During the Maternity Hospital Stay

When Exclusive Breastfeeding is not Possible

During the Maternity Hospital Stay
Learning Objectives

• Describe the reasons supplementation for the breastfed infant may be considered

• Describe alternative feeding methods when providing supplemental feedings

• Discuss strategies to support lactation and facilitate breastfeeding when providing supplemental feedings
Why are Supplements Needed?

• Infant condition resulting in poor milk transfer
• Maternal condition resulting in low milk supply
• Inadequate breastfeeding despite interventions
Infant Conditions That *May* Require Supplementation

- Hypoglycemia
- Hyperbilirubinemia
- Weight loss > 7% of birthweight
- Dehydration
- Prematurity

What percent of healthy breastfed newborns does the American Academy of Pediatrics state should need supplementation?

20%

*American Academy of Pediatrics*  
*Academy of Breastfeeding Medicine*
3 Goals of Breastfeeding Management

Low risk mom-infant

A - Attachment
B - Breast milk production
C - Calories

High risk mom-infant

C - Calories
B - Breast milk production
A - Attachment

Morton, Hall & Pessl (2014). Nursing Women’s Health
Breastfeeding Management Goals
Low-Risk Mother-Infant

A. Attachment
B. Breast milk production
C. Calories
Infant Behavior/Sleep Patterns
There’s No Place Like Home

Baby drifts off to sleep at the breast

Mom lays him in his crib

Baby gets fussy almost immediately

Mom puts him back to breast

Baby falls asleep, but starts rooting around when put back in crib
Managing the Second Night

Infant sleep pattern

Mom/Dad sleep pattern
Managing the Second Night

- Ease baby into a deep sleep
- Don’t try to burp him
- Mom and dad take turns holding the baby skin to skin
- Avoid swaddling – let babies use their hands
Addressing Maternal Concerns About Milk Production
Why the First 14 Days Are So Important
Strategies to Maximize Milk Production

**Access**
- Rooming in
- Skin to skin

**Cues**
- Infant led
- Frequency

**Technique**
- Latch
- Stimulation
Breastfeeding Management Goals
High-Risk Mother-Infant

C - Calories
B - Breast milk production
A - Attachment
High-Risk Infant Conditions

- Hypoglycemia
- Hyperbilirubinemia
- Weight loss > 7% of BW
- Dehydration
- Prematurity
<table>
<thead>
<tr>
<th>Study</th>
<th>Key Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harris et al Lancet 2013 “Sugar Babies study”</td>
<td>- RDBPCT of 514 infants treated w/dextrose gel or placebo&lt;br&gt;- Dextrose gel more effective compared w/placebo</td>
</tr>
<tr>
<td>Harris et al J Peds 2015 Sugar Babies follow-up</td>
<td>- Of the Harris cohort, 36% had neuro impairment (1 severe, 6 moderate, 59 mild)</td>
</tr>
<tr>
<td>McKinlay et al NEJM 2015</td>
<td>- Prospective cohort of 528 hi-risk infants for LBS treated for LBS (&lt;47 mg/dl) not associated with poor neuro</td>
</tr>
<tr>
<td>Kaiser et al JAMA 2015</td>
<td>- Controlling for perinatal factors, LBS was associated with poor 4th grade proficiency</td>
</tr>
</tbody>
</table>
Calories + BM Production + Attachment

- Do not separate; Skin to Skin

- Breastfeed on cue

Feed colostrum
Neonatal Weight Loss

- Initial postnatal weight loss is nearly universal
- Intake is low during the time of colostrum production
- Most newborns tolerate this brief period of low intake and weight loss
The Study Sample

Early Weight Loss Nomograms for Exclusively Breastfed Newborns

18,368 were excluded:
3,859 multiples
54 missing delivery type
205 missing birthweight
387 had BW <2000g or > 5000g
10,724 were missing weight or feeding data
3,139 had 2 recorded BWs

481 were excluded because wt was recorded outside acceptable range

33,715 were excluded:
4,092 had no recorded wt btwn 6 & 72 hrs (vag) or 6-96 hrs (CS)
17,964 fed formula before 6 hrs
11,659 fed formula before any wt recorded at ≤ 6 hrs

161,471 newborns in original cohort

143,103 newborns

142,622 newborns

108,907 contributed to centile

83,433 vaginal births

25,474 cesarean births

14 Northern CA hospitals
Infants born Jan 1, 2009 to Dec 31, 2013

20.7% supplementation rate
Demographic and Clinical Characteristics of Included Newborns

