The Feeding Therapist’s Role: Breastfeeding in the NICU

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Disclosures

• Amber

  Employed by Baptist Health Lexington. No further relevant financial or non-financial relationships to disclose.
Objectives

Participants will be able to...

• identify concept of recreational breastfeeding.
• list techniques for non-nutritive sucking.
• list at least two feeding readiness cues.
• identify at least two ways that feeding therapists support breastfeeding.
Breastfeeding is the GOLD STANDARD

American Academy of Pediatrics

- Breastfeeding and human milk are the normative standards for infant feeding and nutrition. Given the documented short- and long-term medical and neurodevelopmental advantages of breastfeeding, infant nutrition should be considered a public health issue, and not a lifestyle choice. (2012 Pediatrics)

World Health Organization

- WHO recommends that low-birth-weight (LBW) infants, including those with very low birth weight (VLBW), should be fed mother's own milk. If these infants cannot be fed mother's own milk, they should be fed donor human milk.

- “Low-birth-weight infants who are able to breastfeed should be put to the breast as soon as possible after birth when they are clinically stable, and should be exclusively breastfed until six months of age. Low birth-weight infants who need to be fed by an alternative oral feeding method should be fed by cup or spoon and should be fed based on the infants' hunger cues, except when the infant remains asleep beyond three hours of the last feed.”
Statistics

- World Health Organization (WHO) and UNICEF have set out three strategies needed for increasing breastfeeding initiation and duration
  1. Promotion
  2. Protection
  3. Support
Ten Steps to Successful Breastfeeding (WHO/UNICEF)

1. Have a written breastfeeding policy that is routinely communicated to all health care staff
2. Train all health care staff in skills necessary to implement this policy
3. Inform all pregnant women about the benefits and management of breastfeeding
4. Help all mothers initiate breastfeeding within one hour of birth
5. Show mothers how to breastfeed and how to maintain lactation even if they should be separated from their infants.
Ten Steps cont.

6. Give newborn infants no food or drink other than breast milk unless medically indicated.

7. Practice rooming-in: allowing mothers and infants to remain together-24 hours a day (when possible)

8. Encouraging breastfeeding on demand

9. Give no artificial nipples or pacifiers (i.e. bottles)

10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic
Hierarchy of Feeding

1. Mother’s own breastmilk (fresh)
   - Helps bonding
   - Helps establish lactation

2. Donated fresh preterm milk
   - Good balance of nutrients (may need supplemental calcium and Vit. D)
   - Prevents infection
   - Easily digested

3. Donated fresh term mature milk
   - Prevents infection
   - Easily digested, but lacks adequate protein
   - Usually foremilk, so may lack fat

4. Pasteurized donated breastmilk
   - Easily digested
   - HIV destroyed, anti-infective factors partially lost

5. Preterm formula
   - Correct nutrients, but not necessarily easily digestible
   - No anti-infective properties
   - More severe infections

6. Ordinary formula
   - Wrong balance of nutrients
   - No anti-infective properties
   - Less optimal growth and development
   - More severe infections
   - Difficult to digest and utilize

WHO, 2006
Paradigm shift:
If humans are designed for human milk, then that SHOULD BE the standard for our goal setting

Think as professionals: are we looking at human milk and nursing as “the norm” and bottle feeding as an adaptive strategy?
Evidence Based Practice

- Individual Clinical Expertise
- Patient's Values & Expectations
- Best Available Clinical Evidence

Improved Patient Outcomes
Team Approach

Who is involved?
Collaboration

Nurses (RN)
- Support feeding as a developmental skills
- Foster the “Dance of Attachment”
- Encourage and promote kangaroo care
- Identify feeding cues and determine if baby is neurodevelopmental ready for PO intake
- Carryout Feeding plan as baby is appropriate
- Provided non-nutritive sucking opportunities
- Collaborate with feeding team
- Educate parents

Patient Care Techs/ Nurse assistance
- Watch for feeding cues and alert feeding team
- Assure the baby’s room is free of distractions and developmentally appropriate
- Non-nutritive sucking during gavage after Therapist approval
Collaboration

