



# Summary AAP/AHA

## 2015 Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care of the Neonate

On October 15, 2015, the American Heart Association (AHA) and American Academy of Pediatrics released new 2015 Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care of the Neonate. The guidelines serve as foundation for the Neonatal Resuscitation Program® (NRP®) 7th edition materials that will be released in Spring 2016 and must be in use by January 1, 2017.



The guidelines are based on a rigorous, 5-year, evidence-based topic review by the International Liaison Committee on Resuscitation (ILCOR), reflected in their Consensus on Science and Treatment Recommendations (CoSTR) also released on October 15, and represent thousands of hours of preparation, review, and oftentimes spirited debate.

The NRP Steering Committee has prepared the following summary that highlights the major changes. The full ILCOR CoSTR and guidelines can be viewed online at [eccguidelines.heart.org](http://eccguidelines.heart.org).

### Initial Steps of Newborn Care

- Meconium-stained amniotic fluid is a perinatal risk factor that requires at least 2 team members at the birth. A person with intubation skills should be immediately available. If additional risk factors increase the likelihood of an extensive resuscitation, a team with full resuscitation skills should attend the birth.
- Current evidence suggests that cord clamping should be delayed for at least 30 to 60 seconds for most vigorous term and preterm newborns. If placental circulation is not intact, such as after a placental abruption, bleeding placenta previa, bleeding vasa previa, or cord avulsion, the cord should be clamped immediately after birth. There is insufficient evidence to recommend an approach to cord clamping for newborns who require resuscitation at birth.

### Oxygen Use

- Resuscitation of newborns greater than or equal to 35 weeks' gestation begins with 21% oxygen (room air). Resuscitation of newborns less than 35 weeks' gestation begins with 21% to 30% oxygen.
- If a baby is breathing but oxygen saturation (SpO<sub>2</sub>) is not within target range, free-flow oxygen administration may begin at 30%. Adjust the flowmeter to 10 L/min. Using the blender, adjust oxygen concentration as needed to achieve the oxygen saturation (SpO<sub>2</sub>) target.
- Free-flow oxygen cannot be given through the mask of a self-inflating bag; however, it may be given through the tail of an open reservoir.

- If the newborn has labored breathing or SpO<sub>2</sub> cannot be maintained within target range despite 100% free-flow oxygen, consider a trial of continuous positive airway pressure (CPAP).

### Positive-pressure Ventilation

- After completing the initial steps, PPV is indicated if a newborn is apneic or gasping or the heart rate is less than 100 beats/min. A trial of PPV may be considered if the baby is breathing and the heart rate is more than 100 beats/min but oxygen saturation (SpO<sub>2</sub>) cannot be maintained within target range despite free-flow oxygen or CPAP.
- For PPV, adjust the flowmeter to 10 L/min.
- Initial ventilation pressure is 20 to 25 cm H<sub>2</sub>O. When PEEP is used, the recommended initial setting is 5 cm H<sub>2</sub>O.
- If PPV is required for resuscitation of a preterm newborn, it is preferable to use a device that can provide PEEP. Using PEEP (5 cm H<sub>2</sub>O) helps the baby's lungs remain inflated between positive pressure breaths.
- When PPV begins, consider using an electronic cardiac monitor for accurate assessment of the heart rate.
- The most important indicator of successful PPV is a rising heart rate. If the heart rate does not increase, PPV that inflates the lungs is evidenced by chest movement with ventilation. After intubation or laryngeal mask placement, inflation of the lungs is assessed by chest movement *and* bilateral breath sounds with ventilation.
- When PPV begins, the assistant listens for increasing heart rate for the first 15 seconds of PPV.
- If you are attempting PPV but the baby is not improving and the chest is not moving despite performing each of the ventilation corrective steps (MR. SOPA), including intubation, the trachea may be obstructed by thick secretions. Suction the trachea using a suction catheter inserted through the endotracheal tube or directly suction the trachea with a meconium aspirator.

Continued on reverse side. >>

JANUARY 1st  
**2017**



**January 1, 2017, is the NRP 7th edition implementation date.**

By January 1, all institutions and learners should be utilizing the 7th edition of the NRP.

