Newborn in need of ppv

**Target group**: Healthcare with responsibilities in labor, delivery, and neonatal resuscitation

**Number of** **Participants**: 1-2 participants **Simulation time**: 10 minutes **Debriefing time**: 15-20 minutes

# Curricular Information

## Learning Objectives

After completion of the simulation and debriefing session, the participants will be able to:

* Perform initial assessment of a newborn and identify the need to perform neonatal resuscitation per local guidelines
* Utilize warming and drying of the newborn and assess the efficacy of these actions
* Recognize the need for immediate positive-pressure ventilation
* Perform immediate positive-pressure ventilation and assess the efficacy of these actions, providing rationale for actions if prompted.

## Scenario Focus

The scenario presents a single, full-term, newborn boy, delivered vaginally after an uncomplicated pregnancy. The infant is non-vigorous, and the learner should immediately clamp the cord and perform initial steps at the radiant warmer. Following this, the learner should recognize low heart rate and decreased breathing efforts, and immediately start positive-pressure ventilation (PPV).

## Scenario Progression

The simulation starts right after delivery where the boy appears limp with slow, shallow breathing, and no crying at initial assessment. HR is 76/min and RR 5/min. The cord should be clamped immediately, and the baby moved to the radiant warmer for initial interventions.

Suctioning and drying the baby has no effect, and the participant should call for help and start PPV immediately. After 15 seconds of continuous ventilation, the heart rate starts to rise and after 30 seconds the baby gets tone and starts grunting. Vital signs will improve during the next minute, and oxygen saturation will end at 90% after 5 minutes

If the participants stop PPV abruptly, the baby’s improvement will stop, and he will start deteriorating slowly until PPV is started again.

At any time during initial assessments, the instructor can use the event “No timely treatment” to prompt the participants to intervene. This event will start a deterioration trend of the vital signs until the needed interventions are performed.

## Debriefing

When the simulation is over, it is recommended that a facilitator-led debriefing be completed to discuss topics related to the learning objectives. The Event Log in Session Viewer provides suggested debriefing questions. Central discussion points could be:

* The signs and symptoms of this baby needing assisted ventilation
* Different methods of providing ventilations
* Indications for and against endotracheal intubation in this case

## References

Wyllie J, Perlman JM, Kattwinkel J, Wyckoff MH, Aziz K, Guinsburg R, Kim H-S, Liley HG, Mildenhall L, Simon WM, Szyld E, Tamura M, Velaphi S, on behalf of the Neonatal Resuscitation Chapter Collaborators. Part 7: Neonatal resuscitation: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Resuscitation,* 2015;95:e169–e201, at <https://www.resuscitationjournal.com/article/S0300-9572(15)00366-4/fulltext>

# Setup and preparation

## Equipment

* Baby hat
* Blankets
* Bulb syringe
* Oxygen blender
* Patient monitor
* Pulse oximeter
* Radiant warmer
* Segment of simulated umbilical cord
* Stethoscope
* Target oxygen saturation table
* Towels
* T-piece resuscitator or simple mask and equipment for providing PPV
* Umbilical cord clamp

## Preparation Before Simulation

* Setup the room to look as a normal delivery room with all equipment ready and the radiant warmer plugged in.
* Insert the standard umbilical cord segment into the abdomen of SimNewB, unclamped.

## Learner Brief

*The learner brief should be read out loud to the learners before the simulation starts.*

You have just assisted a 42-years-old woman in delivering a term baby boy after 20 hours in unstable labor. Membranes ruptured 2 hours ago, where after contractions increased heavily in intensity and duration. The amniotic fluid was clear. Fetal heart rate declined slightly during contractions the last 20 minutes before birth.

You have just received the baby in your arms, ready for your initial assessment before handing him to the mother.

Before the simulation starts, please orient yourself to the birthing room and the available equipment.

# Customization of the Scenario

The scenario may form the basis for creating new scenarios with other or additional learning objectives. Making changes to an existing scenario requires careful consideration of what interventions you expect the learners to demonstrate, and what changes you will need to make to learning objectives, progression of scenario, programming and support material. It is, however, a quick way to increase your pool of scenarios because you can reuse much of the patient information and several elements in the scenario programming and support material.

For inspiration, here are some suggestions to how this scenario can be customized:

|  |  |
| --- | --- |
| **New learning objectives** | **Changes to the scenario** |
| Adding to the fidelity | To create a more realistic setting, you can add extra props like:   * Bloodstained towels * Gloves * Simulated amniotic fluid * Simulated blood   You can also add a mother giving birth or a relative, acted by standardized participants or fellow participants. This person should be instructed to play nervous and attentive without taking over the simulation with too much disturbance. |
| Include learning objectives on team training | This scenario could support team training for 2 participants by changing the patient story to indicate risk factors; for instance, changing the status of the amniotic fluid from clear to meconium-stained when membranes ruptured in the patient story. Remember to change the learner brief and add your wanted events for logging team-related actions. |
| Include learning objectives on communication | If you wish to train in communication with relatives during resuscitation, you can add a standardized patient or fellow participant to act as a relative who ask questions during simulation. Remember, to add the needed information in the learner brief and add your wanted events for logging communication-related actions. |
| Include learning objectives on prenatal preparation | If training in prenatal preparation, you can add time before the delivery for the participant to gather information to help anticipate any risk factors, to brief any additional team members if needed, and to check equipment. Remember to change the learner brief accordingly and add a pre-birth state to the programming with your wanted preparation-events. |