

Infant Driven Feeding for Preterm Infants: Learning Through Experience



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ABSTRACT

Studies have shown that by feeding preterm infants in response to their developmental cues, infant-driven feeding (IDF) might help establish independent oral feeding skills. The goal of the project was to incorporate an IDF model of care into large, referral neonatal intensive care unit and to assess its effects on infants born at ≥ 30 weeks gestation. An algorithm detailing an IDF practice, educational programs for the nurses and parents, a chart audit tool, and practice guidelines were developed as quality improvement intervention strategies. Infants in the IDF group attained *ad libitum* feedings earlier (35.0 ± 1.1 vs. 35.6 ± 1.1 weeks' PCA, $p = 0.008$) without compromising weight gain. There was propensity to the earlier hospital discharge and fewer feeding therapist consults in the IDF group, but the results did not reach statistically significant difference. The article offers one institution's approach, our experience and lessons learned.

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Background

Facilitating a successful transition to oral feeding is a key factor in preparing an infant for discharge from the neonatal intensive care unit (NICU).^{1–3} Nipple feeding is a complex, highly coordinated sensorimotor task, and the preterm infant has to reach a certain level of developmental maturity to be successful in the oral feeding process. It also requires a skilled, observant caregiver to assist the infant in achieving a pleasurable experience as well as maximizing intake and minimizing stress.

Traditional practices involve the clinician ordering nipple feedings, which are primarily based on an infant's weight and gestational age. In this model of care, successful feeding is often defined as the volume taken by an infant and infant readiness is determined by the time on the clock, not by the overall state of the infant. This practice can lead to increased stress on the infant and slow the progression to successful oral feedings.^{4,5}

Feeding preterm infants in response to their developmental cues, cue based feeding, may help in the establishment of independent oral feeding.^{5–7} Infant-Driven Feeding Scales © (IDFS©) were developed by Ludwig & Waitzman (2007; 2014) to incorporate a cue-based approach into feeding practices of premature infants in the NICU.^{4,8} It includes scales on feeding readiness, quality of nipple feeding, and caregiver techniques. The scales are used together to capture the infant's readiness to nipple feed, the infant's feeding abilities, as well as techniques used by the caregiver feeding the infant. These scales, used in conjunction with standard documentation, provide the health care team with a picture of the infant's feeding skills, overall stability, and progress toward

discharge.⁴ This practice requires the bedside nurse to identify the infant's feeding readiness signs to establish when an infant is ready to attempt nipple feedings and when he is ready to be advanced. The infant will be given nipple attempts only if he shows certain readiness cues; this may give an infant shorter, more frequent oral feeding opportunities and lead to an infant driven feeding approach as opposed to a physician driven approach. A successful feeding in the IDF model includes the achievement of the following major goals: the feeding is safe, functional, nurturing, and individually, as well as developmentally appropriate. This type of practice is considered to be more physiologically appropriate compared to the traditional practice and has been shown to accelerate feeding advancement and shorten the time of hospital stay.^{4,5} Infant-Driven Feeding Scales © work as a comprehensive communication plan and educational campaign for the neonatal nurses, clinicians, and caregivers that promotes a safe, positive, individualized feeding experience for our patients.

The goals of this project were: 1) incorporate the Infant-Driven Feeding Scales © into our NICU practice, 2) develop a process to identify which infants are ready to begin IDF, 3) develop a process to safely advance oral feedings, 4) assess the effect of the IDF method of feeding on post-conceptual (PCA) age at initiation of oral feedings, at *ad libitum*, and at discharge.

Methods

The project was reviewed and approved by the Children's Memorial Hermann Hospital (CMHH) Quality Council. The project activities were part of regular hospital education and quality improvement activities; identifiable information about patients, parents, and nurses was not collected. The project was carried out over a 12-month period, from October 2013 to October 2014. The CMHH NICU is a large referral tertiary care unit in Houston, Texas with an average census of 100–120 infants, including 30–35 patients in the level II nursery. There are about 1000 admissions

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to the NICU per year. The project took place in the level II NICU where all healthy premature infants born at ≥ 30 weeks' gestation were included.

Overall Framework

A quality improvement model was developed to translate IDF model of care into nursing practice in our NICU. The IDF task force was formed and included representatives from nursing, physicians, occupational therapists, and lactation specialists. Task force members met regularly once or twice a month for the duration of the project and ultimately became IDF champions. As task force members, they were responsible for developing the IDF guideline for the unit, educational materials for nurses and parents, a tool for auditing charts, and were responsible for conducting parental and nursing surveys. Team members performed literature searches and group interviews with physicians, nurses, and parents to identify facilitators and barriers for developing and implementing IDF policies in premature infants. The project was divided into before- and after-intervention phases, each lasted about 6 months. The transition interval lasted about 3 months with a pilot study-taking place during that period. The after-intervention phase was measured after the IDF medical guideline and nursing education campaign were completed.

