NEWBORN

Estimated Time: 40 minutes • Debriefing Time: 30 minutes

Scan to Begin

Mom's Name: Olivia Brooks

SCENARIO OVERVIEW

Olivia Brooks was induced at 41 6/7 weeks gestation. She labored for 23 hours and refused a fetal monitor. Baby Girls Brooks was delivered vaginally. She was limp with the cord around her neck and meconium was present. She required resuscitation and is intubated. Students are called to set up and initiate mechanical ventilation.

LEARNING OBJECTIVES

1. Demonstrate proper infection control
2. Perform a neonatal assessment/resuscitation per NRP guidelines
3. Recognize and respond to abnormal findings
4. Initiate and apply mechanical ventilation for a neonate
5. Effectively communicate with the interprofessional team
6. Document accurately

CURRICULUM MAPPING

WTCS RESPIRATORY THERAPY PROGRAM OUTCOMES

- Apply respiratory therapy concepts to patient care situations
- Demonstrate technical proficiency required to fulfill the role of a respiratory therapist
- Practice respiratory therapy according to established professional and ethical standards

RESPIRATORY SURVEY

- Perform pulse oximetry
- Review the medical record utilizing medical record keeping and charting methods consistent with hospital policy and procedures
- Utilize infection control principles
- Evaluate patient data
- Perform a basic cardiovascular assessment
- Perform a respiratory assessment
- Obtain vital signs

RESPIRATORY THERAPEUTICS I

- Perform procedures to assess oxygenation

- Evaluate oxygenation
- Demonstrate the use of medical gas equipment
- Assess the need for medical gas therapy

RESPIRATORY DISEASE

- Analyze signs, symptoms, etiology, pathogenesis and treatment for cardiovascular diseases/disorders

RESPIRATORY NEO/PEDS CARE

- Differentiate cardiopulmonary diseases/disorders of the neonatal/pediatric patient
- Evaluate cardiopulmonary status of the neonatal/pediatric patient
- Evaluate radiologic images of neck and chest

CLINICAL PRACTICE

- Apply standard precautions
- Assess vital signs
- Perform pulse oximetry
- Perform chart review
- Perform manual ventilation
- Perform mechanical ventilation of the neonate/pediatric patient

SIMULATION LEARNING ENVIRONMENT & SET-UP

ENVIRONMENT

Inside room: Baby on open-incubator/bed

Inside or outside room: Hand sanitizer and/or sink

Outside room: Computer or form(s) for documentation

PATIENT PROFILE

There is no patient profile as the baby was just born. Her name is Baby Girl Brooks.

EQUIPMENT/SUPPLIES/SETTINGS

Patient

- Moulaged to appear newly born (meconium stained towels are present in the bed)
- The neonate is intubated and being bagged. Resuscitation bag should be hooked up to a blender and pressure manometer.
- Should have an umbilical line.
- ID band with QR Code present

Monitor Settings

- Monitor applied when the neonate arrives to the nursery which is towards the end of State 1.
- Simulator vitals: HR = 142, RR = bagged at about 50 (no spontaneous efforts), BP = 72/46, Temp = 36.4, SpO2 = 93% using 40 % O2

Supplies

- General
    - Neonatal ECG patches
    - Respiratory Equipment
        - Neonatal resuscitation bag, blender, pressure manometer
        - Neonatal suction supplies

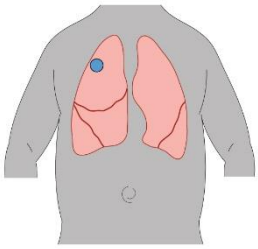
        - Neonatal pulse oximeter probe
        - Mechanical Ventilator
- Medications
    - Normal Saline IV bag – 1000 ml

QR CODES

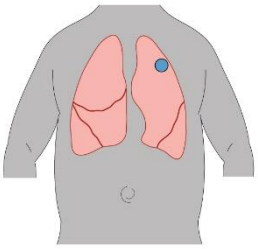
START	MOM	REPORT	PATIENT ID
FACILITATOR	DELIVERY	NORMAL SALINE	

CHEST QR CODES

Cut along the dotted lines. Fold along the solid line to create a bi-fold of the diagram and QR code.



