

Educational Focus

Scenario Outline

This scenario targets ventilation corrective steps, intubation, and use of the tracheal aspirator to clear thick secretions from the trachea. After a vaginal birth, the newborn is apneic and requires PPV. No chest movement with ventilation is achieved despite all ventilation corrective steps, including intubation. The newborn requires tracheal suction with a tracheal aspirator to clear the airway obstruction. After tracheal suction followed by PPV that inflates the lungs, the newborn recovers a heart rate over 100 bpm and spontaneous breathing, but requires supplemental oxygen until the target oxygen saturation is reached. The learners are expected to prepare for the birth by asking the 4 pre-birth questions, assembling a resuscitation team based on perinatal risk, conducting a team briefing and performing the equipment check.

Learning Objectives

Upon completion of the simulation, the learners will be able to:

- Demonstrate progression through the ventilation corrective steps (including correct positioning of an endotracheal tube) in an attempt to establish ventilation that moves the chest
- Recognize signs of airway obstruction
- Use a cardiac monitor for accurate assessment of heart rate if pulse oximetry is not functioning, if the baby's heart rate is low, or if the baby has poor perfusion
- Demonstrate correct technique for use of the tracheal aspirator to clear suspected airway obstruction

Debriefing Points

Points for discussion during debriefing could include:

- Indications for tracheal suction
- How the scribe can help ensure that resuscitation events are following the sequence of the NRP Algorithm
- How the team can help the scribe document events accurately
- Use of NRP Key Behavioral Skills

Reference Materials

Textbook of Neonatal Resuscitation, 8th edition, Lesson 5: Endotracheal Intubation

Setup & Simulation

Equipment

For setup:

- Damp, lightly blood-stained blanket or towel
- Segment of simulated umbilical cord
- Simulated amniotic fluid or water
- Simulated blood

For use during simulation:

- All items included in the NRP Quick Equipment Checklist
- Umbilical cord clamps

Setup & Preparation

- Setting: Delivery room.
- Moisten the simulator's skin with simulated amniotic fluid and blood and insert the umbilical cord segment into the abdomen.
- Wrap the simulator in a damp, lightly blood-stained blanket or towel, without a diaper, and place it under a blanket or towel on the mother's abdomen.

Learner Brief

Provide this information to the participants as they enter the simulation:

You have been asked to attend the vaginal birth of a term newborn. The OB provider is present. Please prepare for the birth.

Additional Information

Provide this information to the participants, if asked during simulation:

Gestational age:	39 weeks
Amniotic fluid:	Clear
Additional risk factors:	Healthy pregnancy. Labor has progressed with no problems, and mother has been pushing for over 2 hours.
Estimated fetal weight:	3500 g (7 lb 11 oz).
Umbilical cord management plan:	Plan to delay cord clamping for 30-60 seconds if baby is vigorous

CRITICAL PERFORMANCE STEPS

- ❑ **Ask the 4 pre-birth questions to assess perinatal risk:**
 - What is the expected gestational age?
 - Is the amniotic fluid clear?
 - Are there additional risk factors?
 - What is our umbilical cord management plan?
- ❑ **Conduct pre-birth team briefing:**
 - Assemble team based on perinatal risk. Team may be one person, due to no identified perinatal risk factors.
- ❑ **Perform equipment check**
- ❑ **Apply gloves and personal protective equipment**

