SETTING THE SCENE: A 3.3 kg baby aged 2 days is in the nursery and has vomited. **WHAT DO YOU DO?**

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
1	Observe baby	Baby looks normal in size, is alert and active	
2	The setting is alright as he can be kept warm and observed when stimulated	The baby makes good movements in response to gentle stimulation	
3	Call for help	No need for help at present	
4	Open the airway (neutral position) and Look, Listen and Feel for breathing What do you do now?	<ul style="list-style-type: none">• The mouth and nose are full of milky mucus• The baby is breathing but is struggling with the vomit in the mouth• Suction the mouth and nares	
5	What equipment do you need for suctioning?	<ul style="list-style-type: none">• Suction pump with collection reservoir attached• Ensure there is a filter in the pump and that a long enough suction tube is attached to the outlet to reach the patient comfortably• Suction catheter (size F6 or F8) and/or Yankauer sucker• Water in a small container• Gloves	
6	When you turn the suction pump on it does not work What do you do?	<ul style="list-style-type: none">• Make sure it is plugged into the wall and switched on at the wall• Press the power switch at the back of the machine to 'on'• Make sure the power cable is pushed well into the socket on the back of the suction machine	

continue to the following page 

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
7	Show me the different sorts of suction catheters	<ul style="list-style-type: none"> • Yankauer sucker: can remove thick mucus and particles • Suction catheter: usually size F6 for preterm and F8 for term babies 	
8	What pressure should the suction pump be set to?	Start at about 60 mmHg. Do not go above 100 mmHg	
9	Please show me how will you introduce the sucker	<ul style="list-style-type: none"> • Choose the correct size (F6) catheter or Yankauer • Show that it is placed in the mouth or nose with the tubing pinched, which is released when the sucker tip is in the correct place to suction 	
10	Please show me where you will suction How long will you suction for?	<ul style="list-style-type: none"> • Suction each nostril and then the mouth • Suction only as far as can be seen and only for as long as it takes to clear the airways (10 seconds) 	
11	What happens if you suck too deep or too long?	<ul style="list-style-type: none"> • The baby's heart rate drops • Bleeding can occur • Damage can be done to the soft tissues at the back of the throat 	
12	Please show me how you remove the suction catheter from the mouth	Pinch the tubing to stop the suction tip from sticking on everything as you pull it gently out of the mouth	
13	Now the airway is clear, what do you do next? Check for other signs of respiratory distress: Head nodding Crackles Grunting Nasal flaring Cyanosis Respiratory rate Pulse oximetry Indrawing / acidotic breathing	<p>The baby has some indrawing and it is difficult to make out breath sounds:</p> <ul style="list-style-type: none"> • RR is 68 b/min • HR is 150 bpm • SpO₂ = 97% 	
14	What do you do now?	<ul style="list-style-type: none"> • Place the baby comfortably into the warmer crib • Check after 15 minutes that secretions have not built up again 	
15	Next, what do you do?	<ul style="list-style-type: none"> • Recheck the SpO₂ after 10-15 minutes • SpO₂ = 95% • Document the readings and actions in the notes 	
16	What do you do with the suction catheter?	<p>To clean the suction catheter:</p> <ul style="list-style-type: none"> • Use the water in the small container, and then put it in an antiseptic solution to sterilise • Or, discard it safely 	
17	Please show me how you put away the suction pump	<ul style="list-style-type: none"> • Switch the power off at the wall and on the suction pump • Empty and clean the collection bottle and replace on the suction pump • Put the suction pump where it is always kept in the department unless the baby needs such frequent suctioning that it should stay near the baby's cot 	

THANK YOU

 REMIND PARTICIPANTS:

All suctioning must be done **gently**, not too vigorously nor for too long.

 INFECTION PREVENTION AND CONTROL

Be sure to wash your hands thoroughly and to put on gloves before handling the baby or any equipment. After every use, remember to disinfect all consumables and equipment before using them again.

Scenario end

Suction Pump 3

Scenario Overview

A 7-week old baby is brought into the emergency room full of secretions and wheezing. The participant should assess the baby, know the right pressure and provide suction, deal with pump problems, give oxygen (monitor by SpO₂), and assess the baby. Complications of suction and cleaning and disposal of tubing are to be discussed.

