



Systematic Review of Quality Improvement Initiatives Related to Cue-Based Feeding in Preterm Infants

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ABSTRACT

Objective: To examine and synthesize the outcomes of quality improvement (QI) initiatives related to cue-based feeding of preterm infants to facilitate implementation of findings to improve nursing practice.

Data Sources: Cumulative Index of Nursing and Allied Health Literature (CINAHL) Complete and PubMed were searched for full-text articles published from 2000 through 2017 included under the medical subject heading *quality improvement* and whose titles included any form of the term *feeding* combined with any of the following: *bottle, breast, cue-based, demand, infant, neonate, newborn, oral, or responsive*.

Study Selection: Articles were considered for inclusion if they were published in English-language journals and focused on QI initiatives concerning cue-based feeding of preterm infants in NICU settings.

Data Extraction: After initial article review, we examined clinical outcomes and assessed study methodology using the Quality Improvement Minimum Quality Criteria Set (QI-MQCS) framework.

Data Synthesis: Our review yielded seven studies related to cue-based feeding of preterm infants. Five studies included multidisciplinary

stakeholder teams to assess their respective NICU environments and facilitate project completion. In two studies, feeding “champions” were designated as facilitators. In one study, researchers used a Plan–Do–Study–Act approach and emphasized process over outcome. In six studies, researchers measured hospital length of stay, which decreased in five intervention groups. In three studies, researchers measured infant weight gain, which increased in two intervention groups. In two studies, researchers monitored weight gain velocity, and in five studies, researchers reported earlier gestational attainment of full oral feedings.

Conclusion: Weight gain, time to full oral feedings, and hospital length of stay may be improved with the use of cue-based feeding. QI initiatives are a practical means to bring best evidence and multidisciplinary collaboration to the NICU.

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KEYWORDS: cue-based feeding, infant-driven feeding, NICU, preterm infant, quality improvement, systematic review

CLINICAL IMPLICATIONS

- Effective transition to oral feeding is one of many challenges a preterm infant must overcome before being discharged from the NICU.
- Cue-based feeding, also known as infant-led or demand feeding, has been initiated in NICUs worldwide, although it is not a universal standard of practice.
- During cue-based feeding, the quality of the feeding behavior is prioritized over quantity of milk or formula consumed.
- Results of quality improvement (QI) initiatives indicate that weight gain, time to full oral feedings, and hospital length of stay may be improved with the use of cue-based feeding.
- The use of a multidisciplinary team or taskforce was an important feature in the QI initiatives reviewed here, and ongoing staff education and parental involvement in infant care and feeding are paramount for success.



Effective transition to oral feeding is one of many challenges a preterm infant must overcome before discharge from the NICU. Feeding difficulties can lead to prolonged NICU stays that result in greater costs and increased financial burdens for families (Muraskas & Parsi, 2008). Poor feeding in preterm infants is also a common reason for hospital readmission within 2 weeks after discharge, particularly among infants born between 34 and 37 weeks gestation (Lubbe, 2017). Even more concerning, adverse or stressful feeding experiences for immature and medically fragile infants may deleteriously affect their feeding ability well beyond hospital discharge (Shaker, 2013b).

Traditionally, task-oriented, volume-based, provider-driven feeding with emphasis on quantity consumed rather than awareness of an infant's state of readiness has been used with the preterm infant population (Shaker, 2013b). Feeding practices in the NICU often are based on custom rather than evidence (Wellington & Perlman, 2015). Quantitative approaches aimed at oral feeding initiation in preterm infants fail to take into account infants' physiologic maturity levels, skills, and capabilities (Lubbe, 2017). When intake becomes the primary focus, an infant's communication signals during feeding may be misunderstood or overlooked altogether (Shaker, 2012).

Feeding is among the most significant activities that occur between an infant and his/her caregiver (Rybak, 2015), and understanding of and ability to perform cue-based feeding

have long-term implications. For example, Lumeng et al. (2012) reported that children of mothers with "assertive prompting and an intrusive [feeding] style" had significantly greater amounts of stored fat at 36 months of age (p. 640). Nurses play a vital role in teaching parents how to interact with their preterm infants. Knowledge of feeding cues in infancy and later development may enhance parents' feeding responsiveness and encourage them to avoid overfeeding, which in turn may decrease the risk of childhood obesity (Hodges, Wasser, & Colgan, 2016).

Cue-based feeding, also known as infant-led or demand feeding, has been initiated in NICUs worldwide, although it is not a universal standard of practice (Lubbe, 2017). Preterm infants are an important focus for quality improvement (QI) initiatives because of variation in care practices throughout medical centers in the United States (Trembath, Iams, & Walsh, 2013). The emphasis of QI work on implementation of evidence in everyday practice clearly distinguishes it from more traditional, evaluative research (Speroff, James, Nelson, Headrick, & Brommels, 2004). To our knowledge, no systematic literature review has been published about QI initiatives focused on cue-based feeding for this vulnerable population. Therefore, the purpose of this systematic review was to examine and synthesize the outcomes of QI initiatives related to cue-based feeding of preterm infants to facilitate implementation of findings to improve nursing practice.

Feeding difficulties can lead to prolonged NICU stays

Background and Significance

Attaining safe and efficient feeding skills is a challenge for most premature infants (Crow, Chang, & Wallace, 2016) because they have not yet have fully developed the skills to coordinate

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