



Beyond the Basics: Managing Common Breastfeeding Challenges

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Purpose

This course provides the nurse with an overview of common breast-feeding challenges in the early postpartum period and provides the knowledge and tools needed to assist mothers with breast-feeding concerns and promote a solid establishment of lactation prior to discharge.

Objectives

After successful completion of this course, you will be able to:

1. Describe methods to promote adequate milk production and transfer.
2. Discuss the management of hypoglycemia in the breastfeeding infant.
3. Review the management of the breastfeeding infant with hyperbilirubinemia.
4. Recognize the different management strategies for breastfeeding the premature infant.
5. Define the guidelines for hospital discharge of the breastfeeding term newborn and mother.

Introduction

The World Health Organization (WHO) recommends that infants be exclusively breast-fed until the age of six months to ensure optimal growth and health (The World Health Organization (WHO), 2015). Breastfeeding and human milk feedings are supported by the American Academy of Pediatrics (AAP) as the normative standards for infant feeding and nutrition (American Academy of Pediatrics [AAP], 2013). Although the literature clearly supports breast milk as the ideal nutrition for infants, many women do not successfully breastfeed their babies.

Per the Centers for Disease Control & Prevention (CDC, 2014), 79% of babies in the United States start out being breastfed. The national average of infants being breast-fed at six months is 49% of total births annually, which is significantly lower than the WHO recommendation.

Women's early experiences with breastfeeding considerably affect whether and how long they continue to breastfeed. Lack of support from professionals has been identified as a major barrier to breastfeeding, and mothers often identify support received from healthcare professionals as the single most important intervention the healthcare system could have offered to help them breastfeed (The Academy of Breast-feeding Medicine Protocol Committee (ABM), 2010a).

This course will cover some of the more common challenges seen in the early postpartum period. For an introduction to breastfeeding, including basic breastfeeding positions, please see RN.com's course: Breastfeeding: The Basics.

Professional Support

The role of the postpartum nurse is to provide consistent and evidence-based advice and support to first time and experienced breast-feeding mothers.

The postpartum nurse should be trained in breast-feeding techniques and should be able to correct most feeding difficulties. A lactation specialist referral should be made for additional education and assistance.

The Academy of Breast-feeding Medicine is a worldwide organization of physicians dedicated to the support of breast-feeding and human lactation. This organization has published a positions paper on breast-feeding and 26 protocols related to breast-feeding and its complications. To find additional information regarding this organization, transcribe the following web address: <http://www.bfmed.org/Resources/Protocols.aspx>

A formal evaluation of breastfeeding should be undertaken by trained healthcare professionals at least twice daily during the hospital stay, and fully documented in the record (AAP, 2013).

Milk Production & Transfer

Human milk is produced through endocrine and autocrine (hormonal) mechanisms. After delivery of the placenta, neurohormonal mechanisms trigger the release of oxytocin and prolactin. These hormones initiate milk production.

Milk production is further enhanced by the effective removal of breast milk. The supply and demand principle of milk production relies on effective emptying of the breasts as a trigger to produce more milk. Effective breast emptying depends on the frequency, duration and efficiency of infant suckling. This means that for milk production to be successful, milk must be continually and effectively removed from the breasts (Haroon, Das, Salam, Imdad, & Bhutta, 2013).

Frequency of feeding: Milk production increases in direct response to frequency of stimulation, during the first 4 postpartum weeks. The healthy, term infant has an inherent ability to self-regulate milk intake and will demand the breast more frequently during the first few postpartum weeks when a milk supply is being established, and intermittently during growth spurts.

Duration of feeding: The number of times an infant feeds during a 24-hour period is highly variable. During the early postpartum period, a healthy term infant should breastfeed a minimum of 8 times in a 24-hour period (Homes, MacLeod, & Bunik, 2013).

Efficiency of infant suckling: Milk production is directly dependent on the efficient removal of milk from the breast, which can only be achieved if the infant is successfully latched to the breast and is actively removing milk from the breast. Ineffective suckling, due to lack of experience of the mother, or the infant, or both parties can lead to other breastfeeding challenges such as sore nipples, low milk supply and weight loss in the infant.

The postpartum nurse is instrumental in assisting new mothers with initiating milk production, and can do much to facilitate successful transfer of breast milk from mother to infant.

TEST YOURSELF

Milk production is dependent on:

- a) Frequency and intensity of feeds and frequency of milk removal
- b) Frequency and duration of feeds and effectiveness of milk removal
- c) Frequency and effectiveness of latch and duration of time at the breast

Rationale: Milk production increases in direct response to frequency of stimulation, during the first 4 postpartum weeks. The healthy, term infant has an inherent ability to self-regulate milk intake and will demand the breast more frequently during the first few postpartum weeks when a milk supply is being established, and intermittently during growth spurts.

Feeding Intervals & Cue-Based Feeding

Ideally, the infant should be "roomed-in" with the mother and fed on demand when signs of hunger are seen. However, parenting preferences and hospital practices often interfere with the ideal situation and infants are often fed fewer times in a 24-hour period than the ideal.

