Oral Feeding in the NICU

About this Document
This document is a resource to the course: Core Measure 7 Optimizing Nutrition, Lesson: Oral Feeding in the NICU.

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Scientific evidence overwhelmingly indicates that breastfeeding is the optimal method of infant feeding and should be promoted and supported to ensure optimal nutrition in infants. Breastfeeding is the single most powerful and well-documented preventive modality available to health care providers to reduce the risk of common causes of infant morbidity. Because breast milk is the most well tolerated substrate for enteral feedings in the premature infant, full enteral feedings are reached sooner when breast milk is used, thereby decreasing the total days of TPN needed and the potential for TPN-induced side effects (Leaf, 2007).

The protective properties of breast milk cannot be duplicated. Significantly decreased risks of necrotizing enterocolitis (NEC), sepsis, and retinopathy of prematurity (ROP) have been demonstrated when breast milk is used for enteral feedings. Increased IQ, improved neurodevelopmental outcomes and larger brain volume have also been found in preterm infants fed breast milk.

Because of the many well-documented benefits of human milk for the preterm infant, supporting mothers in the initiation and maintenance of adequate breast milk supply should be a major focus in the NICU.

Breastfeeding and Breast-milk Administration

Mothers of preterm or ill infants who are educated about the benefits of breast milk often choose to pump milk for their infants; many, however, are unable to maintain sufficient lactation for successful or exclusive breastfeeding at discharge. Early initiation and maintenance of frequent breast pumping with an electric breast pump, skin-to-skin holding as soon and as often as possible, non-nutritive sucking at breast (breast pumped first, although the breast is never truly empty and some milk may be available), and establishing the basics of breastfeeding before offering a bottle are all useful in establishing and maintaining a milk supply (Phillips, 2012; Cosimano & Sandhurst, 2011).

Providing support for breastfeeding mothers in learning to feed their preterm infants at the breast, as well as learning to feed with a bottle (with expressed breast milk or preterm formula) is important and should not be left for the day of discharge. Late preterm infants (34 weeks to 36 6/7 weeks gestation) are especially vulnerable to being discharged before breastfeeding is well established, with increased risk of significant medical complications and higher rates of readmissions.

Breastfeeding support to the mother-preterm infant dyad can be a challenge to nurses working in the NICU. Professional and peer support has proven to be the most effective motivator for mothers to provide breast milk for their preterm or ill babies. Breastfeeding failure is far more likely for mothers of preterm infants than for mothers of term infants. Some women choose to express their breast milk for only a short period of time with no intention of breastfeeding. Others are unsuccessful because of infant-related or situation factors. There are many factors that may lead to
lactation failure and low breastfeeding rates in this population, including lack of support from the partner or family, return to work, failure to establish or maintain a milk supply, stress, and fatigue. Inconsistent, inaccurate information and lack of support by health care professionals has also been discussed (Hake-Brooks & Anderson, 2008; Almeida et. al., 2010).

Education of health care professionals is instrumental in the success of establishing lactation in mothers. Awareness of cultural mores, previous exposure to breastfeeding, and current educational gaps are important components to preparing an educational environment conducive for patient-centered teaching. An unprepared NICU nurse-educator can create a sense of insecurity in a new mother. An ambivalent nurse may unintentionally send mixed messages and create doubt about a new mother’s decision to provide breast milk or breastfeeding. NICU nurses cannot underestimate their degree of influence on new mothers. The bond created by the patient-nurse relationship, during the crisis of preterm infant care, has significant implications for a new mother’s decision making. Among the many ways in which the nurse can be supportive of the mother-preterm infant dyad are the following:

1. Encourage skin-to-skin contact as early as possible and for as long as possible as much as the infant’s medical condition permits.
2. Offer the infant the opportunity to nuzzle as soon as he or she is stable, and progress to breastfeeding as the infant matures and develops.
3. Plan the infant’s day so breastfeeding sessions do not occur after a stressful or exhausting activity.
4. Provide the mother with a comfortable chair with sufficient support for back, arms, and feet.
5. Offer privacy by providing screens in the nursery.
6. Review positioning and latching-on techniques.
7. Support mother in learning to read and respond to her infant’s feeding cues.
8. Know the behaviors at the breast for the different gestational ages so the mother can set realistic expectations based on the infant’s maturity, medical history, and current condition.

