STUDY GUIDE

2025 Korean Guidelines for Cardiopulmonary Resuscitation: Part 9. Neonatal resuscitation.

Korean Association of Cardiopulmonary Resuscitation · 2026

2025 Korean Guidelines for Neonatal Resuscitation: Study Guide

This study guide provides a comprehensive overview of the updated, evidence-based recommendations for neonatal resuscitation as outlined in the 2025 Korean Guidelines. It covers the physiological transition at birth, specific procedural updates, pharmacologic interventions, and ethical considerations for healthcare providers.

Key Concepts and Clinical Recommendations

1. The Physiology of Transition

Birth involves a rapid shift from placental gas exchange to pulmonary respiration. Key physiological changes include:

- **Lung Aeration:** Leads to a dramatic decrease in pulmonary vascular resistance.
- **Increased Pulmonary Blood Flow:** Facilitates left ventricular filling and maintains cardiac output.
- **Adaptation Statistics:** Approximately 85% of term newborns initiate spontaneous breathing independently. However, 10% require simple assistance, 5% require positive pressure ventilation (PPV), and a small fraction (0.05%) require epinephrine.

2. Immediate Assessment and the "Golden Minute"

Clinical intervention is guided by three rapid assessment questions immediately following birth:

1. Is the infant preterm?
2. Does the infant have poor muscle tone?
3. Is the infant not breathing or not crying effectively?

If the answer to any of these is "yes," the infant is moved to a radiant warmer. Respiratory support should be initiated within the **"golden minute"** (approximately 60 seconds after birth).

3. Umbilical Cord Management

The 2025 guidelines prioritize Deferred Cord Clamping (DCC) to improve neonatal outcomes.

Infant Category	Recommended Action
Vigorous Term & Preterm (<37 weeks)	DCC for at least 60 seconds.
Nonvigorous Term & Late Preterm (≥35 weeks)	Intact Umbilical Cord Milking (I-UCM) is suggested if DCC is not possible.
Preterm (28 0/7 to 36 6/7 weeks)	I-UCM is a reasonable alternative if DCC is not performed.
Extreme Preterm (<28 weeks)	I-UCM is **not** recommended.

4. Respiratory Support and Oxygen Administration

Oxygen concentration is titrated based on gestational age and heart rate response.

- **Term and Late Preterm (≥35 weeks):** Start with 21% inspired oxygen.
- **Preterm (<32 weeks):** Start with ≥30% inspired oxygen.
- **Target SpO2:** Oxygen should be titrated to meet specific preductal saturation targets:
  - 1 minute: 60%–65%
  - 5 minutes: 80%–85%
  - 10 minutes: 85%–95%

5. Advanced Airway and Circulatory Support

- **Video Laryngoscopy:** Recommended over direct laryngoscopy, especially for less experienced providers, provided resources allow.
- **Supraglottic Airway (SGA):** A viable alternative to a face mask for infants ≥34 weeks or when intubation is unsuccessful.
- **Chest Compressions:** Initiated if the heart rate is <60/min despite 30 seconds of effective PPV. The preferred technique is the **two-thumb encircling hand technique** with a **3:1 compression-to-ventilation ratio**.

6. Pharmacology and Fluids

- **Epinephrine:** Administered if heart rate remains <60/min after 60 seconds of coordinated compressions and ventilation.
  - *Intravascular dose:* 0.01–0.03 mg/kg (Primary route).
  - *Endotracheal dose:* 0.05–0.1 mg/kg (Only if vascular access is not yet available).
- **Volume Expansion:** 10 to 20 mL/kg of crystalloid or packed red blood cells for suspected blood loss.
- **Sodium Bicarbonate: No longer recommended** in neonatal resuscitation, even in prolonged scenarios.