Preferably, infants should be put to breast when they are in the quiet, alert state and displaying signs of readiness to feed. These signs include:

- Rooting (moving head from side to side with an opened mouth)
- Suckling motions (sucking on a finger or fist)
- Motor activity: Bringing hands to the mouth and flexing the arms and the legs. As the infant gets hungrier, the posture becomes more tense, with clenched fists and some arching of the back.
- Crying: This is a late sign of hunger that usually occurs after all the other cues have been missed. It is preferable to get the infant to the breast before crying begins.
- Quiet alert: Infants are most attentive to their environment, and responding to caregivers.
- inability to settle after position change, diaper change, or with pacifier

(Puckett, Grover, Holt, & Sankaran, 2008)

In numerous policy statements, the AAP (2013) recommends breastfeeding for all healthy term and near term newborns. This guideline strongly supports the general recommendation that clinicians should advise mothers to nurse their infants at least 8 to 12 times per day for the first several days.

TEST YOURSELF

What is the minimum number of times a newborn should be put to the breast in a 24-hour period?

- a) 4 times
- b) 6 times
- c) 8 times**
- D) As often as the pediatrician orders

Rationale: In numerous policy statements, the AAP (2013) recommends breastfeeding for all healthy term and near term newborns. This guideline strongly supports the general recommendation that clinicians should advise mothers to nurse their infants at least 8 times per day for the first several days.

Signs of Satiety

It is important to educate the mother on how to recognize fullness or signs of satiety in her baby. Observance of the following behaviors in an infant usually means that the baby has had a successful feeding:

- Audible swallowing is heard and observed during a feed, followed by more shallow superficial non-nutritive suckling
- Self-removal of the infant from the breast by unlatching and turning head away from the breast
- Infant posture becomes relaxed and arms and legs move away from the midline in a relaxed posture
- The infant falls into a deep sleep
- No interest in restarting feed after burp/break and sucking

(Pucket et al., 2008)

Audible swallowing is the most reliable indicator of milk transfer

TEST YOURSELF

A reliable indicator of a successful feed would be:

- a) A sleepy baby
- b) Audible swallows**
- c) Lack of interest in the breast

Rationale: Audible swallowing is the most reliable indicator of milk transfer

Signs of Adverse Events

- Apnea
- Bradycardia
- Desaturation
- Combination of above events

(Pucket et al., 2008)

Positioning the Infant at the Breast

Appropriate positioning at the breast will assist an infant in obtaining a deep latch, which will make it easier to withdraw the milk from the breast.

The postpartum nurse can facilitate latching by creating a calm and soothing environment, and assisting the mother in achieving a comfortable position in which her back, shoulders, arms and wrists are well supported on pillows or a breastfeeding cushion.

There are two basic positions that should be taught to the mother prior to discharge. These are the cross cradle and the football holds.



Good positioning and latching techniques are important to help the baby get the milk that is available.

Cross-Cradle Position

The cross-cradle position uses the opposite hand to support the baby's neck and align the baby's nose at the level of the nipple, using support pillows as needed. The baby's body and legs should be closely wrapped around the mother, with the infant's arms out to the side. This offers maximum skin to skin contact. This position also aligns the baby to latch with the nipple pointing to the roof of his mouth. The neck is supported but the head is NOT pushed in against the breast. The baby's head should be tilted back slightly so the nose is up and the baby's chin is coming into the breast while the nose never touches the breast.

When ready to latch, run the nipple along the baby's upper lip, from one corner to the other, lightly, until baby opens wide. Bring the baby onto the areola, with the lips flanged widely, so that a substantial amount of areola tissue is inserted into the mouth. Once latched, baby's top and bottom lips are well flanged against the breast. Watch the lower lip and aim it as far from the base of nipple as possible, so tongue draws lots of breast tissue into the mouth.

The baby is always brought up to the breast; the breast is never moved down to the baby.



Note: In the image above, both the infant's top and bottom lip are well flanged against the breast and fully visible.

The Football Hold

The football hold, the "clutch hold", is excellent for primigravidas (first time mothers), and mothers with large breasts or inverted nipples.

The mother needs to assume a comfortable position with neck, shoulders and forearms well supported. A breastfeeding pillow is a valuable aid for this position. If not available, use many pillows around the mother to provide support. The legs should be slightly elevated off the ground to release the abdominal muscles. Use a breastfeeding stool if available.

The infant should be positioned on his side, with the ears, shoulders and hips in a straight line. The infant's head should rest at the level of the nipple, and the neck should be supported with the palm of the hand at the base of the baby's head. The baby's chest should be in direct contact with the mother's chest, without hands or blankets in the way. Ideally, each hand of the infant should cup the outer edges of the breast. The mother's wrist and elbow are supported on pillows, so that she is not straining her wrist to hold the weight of the infant.

When the baby opens his mouth wide, the supporting arm brings the baby up to the breast and a deep latch is achieved by inserting as much areola tissue into the baby's mouth as possible. The lips should be well flanged around the breast, and there should not be any dimpling of the cheeks when suckling.



TEST YOURSELF

The football hold is recommended for mothers who:

- a) Have small breasts
- b) Have inverted nipples
- c) Are experienced breast feeders

Rationale: The football hold, the "clutch hold", is excellent for primigravidas (first time mothers), and mothers with large breasts or inverted nipples.