Typically, breastfeeding or bottle-feeding has not been recognized by nursing or medicine, as an intervention requiring expertise. Both breast and bottle methods of feeding have been thought to be instinctual for both the infant and the caregiver; consequently, it is believed that anyone can feed a baby. When oral feeding is unsuccessful, caregivers are just as likely to be found at fault as infants. This is especially true of parents who are trying to become competent at feeding their preterm infant (McGrath, Medhoff-Cooper, Hardy, & Darcy, 2010). In the NICU, long-term relationships between the nurse and the new mother are often established as a result of the length of stay of the preterm infant. For this reason, NICU nurses have the unique opportunity to affect, support, and enhance a new mother’s lactation and breastfeeding experience, as well as bottle feeding experiences.
Lesson: Oral Feeding in the NICU

Practice strategies to facilitate safe nurturing oral feeding experiences

1. Individualize care by incorporating cue-based/infant-driven feeding practices.
2. Facilitate early, frequent, and prolonged skin-to-skin care (kangaroo mother care).
3. Support mother’s EBM supply.
4. During feedings, swaddle (and hold) the infant with hands free toward face and flex the infant in a semi-upright, side-lying position.
5. Maintain a quiet, nurturing environment for the feeding experience.
6. In collaboration with mother, select the correct feeding method (breast, nipple and bottle) for each individual infant. (Encourage and support breastfeeding before bottle-feeding).
7. Consider maintaining an indwelling nasogastric feeding tube vs. placing an intermittent oral gavage feeding tubes.
8. Promote nonnutritive sucking (NNS) between and with feedings.
10. Minimize suctioning interventions & other negative perioral stimulations.
11. Provide positive perioral and intraoral stimulation as tolerated to facilitate normal sucking behaviors.
12. Employ external pacing strategies as needed for infants with transitional sucking pattern.
13. Continually assess the infant for signs & symptoms of physiologic instability, fatigue, stress, disorganization, lack of coordination with the suck-swallow-breathe sequence, progressive leaking of milk around mouth. Discontinue the feeding as indicated by these signs & symptoms, reassess the infant’s level of readiness and proceed with care as directed by the infant’s behavioral cues.
14. Do NOT force feed any infant. Feedings should be interactive with the infant.
15. Provide frequent respites for the infant and burp the infant through gently rubbing of the back, not patting.
16. Limit a nippling session to 20-30 minutes.
17. Provide consistent caretakers whenever possible.
18. Individualize feeding care plans utilizing a multidisciplinary approach.

Oral Bottle Feeding

Historically, traditional criteria for feeding success in the NICU focus on measurements; a prescribed volume is ingested within a prescribed time frame (usually 20-30 minutes). Every unit had one or more nurses with the dubious distinction of being able to “feed a rock”, using various strategies to empty the bottle (e.g. slitting the nipple, “pumping” or twisting the nipple in the baby’s mouth to manually squeeze milk from the nipple, rhythmically tapping the bottom of the bottle) without much regard to infant participation or tolerance. This traditional approach to feeding does not hold up under the scrutiny of current research and has resulted in an increased risk of disorganization and silent aspiration in the NICU population (Comrie & Helm, 1997).

The emphasis in the NICU has been on technology and numbers rather than on infant behaviors. Developmentally supportive feeding focuses on the infant. Neurological maturation, medical issues, ongoing physiologic status, current stage of feeding readiness and skills, and psychosocial and interactive skills has redefined feeding success in the NICU. Quantity becomes secondary to the safety and quality of the feed (Ross & Philbin, 2011; Shaker, 2013). The infant is supported during the feeding to avoid physiologic and neurobehavioral stress and instability, to facilitate healthy adaptive feeding behaviors, and to encourage nurturing interaction. The family must develop confidence in their ability to read and respond to their infant’s cues, and to nourish and nurture their baby as he/she learns to eat (Hunter, Lee, & Altimier, 2014).

A cue-based or infant-driven approach to oral feeding is the state-of-the-art approach that incorporates tremendous observation skills which neonatal nurses require to identify infant feeding
readiness signs in establishing when an infant is ready to attempt oral nipple feedings (Waitzman & Ludwig, 2007). This individualized approach to feeding readiness considers such factors as the infant's medical status, neurobehavioral organization (i.e., vigor, sleep-wake cycle, ability to achieve some stable alert periods, autonomic/motor/state stability), and feeding readiness cues [e.g., awakening or fussing prior to feedings (alertness), spontaneous rooting and sucking behaviors (hunger), and gagging with gavage tube insertion] (Shaker, 2013). Initiation of oral feeding, whether at breast or bottle, is based on when the infant shows readiness, which is assessed at or surrounding each feeding time (Hunter, Lee, & Altimier, 2014). If the infant awakens (either on his own or with caregiving) and shows readiness cues, he is given a chance to orally feed. With this approach, oral feeding is infant-driven rather than caregiver-driven.

**Effective Eating**

There are four essential components to ensure that an effective feeding experience occurs:

1. Physiologic stability
2. Infant Organization
3. Parental Attributes
4. Motor stability

Once the oral feeding begins, continual caregiver assessment of the infant's physiologic stability and participation in feeding determines how long the oral feeding lasts. Any volume that is not taken orally is simply given through the nasogastric tube. Because infant-driven feedings depend on active infant participation rather than caregiver manipulations, organization and safety are increased.

