Human Milk & Breastfeeding for Vulnerable Infants: Discharge & Follow-up

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Ten Steps for Promoting/Protecting Breastfeeding in the Vulnerable Infant

- Step 1: Informed decision
- Step 2: Establishment & maintenance of milk supply
- Step 3: Human milk management
- Step 4: Feeding the infant the milk
- Step 5: Skin-to-skin care
- Step 6: Non-nutritive sucking
- Step 7: Transition to breast
- Step 8: Measuring milk transfer
- Step 9: Preparation for discharge
- Step 10: Appropriate follow-up

Discharge Planning Starts on Admission!

- If mother’s goal is to breastfeed—we need to make that happen!

Increasing capacity for the provision of evidence-based human milk and breastfeeding support

- Often, health care providers fail to make breastfeeding a priority!
Transition to Breast Pathway

• 100% of eligible infants were able to transition to direct breastfeeding prior to discharge

Step 6: Non-Nutritive Sucking

• Pre-assessment questions

• Does your institution currently allow infants to participate in non-nutritive suckling at the breast?
  • What are the inclusion criteria?
  • What are the exclusion criteria?
WHAT ARE THE NEEDS FOR MOTHERS OF VULNERABLE INFANTS?

New BFHI Guidelines have been released:

http://apps.who.int/iris/bitstream/10665/259386/1/9789241550086-eng.pdf?ua=1

Pacifier “Nipple Confusion”

• 10 studies on pacifier use
  • 4 yes
  • 6 no

NONE were on NICU or vulnerable infants!
Infants who participated in Non-nutritive suckling transitioned to direct breastfeeding significantly earlier.

• Improved milk transfer

Non-Nutritive Sucking

• As soon as baby is extubated (i.e. same day)!

• Mother should pump breast completely-2 minutes after no jets of milk

• Place baby to breast during tube feeding session

Non-Nutritive Sucking

• If baby is expected to have long period of not being able to orally feed = NNS can still be practiced!

• Pump first, place infant to breast during tube feedings
Non-Nutritive to Facilitate Transition to Breast

- During advancement of human milk feeds via tube
- Non-nutritive sucking should be minimally once per day
- Can be more!

Odor of Human Milk

- Sterile pad soaked in human milk was placed 2 cm from infant’s nose (daily)
- Intervention group transitioned to oral feeding approximately 3 days earlier
  - 9.40 ± 2.84 days
  - Control group = 12.33 ± 8.13 days

STEP 7: TRANSITION TO BREAST
Step 7
Pre-Assessment Questions

• What is your institution’s criteria for transition to direct breastfeeding?

• Does your institution ensure infant is able to direct breastfeed prior to introducing bottle?

• Does your institution have a policy for use of nipple shields?
  - Are nipple shields easily accessible & stocked on unit?

Bottle “Nipple Confusion”

• 6 studies on bottle use
  - 4 said yes bottles caused nipple confusion
  - 2 said no

• However, there is research to support that first feed MUST be at the breast

None were on NICU or vulnerable infants!
Vacuum is Necessary for Milk Removal!

- A NICU infant MAY get more milk transfer from the bottle than the breast
- This does not mean it is better for the infant
- Breastfeeding is associated with better physiologic stability

Breastfeeding after Cesarean!

- Baby can go to breast even in operating room!

Research from Connecticut Children’s Hospital

- Maternal breastfeeding goal
- First feed at breast
Guidance for Transition to Breast for Nutritive Purposes

• There is no research to support that infants need to be a certain gestational age or certain weight

• Obvious rooting, efficient areolar grasp, and repeated short sucking bursts were noted from 29 weeks

• Occasional long sucking bursts and repeated swallowing from 31 weeks.

• The maximum number of consecutive sucks was limited to between 5 and 24 sucks, with a median of 17.

• Full breastfeeding was attained at a median of 35 weeks, between 32 and 38 weeks.


