

Newborn Critical Care Center (NCCC) Clinical Guidelines

Nasal Cannula Guidelines

Introduction:

Use of the nasal cannula is intended for non-invasive oxygen delivery via variable liter flow and fractions of inspired oxygen.

- **Low flow nasal cannula** delivers a fraction of inspired oxygen by variable flow of 100% oxygen (FiO₂ 1.0), typically with flow rates up to 1 liter per minute (LPM).
- **High flow nasal cannula** delivers a variable fraction of inspired oxygen at a fixed flow rate in order to generate positive airway pressure, (typically ≥ 1.5 LPM, as lower flows do not exceed the patient's maximum inspiratory demand, which in neonates is ~ 2 LPM). The amount of flow necessary to provide various levels of positive airway pressure is related to the infant's body weight in a linear fashion. Higher flow produces increased (but variable and unpredictable) positive end-expiratory pressure.

	Low Flow Nasal Cannula	High Flow Nasal Cannula
Definition	≤ 1 liter per minute (LPM)	≥ 1.5 liters per minute (LPM)
Equipment	Nasal cannula is attached to a humidifier and flow meter which then attaches directly to oxygen source from the wall.	Nasal cannula is attached to heater & humidifier, flow meter, and oxygen blender.
Initial Settings	<p>Flow: Initial flow should be set to achieve the desired oxygen saturation levels.</p> <p>Oxygen: FiO₂ is set and fixed at 1.0, sourced directly from the wall.</p>	<p>Flow: Set liter flow to provide positive pressure for improvement in work of breathing and estimated end-expiratory lung volume.</p> <p>Oxygen: Set the blended oxygen level (FiO₂ 0.21-1.0) on humidified blender to achieve desired saturation levels.</p>
Optimization of Therapy	<p>Flow: Titrate flow to maintain goal saturations per EPIC orders.</p> <p>Oxygen: The FiO₂ is set and fixed at 1.0.*</p> <p>* Blended oxygen on LFNC can be utilized at the provider's discretion in select circumstances (i.e. cardiac patients)</p>	<p>Flow: Titrate flow based on work of breathing and oxygen requirement. The rate of weaning is dependent on patient characteristics and the underlying disease process.</p> <p>Oxygen: Titrate to maintain goal saturations per EPIC orders.</p>

See [BCPAP Guidelines](#) for assistance in determining whether BCPAP is required or nasal cannula may be used.

References:

1. Chao KY, Chen YL, Tsai LY, et al. The Role of Heated Humidified High-flow Nasal Cannula as Noninvasive Respiratory Support in Neonates. *Pediatr Neonatol* 2017; 58:295.
2. Cummings JJ, Polin RA, Committee on Fetus and Newborn, American Academy of Pediatrics. Noninvasive Respiratory Support. *Pediatrics* 2016; 137.
3. Martin, R, Deakins, KM, (2021). Respiratory Support, Oxygen Delivery, and Oxygen Monitoring in the Newborn. *UpToDate*, Retrieved October 2021 from <https://www.uptodate.com/contents/respiratory-support-oxygen-delivery-and-oxygen-monitoring-in-the-newborn/contributors>
4. Yoder BA, Manley B, Collins C, et al. Consensus approach to nasal high-flow therapy in neonates. *J Perinatol* 2017; 37:809.

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