**Occupational Therapy**
- Assist with “occupations” of the NICU
  - Sleeping
  - Feeding
  - Interacting with parents/caregivers
  - Use eyes/hands to explore the environment
- Support and promote feeding
  - Neurobehavioral organization
    - Maintain calm awake for feeding
  - Sensorimotor processes
    - oral aversion
    - sensory integration
  - Neuro-motor development
    - Hands to mouth
    - Positioning for feeding
- Child/caregiver bonding
  - Kangaroo care
  - Eye contact
  - Mother ease speech

**Physical Therapy**
- Motor development
- **Stability before mobility**
- Need to be held upright for 30 min.
- Ensure no pressure on stomach
- Supervised “tummy time”
- Limit time in baby equipment
- Avoid positioning in car seats

AOTA, 2007

ABPTS, 2015
Collaboration

Dietician (RD)

- Breastfeeding is an important public health strategy for improving infant and child morbidity and mortality, and improving maternal morbidity, and helping to control health care costs.” – 2009 by the American Dietetic Association
- Breastfeeding is optimal for nutrition
  - Determine if breastmilk needs fortifier
  - Consider how fortifier may affect gut
- Formula for nutrition
  - Partially hydrolyzed: 100% whey
  - Intact Protein: 52 whey/48 casein
  - Intact Protein: 40 whey/60 casein

Medical Doctor (MD)

- Guide total care of infant
- Orchestrate consultations/collaborative care
- Collaborate with parents/families
The Feeding Dream Team

Lactation Consultant

• Assessment and evaluation
  • Adequate milk supply
    • Promote pumping as needed
  • Infant latch
    • Knowledge on frenulum and tongue tie

• Intervention
  • Provide instructions and education to increase milk supply
  • Positioning for nursing
  • Promote Kangaroo Care

Speech-Language Pathology

• Assessment and evaluation
  • Pre-feeding readiness
  • Oral swallow function
    • Oral mechanism exam
    • Latch
    • Transfer of milk
  • Pharyngeal swallow function
    • Stress cues
    • Instrumental swallow assessment

• Intervention
  • Promote infant feeding readiness
  • Positioning for nursing
  • Tools (nipple shield
  • Provide education to parents and support staff
Why should SLPs care about breastfeeding?

- “The American Speech-Language-Hearing Association (ASHA) has long accepted the prevention of communication disorders as one of the profession's primary responsibilities.”
  - GI, Respiratory, Otitis media (Ip et al., 2007), IQ* (Belfort et al., 2013)
- “Developmentally supportive” care
  - “…support the infant's physiological stability, self-regulation, behavioral organization, and developmental progressions…”
  - Babies are more stable at the breast (Bier et al., 1993; Chen et al., 2000; Goldfield et al., 2006)
- ASHA Practice Recommendations
  - Clinicians providing pediatric dysphagia services should have knowledge and skills to assess and treat breastfeeding as well as bottle feeding.

Blake, McComish, Crais, & Thoyre, 2014
Neurodevelopment

Why is cue based feeding important?
Feeding and Neurodevelopment

- Feeding is
  - the most complex task an infant is asked to do
  - a time to continue to develop positive motor and sensory neuro-pathways
  - critical element of patient care
  - a time for family and infant to build a relationship
- Positive feeding experiences during infancy lead to positive relationships with food and meal times for child and families throughout life

Shaker, 2013
Feeding and Neurodevelopment

- Professionals should foster the parent-infant relationship during feeding by
  - Supporting and guiding the parents and infant to have a positive feeding experience
  - Facilitating parent-baby attachment/ “dance of attachment”
  - Empower the parents to
    - Understand the infant’s behaviors
      - Read baby’s cues
    - Trust in establishing the parent-infant bond

A lack in continuity of the feeding approach and communication can adversely affect the baby’s overall feeding experiences leading to decreased PO intake and longer hospital stay

Shaker, 2013
Feeding should never be considered a care task.
Feeding Signs of Stress or Discomfort