Basic Principles of Latching

The following basic principles of latching can be used as a tool to assist the mother-infant dyad in obtaining a deep latch:

- **Correct positioning:** Proper alignment of the infant's body in relation to the breast is critical for achieving a good latch, irrespective of the position used. In all breastfeeding positions, the infant's ear, shoulder and hip should be in a straight line with the infant facing the breast fully, and nothing should impede contact between the infant and the breast. For example, the infant's arms should fold around the breast, rather than curl up between the breast and the baby's body.
- **Prepare for latch-on:** Educate the mother by providing some helpful tips to facilitate a deep latch. Explain that the nipple should be centered in the infant's mouth, with the baby's nose directly in line with the nipple. The infant should also be brought to the breast chin first, with the mother tilting her breast slightly upwards. This ensures that the infant draws the nipple far back towards the hard palate of the infant's mouth.
- **Observe for signs of milk transfer during a feed:** Signs of milk transfer include audible swallows, change in the infant's posture and behavior and softening of the breast (usually only observed once the milk has come in, on or around the 3rd to 4th postpartum day).
- **Ending a feed correctly:** A breastfeeding session should not be timed per a clock, but should be terminated when the infant can no longer be aroused to actively suckle at the breast, or the infant displays signs of satiety. If the infant falls asleep with the breast still in his mouth for non-nutritive sucking, the mother can be taught to insert a clean finger into the corner of the baby's mouth, to break the suction gently. This avoids undue pressure on the nipple when the baby is removed from the breast.



Note: See how well flanged the baby's lips are around the areola.

Skin-to-skin contact is between the baby's front and the mother's chest. The more skin--to-skin contact, the better. Skin-to-skin contact should ideally start at birth, but is helpful at any time. It should ideally be continuous, but short periods are still helpful.

Tips for Waking a Sleepy Infant

In most healthy, full-term infants, feeds will be initiated by the infant when he or she displays a readiness to feed and exhibits feeding cues. However, there are times when it is necessary to wake the infant up to ensure adequate intake of

breast milk. Jaundice, prematurity and illness can interfere with the normal patterns of breastfeeding and in these situations; the nurse can be instrumental in assisting the mother in waking her baby up to nurse.

A sleepy baby needs to be aroused before coming to the breast to achieve a good latch and milk transfer. Once the mother is positioned comfortably with an empty bladder and support pillows, the nurse can use the following methods to arouse a stable infant:

- Gently unwrap the infant's blanket and remove the knitted cap if the infant's temperature is stable.
- Place infant skin-to-skin with the mother to help stabilize the infant's temperature, and facilitate let-down in the mother.
- Use a cool cloth to gently wipe the sides of the infant's face, and encourage the mother to stimulate the sleepy infant by talking to her baby, moving his arms and legs around gently, and softly rubbing his cheek or head.
- Encourage the mother to express a drop or two of colostrum or breast milk onto the nipple and areola to stimulate the infant's smell and taste receptors.

Troubleshooting Common Breastfeeding Challenges

During the early postpartum period, the breastfeeding mother needs a lot of support, encouragement and education from the postpartum nurse. In addition to observing and documenting milk transfer, the nurse can troubleshoot basic breastfeeding challenges by identifying:

- Early signs of low milk supply
- Poor latch resulting in sore nipples
- Ineffective drainage of the breast leading to mastitis

How to Know the Baby is Getting Enough Breast Milk: Elimination Patterns

One of the most common questions that the postpartum nurse encounters is: "How can I tell the baby is getting enough milk?"

Mothers need reassurance that their babies are getting adequate nutrition and can be taught that there are several ways to tell whether a baby is getting enough milk. One way is to count the number of wet diapers the infant produces in 24 hours. Please refer to the Elimination Guidelines Table on the next screen. Make sure he has at least six wet diapers per day with pale yellow urine, beginning around the third or fourth day of life. An infant should also have several small bowel movements daily (there may be one after every feeding in the first few weeks). During the first week of life, an infant should have at least two stools per day. From about 1 to 4 weeks old these should increase to at least 5 per day. As a baby gets older, bowel movements may occur less often, and may even skip a few days. Bowel movements of breastfed babies usually smell somewhat sweeter than the stools of formula fed babies (Homes et al., 2013).

Elimination Guidelines for Breastfed Infants

**Minimum number of wet diapers and bowel movements in a baby's first week
(it is fine if your baby has more) 1 day = 24 hours**

Baby's age	Number of wet diapers	Number of bowel movements	Color and texture of bowel movements
Day 1 (first 24 hours after birth)	1	The first one usually occurs within 8 hours after birth	Thick, tarry, and black
Day 2	2	3	Thick, tarry, and black
Day 3	5-6	3	Looser greenish to yellow (color may vary)
Day 4	6	3	Yellow, soft, and watery
Day 5	6	3	Loose and seedy, yellow color
Day 6	6	3	Loose and seedy, yellow color
Day 7	6	3	Larger amounts of loose and seedy, yellow color

Table provided courtesy of Womenshealth.gov (2016).

How to Know the Baby is Getting Enough Breast Milk: Feeding Patterns & Weight Gain

A baby's feeding patterns are also an important sign that he is feeding enough. A newborn may nurse every 1½ to 3 hours around the clock. If a baby sleeps for stretches of longer than 4 hours in the first 2 weeks, wake him for a feeding. It is most important that a baby is latched-on properly during feedings. (See "Latching-on".) Listen for gulping sounds and slow, steady jaw movement to know that a baby is swallowing the milk and not just sucking.

A baby should be steadily gaining weight after the first week of life. During the first week, some infants lose several ounces of weight, but they should be back up to their birth weight by the end of the second week. A pediatrician's office will weigh a baby at each visit. Keep in mind that a baby may breastfeed more often during growth spurts.