<table>
<thead>
<tr>
<th></th>
<th>Vaginal (n = 83,433)</th>
<th>Cesarean (n = 25,474)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BW (g)</td>
<td>3416.9±426.2 (2000-5000)</td>
<td>3487.7±426.6 (2010-5000)</td>
</tr>
<tr>
<td>GA (wk)</td>
<td>39.2±1.2 (36-42)</td>
<td>39.1±1.1 (36-43)</td>
</tr>
<tr>
<td>LOS (d)</td>
<td>1.7±0.8 (1.2-2)</td>
<td>2.8±0.9 (2.1-3.2)</td>
</tr>
</tbody>
</table>

No data available for:
- Parity
- Previous breastfeeding
Estimated Percentile Curves of % Weight Loss by time after Vaginal Birth

By shortly after 48 hours, curves for median weight loss (★) had risen
Infants born by cesarean have weight loss curves begin to rise later, by 72 hours.
NEWT
Newborn Weight Tool

- Allows clinicians/parents to see how a newborn’s weight during the first few days compares with a large sample of exclusively breastfed newborns
- Helps with early identification of weight loss issues

https://www.newbornweight.org/
# Neonatal Weight Loss

<table>
<thead>
<tr>
<th>Pounds</th>
<th>Birth – 24 hrs</th>
<th>24 – 48 hrs</th>
<th>48 – 72 hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pee</td>
<td><img src="image1.png" alt="Illustration" /></td>
<td><img src="image2.png" alt="Illustration" /></td>
<td><img src="image3.png" alt="Illustration" /></td>
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<tr>
<td>Poop</td>
<td><img src="image4.png" alt="Illustration" /></td>
<td><img src="image5.png" alt="Illustration" /></td>
<td><img src="image6.png" alt="Illustration" /></td>
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</tbody>
</table>

Average of 7%, not to exceed 10% (AAP)

Weight loss of >7% *may* indicate a possible breastfeeding problem.
Breastfed infant with > 7% weight loss algorithm

This algorithm is to be used to facilitate effective breastfeeding and to avoid unnecessary formula supplementation.

Wednesday, July 13, 2011

Key:
ExBF = exclusive breastfeeding
STS = skin to skin holding
EBM = expressed breast milk
SNS = supplemental nutrition system

ExBF infant with > 7% weight loss from birth weight

Other morbidities identified (i.e. hypoglycemia)

No

Review BF frequency and infant output, observe BF, and modify BF technique as needed

Infant BF effectively* and output WNL

Yes

Continue to monitor infant’s BF behavior, exam and output

BS/Output Guidelines
Birth-24 hrs
2-5 breastfeeds
1 urine/1 stool or more
24-48 hrs
6-8 breastfeeds
2 urine/2 stool or more
48-72 hrs
8-10 breastfeeds
3 urine/3 stools or more

Yes

Instruct mom to hand express/pump colostrum and complement BF via spoon/syringe

Obtain comprehensive Lactation Consultation @ earliest available time

In consultation with Pediatrician and Lactation Consultant, develop an individualized feeding plan and post-discharge I/u to support optimal infant milk intake and maternal breast stimulation.

* Infant signs of effective breastfeeding include:
  - Maintains deep latch on to breast
  - Long jaw movements observed
  - Some swallowing heard/observed

Supplement Guidelines
Type: Colostrum/EBM
First choice then formula
Method: (spoon, cup, SNS, bottle) determined in consultation with mom
Amount:
Birth-24 hrs
2-5 mls
24-48 hrs
5-15 mls
48-72 hrs
15-30 mls
High Risk Maternal Conditions

- Inadequate breast stimulation
- History of breast surgery
- Nipple pain/trauma
- Conditions associated with delayed onset of lactogenesis 2 (i.e., obesity, CS, diabetes)
- Insufficient mammary glandular tissue
- Polycystic ovarian syndrome
- Retained placental fragments

Hurst, N. (2007). J Midwifery 52(6), 588
Know Your Patient’s History

Lactogenesis II

- Breast stimulation
- Prenatal breast changes
- Breast surgery
- Birth or postpartum complications
- Endocrine or medical conditions
- Psychosocial stress and/or pain
Late Preterm and Multiple Births

BREASTFEEDING MANAGEMENT IN SPECIAL CONDITIONS
Late Preterm Infants

At higher risk for:

• Temperature instability
• Hypoglycemia
• Respiratory distress
• Hyperbilirubinemia
• Ineffective breastfeeding
Maternal and Preterm Infant Risk Factors

Immature Physiology of the PT infant

Maternal risk factors for poor lactation

- Delayed or impaired lactogenesis II
- Decreased maternal milk volume
- Inadequate infant milk intake during breastfeeding

Poor sucking ability
Immature suction pressures

Adapted from Meier et al, Clin Perinat, 2013
## Developmental Sucking Scale in Preterm Infants


