Multidisciplinary Evidence-Based Approach to Feeding and Enteral Nutrition for Patients 0-12 Months on High Flow Nasal Cannula (HFNC)

Prior to using framework consider:

1. How the patient was feeding prior to admission
2. Consult OT, RD and RRT as available
3. The target estimated energy requirements/feeding goal
4. Any contraindications to enteral nutrition

START HERE

Are HFNC settings ≤ 2 L/Kg and ≤ 40% FiO_2?

YES

Are HFNC settings decreasing or stable?

YES

Is a feeding tube* in situ?

YES

Start tube feeds

NO

Tolerating continuous tube feeds?

YES – Consider transition to bolus feeds

Tolerating bolus feeds?

YES

NO

Unsafe to PO Feed

MRP to make NPO or initiate/continue tube feeds.

Reassess safety for PO feeds and enteral nutrition

* The term feeding tube includes any enteral feeding tube (nasogastric, G-tube etc.).

Clinical assessment prior to attempting PO:

- ☐ Normal HR for age or explained tachycardia
- ☐ Modified TAL score of 0-5 at rest and with handling
- ☐ WAT score < 3 (as applicable)
- ☐ No cyanosis or colour with coughing
- ☐ Resolved and/or improving upper airway sounds
- ☐ No stridor or stertor above baseline
- ☐ Latching and sustaining suck on soother
- ☐ Stable weight or weight gain appropriate for age

YES

Consider risk level

High Risk Infants

- Required intubation(s)
- Sedation > 5 days
- Fluctuations in respiratory status
- Comorbidities*

OT to assess safety and establish feeding plan

Moderate Risk infants

- Required moderate respiratory support (i.e. CPAP)
- Short term sedation
- Comorbidities*

May attempt PO:

- If bottling, use slow flow nipple and start with **10% of goal volume**
- If breastfed, pump prior and feed in reclined position
- Supervise first feed

Lower Risk Infants

- Did not escalate beyond HFNC
- Feeding well prior to admission
- No comorbidities*

May attempt PO:

- If bottling, use slow flow nipple and start with **25% of goal volume**
- If breastfed, pump prior and feed in reclined position
- Supervise first feed

* Examples of comorbidities include prematurity, feeding issues prior to admission, inconsistent growth, developmental concerns or diagnosis, other system involvement etc.

Monitor feeding progression. If feeds are not tolerated at any point during progression, consider re-assessment of feeding regimen.
Tolerating = no emesis, no abdominal distension, regular bowel movements, cardiorespiratory stability

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Background: There is a growing body of recent evidence that supports safely oral feeding on HFNC; however, there continues to be a lack of clinical consensus on how and when to initiate feeding.[1,2,3,4] The literature does suggest that a slow introduction and progression of feeds with daily clinical assessments will help to reach feeding goals earlier.[1,2,6] In addition to respiratory status, there are many other cues that can determine readiness to orally feed including physiologic stability, regulation, and behaviour of the patient.[6] Clinically, we have identified a need to explore if, when, and how infants can safely initiate and progress their oral feeding when on HFNC. We have also observed the importance of ongoing clinical assessment and multidisciplinary communication of oral feeding and nutrition.

Purpose: In the context of increased clinical need and evolving evidence about feeding on HFNC, this framework was developed with the purpose to inform decision making surrounding feeding and nutrition for patients on HFNC at McMaster Children's Hospital. The use of a standardized, multidisciplinary feeding protocol can improve consistency in practice and enhance safety for infants.[1,3,5]

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Modified TAL Scale

	Respiratory rate (breaths/min)				
Score	**Age less than6 months**	**Age 6 months and older**	**Wheezing/Crackles**	**O2 Saturation (room air)**	**Accessory Muscle Use**
0	Less than or equal to 40	Less than or equal to 30	None	Greater than or equal to 95%	None (no chest in-drawing)
1	41-55	31-45	Expiration only	92-94%	+ Presence of mild intercostal in-drawing
2	56-70	46-60	Expiration and inspiration with stethoscope only	90-91%	++Moderate amount of intercostal in-drawing
3	Greater than or equal to 71	Greater than or equal to 61	Expiration and inspiration without stethoscope	Less than or equal to 89%	+++Moderate or marked intercostal in-drawing, with presence of head bobbing or tracheal tug
Mild 0-5			**Moderate 6-10**		**Severe 11-12**

NOTE: if infant is on oxygen they are scored a "3" for O2 saturation.

Nutritional Needs

Initiation of NGT feeds	**Example: 5kg Infant**	**Tube fed prior to admission**
As a starting point, 0-12 months typically need $100\frac{kcal}{kg} per\ day$ Breast milk and formula has $0.68\frac{kcal}{ml}$ Start feeds at rate of 1 ml/kg/hour	**Daily energy needs:** $5kg\ x\ \frac{100kcal}{kg}$ = 500 kcal per day **Daily volume:** $\frac{500\ kcal\ per\ day}{0.68\frac{kcal}{ml}\ formula\ or\ breast\ milk} = 735\ ml/day$ **Goal rate:** $\frac{735\frac{ml}{24\ hours}}{24\ hours} = 31\ ml/hour$	If G-tube, GJ-tube, J-tube or NGT fed prior to admission **Continuous feeding rate =** $\frac{prescribed\ home\ volume}{24\ hours}$

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