**Major stress cues**
- Coughing/choking
- Change in color
- Bradycardia
- Breath holding or apnea
- Stridor
- Decreased O2 SATS
- Multiple swallows
- Moderate drooling

**Minor stress cues**
- Irritable/frantic
- Disorganized/difficulty latching
- Respiratory fatigue
- Tachypnea or increased WOB
- Nasal flaring/blanching
- Gulping
- Minimal drooling
- Anterior loss

Shaker, 2014
REMEMBER

Clocks have batteries

Babies have brains

#ADAM
Breastfeeding Benefits
Important for Preemies

- The bioavailability of nutrients (e.g. iron) in human milk is higher than in other foods
  - Preterm Milk has a different composition for the first 30 days after delivery.
  - Higher in protein, fat, electrolytes compared to mature milk
    - Mother’s breasts make baby specific milk
  - Improved neuro-development outcomes
- Infants fed breast milk have faster brainstem maturation compared with infants fed preemie formulas (especially for those born between 28-32 weeks)
- Improves eye and brain development in preterm infants

Callen, J (2005)
Respiratory and GI Benefits

- **Respiratory**
  - Reduces incidence of Chronic Lung Disease, RVS, and PNA
  - Very low birth weight infants are less likely to exhibit oxygen desaturation to less than 90% during breastfeeding
  - Some hospitals have policies in place to allow for breastfeeding in high risk for aspiration population

- **Gastrointestinal**
  - Reduces the risk of Necrotizing Enterocolitis and other Nosocomial Infections
  - Less diarrhea is the most readily acknowledged advantage of breastfeeding
    - Low iron in the stomach so organisms can't grow and multiply
    - Bifidus factor promotes growth of friendly bacteria that maintains low pH and crowd out pathogenic organisms
    - Antimicrobial activity boosters
    - Antibodies, such as Secretory IgA which bind to the microbes in the digestive tract and prevent them from being absorbed in the body
    - Breastmilk contains antibodies, proteins, and immune cells used to fight infection from foreign bodies (Field 2005)
    - ANY breastfeeding is associated with a 64% reduction in non-specific GI tract infections
  - *Absence of the exposure to contaminants (bottle, nipple, water) and formula ingredients*
Mother’s Benefits

- Improved bone density; decreasing risk for hip fracture
- Decreased risk for postpartum depression
- Reduced post-partum bleeding and delays in cycles
- Enhances self-esteem in the maternal role
- Strong bonding with infant
- Saves Time and money on formula and associated increased medical needs
- Increased energy expenditure which may lead to faster return to pre-pregnancy weight
- Faster shrinking of the uterus
- Decreased risk for chronic diseases such as type 2 diabetes, breast and ovarian cancers
Why is breastfeeding difficult?

Breastfeeding

- Unrealistic expectations
- Lack of timely interventions/support
  - The fastest drop-off is in the first ten days after discharge (note this is not after birth but after d/c from the hospital)
- Misinformation
  - About why mothers stop breastfeeding
  - Parent to parent information
  - 5% of the female population actually has an issue with undersupply

Pumping

- Providing breast milk for 6-12 months is very difficult for mothers who exclusively pump
- Providing breast milk even to discharge in the NICU is extremely difficult if there is no skin to skin and/or breastfeeding
- When a mother in NICU is able to establish successful actual breastfeeding during the infant’s stay, long-term breastfeeding success is much more likely

Healthy Children’s Initiative

Pineda, R. (2011)
Sound of child’s cry

Hypothalamus

PIH cell

Oxytocin neuron

Portal system

Anterior pituitary

Posterior pituitary

Inhibition of prolactin cells is removed.

↑ Prolactin

↑ Oxytocin

Milk secretion

Smooth muscle contraction

Milk ejected

Baby suckling

Mechanoreceptors in nipple

Ascending sensory information
Recreational Breastfeeding

Non-nutritive sucking
What is recreational breastfeeding?