Because the infant participates during cue-based feedings, parents often experience greater success feeding their baby. Teaching parents how to reduce extraneous external stimuli, read and respect their infant's individual cues, provide secure postural support, and facilitate rest pauses or breathing breaks as needed (external pacing) boosts their confidence and increased the success of oral feeding after discharge.
Infant – Driven (Cue-Based) Feeding

Even when adequate breast milk is available, most premature neonates learn to eat via nipple feeding. Nipple feeding is a complex task for premature infants and requires a skilled caregiver in assisting the infant in achieving a safe, effective, and pleasurable feeding experience. Goals for successful infant-driven feedings (Ludwig & Waitzman, 2008) are that oral feedings are:

- Safe
- Functional
- Nurturing
- Individually and developmentally appropriate

To support the implementation of infant-driven (cue-based) feeding, a quantifiable and measurable tool to provide information to the caregiving team about how infants behave during feedings and the nursing activities that support oral feedings is beneficial. Descriptive feeding scales are utilized more consistently and objectively to document both feeding readiness, quality of each oral feeding, as well as caregiver strategies (Ludwig & Waitzman, 2007; Newland, L’Huillier & Petrey, 2013). These scales allow NICU staff to quickly document behaviors and interventions so that all caregivers involved in supporting the infant’s oral feeding development can have a full picture of what is occurring.

The Infant-Driven Feeding Scales © (IFDS) are used for infants in the NICU/SCN that are medically stable and are > 33 weeks PMA. The IFDS© are tools used in an infant-driven feeding practice. The IFDS is composed of three scales meant to be used together to assist the healthcare team in identifying the infant’s readiness to nipple feed, the infant’s feeding abilities, and the techniques used by the caregiver to assist the infant during feeding.

**Description of Scoring**

Both the Feeding Readiness and Quality of Nippling Scale are five-point scales with 1 being the most optimal mature infant response and 5 being the least. The Caregiver Technique Scale is done in letters to differentiate infant responses from descriptions if caregiver interventions.

**Determining Feeding Readiness**

The Feeding Readiness Scale is designed to be part of the overall evaluation leading to initiation and progression of oral feeding. The feeding readiness scale should be administered during provision of care.

**Determining Feeding Quality**

The Quality of Nippling Scale encourages the staff to observe the infant’s behavior throughout oral feeding. Infant behaviors are documented from 1 (most stable performance) to 5 (least stable performance).

**Caregiver Technique**

Documenting caregiver techniques provides consistency for the infant and standardizes reporting of infant needs during the feeding process. One or a combination of techniques can be used and documented as indicated.
Infant-Driven Feeding Scale

* Implementation of the IDFS is best accomplished after education about both the use of the scales and the protocol for progression of feedings (Ludwig & Waitzman, 2007).

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<th>Scale</th>
<th>Score &amp; Description</th>
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| Infant Readiness       | 1. Alert or fussy prior to care. Rooting and/or hands to mouth behavior. Awakens at or before scheduled feeding time. Good muscle tone.  
5. Significant changes in HR, RR, O2, WOB outside safe parameters. |
| Quality of Nippling    | 1. Nipples with a strong coordinated suck, swallow, breathe (SSB) throughout feed.  
2. Nipples with a strong coordinated SSB but fatigues with progression.  
3. Difficulty coordinating SSB despite consistent suck.  
4. Nipples with weak and/or inconsistent suck. Little to no rhythm.  
5. Unable to coordinate SSB pattern. Significant change in HR, RR, O2, WOB outside safe parameters. |
| Caregiver Technique    | A. Modified Side-lying  
Position infant in inclined sidelying position with head in midline to assist with bolus management.  
B. External Pacing  
Tip bottle downward to facilitate rhythmical suck-swallow-breathe pattern.  
C. Cheek Support  
Provide gentle unilateral support to improve lip seal and/or intra oral pressure.  
D. Specialty Nipple  
Using nipple other than standard for specific purpose (i.e. Haberman, slow-flow, nipple shield).  
E. Chin Support  
Provide gentle forward pressure on mandible (for infant with small chin or wide jaw excursion) to ensure tongue stripping. |

Discharge Criteria

Parents often ask when their baby can go home. For most NICU babies, the last obstacle to hospital discharge is accomplishing oral feeding. The criteria below describe what has become a “gold standard” for determining stability in growing preterm infants before discharge.

Criteria for Discharge of Preterm Infants (Merritt, Pillers & Prows, 2003)

- Cardiorespiratory Stability
- No apnea or bradycardia for 5-7 days
- Consistent weight gain
- Thermal regulation
- Successful bottle feeding (even if mother intends to breastfeed)
- Active parental participation in caregiving
- Parents confident regarding feeding skills
- Home environment is calm and prepared for care of an infant
Historically, sufficient time was allowed for the preterm infant to gain endurance and for suck-swallow-breathe coordination to mature. However, oral feedings are often initiated at earlier ages or pushed more aggressively for earlier discharge. While this may be successful with some infants and families; others struggle for weeks at home, and some babies are readmitted for dehydration or failure to gain weight (Browne & Ross, 2011, Ross & Browne, 2013). Because premature infants are often discharged home before oral feeding skills are fully mastered, parents/caregivers need to be comfortable and confident in recognizing, interpreting and responding to their infant’s behaviors to appropriately support him/her through the final steps of feeding mastery at home (Shaker, 2013).