Cue Based Feeding: Improving Consistency to Improve Outcomes

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Background

- Over than 50% of G-tube placements are in children under 1 year of age (Fox, 2014)
- Surgical and PEG
- Transition from dependent to independent feeding happens during first year of life (Pridham, et al., 2007)
- Preterm infants require additional support for transition to self-regulated feeding (Dodrill, Donovan, Cleghorn, McMahon, & Davies, 2008)

Premature infants are at increased risk for:
- Prolonged length of stay in the NICU
- Feeding difficulties including emesis, decreased appetite, prolonged feeding times, and motor impairments, physiological instability, impacted transitions across textures (DeMauro, et al., 2011; Dodrill, et al., 2008; Thoyre, 2016)
- Compromised growth (Ross and Browne, 2013)
- Growth of preterm infants is negatively impacted by medical issues and lack of feeding skill development (Ross & Browne, 2013)

- Shift from volume driven feeding to cue-based feeding (Ross & Philbin, 2011; Shaker, 2013)
- Transition to cue-based feeding remains inconsistent

A successful feeding is one built on QUALITY

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Quality</th>
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<tbody>
<tr>
<td>Frequency of feedings</td>
<td>Skill</td>
</tr>
<tr>
<td>Volume intake</td>
<td>Physiologic stability</td>
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<tr>
<td>Caloric density of formula/breastmilk</td>
<td>Motor stability</td>
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<tr>
<td>Duration of feedings</td>
<td>State regulation</td>
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<tr>
<td>Weight gain</td>
<td>Pleasure</td>
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“If the QUALITY of the feeding takes priority over the QUANTITY ingested, feeding skills develop pleasurably and at the infant’s own pace.”

Ross & Philbin, 2011

Research supports putting Quality first

Cue-Based / Co-Regulated Feeding

- Reciprocal approach based on readiness cues
- Defined stop and stress cues identified for caregiver
- Feeding discontinued if infant passive, disengaged, or demonstrates change in physiologic stability

Volume-Driven / Scheduled Feeding

- Pre-defined feeding schedules and volumes
- Focus on volume ingested rather than skill development
- Success viewed as skill of caregiver not skill of infant
- May result in increase of feeding aversions and lack of feeding skill progression
**Ultimate Goal of Cue-Based Feeding**

Safe and pleasurable consumption of age-appropriate foods while maintaining adequate growth and nutrition.

**Inconsistencies that Impact Cue-Based Feeding Success**

- Inconsistent definitions of cues
- Nursing education and support
- Parent education and support

**Oral Feeding Readiness**

The infant’s condition immediately prior to the nipple feeding. Readiness affects feeding skill AND long term feeding success.

**State/Level of Alertness**

- Awake/alert
- Calm/alert
- Frantic
- Drowsy
- Asleep/shut down

**Readiness to feed?**

- State/Level of Alertness
- Physiological Cues
- Postural Stability
- Readiness vs. Stress/Stop Cues

**Physiological Cues**

- Respiration Rate
  - Tachypnea –
  - Decreased RR
  - Apnea/Breath holding
- Heart Rate
  - Bradycardia
  - Tachycardia
- Oxygen Saturation
  - O2 desaturation less than 90%
  - Unstable O2 saturations

**Behavioral Readiness Cues**

- Moving head toward nipple
- Hands to mouth
- Suckle
- Mouthing
- Rooting
- Smacking lips
- Happy/yum sounds
Stress/Stop Cues:

- Raised eyebrows/ furrowed brow
- Worried look
- Crying
- Audible Swallows
- Shut down/fall asleep
- Excessive drooling
- "Stop" hands / splayed fingers
- Hiccups
- Mottling
- Stridor
- Fussing
- Tachycardia
- Abrupt BR
- Abnormal heart sounds
- Retractions
- Multiple swallows
- Turn head away
- Pushing nipple out with tongue
- Pursed lips/pushing
- Altered/increased respiratory effort
- Head bobbing
- Neck flaring
- Cough/choke/gag
- Color change
- Red/watery eyes

If not ready, feeding is deferred:

- Offer rest break
- Environmental changes (light, noise, etc)
- Assist with body organization/stability
- Stabilize behavioral state
- Stabilize physiology

STOP and gavage feed if instability continues

Ensure-active participation

- Necessary for learning coordinated, well-regulated feeding behaviors
- Infants can be MADE to suck by stimulating the suck reflex BUT can have detrimental consequences such as:
  - Poor coordination of airway protection
  - Defensive feeding behaviors
  - Association between feeding and aversive experience may result in feeding aversion.

Indicators of active participation

- Physiologic stability
- Behavioral state: awake/alert
  - May have eyes closed but awake
- Movement and tone
- Spontaneous sucking
  - If strong seal as try to remove the nipple, actively involved
  - If allows nipple to slide out of mouth, passive - defer

When to STOP:

- Physiologic instability
- Decreased engagement in the feeding
  - Passive sucking
  - Change in tone (increase or decrease)
  - Fatigue
- Difficulty integrating suck-swallow-breathe pattern despite feeder efforts

Supports for cue-based/co-regulated feeding

- Nipples/bottle systems
- Swaddling
- Positioning
- Pacing
- Supplemental oxygen use
- Non-nutritive experience
- Video Swallow studies
Positioning/swaddling

- Swaddled: how and why
  - Semi-upright
  - Sidelying
    - Right vs. left

Positioning and Pacing

- MAINTAIN physiological stability
  - NOT to respond to distress
- Pacing can provide neurobehavioral “practice” that facilitates development of mature suck-swallow-breathe coordination

Oxygen

- Maintain airway patency (e.g., laryngomalacia)
- Maintain appropriate O2 saturation levels
- Maximize stamina/endurance
- Balance
  - Too high can damage vision

Non-nutritive Experience

When to use:
- Not stable for nipple feeding
  - Maintain association between sucking and satiation
- Positive oral input/experience
  - Vent dependent
  - Aversive/disinterested
- To improve organization prior to or during nipple feeding
  - Silent aspiration

Characteristics of Late Preterm Infants

- 34–36 6/7 weeks gestation
- Similar rates of feeding dysfunction as early preterm infants
- More likely to require multidisciplinary feeding evaluation than early preterm infants
- More immature feeding behaviors at 35-36 weeks PMA than early preterm infants
- Positive feeding experience leads to more mature feeding skills
- Sensory modulation impairments

Parents as Partners

- Improved definitions of cues
- Improved training, which comes from improved standard definitions of cues
- Improved parent support

DeMauri, et al., 2011
References


References