Indications of Adequate Milk Transfer

Signs that baby is getting enough milk are as follows:

- At least six wet diapers per day and two to five loose yellow stools per day, depending on baby's age. (A baby's stools should be loose and have a yellowish color to them. Be sure a child's stools are not white or clay-colored.)
- Steady weight gain, after the first week of age.
- Pale yellow urine, not deep yellow or orange.
- Sleeping well, yet baby looks alert and healthy when awake.
- Most breastfeeding babies do not need any water, vitamins, or iron in addition to breast milk for at least the first 6 months. Human milk provides all the fluids and nutrients a baby needs to be healthy. By about 6 months of age, however, a mother should start to introduce an infant to baby foods that contain iron. A pediatrician may prescribe Vitamin D if there is a need for it.

The American Academy of Pediatrics and the American Academy of Pediatric Dentistry recommend that breastfed infants (as well as bottle fed infants) not receive fluoride supplements during the first 6 months of life.

Management Strategies for Increasing Milk Supply

To assist with establishing a good milk supply, mothers can be encouraged to feed on demand and taught to recognize

hunger cues in the infant. By not restricting the length of a breastfeeding session to a set time, the mother can further boost her milk supply by allowing adequate time at the breast to facilitate complete emptying of the breast.

Mothers often ask how long should the baby nurse for? It is recommended that the mother watch the baby for signs of satiety, rather than watching the clock to determine the length of time that the baby spends at the breast. The baby can be removed from the breast when active sucking is replaced by non-nutritive suckling and swallowing is no longer seen or heard.

For more information on how-to information and support for breast-feeding mothers follow this link:
<https://www.womenshealth.gov/publications/our-publications/breastfeeding-guide/?from=breastfeeding>

Newborn Sucking Styles

Newborns exhibit different styles of nursing at the breast that indicate different feeding patterns. By educating the mother to recognize the individual feeding style of her own baby, she can confidently determine when to terminate a feed, based on the feeding style she observes in her baby.

Biancuzzo (2003) identifies 5 distinct sucking styles:

- 1) **Barracudas:** In this feeding style, an infant goes to the breast quickly and vigorously, and actively exerts negative pressure on the nipple for a 10 - 20-minute time span. This can create tender nipples in the first few postpartum days.
- 2) **Excited Ineffectives:** This type of infant alternately grasps and loses the nipple, becoming agitated and upset quickly. This usually causes the mother to tense up and inhibits her let-down reflex. It can be helpful to remove the baby from the breast and calm the baby down before returning to the breast. Hand expressing a drop of colostrum or breast milk onto the nipple before bringing the baby to the breast can help keep the infant calm as well.
- 3) **Procrastinators:** In this feeding style, the infant tends to be laid back and will only nurse when ready to do so. If the infant is a healthy term baby, this style can be indulged for a day or two, but if there are risk factors present, supplementation may be necessary. In such cases, pumping or hand expression of breast milk may be indicated.
- 4) **Gourmet Connoisseurs:** These infants like to sample a bit of milk at first, and may even smack their lips together before deciding to go to the breast. These infants like to take their time at the breast and can become upset if rushed at the breast. These connoisseurs do best when allowed to taste the milk and given a few minutes to begin suckling.
- 5) **Snackers:** Like to suckle for a while and then take a break from the breast. This type of feeder does not do well when rushed or forced to suckle at the breast. Gentle encouragement to suckle can be provided by stroking the baby's cheek, moving his arms and legs gently or massaging the breast to encourage let-down. When milk spurts into the snacker's mouth, he is often encouraged to begin active suckling to acquire additional milk. This type of feeder can take longer at the breast than the barracuda, and needs more time to effectively empty the breasts.

TEST YOURSELF

Which of the following feeding styles best describes an infant who goes to the breast willingly, but stops suckling after a few seconds?

- a) Barracuda
- b) Procrastinators
- c) Excited Ineffectiveness

Rationale: Procrastinators, in this feeding style, the infant tends to be laid back and will only nurse when ready to do so. If the infant is a healthy term baby, this style can be indulged for a day or two, but if there are risk factors present, supplementation may be necessary. In such cases, pumping or hand expression of breast milk may be indicated.

Painful Nipples

Per Amir & ABM, 2014 nipple pain can be attributed to one or more of 4 causes:

- **Transient, Physiological Causes:** In the early postpartum period when the infant is not removing milk effectively and efficiently, the build-up of negative pressure within the breast can cause nipple pain. Effective management of tender nipples due to the buildup of milk in the breast is best achieved by encouraging the mother to offer the least tender breast first at a feed, when the infant's suck is strongest. Suggesting that the mother also varies the position, in which

the baby is latched onto the breast, will redistribute some of the pressure within the breast and alleviate some maternal discomfort.

Incorrect Latch-on: There is a strong correlation between sore nipples and poor infant latch (Amir & ABM, 2014).

- By exploring the type and location of pain that the mother is experiencing, the nurse can identify possible solutions. If the nipple tenderness is on the top of the nipple, it is likely that the infant is thrusting his tongue out due to a poor latch. Try to work with the mother in finding a different position in which the infant can achieve a deeper latch. The football position is often recommended for this reason. If the pain is located at the base of the nipple, it could be possible that the infant is not flanging his lower lip widely enough beneath the nipple. Teaching the mother to pull down gently on the baby's chin can sometimes invert the lower lip of the infant and minimize the nipple pain.
- **Misuse of Equipment:** Prolonged exposure to wet nursing pads may cause nipple discomfort. Incorrect positioning and the misuse of an electric breast pump in the early postpartum period can also exert excessive pressure on the nipple, if the pump pressure is set too high. The overuse of breast shells or nipple shields can also cause nipple pain. The use of breast shells and/or nipple shields should be managed by a Lactation Consultant.
- **Pathological Causes:** Sometimes, a pathological condition in the infant can present as nipple pain. For example, an infant with a cleft-palate or tight frenulum (membrane connecting the underside of the tongue to the floor of the mouth) cannot latch properly and the incorrect latch and action of the tongue will cause maternal nipple pain. If tender nipples persist after changing the infant's position, a digital examination of the baby's mouth should be done by the pediatrician or lactation consultant.