Early-Frequent-Continuous Monitoring of Milk Supply = Direct Breastfeeding

With Milk Supply-Best Strategy to Ensure Breastfeeding!

• Skin to skin!!!

• Odor of milk is effective intervention for transition to breast!

HOPE & CONCERN FOR DIRECT AT BREAST FEEDING

He’s getting the hang of it, it’s getting easier: “Well the first time he really breastfed, it was like a newborn… I mean the first time the baby doesn’t know what to do really and you have to… and I was like okay I have to remember what to do too. I was like what did my lactation consultant with my son, you know? I think the first time there was a fair amount of on and off and that’s to be expected, and probably the second time too. But his learning curve was much smaller than I thought it would be.” – Hannah

A good safety net: “That’s the one good thing about the feeding tube; you’re not like oh my God, if I don’t do this right, then he’s gonna be in trouble. You just feel like well, this is just what it’s gonna be. Whatever he doesn’t get he’s gonna get like that [via the feeding tube].” – Amy

Finding a way that works for us: “Me and Noah’s dad were a kind of intimidated by the fact that he wasn’t premature… He’s six weeks old but we had to use premature things – premature nipples, premature breast shield. We tried the breast shield and then we went down to a preemie breast shield, and he latched on right away! So he actually… he nurses now but through a preemie breast shield but he takes about half his feeds. But he’s a baby and things are moving a little bit slower for him… so don’t feel crazy about having to take two steps back to go four steps front.” – Kenya

Teaching is Essential

• Critical to teach mothers:
  • Feeding cues
  • What does nutritive suckling look like
  • What does non-nutritive suckling look like
First Breastfeed-Infant with CCAM

First Breastfeed-Late Preterm & Gastrochisis

Late Preterm Infant Breastfeeding
Step 8: Measuring Milk Transfer

Step 8
Pre-Assessment Questions

• Does your institution routinely perform pre- and post-weights?
  • If not, why not?
  • If so, do you have a policy/standard for the procedure?

• What type of electronic scales does your institution have available?
  • *Need scale that is accurate to at least ± 2 grams

Milk Transfer

• The amount of milk an infant consumes as determined by pre- and post-weights
  • Only method to accurately know exactly what infant is getting at breast!

Evaluation of Milk Transfer

• #1 concern of women worldwide is “how do I know my baby is getting enough?!

• Use of Baby Weigh® Scale to validate milk transfer and increase maternal confidence

The Relationship Between Breastfeeding Test Weights and Postpartum Breastfeeding Rates

Susan Wilhelm, RNC, PhD, T. Kim Rodheurst-Weber, RN, AE-C, PhD,
Mary Beth Flanders Stephens, RN, PhD, and Melody Hertzog, PhD

Abstract

This secondary analysis was conducted to determine the relationship between test weights and days of breastfeeding. Test weights were performed with a scale (accurate to 2 grams) before and after feeding. Days of breastfeeding was measured by self-reporting. All test weights were intermixed and were associated with higher days of breastfeeding. Test weights at day 3 to 4 and at 2 weeks were not correlated significantly with either intention or self-efficacy at any time. However, 6-week test weights were correlated with intention at all 3 times, and self-efficacy at 6 weeks. Women with higher breastfeeding self-efficacy scores tended to report higher intention to breastfeed for 6 months. / J Hum Lact. 26(2): 168-174

Keywords: breastfeeding support, breastfeeding duration, breastfeeding promotion

Conceptual Model
Test Weights Improve Breastfeeding Outcomes

• Breastfeeding test weights performed at critical time periods are associated with increased days of breastfeeding

• This early experience with breastfeeding demonstrated a trend toward strengthening intention to continue breastfeeding for 6 months over time

• Tangible milk transfer demonstrated by performing test weights was positively associated with mother’s self-efficacy for breastfeeding over time

APPROPRIATE GUIDANCE FOR MILK TRANSFER

<table>
<thead>
<tr>
<th>TABLE 2. Example Case Rx Daily Log</th>
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<tbody>
<tr>
<td>Infant’s Day of Life</td>
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</table>
**Low Supply and Breastfeeding**

**Step 9: Preparation for Discharge**
Step 9
Pre-Assessment Questions

• Does your institution regularly do “cue based” or “infant driven” feeding?