Reminder to Facilitator

Facilitator team to decide what is essential for participants' understanding; we suggest facilitator team underline or mark these essential items in the **INFORMATION/RESULT** column before beginning the session to ensure these are highlighted in that section.

ALWAYS REMEMBER THE CANDIDATE SHOULD START WITH THE 4 Ss

- Safety** of the staff and patient
- Setting** for the environment and patient
- Stimulate** the patient for response
- Shout** for help

Begin Scenario

SETTING THE SCENE: A 4 kg, 7-week-old baby is brought into the emergency department with rapid breathing. He has an audible wheeze and a lot of secretions on the nose and mouth. **WHAT DO YOU DO?**

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
1	Observe baby	Baby looks well-nourished and is alert	
2	The setting is alright as he can be kept warm and observed when stimulated	The baby makes vigorous movements in response to gentle stimulation	
3	Call for help	Help is on the way	
4	Open the airway (neutral position) and Look, Listen and Feel for breathing What do you do now?	<ul style="list-style-type: none"> • The airway is full of mucus • The baby is breathing rapidly but regularly • Suction the mouth and nares 	
5	What equipment do you need for suctioning?	<ul style="list-style-type: none"> • Suction pump with collection reservoir attached • Ensure there is a filter in the pump and that a long enough suction tube is attached to the outlet to reach the patient comfortably • Suction catheter (size F6 or F8) and/or Yankauer sucker • Water in a small container • Gloves 	
6	When you turn the suction pump on it does not work What do you do?	<ul style="list-style-type: none"> • Make sure it is plugged into the wall and switched on at the wall • Press the power switch at the back of the machine to 'on' • Make sure the power cable is pushed well into the socket on the back of the suction machine 	
7	What if it still doesn't work?	<ul style="list-style-type: none"> • Check that power is on • If it is but the machine still won't turn on, find a working suction pump quickly 	

continue to the following page

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
8	Show me the different sorts of suction catheters	<ul style="list-style-type: none"> • Yankauer sucker: can remove thick mucus and particles • Suction catheter: usually size F6 for preterm and F8 for term babies 	
9	What pressure should the suction pump be set to?	Start at about 60 mmHg. Do not go above 100 mmHg	
10	Please show me how will you introduce the sucker	<ul style="list-style-type: none"> • Choose the correct size (F6) catheter or Yankauer • Show that it is placed in the mouth or nose with the tubing pinched, which is released when the sucker tip is in the correct place to suction 	
11	Please show me where you will suction How long will you suction for?	<ul style="list-style-type: none"> • Suction each nostril and then the mouth • Suction only as far as can be seen and only for as long as it takes to clear the airways (10 seconds) 	
12	What happens if you suck too deep or too long?	<ul style="list-style-type: none"> • The baby's heart rate drops • Bleeding can occur • Damage can be done to the soft tissues at the back of the throat 	
13	Please show me how you remove the suction catheter from the mouth	Pinch the tubing to stop the suction tip from sticking on everything as you pull it gently out of the mouth	
14	Now the airway is clear, what do you do next? Check for other signs of respiratory distress: Head nodding Crackles Grunting Nasal flaring Cyanosis Respiratory rate Pulse oximetry Indrawing / acidotic breathing	Despite suctioning of the upper airway, the baby has marked indrawing, there may be fine crepitations, but the chest is difficult to auscultate because of the noises from the nose and mouth <ul style="list-style-type: none"> • RR is 80 b/min • HR is 180 bpm • SpO₂ = 88% 	
15	What do you do?	<ul style="list-style-type: none"> • Give O₂ 0.5 L/min by nasal prongs • Place the baby comfortably into the warmer crib • Check after 15 minutes that secretions have not built up again 	
16	Next, what do you do?	<ul style="list-style-type: none"> • Recheck the SpO₂ after 10-15 minutes • SpO₂ = 91% • HR is 180 bpm 	
17	What do you do now?	<ul style="list-style-type: none"> • Continue O₂ • Document the readings and actions in the notes 	
18	What do you do with the suction catheter?	To clean the suction catheter: <ul style="list-style-type: none"> • Use the water in the small container, and then put it in an antiseptic solution to sterilise • Or, discard it safely 	
19	Please show me how you put away the suction pump	<ul style="list-style-type: none"> • Switch the power off at the wall and on the suction pump • Empty and clean the collection bottle and replace on the suction pump • Put the suction pump where it is always kept in the department unless the baby needs such frequent suctioning that it should stay near the baby's cot 	

A full history and examination need to be taken to make a definitive diagnosis

THANK YOU

i REMIND PARTICIPANTS:

All suctioning must be done **gently**, not too vigorously nor for too long.