### Endotracheal Intubation and Laryngeal Masks

- Intubation is strongly recommended prior to beginning chest compressions. If intubation is not successful or not feasible, a laryngeal mask may be used.
- Newborns greater than 2 kg and greater than 34 weeks' gestation require a size 3.5 endotracheal tube. The size 4.0 endotracheal tube is no longer listed on the NRP Quick Equipment Checklist.
- The vocal cord guide on the endotracheal tube is only an approximation and may not reliably indicate the correct insertion depth. The tip-to-lip measurement, or depth of the endotracheal tube, is determined by using the "Initial Endotracheal Tube Insertion Depth" table or by measuring the nasal-tragus length (NTL).

### Chest Compressions

- Chest compressions are indicated when the heart rate remains less than 60 beats/min after at least 30 seconds of PPV that inflates the lungs, as evidenced by chest movement with ventilation. In most cases, you should have given at least 30 seconds of ventilation through a properly inserted endotracheal tube or laryngeal mask.
- Chest compressions are administered with the 2-thumb technique. Once the endotracheal tube or laryngeal mask is secured, the compressor administers chest compressions from the head of the newborn and the person delivering ventilation via endotracheal tube or laryngeal mask moves to the side to make room for the compressor at the head of the newborn.
- An electronic cardiac monitor is the preferred method for assessing heart rate during chest compressions.
- Chest compressions continue for 60 seconds prior to checking a heart rate.

### Medication

- Epinephrine is indicated if the newborn's heart rate remains less than 60 beats/min after at least 30 seconds of PPV that inflates the lungs (moves the chest), preferably through a properly inserted endotracheal tube or laryngeal mask, *and* another 60 seconds of chest compressions coordinated with PPV using 100% oxygen. Epinephrine is *not* indicated before you have established ventilation that effectively inflates the lungs.
- One endotracheal dose of epinephrine may be considered while vascular access is being established. If the first dose is given by the ET route and the response is not satisfactory, a repeat dose should be given as soon as emergency umbilical venous catheter (UVC) or intraosseous access is obtained (do not wait 3–5 minutes after the endotracheal dose).
- The recommended solution for acutely treating hypovolemia is 0.9% NaCl (normal saline) or type-O Rh-negative blood. Ringer's Lactate solution is no longer recommended for treating hypovolemia.

- The umbilical venous catheter is the preferred method of obtaining emergency vascular access in the delivery room, but the intraosseous needle is a reasonable alternative. All medications and fluids that can be infused into an umbilical venous catheter can be infused into an intraosseous needle in term and preterm newborns.
- Sodium bicarbonate should not be routinely given to babies with metabolic acidosis. There is currently no evidence to support this routine practice.
- There is insufficient evidence to evaluate safety and efficacy of administering naloxone to a newborn with respiratory depression due to maternal opiate exposure. Animal studies and case reports cite complications from naloxone, including pulmonary edema, cardiac arrest, and seizures.

### Thermoregulation and Stabilization of Babies Born Preterm

- In preparation for the birth of a preterm newborn, increase temperature in the room where the baby will receive initial care to approximately 23°C to 25°C (74°F–77°F).
- The goal is an axillary temperature between 36.5°C and 37.5°C.
- If the anticipated gestational age is less than 32 weeks,
  - ▮ Additional thermoregulation interventions, such as plastic wrap or bag and thermal mattress and hat, are recommended.
  - ▮ A 3-lead electronic cardiac monitor with chest or limb leads provides a rapid and reliable method of continuously displaying the baby's heart rate if the pulse oximeter has difficulty acquiring a stable signal.
  - ▮ A resuscitation device capable of providing PEEP and CPAP, such as a T-piece resuscitator or flow-inflating bag, is preferred.
- If the anticipated gestational age is less than 30 weeks, consider having surfactant available. Consider administering surfactant if the baby requires intubation for respiratory distress or is extremely preterm.

### Ethics and Care at the End of Life

- If responsible physicians believe that the baby has no chance for survival, initiation of resuscitation is not an ethical treatment option and should not be offered. Examples include birth at a confirmed gestational age of less than 22 weeks' gestation and some congenital malformations and chromosomal anomalies.
- In conditions associated with a high risk of mortality or significant burden of morbidity for the baby, caregivers should allow parents to participate in decisions whether resuscitation is in their baby's best interest. Examples include birth between 22 and 24 weeks' gestation and some serious congenital and chromosomal anomalies.

### Keep in Mind

- **January 1, 2017, is the NRP 7th edition implementation date. By January 1, all institutions and learners should be utilizing the 7th edition of the NRP.**