Short-Answer Practice Questions

1. What is the designated time frame for "the golden minute" in neonatal resuscitation? *Answer: The first 60 seconds after birth, during which respiratory support should be initiated if needed.*

2. For a vigorous infant born at 36 weeks, what is the recommended duration for deferred cord clamping? *Answer: At least 60 seconds.*

3. What are the three rapid assessment questions used to determine if a newborn requires resuscitation? *Answer: 1. Is the infant preterm? 2. Does the infant have poor muscle tone? 3. Is the infant not breathing or not crying effectively?*

4. According to the 2025 guidelines, which pharmacologic agent previously used is now explicitly not recommended? *Answer: Sodium bicarbonate.*

5. What is the preferred technique for chest compressions in neonates, and why? *Answer: The two-thumb encircling hand technique; it provides greater compression depth, lower provider fatigue, and more accurate hand positioning.*

6. At what point should a medical team consider discussing the discontinuation of resuscitation if there is no response? *Answer: Approximately 20 minutes after birth.*

7. What is the initial recommended oxygen concentration for a newborn at 31 weeks' gestation? *Answer: ≥30% inspired oxygen.*

8. If endotracheal intubation is unsuccessful or not feasible during chest compressions, what device is suggested as a reasonable alternative for ventilation? *Answer: A supraglottic airway (SGA).*

Essay Prompts for Deeper Exploration

1. **Comparative Analysis of Cord Management:** Evaluate the clinical evidence supporting the shift from Early Cord Clamping (ECC) to Deferred Cord Clamping (DCC) and Intact Umbilical Cord Milking (I-UCM). Discuss the specific gestational age thresholds where these recommendations change and the physiological benefits of these practices.
2. **Technological Integration in Resuscitation:** Discuss the role of video laryngoscopy and cerebral regional oxygen saturation monitoring in the 2025 guidelines. How do these tools address the "human factors" of resuscitation, and what are the limitations to their routine implementation in various healthcare settings?
3. **Ethical Challenges in Extremely Preterm Births:** Analyze the guidelines regarding the withholding and discontinuation of resuscitation. How should a clinical team balance parental informed consent with the ethical equivalence of withholding versus withdrawing treatment in cases of extreme prematurity or major chromosomal abnormalities?

4. **The Importance of Education and Debriefing:** The guidelines suggest that technical skills alone are insufficient for optimal resuscitation. Elaborate on the role of behavioral skills, team collaboration, and the effectiveness of video-assisted debriefing in improving clinical outcomes.

Glossary of Important Terms

- **CPAP (Continuous Positive Airway Pressure):** A form of respiratory support for infants with spontaneous breathing who exhibit respiratory distress.
- **DCC (Deferred Cord Clamping):** The practice of delaying the clamping of the umbilical cord (usually for $\ge$60 seconds) to allow for placental transfusion.
- **ECC (Early Cord Clamping):** Clamping the umbilical cord immediately or very shortly after birth.
- **HIE (Hypoxic-Ischemic Encephalopathy):** A type of brain damage caused by a lack of oxygen; the guidelines recommend therapeutic hypothermia for infants $\ge$36 weeks with moderate to severe HIE.
- **I-UCM (Intact Umbilical Cord Milking):** The process of manually pushing blood from the umbilical cord toward the infant before it is clamped.
- **Normothermia:** The maintenance of a normal body temperature; for term/late preterm infants, a delivery room temperature of approximately 23°C is suggested.
- **PPV (Positive Pressure Ventilation):** A life-saving intervention used when a newborn is apneic, gasping, or has a heart rate <100/min.
- **SGA (Supraglottic Airway):** An advanced airway device used as an alternative to a face mask or endotracheal tube.
- **Sniffing Position:** The neutral or slightly extended head and neck position used to maintain an open airway in a newborn.
- **T-piece Resuscitator:** A device suggested for providing PPV over a self-inflating bag because of its ability to provide consistent pressures.
- **UVC (Umbilical Venous Catheter):** The first-line method for establishing vascular access to administer medications like epinephrine during resuscitation.