- Non-nutritive sucking: experiences to promote nutritive sucking and breastfeeding
  - Optimal after 15-20 min of kangaroo care as it helps with state transitions
- Mother pumps breast until empty
- Baby dressed in diaper and hat
- Place baby nose to nipple for latch
- Nerve fibers of touch and smell lead directly to the amygdala (emotional memory and fear conditioning) (Shore, 2001a)
Who does it benefit?

**Baby**
- Quality skin to skin time
  - Homeostasis
  - Warmth
  - Stability
  - Movement
- Develop skills
  - Suck
  - Latch
  - Hand massage on breast
- Improves cardio respiratory stability
- Exposure to the infant’s NICU environmental pathogens stimulate the mother to produce antigens particular to her baby’s needs

**Mother**
- Bond with baby
- Skin to skin and suck increases prolactin which helps with milk supply
- Reduces stress of mother
Feeding therapist’s role

- Encourage recreational breastfeeding
  - When baby cueing to feed
  - Encourage rooting reflex
  - During gavage times
- Ensure and promote adequate latch
  - Educate mother to ensure adequate latch with each attempt
  - Encourage proper latch without the use of nipple shield
- Educate and encourage family
  - Feeding cues
  - Positioning for feeding
  - Appropriate state for feeding
  - Benefits of breastfeeding
  - How to breastfeed when baby is ready
  - How to encourage and maintain milk supply
Mature Non-Nutritive Suck Ability ≠ Nutritive Feeding Success

McGrattan, 2015
Breastfeeding

Nutritive suck:swallow:breath
Are We Ready Yet?

- Assess breastfeeding readiness similarly to bottle feeding, however keeping in mind that infants may be able to attempt breastfeeding slightly earlier than bottle feeding due to state regulation with skin to skin contact.

- Look for:
  - Stability with handling
  - Showing oral interest
  - All infant led

***Progression from skin to skin position to actual exposure to the breast to eventual latching and non-nutritive sucking***
Baby Feeding Cues (signs)

**EARLY CUES - “I’m hungry”**
- Stirring
- Mouth opening
- Turning head
  - Seeking/rooting

**MID CUES - “I’m really hungry”**
- Stretching
- Increasing physical movement
- Hand to mouth

**LATE CUES - “Calm me, then feed me”**
- Crying
- Agitated body movements
- Colour turning red

Time to calm crying baby
- Cuddling
- Skin to Skin on chest
- Talking
- Stroking
Flow Rate

- Physiologic Differences: The Vessel
  - Flow rate: baby driven vs passive flow
  - Bottle feeding Respond to a more passive flow
  - Same relative flow rate throughout the feeding (minus gravity)
  - Breastfeeding allows ability to stop and modulate flow with movement of the gums/tongue movement
  - Milk Ejection Reflex (letdown)
  - Flow slows as feeding progresses, thicker milk at end

Successful Feeding

- **Experience vs. Volume**
  - When an infant is learning to oral feed, the *experience* is more important than the volume of PO accepted
  - Perfect, consistent infant practice leads to faster learning
  - Feeding is a developmental skill
  - The goal is to have infants become successful feeders NOT just successfully feeding (for one meal for example)

Slow and steady WINS the race

Ewing & Seitz, 2014
Cue based Feeding

- Co-regulated approach
  - Partnership between infant and caregiver
  - Caregiver understands and uses the infant’s communication to guide feeding
    - Physiologic and behavioral communication during feeding
  - During the feed
    - Observes the infant for movement and signs of stress
    - Continuously modifying the feeding approach in accordance with the infant’s communication

A lack in continuity of the feeding approach and communication can adversely affect the baby’s overall feeding experiences leading to decreased PO intake and longer hospital stay

Shaker (2013)
Impact of Cue based Feeding

- Transitioning from volume driven feeds to infant driven
- Anderson et al. (1990) and McCain et al. (2001)
  - Infants 32-34 Post menstrual age
  - Experimental group
    - Received bottle feeds based on physiologic and behavioral responses
  - Control group
    - Received standard care (volume driven)
- Results
  - Experimental group achieved full PO nutrition sooner and gained more weight.

