

2015 New Neonatal Resuscitation Guidelines

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Case Presentation

A 1700-g, low-birth-weight, preterm infant was born at 32 weeks gestation. At delivery, the infant was not breathing or crying, and had poor tone. The umbilical cord was clamped immediately, and the infant was warmed to a stable, normal temperature and dried. The airway was positioned, and secretions were cleared. Unsuccessful efforts were made to stimulate the infant. On initial auscultation, the infant's heart rate was 45 bpm, and positive pressure ventilation (PPV) was initiated. After 30 seconds of PPV, there was no change in heart rate. Corrective steps (mask adjustment, repositioning, etc) were taken to ensure effective ventilation was being achieved, but repeat ventilation failed to increase the infant's heart rate above 60 bpm. The infant was intubated, an ECG monitor placed, and chest compressions initiated. After 60 seconds of compressions, the infant's heart rate had not increased. Intravenous epinephrine was administered and another 60 seconds of compressions performed, which increased the heart rate to >60 bpm.

Discussion Items

- Has your institution adopted the 2015 Neonatal Resuscitation Guidelines? If not, when will they be adopted? Is there a transition plan in place for adopting the new recommendations?
- What are your initial steps when a preterm infant is born and is not breathing or crying? Do your procedures differ for full-term infants?
- Do you routinely perform suction and intubation in non-vigorous, meconium-exposed infants?
- At what point do you clamp the cord in pre- and full-term infants? Do you delay cord clamping in infants who are born requiring resuscitation?
- How do you assess the effectiveness of ventilation? Do you use the MR SOPA schema?
- How do you initially assess an infant's heart rate? Do you use auscultation or palpation of the umbilical cord?
- Do you intubate prior to chest compressions?
- Do you use electronic cardiac monitors after initiating PPV? After initiating chest compressions?
- When do you use epinephrine?
- How do you administer epinephrine? Intravenously or via endotracheal route?
- Does your team hold a postresuscitation debriefing?

Suggested Readings and Resources

1. Balaguer A, Escribano J, Roqué i Figuls M, Rivas-Fernandez M. Infant position in neonates receiving mechanical ventilation. *Cochrane Database Syst Rev*. 2013 Mar 28;3:CD003668.
2. Bamat N, Millar D, Suh S, Kirpalani H. Positive end expiratory pressure for preterm infants requiring conventional mechanical ventilation for respiratory distress syndrome or bronchopulmonary dysplasia. *Cochrane Database Syst Rev*. 2012 Jan 18;1:CD004500. doi: 10.1002/14651858.CD004500.pub2. Review. PubMed PMID: 22258957.
3. Bayer K. Delayed Umbilical Cord Clamping in the 21st Century: Indications for Practice. *Adv Neonatal Care*. 2016 Feb;16(1):6-73.
4. Bhandari V. Noninvasive respiratory support in the preterm infant. *Clin Perinatol*. 2012 Sep;39(3):497-511.
5. Bhandari V. The potential of non-invasive ventilation to decrease BPD. *Semin Perinatol*. 2013 Apr;37(2):108-14.
6. Chettri S, Adhisivam B, Bhat BV. Endotracheal Suction for Nonvigorous Neonates Born through Meconium Stained Amniotic Fluid: A Randomized Controlled Trial. *J Pediatr*. 2015 May;166(5):1208-1213.e1.
7. Chiruvolu A, Tolia VN, Qin H, et al. Effect of delayed cord clamping on very preterm infants. *Am J Obstet Gynecol*. 2015 Nov;213(5):676.e1-7.
8. Elimian A, Goodman J, Escobedo M, Nightingale L, Knudtson E, Williams M. Immediate compared with delayed cord clamping in the preterm neonate: a randomized controlled trial. *Obstet Gynecol*. 2014 Dec;124(6):1075-9.
9. Halbertsma FJ, Mohns T, Bok LA, Niemarkt HJ, Kramer BW. Prevalence of systemic air-embolism after prolonged cardiopulmonary resuscitation in newborns: A pilot study. *Resuscitation*. 2015 Aug;93:96-101.
10. Handley SC, Sun Y, Wyckoff MH, Lee HC. Outcomes of extremely preterm infants after delivery room cardiopulmonary resuscitation in a population-based cohort. *J Perinatol*. 2015 May;35(5):379-83.
11. Jelin AC, Zlatnik MG, Kuppermann M, Gregorich SE, Nakagawa S, Clyman R. Clamp late and maintain perfusion (CLAMP) policy: delayed cord clamping in preterm infants. *J Matern Fetal Neonatal Med*. 2015 Aug 17:1-5. [Epub ahead of print]
12. Trevisanuto D, Bertuola F, Lanzoni P, et al. Effect of a Neonatal Resuscitation Course on Healthcare Providers' Performances Assessed by Video Recording in a Low-Resource Setting. *PLoS One*. 2015 Dec 11;10(12):e0144443.
13. Wyckoff MH, Aziz K, Escobedo MB, et al. Part 13: neonatal resuscitation: 2015 American Heart Association Guidelines Update for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation*. 2015;132(suppl 2):S543-S560.
14. Yamada NK, Yaeger KA, Halamek LP. Analysis and classification of errors made by teams during neonatal resuscitation. *Resuscitation*. 2015 Nov;96:109-13.