



# IMPLEMENTATION OF A DEVELOPMENTAL CUE-BASED FEEDING IN THE NICU: A QUALITY IMPROVEMENT INITIATIVE

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## BACKGROUND

- Effective and safe transition from tube feeds to oral feeds is an important milestone in the NICU prior to discharge home.
- Premature infants are at increased risk of feeding failure due to their innate immaturity.
- NICU infants are also exposed to noxious orofacial sensory stimuli that can alter oral and sensory motor experiences.
- Historically, advancing oral feeds in the NICU were often inconsistent and contradictory.
- Quantitative approaches were used that measure infant's success based on volume intake.

## PROBLEM

- There is no established standardized approach and staff education for best practice feeding practices in premature infants in our NICU.
- Inconsistent practices and information between providers cause negative feeding experiences for infants and parents.

## NEW FEEDING ALGORITHM THAT INCORPORATES PRE-FEEDING READINESS ASSESSMENT AND POST-FEEDING QUALITY ASSESSMENT

### PRE-FEEDING READINESS SCORE:

**1:** Drowsy/alert/fussy before cares and rooting with good tone.

**2:** Drowsy/alert once handled with some rooting and adequate tone.

**3:** Briefly alert with care with no hunger behaviours, no change in tone.

**4:** Sleeps throughout care without hunger cues. No change in tone.

**5:** Needs increased oxygen with care, A/B/D with care, tachypnea greater than 65 bpm

### POST-FEEDING QUALITY SCORE:

**1:** Strong coordinated SSB / latched well with strong suck and swallow for greater than 15 minutes.

**2:** Strong coordinated suck and swallow initially but fatigues with progression / latched well initially but fatigues with active suck for 10 to 15 minutes.

**3:** Consistent suck and swallow with pacing, some loss of liquid or difficulty pacing / Difficulty maintaining strong, consistent latch with active suck for less than 10 minutes.

**4:** Weak suck or latch little rhythm and requires rest breaks.

**5:** Unable to coordinate and has ABDs and large liquid loss. Unable to latch.

## METHOD

1. Retrospective data on the average PMA at discharge of premature infants less than 32 weeks GA between 2022-2023.
2. Gather a multidisciplinary feeding working group and develop a standard oral feeding guideline.
3. Collaborate with health informaticist to incorporate components of the feeding guidelines into online charting.
4. Guideline reviewed by relevant stakeholders and policy office.
5. Staff training and education.
6. Implementation of the new oral feeding guideline.

## OUTCOME

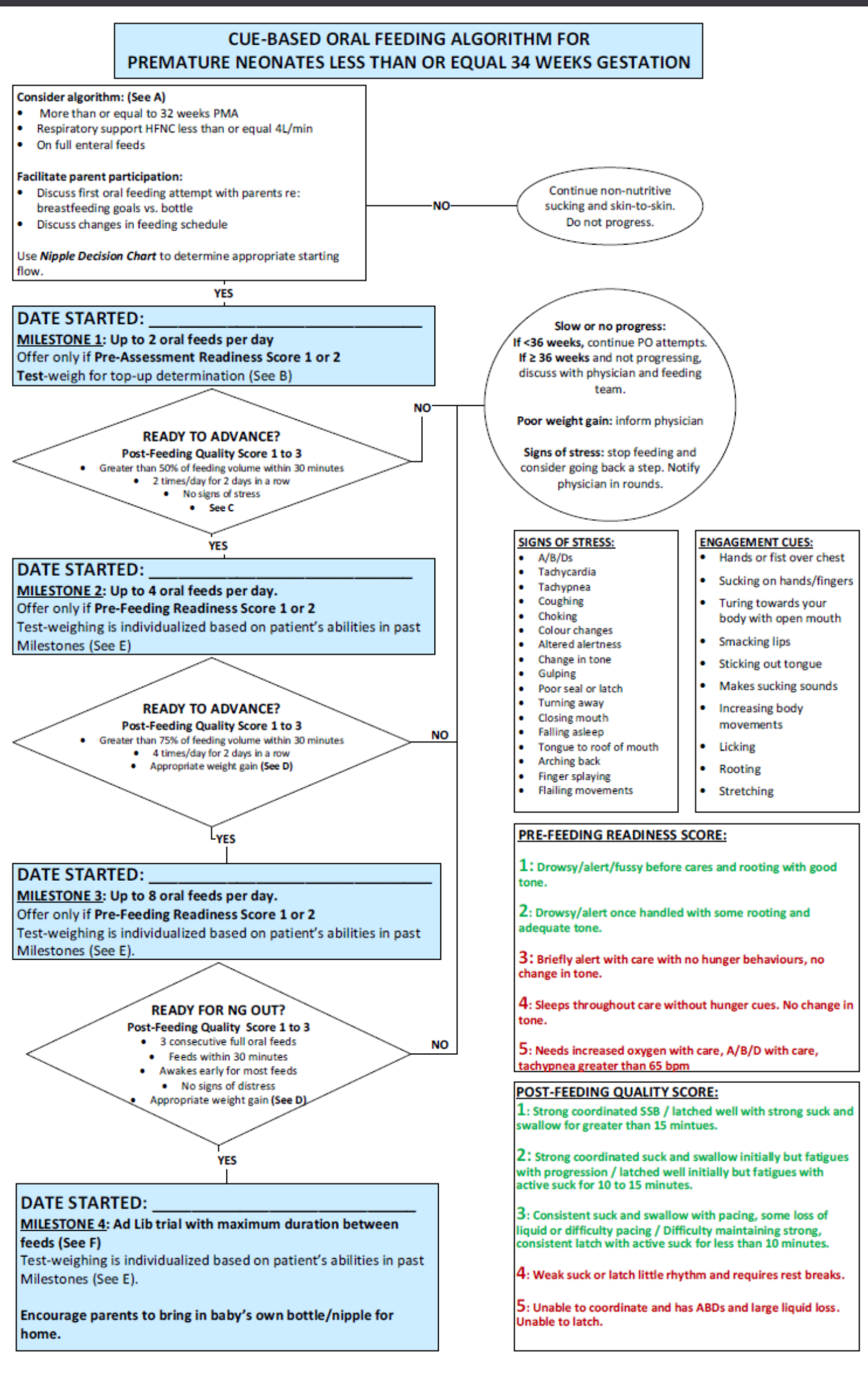
1. Review data on average PMA at discharge of premature infants less than 32 weeks GA one year post-implementation.
2. Gather post-implementation survey feedback from staff after one year.
3. Gather post-implementation survey feedback from parents at discharge for one year.





