

## CHAPTER 3: BREASTFEEDING

Breast milk is the optimal food for infants. A mother's breast milk has the perfect combination of nutrients needed for her infant's growth and development. The American Academy of Pediatrics (AAP), American College of Obstetricians and Gynecologists, American Academy of Family Physicians, American Dietetic Association, and World Health Organization are some of the major health organizations that recommend exclusive breastfeeding for the first 6 months of life.<sup>1, 2, 3, 4, 5</sup> Breastfeeding rates are rising in the United States; in 2004, 70.3 percent of new mothers reported initiating breastfeeding their infants and 36.2 percent reported breastfeeding at 6 months.<sup>6</sup> Healthy People 2010 established a goal for 75 percent of mothers to initiate breastfeeding, 50 percent to breastfeed at 6 months, and 25 percent to breastfeed at 12 months.<sup>7</sup>

Breastfeeding helps to establish a secure and loving relationship between the mother and her infant and offers many other positive benefits. For these reasons, breastfeeding should be actively promoted and supported as the most desirable method of infant feeding.

This chapter provides information on the benefits of breastfeeding; factors affecting the decision to initiate or continue breastfeeding; methods to support breastfeeding mothers; the basics of breastfeeding; practical breastfeeding techniques and tips; planning for time away from the infant; common concerns; and use of cigarettes, alcohol, other drugs, and certain beverages while breastfeeding. Counseling points related to the information presented in this chapter are found in Chapter 8, pages 159–164.

### Benefits of Breastfeeding

*For the infant, breast milk or breastfeeding:*

- Provides the right balance of nutrients to support the infant's growth and development. These nutrients are provided in a form that is easy to digest and absorb. Breast milk composition changes over time to meet the infant's changing nutritional needs. Breast milk is designed to perfectly meet the needs of the human infant;
- Is sanitary and at the right temperature all the time;
- Provides skin-to-skin contact that is important for making the infant feel secure and loved;
- Contains “bioactive factors” that protect against infections.<sup>8</sup> These factors include secretory IgA, lactoferrin, lysozyme, cytokines, growth factors, enzymes, and nucleotides. Antibodies from the mother help provide immunity which is important because the part of the infant's immune system that secretes antibodies does not mature for several months after birth;
- Appears to reduce the risk of developing gastrointestinal diseases, respiratory diseases, and otitis media (ear infections);<sup>9,10</sup>
- May be associated with higher cognitive development scores;<sup>11,12</sup>
- May protect an infant against food allergies;<sup>13</sup>
- May have a protective effect against obesity in children;<sup>14</sup> and
- Is always available when the mother and infant are together.

*For the mother, breastfeeding:*

- Allows for quicker recovery from childbirth by helping the uterus to return to its pre-pregnant size sooner;
- Suppresses ovulation for many women.<sup>15</sup> However, to assure that pregnancy is prevented in the postpartum period, alternate forms of birth control should be used;
- May be protective against breast cancer and ovarian cancer;<sup>15</sup>
- May have an effect on weight loss after childbirth in some women;
- Is less expensive, more convenient, and requires no time for preparation (e.g., no sterilization and preparation of bottles is required); and

- Stimulates the release of the hormone prolactin that brings a sense of relaxation and well-being to the mother.

The AAP recommends that breastfeeding be continued for the first year and as long as it is mutually desired by both the mother and child.<sup>1</sup> Breastfeeding provides significant benefits even if a mother breastfeeds for a limited time. Women should be encouraged to breastfeed even for a short period; however, exclusive and extended breastfeeding confers the greatest benefits.

## Factors Affecting the Decision To Initiate or Continue Breastfeeding

Several factors have been identified as having a significant impact on a mother's decision to initiate or continue breastfeeding. These include the attitudes of healthcare providers; the mother's support network that may include fathers/partners, family members, and/or friends; hospital practices such as providing infant formula to newborns; a mother's personal experience; and workplace environment.