ANTERIOR 2



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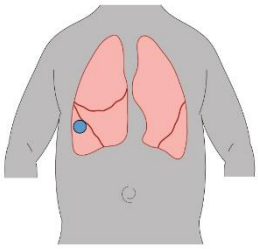

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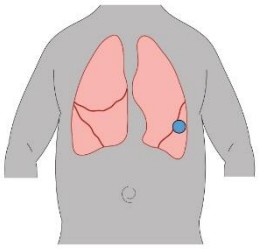
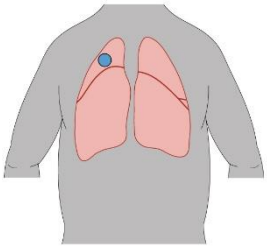
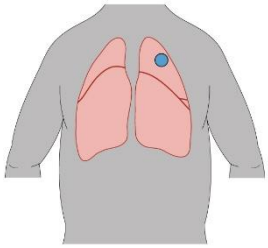


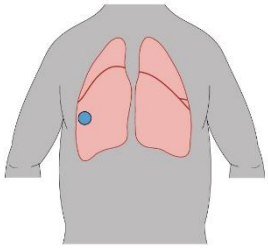
ANTERIOR 7



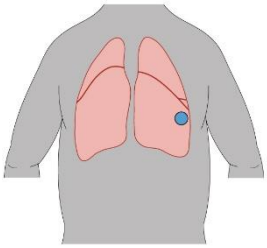
POSTERIOR 0



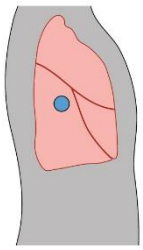
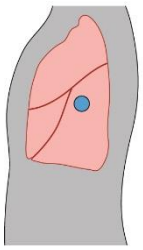
POSTERIOR 1



POSTERIOR 4



POSTERIOR 5

	
RIGHT AXILLARY 1	LEFT AXILLARY 1

TEACHING PLAN

PREBRIEF

The facilitator should lead this portion of the simulation. The following steps will guide you through Prebrief.

- Scan the **QR Code: "Scan to Begin"** while students are in Prebrief.
- "Meet the Mom" (on iPad) and explain how the iPad works in the simulated learning environment including:
    - Explain how to use the iPad scanner and QR codes. Remind students that there are multiple QR codes in the simulation, but they should only scan them if they think it will provide data necessary for their assessment and evaluation of the patient.
    - For some scenarios, it may be helpful to tell students where the QR code are located. For others, you may want students to "find" the QR codes during their assessments. This is your choice.
    - Describe how a QR code sound will work in the scenario. For the most authentic sound experience, student should use ear buds or the ARISE "stethoscope" for all QR codes with the following symbol: 🔈. Example: **QR Code: Chest Anterior 1** 🔈
    - As the facilitator, you should be aware that throughout the simulation some QR codes are necessary to the programming of the iPad content. Directions for which QR codes are required (to be scanned) in each state are listed under each state of the documentation below. The QR codes are also in **BOLD** type.
    - Level tab – This tab "tells" the content in the iPad to change to what is needed for the next state of a simulation. It is used a few times in this scenario after the provider is notified to display new orders (those just given over the phone) and lab results, etc.
    - Medication QR Codes – The student(s) must scan **QR Code: Patient ID** prior to scanning any medication. That scan is valid for 2 minutes and then it "times out." The student(s) will need to scan **QR Code: Patient ID** again to give more medications.
    - MAR Hyperlinks – On the MAR all medications are underlined and hyperlinked to DailyMed, which is a medication reference housed by the

National Library of Medicine. Students can click on these links during the simulation for up-to-date medication content, labels, and package insert information.

- Discuss the simulation "Learning Objective(s)" (on iPad) as well as any other Prebrief materials
- View "Video" of a vaginal delivery
    - Possible Facilitator Questions
        - What did you notice during the delivery?
        - What will the Delivery Team do for the neonate at this time?
- Get "Report" on iPad
    - Possible Facilitator Questions
        - What are your concerns at this time?
        - What did Felicia mean when she stated the baby was resuscitated?
        - How can meconium affect a neonate?
- View a plaque that reads, "Bring a mechanical ventilator to the Newborn Nursery."
- Tabbed iPad Prompts and Content
    - There is no tabbed content at this time. Students should bring a mechanical ventilator to the Newborn Nursery.