Questions to Ask About Nipple Pain:

Where is the tenderness or pain located?

- When did it begin, and is it present at the beginning, middle or end of the feeding?
- Identify the characteristics of the pain including intensity, type (sharp versus dull etc.) and severity. (Amir & ABM, 2014).

Management Strategies for Painful Nipples

Good positioning and latch are the key preventative strategies for minimizing nipple pain or tenderness.

In addition, it is useful to alternate positions, and teach the mother to elicit a let-down response before bringing the baby to the breast. By hand expressing a drop or two of breast milk/colostrum onto the nipple before placing the baby at the breast will lessen the infant's urgency at the breast and relieve some nipple discomfort. Using warm towels and gentle hand massage (away from the areola) is often helpful in eliciting a let-down reflex.

Allowing the nipples to air dry after a feed can also promote nipple healing. Teach the mother to hand express a drop of milk or colostrum onto the nipple at the end of the feed and allow to air dry (Amir & ABM, 2014).

Any questions regarding home remedies or over-the-counter ointments should be directed to a Lactation Consultant.

"Sore nipples are not an expected consequence of breastfeeding, but a signal for help"

(Amir & ABM, 2014)

Mastitis

A breast infection (mastitis) is a particularly tender or painful area in the breast caused by a bacterial infection. Mastitis may be inflammatory or infectious (Amir & ABM, 2014). Both types of mastitis are associated with milk stasis or the inadequate removal of milk from the mammary ducts. A mother with milk stasis is at high risk for developing a plugged duct, engorgement and/or mastitis (Amir & ABM, 2014).

Like a plugged duct; mastitis usually only occurs in one breast, but is localized to one area of the breast. The infected area is usually warm, tender and swollen. Mastitis is usually accompanied by a high fever and/or flu-like symptoms, which are absent in the case of a plugged duct. The onset of mastitis is rapid, and the pain is intense; the mother feels acutely ill.

Mastitis can also be differentiated from a plugged duct by the speed of onset. Whereas the pain from a plugged duct builds up gradually over many feeds, mastitis pain begins suddenly and is very intense in nature.

Engorgement is often confused with mastitis, but has a different pattern of onset. Engorgement usually builds up over several days, and is almost always found in both breasts at the same time. The engorged mother does not experience flu-like symptoms and usually has a normal body temperature.

Management Strategies for Mastitis

Management strategies for mastitis include:

- Advising the mother to breastfeed often on the affected side, to keep the milk moving freely and avoid the breast from becoming overly full. It is most important to empty the breast at regular intervals to maintain the milk supply. Allowing the milk to remain in the breast will worsen the infection. It is also not necessary to discard breast milk from the affected side. The milk itself is not infected.
- Early antibiotic use is critical in the management of mastitis, and should be commenced if supportive measures such as heat and massage prior to nursing are ineffective. There are many antibiotics available that are safe to use during breastfeeding and there is usually no need to interrupt breastfeeding.
- Promoting rest. Often a breast infection is the first sign that a mother is doing too much and becoming overly tired.
- Advise nursing mothers to avoid nursing bras with underwire, as the underwire exerts too much pressure on the lactating ducts.
- Applying heat to the affected area with warm compresses and massaging the breast gently prior to a feed helps the milk let-down and may alleviate some of the pain.

Breastfeeding the Premature Infant

Thanks to medical advances today, premature infants (*less than 37 week's gestation*) are surviving at earlier gestational ages. Breastfeeding is even more important for these premature infants, since they are at increased risk for respiratory difficulties, septicemia, anemia, and low blood pressure (AAP, 2013).

Depending on which complications arise, a premature baby's nutrition may initially take a backseat to the larger issues. Breast milk, though, has been shown to play a crucial role in improving the health of premature infants. Human milk is the biological norm, the time-tested standard of care (AAP, 2013).

Benefits of Breast Milk for the Premature Infant

Initially, most premature infants won't be able to latch as the suck-swallow reflex and gastrointestinal tract may be immature. However, breast milk has a lower casein/whey ratio, making it more easily digested and absorbed than formula (ABM, 2011).

Another huge benefit of breast milk is that it plays an important role in preventing necrotizing enterocolitis (NEC), a serious intestinal infection. Studies have shown that infants who received artificial milk had 6-10 times increased risk for NEC than infants fed breast milk (ABM, 2011).

Other studies revealed that premature infants fed breast milk were at a significantly decreased risk of any kind of infection, then formula fed premature infants (ABM, 2011).

Premature infants who receive breast milk have also shown improved cognitive development, compared with those fed artificial formulas (ABM, 2011). This is believed to be due to the presence of long chain polyunsaturated fatty acids found only in breast milk.

While the nutritional and protective benefits of human milk are well established, breast milk is sometimes inadequate for very low birth weight (VLBW) premature infants. In these cases, additional nutrients must be added in the form of human milk fortifiers, to provide additional needed calcium, vitamins, and protein. Clinical evidence has shown that premature infants who receive fortified breast milk experienced improved growth and a better nutritional status (AAP, 2013).

