Supporting Parents and Infants During Early Feedings in the Intensive Care Unit and at Home

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Financial Disclosures

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Objectives

• List at least one emotion families report having while feeding their infants in the NICU
• Define “nourish” and “feed”
• List at least one resource available to families
• List at least one way staff in the NICU can help parents feel attached to their infant in the NICU
• List at least one area of knowledge parents need to be taught
Core Values

• The family is the most important and consistent context in which an infant develops (Hanson et al., 1994)

• An informative and supportive relationship with the family will benefit the infant

• Providing support and information for the family will optimize infant development (Achenbach et al., 1993)

Long Term Benefits of Parent Education

• RCT, n=91; term, preterm (E) and preterm (C)

• 11 total one-hour sessions

• Longitudinal across 9 years

• Preterm (E) and term infants no different at 36 months and 9 years of age on developmental and academic testing

• Preterm (C) lower scores, p<.05 at 36 months and 9 years

Achenbach, et al., 1993
Core Values

• Family members are treated as equal partners

• Developmentally supportive care must be a collaborative approach that draws on the expertise, strengths and resources of the family (Hanson et al., 1994)

• Infants are in continuous interaction with their environment (Als, 1986; Sweeney, et al., 2010)

• Infants are active collaborators in their interactions (Als & Gilkerson, 1995) and their behaviors should be interpreted and responded to by the caregiver

Core Values

• In providing developmentally supportive care, there are basic principles for optimizing behavioral organization and supporting regulation

• Regulation is defined as physiological, neurological, behavioral, and emotional processes “that modulate a wide variety of functions to keep them within adaptive ranges” (Shonkoff and Phillips, 2000)
Biological Expectations

- Uterine environment provides the fetus with everything necessary to grow and develop:
  - Physiologic
  - Motor
  - Sensory

- After birth, the newborn expects to be cared for by a small, consistent number of people
Neonatal Intensive Care Units

- Mismatch between biological expectations and environment
  - Physiologic
  - Motor
  - Sensory
  - Parental

Disruptions in Parenting

- Need to continue with expected life tasks (groceries, bills, etc)
- Fear/uncertainty of caring for their infant
- Reliance on NICU staff
- Role stress (no longer their infant’s primary caregiver)

Madhoun & Dempster, 2019
Disruptions in Feeding Post-Discharge

- Feeding and weight problems are some of the top readmission reasons
- Difficulty controlling the environment
- Goal of avoiding supplemental tube feedings
- Shifting off calculating everything (volume, weight gain)

Madhoun & Dempster, 2019

Preterm Infant Feeding Outcomes
Feeding at Discharge

• Kirkby et al (2007)
  • 0.8% of infants (N=4932) born between 32 and 36 weeks GA were discharged with the need of a supplemental tube

• Jadcherla et al (2010)
  • 79% discharged to home fully nipple feeding
  • 16.6% discharged home on oral plus tube feeds
  • 8.6% on gastrostomy-tube feedings

Breastfeeding or Human Milk?

• Current breastfeeding definitions focus on what the infant receives, NOT HOW

• Where is the breastfeeding relationship?

Noel-Weiss, et al., 2012
What Exactly is “Exclusive Breast Feeding”?  

• World Health Organization defines exclusive breast feeding as an infant receiving 100% human milk, donor or mother’s
• With this definition, infants may be exclusively bottle feeding, but receiving 100% human milk, and still meet the criterion

Decline in Breastfeeding Rates  

• Study of neonatal outcomes (Sweden 2004, 2013)  
• Rates declined in all groups:  
  • GA 22–27 weeks: from 55% to 16%  
  • GA 28–31 weeks: from 41% to 34%  
  • GA 32–36 weeks: from 64% to 49%
Feeding Problems

- Parental questionnaires at 3, 6, and 12 months (adj)
- Compared early born (25 to 33.6 weeks GA) and later born (34 to 36.6 weeks GA) groups
- No significant differences between groups for:
  - Low appetite: 12-14% across study
  - High avoidant behavior: 2-4% (3, 6 mos)
  - Med-High Maternal anxiety: 25-39% (3, 6 mos)