STATE 1

INITIATION OF MECHANICAL VENTILATION

- Patient Overview
    - Students are to bring a ventilator to the Newborn Nursery and set it up while awaiting the neonate's arrival. The neonates arrives after the ventilator is set up. There is still no iPad content.
- Expected Student Behaviors
    - Students should set up the mechanical ventilator, suction, etc… with the direction of the Facilitator.
        - The neonate's height and weight, gestation, APGARs', etc… are unknown at this time. Options:
            - The students could call the RT that gave report to get more information. See below.
            - An RN could bring the following data to the room as he/she sets up other needed equipment:
                - Height = 57.15 cm
                - Weight = 4.28 kg
                - Gestation = 41 6/7 weeks
                - The neonate required compressions and positive pressure on birth. APGAR's were 1 @ 1 minute and 4 @ 5 minutes.
                - 1 dose of surfactant was given about 5 minutes ago.
        - Possible Facilitator Questions
            - What information would be more helpful in setting up this ventilator?
            - What settings are appropriate for a full-term neonate?
            - What are the indications for surfactant? How does it work?
            - What is your plan when the neonate arrives?
            - What additional tests/procedures would you expect to be performed?

- Apply mechanical ventilator to the neonate
    - About 15 minutes into the scenario or whenever appropriate ventilator settings have been selected, the neonate arrives to the room and is transferred into the open incubator and connected to the ventilator and monitor.
    - To continue, students must scan **QR Code: Facilitator**
    - Facilitator Note: The iPad content is still not available.
- View a plaque entitled "Documentation" with text that reads, "Document initial assessment and ventilator check."
    - When continue is tapped, the iPad advances to a "fillable" ventilator flowsheet. The tabbed content becomes available at this time as well (see below).
- Students should perform a Neonatal Assessment and Ventilator Check and document on the provided fillable flowsheet.
    - Auscultation – Scan **QR Code: Chest**
        - There are ten QR codes to apply to the chest – see above Chest QR Code chart for locations
        - Students will hear the following breath sounds throughout all lung fields:
            - Faint inspiratory crackles with a low-pitched expiratory wheeze.
    - Optional: Review the 1 and 5 minute APGAR scores. An APGAR Protocol is available in the tabbed content as well.
    - Possible Facilitator Questions
        - How does the neonatal assessment differ from an adult assessment?
        - What settings are appropriate for a full-term neonate?
        - What are the indications for surfactant? How does it work?
        - What is your plan when the neonate arrives?
        - What additional tests/procedures would you expect to be performed?

- Tabbed iPad Prompts and Content
    - Scan **QR Code: Facilitator** to advance to State 2
    - This tabbed content is not available until towards the end of State 1. See progression of State 1 above.

HOME

As there is no Patient Profile yet (baby was just born), this screen is intentionally blank and a resting spot for the iPad.

VENTILATOR FLOWSHEET

This is the fillable ventilator flowsheet for documentation. A printable version is available in Appendix A. Dropdown menus are only available on the iPad.

APGAR SCORES

Patient Name	**DOB**	**MR#**
Baby Brooks	*Now*	*105115*
Allergies	**Height (cm)**	**Admission Weight (kg)**
NKDA		

APGAR Scores

5 Minute APGAR		**Score = 4**
Score of 0	Score of 1	Score of 2
blue or pale all over	blue at extremities; body pink (acrocyanosis)	~~no cyanosis; body and extremities pink~~
absent	< 100 beats per minute	> 100 beats per minute
no response to stimulation	grimace on suction or aggressive stimulation	cry ~~on stimulation~~
none	some flexion	flexed arms and legs that resist extension
absent	weak, irregular, gasping	strong, robust cry