! INFECTION PREVENTION AND CONTROL

Be sure to wash your hands thoroughly and to put on gloves before handling the baby or any equipment. After every use, remember to disinfect all consumables and equipment before using them again.

Scenario end

CLINICAL SCENARIO

Radiant Warmer 1

NAME: _____ DATE: _____

PURPOSE: Teaching / Practice
 Test Result: Pass / Fail / Retest

Scenario Overview

A very floppy, bradypnoeic 1.2 kg baby is born to a heavily sedated pre-eclamptic mother. The participant should assess the baby, place the baby under a radiant warmer, and give oxygen. Discuss temperature control.

Reminder to Facilitator

Facilitator team to decide what is essential for participants' understanding; we suggest facilitator team underline or mark these essential items in the **INFORMATION/RESULT** column before beginning the session to ensure these are highlighted in that section.

ALWAYS REMEMBER THE CANDIDATE SHOULD START WITH THE 4 Ss

Safety of the staff and patient

Setting for the environment and patient

Stimulate the patient for response

Shout for help

Begin Scenario

SETTING THE SCENE: A premature baby weighing 1.2 kg is born by normal vaginal delivery to a pre-eclamptic mother who has been sedated with diazepam and received hydralazine to prevent incipient eclampsia. The baby is floppy and breathing very slowly. You are waiting in NICU to receive the baby. **WHAT DO YOU DO?**

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
1	(Setting) where will you put the baby?	<ul style="list-style-type: none">The baby needs to go under a radiant warmer: oxygen and emergency tray must be near at handA hat will be needed to prevent heat loss	
2	(Safety) what do you do now?	<ul style="list-style-type: none">Wash handsPut on gloves	
3	Call for help	Let sister in charge and doctor on duty know that a sick baby is soon arriving in the ward	
4	Prepare the radiant warmer to receive the baby, choose manual setting	<ul style="list-style-type: none">Plug in radiant warmer and switch on the powerSelect manual setting	
5	What power setting will you use?	25% or prewarm setting (if available on model)	
6	Please show me where you will plug in the temperature probe	<ul style="list-style-type: none">Plug temperature probe into the infant temperature probe portHold temperature probe in hand	
7	How do you check that the temperature probe is working?	<ul style="list-style-type: none">Hold temperature probe in hand and move hand directly under overhead heating elements to check for heatAllow bedding to get warm while waiting for the baby to arrive in the nursery	

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#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
8	The baby has arrived wrapped in a cloth What do you do now?	<ul style="list-style-type: none"> Quickly check ABCs Airway: is clear Breathing: baby is breathing slowly and irregularly Circulation: Call for help – start oxygen by nasal prongs 0.5 L/min Put a hat on the child Unwrap the baby under the radiant warmer 	
9	Please show me how you apply the temperature probe to the baby	<ul style="list-style-type: none"> Collect: tape or elastic bandage, gauze, alcohol Position infant in middle of radiant warmer cot, keeping nasal prongs and tubing in place Use gauze and alcohol to clean temperature probe 	
10	The baby is wet What do you do?	<ul style="list-style-type: none"> Dry the baby Place temperature probe directly over infant's liver and secure with tape or elastic bandage The probe is secured enough not to fall off, but not too tight 	
11	If the temperature probe is too tight what problem will occur?	Pressure sore at probe site	
12	When will you check the temperature of the baby?	After 5 minutes	

THANK YOU

i REMIND PARTICIPANTS:

- A radiant warmer may be used on all neonatal patients admitted to the nursery ward, but especially for:
 - Prematurity
 - Birth asphyxia
 - Low birth weight
 - Intrauterine growth restriction
 - Hypothermia
 - Undertaking invasive procedures
- It is usually used for short periods of time before a baby is placed in a warmer cot or an incubator or when a baby is having a procedure done that is difficult to do in an incubator or cot
- Obstetrics/Labour Ward Note:** A radiant warmer provides an area post-delivery to prevent hypothermia

TAKE AWAY MESSAGES:

- Be prepared for an infant referral from labour ward
- Check that the radiant warmer is clean and working and already warm when the baby arrives
- Ensure that all emergency treatment that could be needed are at hand
- Warn the staff on duty that a sick baby is on the way

! INFECTION PREVENTION AND CONTROL

Be sure to wash your hands thoroughly and to put on gloves before handling the baby or any equipment. After every use, remember to disinfect all consumables and equipment before using them again.