DeMauro et al., 2011

Feeding Problems

- Significant differences (higher rates) in Early Born:
  - Oromotor dysfunction at 3 and 12 months
    - Borderline (19% vs 13%, and 6% vs. 4%)
    - High (10% vs 4%, and 3% vs 0%)
  - Avoidant Behavior at 3 months
    - High (7% vs. 3%)
  - Maternal feeding anxiety at 12 months
    - Med-High (37% vs. 27.4%)

DeMauro et al., 2011
Quality of Feeding Skills

Subjects: N=20
BW<1000 grams; mean GA 27 weeks
• Feedings are prolonged and messy
• Much of food drops out of mouth
• Pace of feeding is rapid
• Increased sensitivity to texture, temperature and tastes
• Both infant and feeder become impatient

Prevalence of Feeding Problems

n=80 children born ≤30-weeks gestation, seen at 2 years
Eating Subscale of the Infant-Toddler Social Emotional Assessment
• 21 were at risk, and an additional 18 had definite feeding difficulties
• Parents of children with more feeding difficulties:
  • higher parenting stress ($P = .02$)
  • more difficulty managing their child's behavior ($P = .002$)
  • more frequent parent-child interaction problems ($P = .002$)

No associations were found between difficult feeding behaviors and growth, maternal mental health, or family factors.
Feeding or Nourishing:

Expanding our Goal

Are We all Thinking About the Same Thing?

**Feeding Definition:**

- To give food
- To supply with nourishment
Are We all Thinking About the Same Thing?

**Nourish Definition:**

- To foster development
- To support and encourage, as during the period of training or development

“...Infant feeding is a matter of infant-mother relationship, a putting into practice of a love relationship between two human beings.”

Winnicott, 1987
“The feeding relationship is important because … parents frequently evaluate their premature infant’s health and their competency as parents by the infant’s feeding success and weight gain before and after discharge.”

Deloian, 1998

“A baby’s ability to eat and a mother’s ability to feed her baby are at the heart of who she is as a mother.”

Thomas, 1995
A majority of the time together in the first year is spent feeding

Thomas, 1995

Feelings When Unable to Breastfeed

• n=33 mothers of preterm infants
  • Sorrow
  • Guilt
  • Disappointment
  • Frustration
  • Insecurity
  • Fear (touching, holding or harming)

Davim, 2011
Feelings After Successfully Breastfeeding

• Fulfillment
• Pride
• Satisfaction

The pressure to “get (the volume) in” the neonate is often then passed along to parents, for whom feeding becomes something they do “to” their newborn, instead of a relationship-based experience through which communicative interactions build trust.”

Shaker, 2017
“Confidence comes from having the information necessary to assess the infant during feeding and to intervene to minimize problems.”

Shaker, 1999

NICU and effect on parents

- NICU stays affect the developing parent-child relationship
- Parents express a feeling of closeness and “attachment” when:
  - They have a role as a parent (autonomy, making decisions)
  - They provide for their infant (feeding, holding, interacting)
  - They receive support from staff
- Parents express a separation when they have to leave their baby in the NICU
- The NICU environment directly influenced the parent’s perception of feeling close, or being separated, from their infant

Treherne, et al, 2017
The NICU interferes with confidence

- 50 Mothers-PreTerm ; 25 Mothers-FullTerm
- M-PT group had significantly more mothers with clinical symptom of anxiety;
- M-PT reported more uncertainties and worries about breastfeeding, and reports were positively correlated with neonatal risk status;
- Lower BW, higher neonatal clinical risk, and longer length of stay in NICU were associated with more mothers' worries and seeing obstacles for breastfeeding

Padovani, et al., 2011

Maternal Stress and Mental Health

- Maternal distress improves as oral feedings begin
- Maternal worry and “role stress” do not decline after the infant reaches full oral feedings
- Maternal depression and role stress lead to changes in maternal behaviors during feedings
  - More stimulation
  - Less regulation of milk flow

Park, et.al, 2016
Learning to Feed...

Subjects: N=12 mothers, 8 fathers

• Three themes identified:
  1. Feeding is an emotional experience
  2. Feeding requires that you “learn as you go”
  3. Feeding is a very technical task requiring learning skills

• Parents felt both positive and negative emotions during feedings

Stevens, et al., 2014

Which Skills Need to be Taught?

Subjects: N=16 mothers, infants mean age 28 weeks at birth

• The top five concerns of parents:
  • Reading cues
  • Co-regulating breathing
  • Providing motoric stability
  • Regulating milk flow
  • Providing rest periods

Maternal Concerns After Discharge

Subjects: Mothers of infants born <32 weeks GA

• Mothers struggled to interpret infant behaviors:
  • including those indicating feeding readiness, hunger and satiation
• Mothers struggled to adjust volume/schedule
• Mothers expressed concern over what they did not know

Reyna, et al., 2006

Maternal Concerns After Discharge

Subjects: Mothers of infants born <32 weeks GA

• Mothers did not express concern regarding skill deficits (even when these were present), such as:
  • problems coordinating sucking/swallowing and breathing
  • ongoing gagging
  • ongoing coughing

Reyna, et al., 2006
Trajectory of Parental Stress

Prospective, longitudinal study, n=125 (4, 24, 36 mos)

• More parenting stress at 4-mos of age reported by:
  • Mothers of multiples
  • Mothers of infants with more medical risks and shorter hospitalization
  • Mothers with lower education and more depressive symptoms
• Parenting stress decreased over time

Spinelli, et al., 2013

When Children Don’t Eat, Families Experience

• All-encompassing fear
• Concerns that are often not heard
• Guilt and a feeling that they are the cause for their children’s growth failure
• Isolation and helplessness

Thomlinson, E. 2002
Child Influences the Parent

Subjects: N=55; mean age 2 years, 27 with a Feeding Disorder

“having a child with a Feeding Disorder puts the mother-child relationship at risk for more negative feeding interactions” pg. 833

- More intrusive
- Less structured

The more worried about her child’s weight, the more a mother’s interactions with her child at mealtimes were impacted

Gueron-Sela, et al., 2011
Food Acceptance

Parent

- Skills & Abilities
  - Own likes/dislikes
  - Parenting Strategies
  - Ability to role model
  - Ability to co-regulate
  - Ability to structure/manage mealtimes
  - Knowledge of child development, nutrition
- Innate Characteristics
  - Temperament
  - Beliefs
- Resources
  - Time
  - Food availability
  - Financial resources, SES

Anti-Strategies

Child

- Skills & Abilities
  - Oral motor, Gross/Fine motor skills
  - Sensory abilities
  - Cognitive abilities / Age
- Innate Characteristics
  - Temperament
  - Genetic taste capabilities
- Experiential Learning
  - Familiarity of flavor
  - Feedback from food
  - Social context
  - Reinforcement of behaviors

Reaction

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Adjusting for Prematurity

Subjects: 72 infants (GA 30 weeks), now 13.7 mos, adj 11.3 mos

- Infant developmental readiness at time of solids introduction
- Parents of infants developmentally ready to start solids:
  - Higher satisfaction with infant’s eating habits ($P < .006$)
  - More comfort when feeding their infant ($P < .007$)
  - Less stress during feedings ($P < .04$)
  - Reported better appetites ($P < .002$)

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In Support of Parents:

• Supporting parents during the earliest feedings in the NICU may
  • Improve parent-infant attachment
  • Reduce stress on the parent
  • Improve intake of volume

• The (coach) has a unique position and responsibility for parental education and support in the NICU

Shaker, 2013

March of Dimes “My NICU Baby” App

• Answers, Tools, Support
• Track feeding and weight
• Track pumping and kangaroo sessions
• And more...
www.Feedingmatters.org

• Online resource for parents of children with feeding problems
• Online and telephone support for parent-to-parent support
• Resource for professionals
• Annual professional/parent conference (live, live-streamed)

Feeding Matters is the first organization in the world solely dedicated to furthering advances in pediatric feeding disorder by accelerating identification, igniting research, and promoting collaborative care for children and families.
A consensus paper declaring pediatric feeding disorder as its own stand-alone diagnosis was published in the *Journal of Pediatric Gastroenterology and Nutrition* in January 2019:

- Pediatric feeding disorder is identified as impaired oral intake that is not age-appropriate, and is associated with medical, nutritional, feeding skill, and/or psychosocial dysfunction*.


Actual incidence is unknown due to mis- and under diagnosis of feeding disorders.
“Children learn in the context of important relationships”

Schore, 1994

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INFANT & CHILD FEEDING QUESTIONNAIRE

“Malnutrition and other associated medical concerns are preventable with early detection & intervention”

• GOAL: Improve PCP early identification and referral of children at risk for pediatric feeding disorders and appropriate intervention

• RED FLAGS: The questionnaire identifies red flags for feeding concerns

• PRELIMINARY FINDINGS: 97% Sensitivity & Specificity with 4 questions for identifying a pediatric feeding disorder.
“When the infant is perceived as having meaningful behavior (i.e., communicative intent), the focus changes from a volume-driven to a co-regulated approach, through which the infant guides the caregiver. This is cue-based feeding.”

Shaker, 2013

Cues, Communication, or Conversation?

• SOFFI™ conceptualizes feeding experiences as a conversation
• It is more than just ‘listening’ to the infant
• Feeding is:
  • Listening
  • Responding
  • Changing what you do in response to the partner (infant) in the conversation
Infant-Led Feedings:
Change in Caregiver Behaviors Based Upon Infant Behaviors

Examples of Infant-Led Feedings

• Early Feeding Skills Assessment (Thoyre, et al., 2005)
• Infant Driven Feeding Scales (Ludwig & Waitzman, 2007)
• McCain Feeding Protocol (McCain, 2001)
• Co-Regulatory Approach (Thoyre, et al., 2012)
• Breastfeeding
Infant-Led Feedings, Self-Scheduled

- N=79 = 40 control, 39 experimental (28-36wk PCA; Paired enrollment > 32 weeks)

<table>
<thead>
<tr>
<th>Feeding Cues</th>
<th>Satiation Cues</th>
<th>Adverse Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crying</td>
<td>Turns head away</td>
<td>Apnea &gt; 20 secs</td>
</tr>
<tr>
<td>Quiet Alert</td>
<td>Holds hands in stop manner</td>
<td>Oxygen saturation &lt; 85%</td>
</tr>
<tr>
<td>Hand-to-mouth activity</td>
<td>Falls asleep</td>
<td>HR &lt; 80 bpm</td>
</tr>
<tr>
<td>Sucking (fingers, fist, pacifier)</td>
<td>No interest in restarting feed after burp/break</td>
<td></td>
</tr>
<tr>
<td>Rooting</td>
<td></td>
<td></td>
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<tr>
<td>Inability to settle after position or diaper change, pacifier</td>
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Puckett, et al., 2008

Outcomes

- No difference in weight gain \(12.1-12.5\text{g/kg per day}\)
- Average length of stay after enrollment
  - 14.5 days (C) vs. 10.0 days (E) \(P =0.009\)
- Average total number of adverse events
  - 12.5 (C) vs. 3.5 (E) \(P =0.007\)
- Mean PCA on study entry (34.4 weeks)
- Mean PCA on exit (36.5 C, 35.8 E, \(P =0.02\))
- No difference in nurse:patient ratio

Puckett, et al., 2008
SOFFI™: Supporting Oral Feeding In Fragile Infants

• Supports begin at birth – include strategies for stability
• Feeding is seen as a result of organization – regardless of medical morbidity
• Focus is on:
  • Pleasurable feeding experiences
  • Skill development

• Wanting to eat, and having the skill to do so safely and comfortably, lead to volume
• SOFFI™ Algorithm assures all caregivers (including parents) use a similar set of decision-points guiding practice to provide continuity of care
• All caregivers respond in the same way based upon infant behaviors
Feeding Model for SOFFITM

Baseline Homeostasis
- Physiologic Stability
- Motor Stability
- Behavioral State Stability

Feeding Challenge
- Maintain stability in the face of the additional external challenge of feeding
- Stability and Instability are communicated by the infant through their observable behaviors

Observer vs. Co-Regulator
- Observer is Aware of infant behaviors
- Co-Regulator is both Aware of behaviors and Responds to signs of distress with the goal of maintaining or regaining Homeostasis

Skill ➔ Efficiency ➔ Endurance

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All Cue-Based Feeding Approaches:

• Recognize the importance of physiologic, motor and state stability on initiation and progression of feeding
• Recognize the impact of the caregiver’s decisions on the successful experience for the baby
• Utilize behaviors before, during and after the feeding to determine success – NOT VOLUME

In Summary

• Feeding is much more than volume
• The Feeding Experience influences parents and children both in the NICU and well after discharge
• Our goal is to support skill development and parental confidence to build a strong foundation for both discharge to home AND for later skill development
In Summary

• Parents benefit from educational and parental resources in the NICU and after discharge

• Feeding struggles often continue past discharge from the NICU

Feeding is the experience...