Another amazing fact about breast milk is its composition. The composition of human milk corresponds with the developmental needs of the infant. Preterm breast milk has a higher protein and fat content than term milk, and higher levels of immunoglobulins to fight infection (ABM, 2011).

Hypoglycemia in the Term Infant

In the past, the fear of low blood sugar of the newborn has become an acceptable reason to separate mothers and babies and give babies supplements of formula in the immediate hours and days after the baby's birth. However, the best way to prevent low blood sugar in the breastfeeding infant is to feed the baby breast milk. Colostrum (precursor of mature breast milk) is far better in preventing and treating low blood sugar than formula. In addition, placing the infant skin to skin with the mother immediately after birth maintains the infant's blood sugar better than if the mother/baby pair are separated (Wight, Marinelli, & the Academy of Breast-feeding Medicine (ABM), 2014).

Unfortunately, there is no reliable method of measuring the blood sugar outside the laboratory. The use of paper strips to measure the blood sugar is unreliable, and tends to underestimate the true value. Only a laboratory reading gives a reliable measure of plasma glucose.

Testing for Hypoglycemia in the Healthy Term Infant

Intermittent low blood glucose levels in the term newborn does not necessarily equate to brain damage. In fact, other constituents released by the infant's body will protect his brain. These include the release of ketone bodies, as well as lactic acid and free fatty acids, in the presence of low blood glucose levels. Babies who are receiving colostrum have much higher levels of ketone bodies than formula fed babies. These 'raised' ketone levels are not necessarily abnormal (Wight et al., 2014).

Term infants born of a normal pregnancy, with an uneventful labor and delivery, and normal birth weight do not need to be tested for hypoglycemia. Be familiar with your unit's policy & procedure regarding testing for hypoglycemia in the healthy term infant. Unnecessary testing for hypoglycemia in a healthy term neonate can be painful for the baby, cause anxiety for the parents, and is costly (Wight et al., 2014).

Note that it is normal for the blood sugar to drop in the first hour or two after birth. Unless the mother is diabetic, a term infant is not at risk of low blood sugar if he is large for gestational age (LGA). Large babies whose mothers are not diabetics are not at increased risk of low blood sugar (Wight et al., 2014). In fact, they are at less risk because their livers are full of glycogen ready to be called into action by the need for more sugar, and they also have fat stores ready to be called into action to produce ketone bodies, lactic acid and free fatty acids (Wight et al., 2014). Mothers with no prenatal care may also have undiagnosed diabetes or glucose intolerance, which can also affect the infant.

TEST YOURSELF

Which infants do NOT have to be routinely tested for hypoglycemia?

- a) An infant of a gestational diabetic
- b) An infant who is large for gestational age
- c) **A healthy term breastfeeding infant**
- d) A healthy 32-week infant

Rationale: Term infants born of a normal pregnancy, with an uneventful labor and delivery, and normal birth weight do not need to be tested for hypoglycemia. Be familiar with your unit's policy & procedure regarding testing for hypoglycemia in the healthy term infant. Unnecessary testing for hypoglycemia in a healthy term neonate can be painful for the baby, cause anxiety for the parents, and is costly (Wight et al., 2014).

Research has shown that a baby who is born small for the length of the pregnancy (under 5lb 8oz if born at term is one definition) maintains his blood sugar just as well if breastfed or formula fed (Wight et al., 2014).

Diabetes in the mother, particularly type 1 (insulin dependent, juvenile), is a high-risk situation for the baby. Since at birth, high insulin levels in the baby (because of prolonged intrauterine exposure to high sugars) not only drop the blood sugar

but also prevent the formation of ketone bodies, lactic acid, and free fatty acids. Therefore, the baby needs to be watched and may require an intravenous to maintain the blood sugar. Good control of diabetes during the pregnancy, labor and delivery can also help prevent hypoglycemia in the neonate.

Routine intravenous fluids containing glucose given rapidly to the mother should be avoided. If the mother's glucose tolerance is impaired, a glucose bolus may increase her blood sugar and provoke a similar response in the baby with a corresponding rise in the baby's insulin secretion.

It is best to put the baby skin to skin with the mother immediately after birth for more effective maintenance of his blood glucose levels. It is possible and desirable to put the baby skin to skin with the mother even if she's had a caesarean section. The baby should also be encouraged to breastfeed as soon as possible after the birth.

Hyperbilirubinemia

Hyperbilirubinemia or jaundice results from the buildup of bilirubin (breakdown product of red blood cells). The newborn baby often becomes jaundiced during the first few days because the liver enzyme that metabolizes bilirubin is relatively immature.

Furthermore, newborn babies have more red blood cells than adults, and thus more are breaking down at any one time. If the baby is premature, stressed from a difficult birth, is the infant of a diabetic mother, or has a Rh incompatibility (an increased number of red blood cells will be breaking down), the level of bilirubin in the blood may rise higher than usual levels. Poor caloric intake and/or dehydration associated with inadequate breastfeeding may contribute to the development of hyperbilirubinemia (ABM, 2010b).

There are four types of jaundice that will be discussed in detail, namely physiological jaundice, pathological jaundice, breast milk jaundice and inadequate breast milk jaundice.

Increasing the frequency of nursing decreases the likelihood of subsequent significant hyperbilirubinemia in breastfed infants (AAP, 2013).

Physiological Jaundice

Physiological jaundice is a normal, non-pathological occurrence that does not require any intervention (ABM, 2010b).