Shaker (2013)
Impact of Cue based Feeding

- McCain et al. (2012)
  - Infants born at <24 weeks GA with chronic lung disease
  - Experimental group
    - Offered bottle feeding based on cardiorespiratory and behavioral responses
  - Results
    - Experimental group achieved full PO 5-6 days sooner than control group

- Thoyre et al (2012)
  - Infant born at <32 weeks GA with lung disease
  - Provided co-regulated approach to feeding had more stable oxygen saturation, less heart rate fluctuation and decline, improved swallowing, less excessive breathing effort

Shaker (2013)
A Newborn's Stomach

Day one
Size of a cherry
5 - 7 ml
1 - 1.4 tablespoons

Day three
Size of a walnut
22 - 27 ml
0.75 - 1 oz

One week
Size of an apricot
45 - 60 ml
1.5 - 2 oz

One Month
Size of a large egg
80 - 150 ml
2.5 - 5 oz

www.babiesfirstlactation.com
Supplemental Nursing System (SNS)

- A device that allows baby to receive extra milk at the breast.
- May be used
  - Baby
    - with weak suck
    - Transitioning from bottle to breast
  - Mother with decreased supply
  - Mother’s milk has not “come in” yet
Bottles to support breastfeeding
Bottles and Breastfeeding

- Be aware of certain nipple shapes
  - Orthodontic nipple
  - Nipples with abrupt change from nipple to base
- Make bottle feeding more like breastfeeding
  - Mimic breastfeeding by letting baby pause and rest periodically while bottle feeding
  - Allow baby to have burst on bottle just like on breast, then take a pause for catch up breathing, simulating a let down
  - Continue allowing burst cycles and rest cycles throughout bottle feed; can leave bottle in the mouth just like a breast would be, just pausing for rests
Milk flow varied significantly between different types of nipples, from 2.1 mL/min (Enfamil Cross-Cut) to 85.3 mL/min (Dr. Brown’s Y-cut).

**Mean Milk Flow Rate (mL/min)**

- Similac Standard
- Similac Slow
- Similac Premature
- Playtex Venteraire Slow
- Pigeon Standard
- Pigeon Slow
- Pigeon No Drip
- Parents Choice Slow
- Nuby Medium
- NUK
- NUK Slow
- Medela Calma
- Medela Wide Base Slow
- Medela Special Needs Feeder
- MAM
- The First Years Gumdrop
- Fisher-Price
- First Essentials
- Enfamil Standard
- Enfamil Slow
- Enfamil Preemie
- Enfamil Cross-Cut
- Dr. Brown’s Y-cut
- Dr. Brown’s Level 3
- Dr. Brown’s Level 2
- Dr. Brown’s Level 1
- Dr. Brown’s Preemie
- Difrax
- Bionix Level 5
- Bionix Level 4
- Bionix Level 3
- Bionix Level 2
- Bionix Level 1

*Note. Nipples are color coded according to brand.*

(Prados et. al, 2015)
Elevated Side-lying Position (ESL)

Benefits:

- Increased O₂ saturations
- Less HR variability
- RR closer to baseline
- More regular intervals between breaths are noted
- Easier for infant to organize and control fluid in oral cavity to prepare for swallowing
- Left side down allows for improved stomach emptying
- Right side down after the feed has been shown to reduce reflux.

Clark et al, 2007; Park et al, 2014
Breastfeeding/Nursing Aversion

Words, not a breast
Abound in real
mother's milk in home
Cup feeding

Affection issues
Engagement
Leaning backs

Debunking myths
Blend check

Recognition of

NO humour allowed in the workplace

Pumping

Feeding in public

Don't feel a breast

Trust your body

Successful breastfeeding

Psychological support

Healthy nipples

Leaking breasts

Nevertheless, she persisted.
Keys to success...

- Maternal Support
- Emotional Support
- Physical support
- Monitor through milk production
- Referrals
- Direct breastfeeding assessment
- Breastfeeding assessment
- Milk Supply Partner support
- Milk Supply Assessment
- Collaborative Team Support
- Community support in NICU
Questions?
References, Slides
Or Questions:

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