• Does your institution allow mothers to stay for 24 hours prior to discharge?

• What planning does your institution do for transport of milk home?

Breastfeeding at Bedside

• Comfortable chair for breastfeeding
• Warmer for warming human milk
• Scale for measuring milk transfer
• Hospital grade breast pump with initiation pattern

Cue Based Feeds

• Cue based feeding in the NICU is hard to do but essential to facilitate breastfeeding

Discharge on Tube Feeds = Improved Breastfeeding

- Study from Netherlands
  - Intervention group = early discharge on tube feeds with follow-up from nurse
  - Control group = routine care
- At 4 months
  - Intervention group = 64% still breastfeeding
  - Control group = only 37% still breastfeeding

Key Points in Management

- Breastfeeding/pumping/supplementation guidelines determined based on:
  - Maternal milk production
  - Infant’s ability to transfer milk from the breast
  - 24 hour intake minimum based on infant’s weight
    - 150-180 ml/kilogram/day
  - Use of technology at home
    - Hospital grade pump
    - Baby Weigh® Scale for at home
    - Nipple shield

Original Article

Human Milk and Breastfeeding Outcomes in Infants with Congenital Heart Disease

Myelomeningocele
In-Utero Repair Now Standard

A Randomized Trial of Prenatal versus Postnatal Repair of Myelomeningocele

W. Scott Reddix, M.D., Elizabeth A. Thrax, M.D., California J. Gey, M.D., John W. Bluemke, M.D.,
Karen K. Barrow, M.S., Nicole F. Johnson, M.D., Judy Hsuell, J.N., M.L. Judy, Kelly B. M.D.,
Mary J. Colburn, P.A., H. S. Wood, A. S. Dover, M.D., Mary G. Gay, M.D., Rob, R. Cooper, M.D.,
Mary F. Frisby, M.D., and Brian L. Farley, M.D., for the MMRM Investigation

Breastfeeding in Infants with MMC

• Research study examined infants (n=181) over 4 year period
  • 2013/2014-Pre
    • Introduction of feeding protocol for breastfeeding & appropriate PO ad lib supplementation guidelines
  • 2015/2016-Post

Breastfeeding Outcomes in Infants with MMC*

• High rates of human milk and breastfeeding for BOTH cohorts
  • 2013/2014-90% infants discharged breastfeeding
  • 2015/2016-93% of infants discharged breastfeeding

• High exposure to formula
  • 2013/2014-60% of infants exposed
  • 2015/2016-only 47% exposed

• NOW-consent mothers before delivery for PDHM as bridge

* manuscript in press
Qualitative Research in Mothers of Infants with CDH

- He’s getting the hang of it, it’s getting easier: “Well the first time he really breastfed, it was like a newborn… I mean the first time the baby doesn’t know what to do really and you have to… and I was like okay I have to remember what to do too. I was like what did my lactation consultant with my son, you know? I think the first time there was a fair amount of on and off and that’s to be expected, and probably the second time too. But his learning curve was much smaller than I thought it would be.” – Hannah

- BUT not all infants will be able to direct breastfeed!

Current Research-Infants with Congenital Diaphragmatic Hernia

- 149 infants born with CDH were evaluated
- 126/149 (84.6%) were born at CHOP
- 76/126 (60%) of the families who delivered with at CHOP received a personalized prenatal lactation consultation
  - 100% of the women who had a prenatal lactation consultation initiated milk expression
  - Of note, 10/76 women had either no intention to breastfeed and/or pump or were unsure of their intention
    - 10/10 (100%) of these women initiated lactation and the average milk supply documented on the final lactation visit was 568.5 mL/day.
  - Of the remaining 66 women, the average milk supply documented on the final lactation visit was 716.2 mL/day.