1 Minute APGAR		Score = 1
Score of 0	Score of 1	Score of 2
blue or pale all over	blue at extremities; body pink (acrocyanosis)	no cyanosis; body and extremities pink
absent	< 100 beats per minute	> 100 beats per minute
no response to stimulation	grimace on suction or aggressive stimulation	cry on stimulation
none	some flexion	flexed arms and legs that resist extension
absent	weak, irregular, gasping	strong, robust cry

APGAR PROTOCOL

APGAR

	Score of 0	Score of 1	Score of 2
Appearance (Skin Color)	blue or pale all over	blue at extremities; body pink (acrocyanosis)	no cyanosis; body and extremities pink
Pulse	absent	< 100 beats per minute	> 100 beats per minute
Grimace	no response to stimulation	grimace on suction or aggressive stimulation	cry on stimulation
Activity	none	some flexion	flexed arms and legs that resist extension
Respiratory Effort	absent	weak, irregular, gasping	strong, robust cry

Scores 7 and above = generally normal

Scores 4 to 6 = fairly low

Scores 3 and below = critically low

Adapted from: Wikipedia, Apgar score

LEVEL 1

The iPad reads, “The iPad is at Level 1.”

SCANNER

Use this to scan available QR Codes.

EXIT

The iPad reads, “Are you sure you want to exit? All data will be lost.”

- If “No” is selected, the iPad will return to the tabbed content.
- If “Yes” is selected, the iPad will let the student(s) exit and prompt them to complete an embedded 3-5 minute survey.

STATE 2

LABS AND IMAGING

- Patient Overview
    - Labs and a chest x-ray have resulted.
- Expected Student Behaviors
    - View a plaque entitled “Tests have Resulted” with text that reads, “Labs and imaging are available.”
        - Students should evaluate the labs and imaging.
            - Facilitator Note: The labs are from 10 minutes after birth.
        - Possible Facilitator Questions:
            - Describe pre-ductal SpO2 readings within the first 10 minutes of birth.
            - Discuss the chest x-ray.
            - What is the prognosis and/or plan moving forward?
            - What determines when the patient is ready to be weaned?
            - How do we determine if another dose of surfactant is indicated?
    - Optional: Students could call the provider to recommend updated labs to help with ventilator management.
    - Scan **QR Code: Facilitator** to advance.
        - View message, “You have been approved to Proceed.”
    - After the Facilitator Code is scanned, view a plaque entitled, “Mechanical Ventilation” with an image of the neonate intubated and on mechanical ventilation with text that reads, “Surfactant administration was successful. Baby was placed on conventional mechanical ventilation and is only requiring 25-30% O2. Repeat chest x-ray is pending.”
        - Facilitator Note: The infant is nasally intubated in the image.
- Technician Prompts
    - Nothing required for the patient.

- Someone can play the role of the Provider if students choose to recommend updated labs be drawn.

- Tabbed iPad Prompts and Content
  - When continue is tapped on the "Mechanical Ventilation" plaque, view a message that reads, "You have been approved to Proceed. You have completed the learning objectives for this scenario and may exit.

LABS-DIAGNOSTICS

Patient Name	DOB	MR#
Baby Girl Brooks	*Today*	*105115*
Allergies	**Height (cm)**	**Admission Weight (kg)**
NKDA	*57.15*	*4.28*

Laboratory Results

CBC				
	10 minutes after birth	[time]	Units	Reference Range
WBC	**31.2**		$x10^3uL$	9.0-30.0
RBC	5.2		$x10^6uL$	3.9-5.9
Hgb	15.2		g/dL	13.4-19.9
HCT	56		%	42-65
MCV	102		fL	88-123
Platelet	262		$x10^9uL$	150-350