As red blood cells are broken down, bilirubin is released, and may sometimes accumulate. This bilirubin has not yet been conjugated by the liver into a water-soluble form, and is not pathological.

Physiologic jaundice begins about the second day of the baby's life, peaks on the third or fourth day and then begins to disappear.

However, there may be other conditions that may require treatment that can cause an exaggeration of this type of jaundice. Since most of these conditions have no association with breastfeeding, breastfeeding should continue (ABM, 2010b).

Pathological Jaundice

The liver conjugates bilirubin into a water-soluble compound that can be eliminated. If, however, the liver is functioning poorly, conjugated bilirubin may accumulate in the blood, causing pathological jaundice.

When this occurs, the conjugated bilirubin is excreted via the kidneys and turns the urine brown.

Jaundice due to conjugated bilirubin is always abnormal, frequently serious and needs to be investigated thoroughly and immediately. Except in the case of a few extremely rare metabolic diseases, breastfeeding can and should continue (ABM, 2010b).

Brown urine is an important clue that jaundice may be pathological (ABM, 2010b).

Breast Milk Jaundice

No one knows precisely what the cause of breast milk jaundice is. To make this diagnosis though, the baby should be at least a week old. Interestingly, many babies with breast milk jaundice also had exaggerated physiologic jaundice (ABM, 2010b).

Breast milk jaundice peaks at 10-21 days, but may last for two or three months. Rarely, if ever, does breastfeeding need to be discontinued, even for a short time. Only very occasionally is any treatment, such as phototherapy, necessary. There is no evidence that this jaundice causes any problem at all for the baby. The assumption that jaundice is pathological comes from the false belief that the formula feeding baby is the standard by which we should determine how the breastfed baby should be (ABM, 2010b).

Breastfeeding should not be discontinued to diagnose breast milk jaundice (ABM, 2010b).

Inadequate Breast Milk Jaundice

Breastfeeding jaundice should correctly be termed *inadequate breast milk jaundice*. This type of jaundice results from higher than usual levels of bilirubin due to relative dehydration, when a breastfeeding infant is not getting *enough* milk. This may be due to the mother's milk may take longer than average to "come in," or the baby is poorly latched on and thus unable to withdraw the milk from the breast (ABM, 2010b).

When the baby is getting little milk, bowel movements tend to be scanty and infrequent, so that the bilirubin in the baby's gut is reabsorbed into the bloodstream, instead of being eliminated in the stool.

The best way to avoid this situation is to get breastfeeding initiated correctly as soon as possible. If the baby is breastfeeding well, more frequent feedings may be enough to bring the bilirubin down (ABM, 2010b).

If the baby is breastfeeding poorly, helping the baby latch on better may allow him to breastfeed more effectively and thus receive more milk. Compressing the breast to get more milk into the baby may help. If latching and breast compression alone do not work, a lactation aid would be appropriate to supplement feedings.

Check your unit's P&P regarding the management of breastfeeding & jaundice.

Phototherapy and Breastfeeding

Phototherapy increases the fluid requirements of the baby. If the baby is breastfeeding well, more frequent feeding can usually make up this increased requirement.

The AAP (2013) recommends against routine supplementation of non-dehydrated breastfed infants with water or dextrose water. Supplementation with water or dextrose water will not prevent hyperbilirubinemia or decrease Total Serum Bilirubin (TSB) levels (AAP, 2013).

However, if there are clinical signs of dehydration, or it is determined that the baby needs more fluids, it is preferable to supplement with expressed breast milk, or dextrose water (Newman, 2009). In breastfed infants receiving phototherapy, supplementation with expressed breast milk or formula is recommended by the AAP, if the infant's intake seems inadequate, weight loss is excessive, or the infant seems dehydrated. This can reduce bilirubin levels and/or enhance the efficacy of phototherapy (AAP, 2013).

All infants should be routinely monitored for the development of jaundice, and nurseries should have established protocols for the assessment of jaundice (AAP, 2013).

Lactation Aids

A lactation aid is a device that allows a breastfeeding mother to supplement her baby with expressed breast milk/colostrum, formula or dextrose water without using a bottle.

A lactation aid or Supplemental Nursing System (SNS) consists of a container for the supplement, usually a feeding bottle with an enlarged nipple hole, and two long, thin tubes leading from the container, to attach to each areola. This system avoids the use of an artificial teat (nipple). Manufactured lactation aids are available and are particularly useful when a mother needs to supplement twins, or any other situation in which the need for a lactation aid will be long term.

The use of a lactation aid should always be considered before using a bottle to supplement a breastfeeding infant (ABM, 2010b). The early use of artificial nipples may result in the baby becoming “nipple confused” especially when the mother’s breastfeeding is not yet well established or flow from the breast is slow because of milk supply issues.



A Supplemental Nursing System (SNS). Image provided by Medela, 2009.

Benefits of a Supplemental Nursing System (SNS)

What are the benefits of using a SNS?

- The baby continues to get the mother’s milk even while being supplemented.
- The baby will not reject the breast.
- It is more desirable to supplement frequently in small volumes, than intermittently in larger boluses. Eight supplements a day of 30 ml (1 ounce) per feeding is preferable to 2 large supplements a day of 120 ml (4 ounces) each.

If a feed is prolonged with the use of a SNS, it may be that the tube is not well positioned, the baby is poorly latched on, or both factors are present. When the lactation aid is functioning well, it should take approximately 15-20 minutes, for the baby to take 30 ml (1 ounce) of the supplement (ABM, 2010b).