Current Research-Infants with Congenital Diaphragmatic Hernia

- 120/126 (95%) of mothers who delivered their infants at CHOP initiated pumping
- 21/23 (91%) of mothers who delivered at an outside hospital initiated pumping
- A total of 118/149 (79%) infants were feeding human milk at discharge
- Over half (55% 65/118) were discharged on unfortified human milk
- 11/118 (9%) were discharged on fractionated (hind) milk
STEP 10: APPROPRIATE FOLLOW-UP

• Need for technology is essential!
  • Continue pumping to maintain supply, pre- & post weights, nipple shields for infants who cannot sustain latch

Step 10
Pre-Assessment Questions

• Does your institution provide guidance for mothers regarding what to expect at home with breastfeeding?

• What post-discharge resources does your institution provide?

Post-Discharge Guidance

• From Sweden-KMC routine & parents have one year paid parental leave
• Sample of 83 infants

• Median breastfeeding sessions per day = 14 (Range 8 to 26)
• Median night time feeding sessions = 4 (Range 1-9)

Discharge Care & Support

- Mother’s only job should be to eat, sleep, breastfeed, & pump!
- Essential to mobilize family/support system
  - Cooking, cleaning, care of mother
  - Any non-feeding care of infant

4 Visits Make a Difference

- Support for low income breastfeeding Outcomes and cost
- Pugh, L.C., Milligan, R., Frick, K., & Spatz, D.L.
  - Educator for the nurses and peer counselors
  - Ensured integrity of the intervention
- Funded: National Institute of Nursing Research (R01)
- R01-NR-007675-01A1 - $2.1 million (3/1/03-4/10/07)

4 Visits Make a Difference

- N=328; all low-income, primarily African American
- Increased breastfeeding rates at 6, 12 and 24 weeks post delivery
CHOP Human Milk & Breastfeeding Outcomes

- 99% pumping initiation rate since Special Delivery Unit opened
- If infants admitted within 7 days or born in Special Delivery Unit \( \rightarrow 86-96\% \) are discharged on human milk/breastfeeding

Breastfeeding Exclusivity & Duration in Surgical Infant Graduates

- Post-discharge telephone survey research of mothers who delivered at CHOP between 2009-2012 & had prenatal lactation consultation
- Breastfeeding outcomes
  - Exclusivity
  - Duration


Mean/Median Breastfeeding Duration = 8 months (Range 0.25 to 30 months!)

<table>
<thead>
<tr>
<th>Breastfeeding measure</th>
<th>CHOP</th>
<th>Nation</th>
<th>Pennsylvania</th>
<th>Healthy People 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any 6 months</td>
<td>100%</td>
<td>79.51%</td>
<td>70.7%</td>
<td>81.9%</td>
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<tr>
<td>At 12 months</td>
<td>84.5%</td>
<td>70.72%</td>
<td>60.9%</td>
<td>60.6%</td>
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<tr>
<td>Exclusive at 12 months</td>
<td>54.3%</td>
<td>40.72%</td>
<td>31.9%</td>
<td>46.2%</td>
</tr>
<tr>
<td>Exclusive at 6 months</td>
<td>35.6%</td>
<td>19.70%</td>
<td>16.5%</td>
<td>25.5%</td>
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</table>

Note: CHOP = Children’s Hospital of Pennsylvania.

Significantly Higher Rates of Human Milk Post-Discharge

One Day Course on Implementation of my Model

The Use of Human Milk and Breastfeeding Education for the NICU Nurse

Does it All Matter?

- 1995-2000
  - My first NIH Grant!
  - Used MSN prepared nurses to improve human milk & breastfeeding for LBW infants
Thank You!

• I can bring my 10 steps to you!
  • spatz@nursing.upenn.edu

For more information: