GUIDELINE

Low Flow Oxygen Therapy

Scope (Staff):	Nursing and Medical Staff
Scope (Area):	NICU KEMH, NICU PCH, NETS WA

Child Safe Organisation Statement of Commitment

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations. This is a commitment to a strong culture supported by robust policies and procedures to reduce the likelihood of harm to children and young people.

This document should be read in conjunction with this disclaimer

Contents

Aim

The aim of this guideline is to ensure safe administration of supplemental oxygen using the low flow nasal cannula (LFNC) system to infants. Such infants usually have residual lung disease but no longer require humidified high flow oxygen or continuous positive airway pressure (CPAP).

Risk

Not following the guideline can result in nasal septal injury, facial skin injury and adverse effects due to hyperoxia or hypoxia.

Key points

- Nasal prongs should not completely occlude the nares; there should be a leak around the prongs.

- Infants on LFNC oxygen therapy should always be monitored for their oxygen saturations using pulse oximeters. For infants discharged on home oxygen therapy, the respiratory team will decide if ongoing pulse oximetry at home is essential.
- Infants on LFNC oxygen require at least weekly monitoring of blood pressures while in the neonatal unit.
- Observe skin integrity to minimise the risk of pressure injury to nares, nasal septum and skin on cheeks. Record NSCS and GS scores as per the Skin Care Guideline
- If infant's oxygen requirement reaches more than 250mL/min, consideration should be given to commencing humidified high flow oxygen or CPAP.
- Flows more than 1L/min should not be used while delivering oxygen through the LFNC systems because of the risk of variable and high pharyngeal pressures delivered [1, 2].
- Whilst there are various formulas to calculate FiO2 while on LFNC oxygen therapy [3-7], each one gives a different result. Moreover, tidal volume and inhalation time are also important determinants of FiO2[7], but it is not practicable to measure them. Hence, the best way to monitor infants on LFNC oxygen is via pulse oximetry and ensuring that the oxygen saturations are in the target range.

Equipment

- Low flow oxygen meter. The neonatal units at KEMH/PCH have four types of low flow meters depending on the amount of flow they can deliver: a.10-50ml/min, b. 10-100ml/min, c. 20-200 ml/min, and d. 0-2.5 Litre/minute. These systems are used without a heater device and directly connected to a 100% oxygen gas source
- Appropriate size nasal prongs
- Skin protection tape / tape to secure prongs to face.

Procedure

Steps	Additional Information
1. Apply skin protection to face	
2. Connect nasal prongs to oxygen supply and dial up required flow on meter	Blender must not be used when administering low flow oxygen
3. Place nasal cannula into nares ensuring the cannulas are	

Steps	Additional Information
pointing downward to follow the natural curve of the nostrils	
4. Maintain oxygen saturations ranges as per Monitoring and Observation Frequency guideline	Monitoring and Observation Frequency guideline.
5. Check and document flow rate hourly	
6. Document any increase or decrease in the flow rate on the observation chart using red pen	

Recognising and Responding to Clinical Deterioration

- Notify medical staff and shift coordinator of any increase in oxygen requirement
- Notify medical staff and shift coordinator with any increase in work of breathing
- If infant's oxygen requirement reaches 250mL/min or higher consideration should be given to commencing humidified high flow oxygen or CPAP. Such infants should be reviewed by the neonatal registrar and also a senior registrar/consultant).

Related CAHS internal policies, procedures and guidelines *(if required)*
Neonatology Clinical Guidelines Monitoring and Observation Frequency guideline Skin Care Guideline

References and related external legislation, policies, and guidelines *(if required)*	
[1]	González AJ, Quinteros A, Luco M, Salinas JA, Martínez A, Tapia JL. Hypopharyngeal oxygen concentration and pressures delivered by low flow nasal cannula in preterm infants: Relationship with flow, gas mixture, and infant's weight. Pediatr Pulmonol 2019;54(10):1596-601.
[2]	Locke RG, Wolfson MR, Shaffer TH, Rubenstein SD, Greenspan JS. Inadvertent administration of positive end-distending pressure during nasal cannula flow. Pediatrics 1993;91(1):135-8.
[3]	Benaron DA, Benitz WE. Maximizing the stability of oxygen delivered via nasal cannula. Arch Pediatr Adolesc Med 1994;148(3):294-300.

[4] Finer NN, Bates R, Tomat P. Low flow oxygen delivery via nasal cannula to neonates. Pediatr Pulmonol 1996;21(1):48-51.
[5] Sung V, Massie J, Hochmann MA, Carlin JB, Jamsen K, Robertson CF. Estimating inspired oxygen concentration delivered by nasal prongs in children with bronchiolitis. Journal of paediatrics and child health 2008;44(1-2):14-8.
[6] Walsh M, Engle W, Laptook A, Kazzi SN, Buchter S, Rasmussen M, et al. Oxygen delivery through nasal cannulae to preterm infants: can practice be improved? Pediatrics 2005;116(4):857-61.
[7] Sabz M, Tavernini S, Pillay K, Christianson C, Noga M, Finlay WH, et al. Variability in low-flow oxygen delivery by nasal cannula evaluated in neonatal and infant airway replicas. Respir Res 2022;23(1):333.

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