Instruct mothers to clean the bottle and nipple after each use. The lactation aid should never be boiled. The tube should be emptied after use and then rinsed through with hot water and then hung up to dry. Soap, though not necessary, may be used if desired, but rinse the tube well (Medela, 2013).



A mother breastfeeding her infant using a Supplemental Nursing Systems. Images provided by Medela, 2009.

Guidelines for Hospital Discharge

The Academy of Breastfeeding's (ABM) Clinical Protocol #2: Guidelines for Hospital Discharge of the Breastfeeding Term Newborn and Mother “The Going Home Protocol,” (2014), advise that healthcare professionals adhere to the following recommendations:

- A formal documented assessment of breastfeeding effectiveness should be performed at least once during the last 8 hours preceding discharge of the mother and baby, by a medical professional trained in formal assessment of breastfeeding. This assessment should include documentation of anticipated breastfeeding concerns, based on the

maternal and/or infant risk factors. A plan of action that includes follow-up of the problem after discharge must be initiated as well.

- At discharge, mothers will benefit from appropriate, non-commercial educational materials on breastfeeding and information about the rationale for exclusive breastfeeding. (AAP & ACOG, 2006; AAP, 2005). Discharge packs containing infant formula, pacifiers, and any other material inappropriate for a breastfeeding mother and baby should not be distributed. These may encourage poor breastfeeding practices, which may lead to premature weaning (AAP & ACOG; 2006; AAP, 2005). If a mother is planning on returning to outside employment or school soon after delivery, she would benefit from additional written information.
- Every breastfeeding mother should receive instruction on the technique of hand expression, so she can alleviate engorgement, increase her milk supply, or prepare to use a pump. (AAP & ACOG, 2006; AAP, 2005; World Health Organization [WHO]. Breast pump instruction should also be provided, if needed.
- Every breastfeeding mother should be provided with names and phone numbers of individuals and medical services that can provide advice, counseling, and health assessments related to breastfeeding on a 24 hour-a-day basis if available, as well as on a less intensive basis. Mothers should be provided with lists of various local peer support groups and services (e.g., La Leche League), hospital/clinic based support groups, with phone numbers, contact names, and addresses.
- If discharge is before or on day 3 of age, appointments should be made prior to discharge, for an office or home visit, within 3 to 5 days, by a physician, midwife, or a physician-supervised breastfeeding trained licensed healthcare provider. The mother's 6-week follow-up visit to the obstetrician should also be confirmed. Infants discharged before 48 hours of age should be seen by 96 hours of age. Additional visits for the mother and the infant are recommended even if discharge occurs at more than 5 days of age, until all clinical issues such as adequate stool and urine output, jaundice, and the baby attaining birth weight by 10 days of age are resolved. Any baby exhibiting a weight loss approaching 7% of his birth weight by 5 to 6 days of life needs to be closely monitored until weight gain is well established. Should 7% or more weight loss be noted after 5 to 6 days of life, even more concern and careful follow-up must be pursued.
- If the mother is medically ready for discharge but the infant is not, every effort should be made to allow the mother to remain in the hospital with access to the infant for exclusive breastfeeding promotion. Maintenance of a 24-hour rooming-in relationship with the infant is optimal during the infant's extended stay (Evans et al., 2014).

Discharge instructions should include:

- Information on engorgement
- Indicators of adequate intake
- Signs of excessive jaundice
- Individual newborn sleep & feeding patterns
- Maternal medications
- Follow-up information

Conclusion

To establish and maintain breastfeeding, women need support from knowledgeable healthcare professionals. Evidence-based knowledge, skills and positive attitudes towards breastfeeding, are vital components of effective and comprehensive breastfeeding care and services. All health professionals should value breastfeeding as an important health promotion and disease prevention strategy.

The United States Breastfeeding Committee (USBC) recommends that all healthcare professionals possess core competencies to integrate breastfeeding care effectively and responsibly into current practice.

All health professionals should understand the importance of protecting, promoting, and supporting breastfeeding, and should strive to develop the skills, attitude and knowledge necessary to assist the breastfeeding dyad in the early postpartum period.

Resources

Academy of Breastfeeding Medicine

<http://www.bfmed.org>

American Academy of Pediatrics

<http://www.aap.org/>

International Lactation Consultant Association

<http://www.ilca.org>

Lactation Institute and Breastfeeding Clinic

This institute offers standards for treatment of breastfeeding problems for professionals as well as breastfeeding families. The clinic is also a research center in the field of lactation. The Lactation Institute has educational programs in lactation for doctors, nurses and other health professions. <http://www.lactationinstitute.org/>

LACTNET

An e-mail listserv for lactation and health care professionals. To join, send e-mail to listserv@peach.ease.lsoft.com, with e-mail reading Subscribe LACTNET your name and credentials. For Professional connection, only.

La Leche League International

Provides links to the Center for breastfeeding Information and other LLL programs and services.

<http://www.lalecheleague.org/>

Newman's breastfeeding Clinic and Institute

<http://www.drjacknewman.com/>

The International Code of Marketing of Breast Milk Substitutes

<http://www.iban.org/>

United States breastfeeding Committee.

Core competencies in breastfeeding care for all health professionals. <http://www.usbreastfeeding.org/>

Office on Women's Health, U.S. Department of Health and Human Services

Your guide to breast-feeding <https://www.womenshealth.gov/publications/our-publications/breastfeeding-guide/?from=breastfeeding>

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