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**A** Once patient meets the criteria for oral feeding, place the **Algorithm** at the bedside and **write the start date** for the first oral feeding.  
**Consider the following criteria:**

- Infant is growing appropriately
- Able to suck on a pacifier for 3 minutes with normal suck/burst/rest pattern
- Respiratory rate (RR) less than 65 when held for feeding
- Pre-feeding readiness score of **1 or 2**

**B** **Test weighing** is used to determine top-up volume in **Milestone 1**. Post-weights should be deferred if the baby has post-assessment scores of 4 or 5.

**C** **Introducing bottle:** bottles may be introduced at night in Milestone 1 if parent desires as long as at least 2 breastfeedings with effective latch and transfer of milk have been achieved.

**D** **Appropriate weight gain:**

- Infants < 2 kg: 18-22 g/day
- Infants > 2 kg: 25-35 g/day

**E** For infants in **Milestone 2 and Milestone 3**, **test-weighing and determining top up** is individualized and depends on the parent's current milk supply. Adequate supply of at least 500 mL of milk pumped per 24 hours is ideal. Top-up volume may be determined based on the post-feeding quality score if not test-weighing:

Post-Feeding Quality Score		
	Breastfeed	Actions
1	Latched well with strong coordinated suck and swallow for greater than 15 minutes	No additional top-up
2	Latched well with strong coordinated suck and swallow initially but fatigues with progression. Active suck for 10 to 15 minutes.	Provide 50% top-up
3	Difficulty maintaining strong, consistent latch. Only active suck and swallow for less than 10 minutes.	Provide 75% top-up
4	Latch is weak or inconsistent with frequent need to re-latch. Limited effort with inconsistent pattern. May be considered NNS	Provide full feed top-up
5	Unable to latch to breast and achieve SSB pattern. Difficulty arousing. Frequent and significant vitals instability	Provide full feed top-up

**F** Ad lib demand feeding should be ordered and maximum duration between feeds should be specified. NGT may remain in situ until patient demonstrates good endurance during demand feeding.  
**Endurance** is the infant's ability to maintain homeostasis. If they are able to complete **3 consecutive feeds in less than 30 minutes**, consistently awakes early for feeds, feeds without signs of stress, and maintains appropriate weight gain, then consider NGT out.

**NIPPLE DECISION CHART**

Gestation at Birth	Initial Nipple to Start	OT/SLP Automatic Consult	Flow too slow -audible sucking, nipple collapse, more than 4 sucks per swallow	Flow too fast -spillage, audible gulping, wide eyes, pulling away, choking
Less than 32 weeks	Enfamil Extra Slow Flow	Yes	Enfamil Slow Flow- OT/SLP consult	OT/SLP consult
32-34 weeks	Enfamil Extra Slow Flow	No	Enfamil Slow flow	OT/SLP consult
34weeks +	Enfamil Slow Flow	No	Enfamil Standard	Enfamil Slow Flow- OT/SLP consult

Adapted from: St. Luke's Neonatology. 2021. Small baby guidelines for infants <28 weeks gestational age. pp 32-33



**References:** Kamity, R., Kapavarapu, P. K., & Chandel, A. (2021). Feeding Problems and Long-Term Outcomes in Preterm Infants—A Systematic Approach to Evaluation and Management. *Children*, 8(12), 1158. MDPI AG. Retrieved from <http://dx.doi.org/10.3390/children8121158>; Lubbe W. (2018). Clinicians guide for cue-based transition to oral feeding in preterm infants: An easy-to-use clinical guide. *Journal of evaluation in clinical practice*, 24(1), 80–88. <https://doi.org/10.1111/jep.1272>; Mayo, S. (2015). Parent satisfaction with feeding competence in preterm infants: Infant driven feeding compared with standard scheduled feeding. *Academy of Neonatal Nursing*. [http://www.academyofneonatalnursing.org/18NewOrleans/460\\_Mayo.pdf](http://www.academyofneonatalnursing.org/18NewOrleans/460_Mayo.pdf); McCain G. C. (2003). An evidence-based guideline for introducing oral feeding to healthy preterm infants. *Neonatal network : NN*, 22(5), 45–50. <https://doi.org/10.1891/0730-0832.22.5.45>; Shaker C. S. (2013). Cue-based feeding in the NICU: using the infant's communication as a guide. *Neonatal Network: NN*, 32(6), 404–408. <https://doi.org/10.1891/0730-0832.32.6.404>