? QUESTIONS FOR THE GROUP **?**

1.	How quickly should you rewarm a hypothermic baby?	If a baby is cold, rewarming must be careful and gradual to prevent seizures
2.	What clinical complications can occur from hypothermia?	<ul style="list-style-type: none"> Associated with an increase in mortality Switches off surfactant production causing respiratory distress, apnoea and hypoxia Increases energy (glucose) requirement, leading to hypoglycaemia, poor weight gain Increases the risk of metabolic acidosis and necrotising enterocolitis

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🔍 QUESTIONS FOR THE GROUP 🔍

- 3.** How can the radiant warmer allow hypothermia to occur?
- **Alarms:** Radiant warmers have in-built alarms that should sound if the patient's temperature is above or below a set normothermic range. If this range is not appropriately set, alarms may sound at incorrect situations.
-
- 4.** What are clinical causes of hypothermia?
- Hypothermia can occur in any sick infant and make the underlying problem worse. It's especially common in:
- Prematurity
 - Intrauterine growth restriction
 - Birth asphyxia
 - Sepsis
-
- 5.** What clinical complications can occur from hyperthermia?
- Risks of hyperthermia include increased fluid loss with development of:
- Hyponatraemic dehydration
 - Convulsions
 - Raised metabolism
 - Tachypnoea
 - Tachycardia
 - Recurrent apnoea
-
- 6.** How can the radiant warmer allow hyperthermia to occur?
- Hyperthermia due to:
- **Alarms:** Radiant warmers have in-built alarms that should sound if the patient's temperature is above or below a set normothermic range. If this range is not appropriately set, alarms may sound at incorrect situations.
 - **Probe:** if the device is set to automatically adjust its temperature based on the patient's temperature (servo mode) and the patient temperature probe falls off the patient or is not well secured, the radiant warmer may overheat in an attempt to compensate for what it observes as a low body temperature. This puts the patient at risk for a body temperature greater than 40°C and clinical harm.
-
- 7.** What are clinical causes of hyperthermia?
- Sepsis and dehydration are the common causes of baby causes of hyperthermia
-

Scenario end

CLINICAL SCENARIO

Radiant Warmer 2

NAME: _____ DATE: _____

PURPOSE: Teaching / Practice
 Test Result: Pass / Fail / Retest

Scenario Overview

A 10-hours old baby weighing 1.6 kg is in the nursery under the radiant warmer. The participant should assess the baby, deal with any alarms that sound on the warmer, and monitor care. Discuss temperature control.

Reminder to Facilitator

Facilitator team to decide what is essential for participants' understanding; we suggest facilitator team underline or mark these essential items in the **INFORMATION/RESULT** column before beginning the session to ensure these are highlighted in that section.

ALWAYS REMEMBER THE CANDIDATE SHOULD START WITH THE 4 Ss

Safety of the staff and patient

Setting for the environment and patient

Stimulate the patient for response

Shout for help

Begin Scenario

SETTING THE SCENE: A 10-hour old baby, Phiri (weighing 1.6 kg at birth) is in the nursery under a radiant warmer.
WHAT DO YOU DO?

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
1	(Setting) where will you put the baby?	Setting is OK	
2	(Safety) what do you do now?	<ul style="list-style-type: none">Wash handsPut on gloves	
3	(Stimulate) the baby	The baby is moving normally when stimulated	
4	Call for help	No need for help at present	
5	What do you do next?	<ul style="list-style-type: none">Quickly check ABCsAirway: is clearBreathing: is regularCirculation: baby is pink	
6	Check the reading on the temperature probe	Temperature is 35°C	
7	What do you do now?	<ul style="list-style-type: none">Check the hat is in place and the baby is dryRaise the temperature of the manual radiant warmer by 1°C	
8	When will you recheck the baby's temperature? What other checks should you do?	<ul style="list-style-type: none">In 5 - 10 minutesMake sure the probe position is correct over the baby's liver and is firmly attached (but not too tight)	