Intervention and Implementation

All nurses working in the level II NICU were required to complete a five hour continuing education program which included a literature review, neurodevelopmental approach to oral feeding, principles of IDF, breastfeeding in the NICU, and a nipple feeding workshop. Numerous question and answer sessions with the nursing staff were conducted to

educate staff regarding specific implementations strategies for our NICU. The project was also discussed with the physicians in a division meeting to elicit their acceptance and incorporate their suggestions.

On the bases of the literature review, expert opinions and numerous unit discussions, an algorithm was developed to determine when an infant was ready to start the IDF pathway and how the oral feedings could be advanced (Fig. 1). Oral feeding progress was monitored for achievement of first and all oral feedings, weight gain, and necessity for feeding therapist involvement. Feeding performance was not only evaluated by the amount of volume transferred during a feeding and time of feeding, but also by readiness (behavior) behavior and qualitative feeding assessments, used with permission from the IDFS© created and validated by Ludwig, S. & Waitzman, K.A. (2007; 2014) (Table 1).^{4,5} Special attention was given to the breast fed infants since direct breastfeeding is often overlooked in the NICU and evidence has shown that duration of breast milk feeding is positively associated with breast feedings in the NICU and the first oral feeding being at the breast.⁹ Exclusive breastfeeding for at least 3 days before initiating any bottle feedings was offered to the infants whose mothers were interested in breastfeeding. Details are addressed in the algorithm for infant driven breastfeeding (Fig. 2). Education related to infant driven feeding was offered to all parents. A parental educational booklet containing language appropriate information on IDF was given to every family participated in the project; neonatal nurses reviewed the material with parents before initiating feeding protocol.

Methods of Evaluation

A chart audit tool was developed to monitor infants' feeding progress. It was created to collect information on the PCAs at birth, at

Algorithm for Infant Driven Feeding

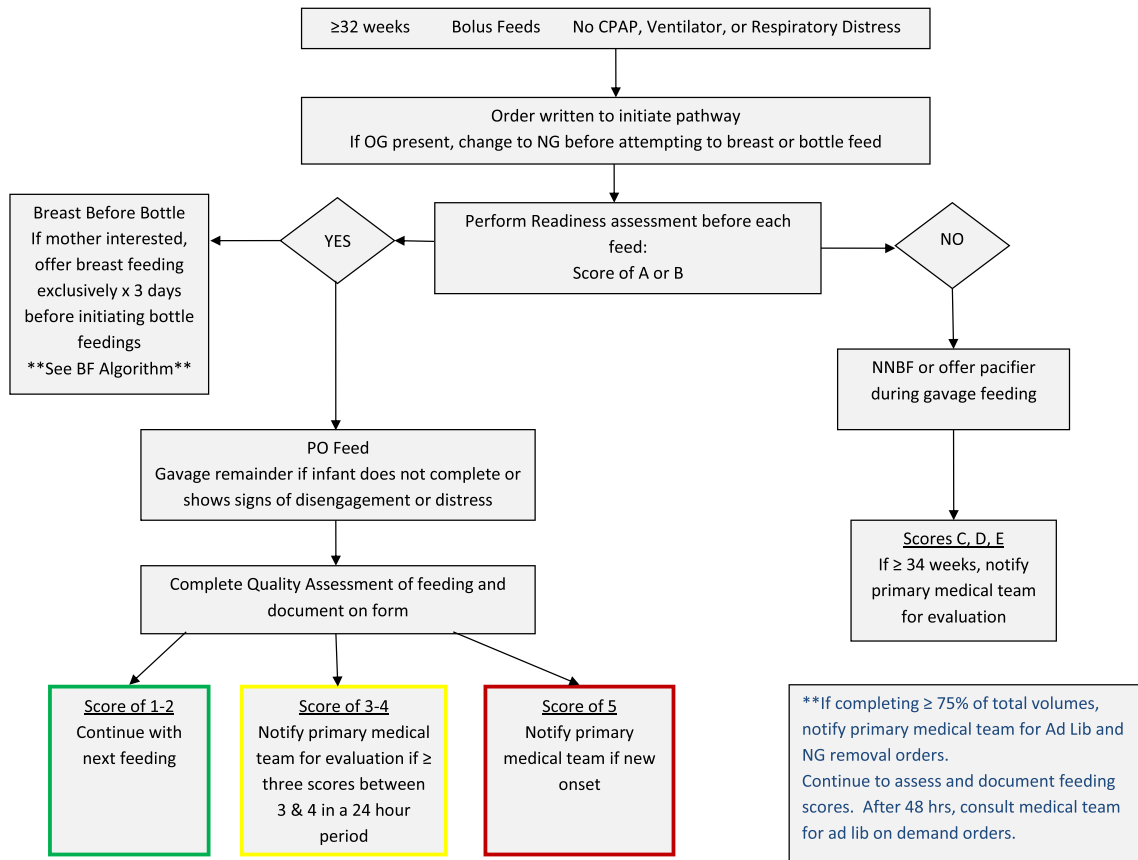


Fig. 1. Algorithm for Infant Driven Feeding.

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