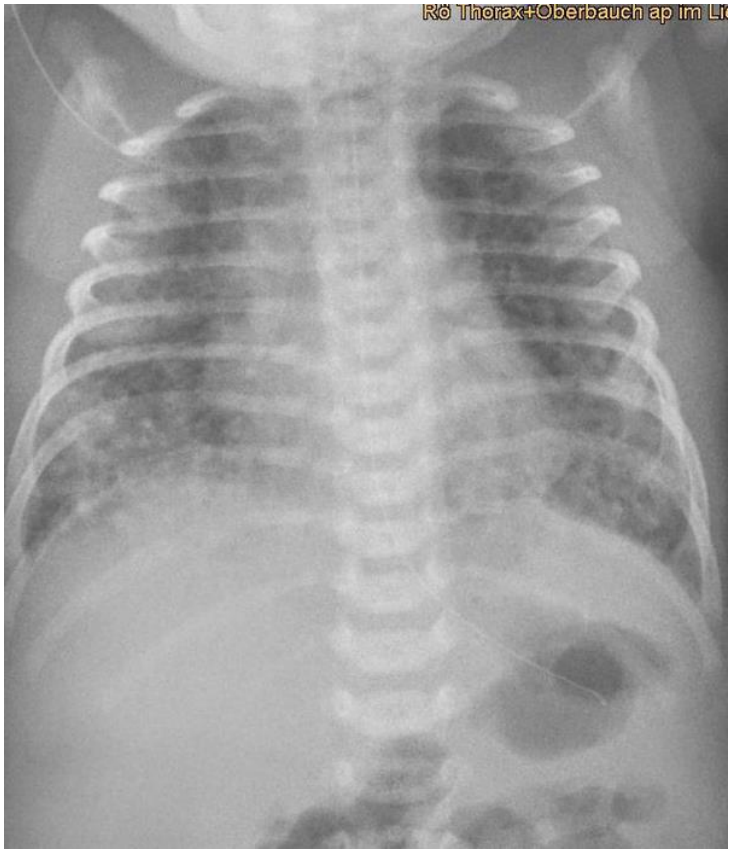
Electrolytes				
	10 minutes after birth	[time]	Units	*** **Cord Blood Reference Ranges** ***
Glucose	31		mg/dL	29-120
Sodium	**128**		mEq/L	129-144
Potassium	3.9		mEq/L	3.4-9.9
Calcium	2.2		mmol/L	2.1-2.8

Chloride	16		mEq/L	15-20

Arterial Blood Gas (ABG)				
	10 minutes after birth	[time]	Units	*** **UA Reference Ranges** ***
pH	**6.98**			7.15-7.38
$PaCO_2$	**71**		mmHg	32-68
PaO_2	**4**		mmHg	6-31
HCO_3	**13.2**		mEq/L	15.4-26.8
Base Excess	**-11.3**		mEq/L	-8.1-0.9

Blood Culture				
	10 minutes after birth	[time]	Units	Reference Range
Bacterial Growth	pending			No Growth

IMAGING



LEVEL 2/EXIT

- When the Level 2 tab is tapped, the iPad reads, “The iPad is at Level 2.”
- The Level 2 tab will automatically disappear after **QR Code: Facilitator** is scanned.
- When the Exit tab is tapped the iPad reads, “Scenario objectives have been met. Are you sure you want to exit the game?”
    - If “No” is selected, the iPad will return to the tabbed content.
    - If “Yes” is selected, the iPad will let the student(s) exit and prompt them to complete an embedded 3-5 minute survey.

DEBRIEF

Nothing needed from the iPad.

QUESTIONS

1. How did you feel this scenario went?
2. What were the main issues you had to deal with when caring for Baby Brooks?
3. Review understanding of learning objective: Demonstrate proper infection control.
    a. What infection control issues did you encounter?
    b. What is your role in assuring infection control procedures are followed during a resuscitation?
    c. What infectious concerns do you have for Baby Brooks?
4. Review understanding of learning objective: Perform a neonatal assessment/resuscitation per NRP guidelines.
    a. What, if any, challenges did you encounter during your assessments of Baby Brooks?
    b. How do vitals differ in the newborn population?
    c. How does the infant's oxygenation status change after birth?
    d. If you could "do over," what would you change about this neonatal assessment?
5. Review understanding of learning objective: Recognize and respond to abnormal findings.
    a. Explain the APGAR scores, Labs, and Imaging results. Are they what you expected? Why or Why not?
    b. Are there any other labs/tests/procedures that would be useful in determining the status of Baby Girl Brooks? Why?
    c. Discuss any abnormal patient ventilator values.
6. Review understanding of learning objective: Initiate and apply mechanical ventilation for a neonate.
    a. What problems, if any, did you encounter when setting up and/or applying the mechanical ventilator?

   b. If you could "do over," what would you change about the initiation and application of mechanical ventilation for this neonate?