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#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
9	As you walk away an alarm on the radiant warmer starts to sound Which alarms to you check and how do you check them?	<p>Check all the alarms</p> <ul style="list-style-type: none"> • Temperature Alarm: Assess if the patient is too hot or cold and change the radiant warmer settings accordingly • Power Alarm: The main power has failed. Turn off the power button on the radiant warmer • Probe Alarm: Make sure the probe is plugged in; if the alarm continues, replace the probe or contact your maintenance department • System Alarm: The radiant warmer may not be warming correctly. Move the patient to another (working) radiant warmer and contact maintenance department 	
10	When will you check the temperature of the baby?	After 5 minutes	

THANK YOU

i REMIND PARTICIPANTS:

- A radiant warmer may be used on all neonatal patients admitted to the nursery ward, but especially for:
 - Prematurity
 - Birth asphyxia
 - Low birth weight
 - Intrauterine growth restriction
 - Hypothermia
 - Undertaking invasive procedures
- It is usually used for short periods of time before a baby is placed in a warmer cot or an incubator or when a baby is having a procedure done that is difficult to do in an incubator or cot
- **Obstetrics/Labour Ward Note:** A radiant warmer provides an area post-delivery to prevent hypothermia

TAKE AWAY MESSAGES:

- Be prepared for an infant referral from labour ward
- Check that the radiant warmer is clean and working and already warm when the baby arrives
- Ensure that all emergency treatment that could be needed are at hand
- Warn the staff on duty that a sick baby is on the way

! INFECTION PREVENTION AND CONTROL

Be sure to wash your hands thoroughly and to put on gloves before handling the baby or any equipment. After every use, remember to disinfect all consumables and equipment before using them again.

? QUESTIONS FOR THE GROUP **?**

1.	How quickly should you rewarm a hypothermic baby?	If a baby is cold, rewarming must be careful and gradual to prevent seizures
2.	What clinical complications can occur from hypothermia?	<ul style="list-style-type: none"> • Associated with an increase in mortality • Switches off surfactant production causing respiratory distress, apnoea and hypoxia • Increases energy (glucose) requirement, leading to hypoglycaemia, poor weight gain • Increases the risk of metabolic acidosis and necrotising enterocolitis
3.	How can the radiant warmer allow hypothermia to occur?	<ul style="list-style-type: none"> • Alarms: Radiant warmers have in-built alarms that should sound if the patient's temperature is above or below a set normothermic range. If this range is not appropriately set, alarms may sound at incorrect situations.

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❓ QUESTIONS FOR THE GROUP ❓

4. What are clinical causes of hypothermia?

Hypothermia can occur in any sick infant and make the underlying problem worse. It's especially common in:

- Prematurity
- Intrauterine growth restriction
- Birth asphyxia
- Sepsis

5. What clinical complications can occur from hyperthermia?

Risks of hyperthermia include increased fluid loss with development of:

- Hyponatraemic dehydration
- Convulsions
- Raised metabolism
- Tachypnoea
- Tachycardia
- Recurrent apnoea

6. How can the radiant warmer allow hyperthermia to occur?

Hyperthermia due to:

- **Alarms:** Radiant warmers have in-built alarms that should sound if the patient's temperature is above or below a set normothermic range. If this range is not appropriately set, alarms may sound at incorrect situations.
- **Probe:** if the device is set to automatically adjust its temperature based on the patient's temperature (servo mode) and the patient temperature probe falls off the patient or is not well secured, the radiant warmer may overheat in an attempt to compensate for what it observes as a low body temperature. This puts the patient at risk for a body temperature greater than 40°C and clinical harm.

7. What are clinical causes of hyperthermia?

Sepsis and dehydration are the common causes of baby causes of hyperthermia

Scenario end

CLINICAL SCENARIO

Radiant Warmer 3

NAME: _____ DATE: _____

PURPOSE: Teaching / Practice
 Test Result: Pass / Fail / Retest

Scenario Overview

A baby in the nursery is well enough to be moved from radiant warmer to a warm cot. The participant should assess the baby, make the move, monitor the baby's temperature, and then clean and prepare the radiant warmer for the next baby. Discuss temperature control.

Reminder to Facilitator

Facilitator team to decide what is essential for participants' understanding; we suggest facilitator team underline or mark these essential items in the **INFORMATION/RESULT** column before beginning the session to ensure these are highlighted in that section.