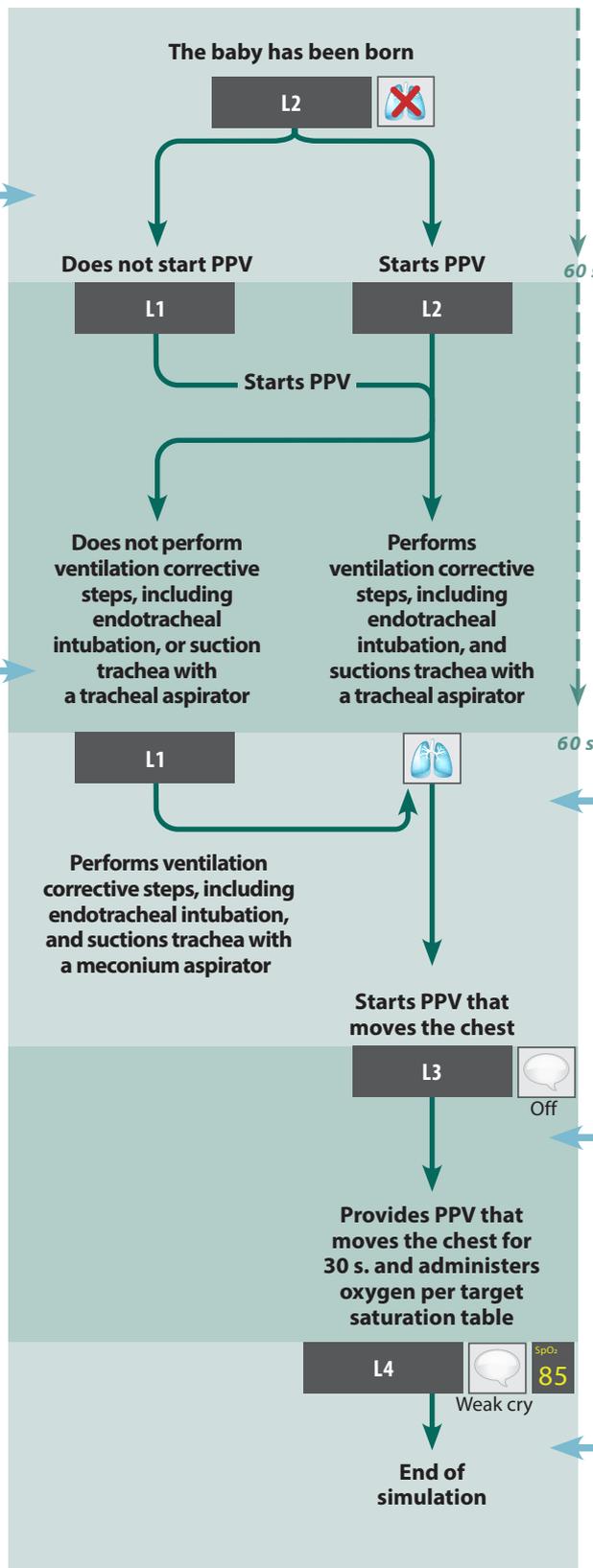
- ❑ **Ask the 3 rapid evaluation questions:**
 - Term?
 - Good muscle tone?
 - Breathing or crying?
- ❑ **Move infant to radiant warmer for initial steps of newborn care**
- ❑ **Perform initial steps of newborn care:**
 - Provide warmth, dry (and remove wet linen), put hat on baby's head, and stimulate
 - Position head and neck in sniffing position
 - Clear secretions from mouth and nose with bulb syringe, anticipating PPV
- ❑ **Evaluate breathing**
- ❑ **Initiate positive-pressure ventilation with 21% oxygen within 60 seconds of birth**

- ❑ **Call for additional assistance with PPV**
- ❑ **Attach pulse oximeter sensor to right hand or wrist**
- ❑ **Request cardiac monitor (optional)**
- ❑ **Document resuscitation events.** The scribe may note 30-60 second time intervals for checking HR and oxygen saturation
- ❑ **Check HR after the first 15 seconds of PPV**
- ❑ **Announce, "HR is less than 100 bpm and not increasing. Chest is not moving."**
- ❑ **Start ventilation corrective steps (MR. SOPA)**
 - Mask Adjustment, Reposition head into sniffing position.
 - Attempt PPV (for 5 breaths). If no chest movement:
 - Suction mouth and nose, Open mouth. Attempt PPV (for 5 breaths). If no chest movement:
 - Increase peak inspiratory Pressure by 5-10 cm H₂O (to maximum of 40 cm H₂O)
 - Attempt PPV (for 5 breaths after each pressure increase). If no chest movement, insert Alternative airway:
 - Use a cardiac monitor in addition to the pulse oximeter for accurate HR assessment
 - Intubate newborn with a 3.5 size endotracheal tube
 - Confirm placement by observing for symmetrical chest movement, bilateral breath sounds
 - Ensure proper depth by using NTL measurement or initial ET tube insertion depth table
 - Increase pressure to by 5-10 cm H₂O to maximum of 40 cm H₂O
- ❑ **Connect tracheal aspirator to ET tube and apply continuous suction of 80-100 mm Hg while withdrawing tracheal aspirator over 3-5 seconds**

Scenario Progression

Before delivery

Vaginal birth • 39 weeks gestation • Clear amniotic fluid • Healthy pregnancy. Labor has progressed with no problems, and mother has been pushing for over 2 hours • Estimated birth weight 3500 g
 • Plan to delay cord clamping for 30-60 seconds



CRITICAL PERFORMANCE STEPS

- ❑ **Re-attempt ventilation with face mask and PPV device** (or resume PPV by quickly re-intubating or inserting a laryngeal mask)
- ❑ **Assess for rising HR and chest movement with PPV**
- ❑ **Perform ventilation corrective steps if necessary until chest movement is achieved.**
- ❑ **When chest movement occurs with ventilation, announce, "Chest is moving NOW. Continue PPV for 30 seconds."**
- ❑ **Continue PPV that moves the chest for 30 seconds**
- ❑ **Monitor HR and respiratory effort**
- ❑ **Adjust oxygen concentration per target oxygen saturation table**
- ❑ **Re-assess HR after 30 seconds of PPV that moves the chest**
- ❑ **Decrease ventilation rate and pressure as newborn begins spontaneous respiration**
- ❑ **Discontinue PPV when baby is breathing spontaneously and sustaining a heart rate above 100 bpm**
- ❑ **Wean oxygen as oxygen saturation improves, and discontinue oxygen when in target range**
- ❑ **Continue to monitor newborn's respirations, HR, oxygen saturation, tone, and activity**
- ❑ **Plan appropriate post-resuscitation care**
- ❑ **Communicate effectively with the medical team and mother**
- ❑ **Perform post-resuscitation debriefing**