7. Review understanding of learning objective: Effectively communicate with interprofessional team.

   a. Were the communication techniques you used with the team effective? Why or Why not?

   b. If you could "do over," how would you change your communication with the team?

8. Review understanding of learning objective: Document accurately.

   a. What is important to document in your assessments and interventions?

9. Summary/Take Away Points

   a. "Today you initiate and applied mechanical ventilation for a newborn patient who needed resuscitation and surfactant administration following a vaginal delivery with meconium at 41 6/7 weeks. What is one thing you learned from participating in this scenario that you will take with you into your respiratory therapy practice?" (Each student must share something different from what the others' share.)

Note: Debriefing technique is based on INASCL Standard for Debriefing and NLN Theory Based Debriefing by Dreifuerst.

SURVEY

Print this page and provide to students.

Students, please complete a brief (2-3 minute) survey regarding your experience with this ARISE simulation. There are two options:

1. Use QR Code: Survey
    a. Note: You will need to download a QR Code reader/scanner onto your own device (smartphone or tablet). There are multiple free scanner apps available for both Android and Apple devices from the app store.
    b. This QR Code will not work in the ARIS app.

SURVEY

2. Copy and paste the following survey link into your browser.
    a. https://ircvtc.co1.qualtrics.com/SE/?SID=SV_6Mwfv98ShBfRnBX

APPENDIX A

Patient Name	DOB	MR#
Baby Girl Brooks	*Today*	*105115*
Allergies	**Height (cm)**	**Admission Weight (kg)**
NKDA	*57.15*	*4.28*

Respiratory Therapy – Ventilator Care Flowsheet

*** Blank field = not assessed ***

Patient Assessment	[time]	[time]	[time]	[time]
Heart Rate				
Respiratory Rate				
BP Systolic				
BP Diastolic				
Temperature (°C)				
O2 Saturation (%)				
Level of Consciousness				
Color				
Lung Sounds – RUL				
Lung Sounds – RML				
Lung Sounds – RLL				
Lung Sounds – LUL				
Lung Sounds – LLL				

Airway Assessment	[time]	[time]	[time]	[time]
Airway/Mask Type				
Airway/Mask Size				
ETT Location Number				
ETT Location				
ETT Relocated (✓)				
Secure & Patent (✓)				
Cuff Pressure (cmH20)				
Oral Care Completed (✓)				
Oral Secretions				

Tracheal Secretions				

Ventilator Bundle	[time]	[time]	[time]	[time]
HOB > 30°				
Daily Sedation Vacation				
Assess Weaning Readiness				
PUD Prophylaxis				
DVT Prophylaxis				

Ventilator Assessment	[time]	[time]	[time]	[time]
Vent/BiPAP				
Mode				
Set Rate				
Total Rate				
Set V_T (ml)				
Expiratory V_T (ml)				
Spontaneous V_T (ml)				
Exhaled Ve (lpm)				
Set PS or PC (cmH2O)				
O2 (%)				
Set IPAP				
Set PEEP (cmH2O)				
Total PEEP (cmH2O)				
PIP (cmH2O)				
Plateau (cmH2O)				
MAP (cmH2O)				
C_L-Static (ml/cmH2O)				
C_L-Dynamic (ml/cmH2O)				
Raw (cm H20/L/sec)				
Peak Flow (lpm)				
Waveform				
Inspiratory Time				

I:E Ratio (of set rate)				
Sensitivity				
All Alarms On & Set (✓)				
Bag/Mask @ bedside (✓)				

CREDITS

Neonatal Pneumonia Chest X-ray has been adapted from Case 2 by Dr Aneta Kecler-Pietrzyk at https://radiopaedia.org/articles/neonatal-pneumonia

Lung sounds used with permission from Thinklabs Medical, LLC, Centennial, CO at www.thinklabs.com

Medication information from National Library of Medicine: Daily Med at http://dailymed.nlm.nih.gov/dailymed/

Retractions, IV and Pulse Oximetry images purchased from Shutterstock

Delivery video purchased from Shutterstock

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