ALWAYS REMEMBER THE CANDIDATE SHOULD START WITH THE 4 Ss

Safety of the staff and patient

Setting for the environment and patient

Stimulate the patient for response

Shout for help

Begin Scenario

SETTING THE SCENE: A baby is well enough to be transferred from the radiant warmer in NICU to a warm cot.
WHAT DO YOU DO?

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
1	Make sure the warmer is on and warmed up and that it has been cleaned	The warmer temperature is 36°C and has been cleaned	
2	(Safety) what do you do now?	<ul style="list-style-type: none">Wash handsPut on glovesCollect: Tape or elastic bandage, Gauze, AlcoholGently remove the temperature probe from the baby and clean the site with gauze or alcohol	
3	You turn off the radiant warmer switch and move the baby quickly to the warmer cot What do you do next?	Check the baby's temperature after 30 minutes to make sure he is maintaining a normal body temperature	
4	Please show me how you clean the temperature probe	Clean temperature probe, including cable and plug head, with 70% alcohol or dilute chlorine	
5	Now please show me how you prepare the warmer for the next baby	Use gauze and alcohol or diluted chlorine to wipe: <ul style="list-style-type: none">Control panelPower buttonMattressBassinet walls	

THANK YOU

continue to the following page 

i REMIND PARTICIPANTS:

- A radiant warmer may be used on all neonatal patients admitted to the nursery ward, but especially for:
 - Prematurity
 - Birth asphyxia
 - Low birth weight
 - Intrauterine growth restriction
 - Hypothermia
 - Undertaking invasive procedures
- It is usually used for short periods of time before a baby is placed in a warmer cot or an incubator or when a baby is having a procedure done that is difficult to do in an incubator or cot
- **Obstetrics/Labour Ward Note:** A radiant warmer provides an area post-delivery to prevent hypothermia

TAKE AWAY MESSAGES:

- Be prepared for an infant referral from labour ward
- Check that the radiant warmer is clean and working and already warm when the baby arrives
- Ensure that all emergency treatment that could be needed are at hand
- Warn the staff on duty that a sick baby is on the way

! INFECTION PREVENTION AND CONTROL

Be sure to wash your hands thoroughly and to put on gloves before handling the baby or any equipment. After every use, remember to disinfect all consumables and equipment before using them again.

? QUESTIONS FOR THE GROUP **?**

1.	How quickly should you rewarm a hypothermic baby?	If a baby is cold, rewarming must be careful and gradual to prevent seizures
2.	What clinical complications can occur from hypothermia?	<ul style="list-style-type: none">• Associated with an increase in mortality• Switches off surfactant production causing respiratory distress, apnoea and hypoxia• Increases energy (glucose) requirement, leading to hypoglycaemia, poor weight gain• Increases the risk of metabolic acidosis and necrotising enterocolitis
3.	How can the radiant warmer allow hypothermia to occur?	<ul style="list-style-type: none">• Alarms: Radiant warmers have in-built alarms that should sound if the patient's temperature is above or below a set normothermic range. If this range is not appropriately set, alarms may sound at incorrect situations.
4.	What are clinical causes of hypothermia?	Hypothermia can occur in any sick infant and make the underlying problem worse. It's especially common in: <ul style="list-style-type: none">• Prematurity• Intrauterine growth restriction• Birth asphyxia• Sepsis
5.	What clinical complications can occur from hyperthermia?	Risks of hyperthermia include increased fluid loss with development of: <ul style="list-style-type: none">• Hyponatraemic dehydration• Convulsions• Raised metabolism• Tachypnoea• Tachycardia• Recurrent apnoea
6.	How can the radiant warmer allow hyperthermia to occur?	Hyperthermia due to: <ul style="list-style-type: none">• Alarms: Radiant warmers have in-built alarms that should sound if the patient's temperature is above or below a set normothermic range. If this range is not appropriately set, alarms may sound at incorrect situations.• Probe: if the device is set to automatically adjust its temperature based on the patient's temperature (servo mode) and the patient temperature probe falls off the patient or is not well secured, the radiant warmer may overheat in an attempt to compensate for what it observes as a low body temperature. This puts the patient at risk for a body temperature greater than 40°C and clinical harm.
7.	What are clinical causes of hyperthermia?	Sepsis and dehydration are the common causes of baby causes of hyperthermia

Scenario end