<table>
<thead>
<tr>
<th>Stage</th>
<th>Sample Tracings</th>
<th>Stage</th>
<th>Sample Tracings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>Suction</td>
<td>3A</td>
<td>Suction</td>
</tr>
<tr>
<td></td>
<td>Expression</td>
<td>and</td>
<td>Expression</td>
</tr>
<tr>
<td>and</td>
<td>Time (sec)</td>
<td>and</td>
<td>Time (sec)</td>
</tr>
<tr>
<td>1B</td>
<td>Suction</td>
<td>3B</td>
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</tr>
<tr>
<td></td>
<td>Expression</td>
<td></td>
<td>Expression</td>
</tr>
<tr>
<td>2A</td>
<td>Suction</td>
<td>4</td>
<td>Suction</td>
</tr>
<tr>
<td></td>
<td>Expression</td>
<td></td>
<td>Time (sec)</td>
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<tr>
<td>and</td>
<td>Time (sec)</td>
<td></td>
<td>Expression</td>
</tr>
<tr>
<td>2B</td>
<td>Suction</td>
<td>5</td>
<td>Suction</td>
</tr>
<tr>
<td></td>
<td>Expression</td>
<td></td>
<td>Time (sec)</td>
</tr>
</tbody>
</table>
Feeding Challenges for the Late Preterm Infant

- Immature behavior/state
- Inconsistent SSB patterns
- At risk for underconsumption of milk

Late preterm infants are in this group with the largest distribution.
Breastfeeding Management for the Late Preterm Infant

Issues to Consider:

A  Attachment (sustain latch)
B  Breast stimulation
C  Calories (measure milk intake)
Have a Plan!

✓ Comprehensive lactation support during maternity stay

✓ Detailed discharge feeding plan

✓ Referral to lactation consultant and post-discharge breastfeeding resources
Considerations When Supplemental Feedings Are Indicated

**What milk type will be provided?**
- Mother’s milk or colostrum
- Donor milk
- Infant formula

**How much milk should be given?**
- Infant’s age?
- Replace or complement a breastfeed?
- How often to offer?

**How long is the supplement needed?**
- Short-term?
- Long-term?
- Uncertain?
## Supplementation Guidelines

<table>
<thead>
<tr>
<th>Day of Life</th>
<th>Milk Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth – 24 hours</td>
<td>2 – 5 mL/feed</td>
</tr>
<tr>
<td>24 – 48 hours</td>
<td>5 – 15 mL/feed</td>
</tr>
<tr>
<td>48 – 72 hours</td>
<td>15 – 30 mL/feed</td>
</tr>
</tbody>
</table>
## Multiple Births

### Common Concerns

<table>
<thead>
<tr>
<th>Produce enough?</th>
<th>• 2 to 4 babies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Adequate stimulation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Manage feedings?</th>
<th>• Together or separate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Modified demand</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Which breast?</th>
<th>• Rotate or assign</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Feeding behaviors</td>
</tr>
</tbody>
</table>
Alternative Feeding Methods: Which Method for Which Situation?

Situations/Factors:

- Allows simultaneous breast stimulation with supplement
- When long-term supplements are needed
- Good for small feedings of colostrum
- When short-term feedings of small volumes are used
- Rewards/entices infant to suck at breast
Achieving Sustained Attachment to the Maternal Breast during Feeding

- Assess shape/function of nipple area
- Determine optimal positioning technique
- Assess infant’s suck/swallow ability
- Determine need for nipple shield
Why Nipple Shields?

• May compensate for developmental deficiencies in sucking pressure
  ▪ Allows infant to use compression with little or minimal suction
  ▪ Stays in mouth during sucking pauses

• Provides intraoral stimulus

• Ready supply of milk (contingent on maternal milk ejection reflex)
Effect of Nipple Shields on Milk Transfer and Duration of Breastfeeding

Volume of Milk Transferred

<table>
<thead>
<tr>
<th>mL</th>
<th>w/o NS</th>
<th>w/ NS</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.9</td>
<td></td>
<td>18.4</td>
<td>14.4</td>
</tr>
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</table>

Meier, Brown, Hurst et al, 2000, JHL
Protecting Maternal Milk Production

Subcontractor Needed!

Infant not able to breastfeed directly

- Pump acts as mom’s mechanical baby

Infant not breastfeeding well

- Pump acts as baby’s twin

Mother returning to work

- Pump acts as mom’s baby away from home
Which Pump Is Best?
Take Home Messages

• Breastfeeding exclusively for the first 2 weeks promotes adequate milk production.

• Some maternal conditions delay the onset of lactogenesis II beyond 72 hours post-birth.

• The duration and volume needed when supplemental feedings are indicated will usually determine the method used.

• A collaborative, comprehensive and detailed feeding plan will ensure the mother reaches her full lactation potential.