Mothers typically know that breastfeeding is the best way to feed their infants. However, mothers may not know about the personal health benefits associated with breastfeeding. Some mothers are challenged with combining breastfeeding and other competing demands and may focus on the barriers to breastfeeding rather than the benefits. Exploring both the benefits and barriers is an effective way to counsel a new mother. Research has shown that the common barriers to breastfeeding are embarrassment, lack of social support, lack of time, and competing demands on the mother.<sup>16</sup>

**Embarrassment** is the primary barrier for women of all backgrounds and in all regions of the country. Strategies to address embarrassment include teaching mothers how to breastfeed discretely, providing the opportunity to discuss mothers' concerns, and reassuring mothers they are doing something good for their infant.

**Lack of social support** has a major influence on the decision to breastfeed and on the duration of breastfeeding. Family and friends are often not aware of the importance of breastfeeding and how to be involved in the care and nurturing of a breastfed infant. Mothers should be encouraged to talk with their family and friends about breastfeeding and to invite them to attend prenatal classes to learn more about breastfeeding.

**Time and competing demands** are a reality of life and new mothers can benefit from information on how breastfeeding can be successfully combined with other commitments in their busy lives.

## Methods To Support Breastfeeding Mothers in Your Program

Breastfeeding mothers benefit from education, support, and encouragement. Appropriate, accurate instruction and support can help women breastfeed successfully. Some methods to support breastfeeding mothers in your clinic or program site include the following:

- Make a place or room available for mothers to breastfeed their infants when visiting a clinic or program site.
- Offer all breastfeeding mothers a list of professional and peer resources (e.g., WIC clinic breastfeeding coordinator, WIC peer counselors, public health nurses, breastfeeding mothers group, etc.) to contact for ongoing encouragement, information, breast pumps, and assistance.
- Display culturally appropriate posters and materials on breastfeeding in the clinic or program site (do not display infant formula and materials with infant formula brand names and logos).
- Demonstrate positive attitudes towards breastfeeding and deliver positive and supportive messages about breastfeeding.

- Provide education about the benefits of breastfeeding to individuals and groups. Use printed materials and audiovisuals on breastfeeding that portray breastfeeding as the preferred infant feeding choice and are appropriate to participants' cultural and ethnic background, language, and reading level.
- Encourage the mother's family and friends to participate in breastfeeding education and support sessions.
- Coordinate breastfeeding support with other health care programs in your community.
- If your program is in a hospital clinic, encourage hospital practices that are supportive of breastfeeding.
- Make available peer counselors and/or staff who can provide regular and ongoing counseling and support services to breastfeeding women.

Refer breastfeeding mothers who request infant formula to a nutritionist, peer counselor, or WIC breastfeeding expert for nutrition assessment and counseling. **Determine why the mother is requesting infant formula and help her address barriers or concerns** (e.g., if a breastfeeding mother does not wish to totally wean her infant off the breast, counseling can be provided on the approximate amount and form of infant formula needed).

The National WIC Association has published guidelines for promoting breastfeeding in the WIC Program in the position paper, "Breastfeeding Promotion and Support in the WIC Program."<sup>17</sup> These recommendations provide assistance to local and State WIC agencies in initiating and enhancing breastfeeding promotion and support programs. Suggestions for implementation accompanied by supporting rationale are provided regarding training, clinic environment, coordinated efforts, program evaluation, breastfeeding education and support, and the food packages for breastfed infants and breastfeeding women.<sup>17</sup> These guidelines are a perfect starting point for establishing or

improving breastfeeding promotion and support in any local or State WIC agency.

## The Basics of Breastfeeding

### Making a Good Milk Supply

For most new breastfeeding mothers, making enough milk is their most important concern. Concern over milk supply is a key reason women wean their infants from the breast in the first 6 months of life.

### Role of the Breasts

During pregnancy, the breasts undergo physiological and anatomical changes that enable them to produce milk for an infant. The breast has many parts, each with very specific functions that help the mother produce milk for her infant. Milk production occurs within the alveoli, which are grape-like clusters of cells located deep within the breast. Once the milk is produced, it is squeezed out through the alveoli into the milk ducts, which resemble highways, to transport the milk through the breast. See Figure 3: How the Breast Makes Milk on page 54. The milk is released through openings in the nipple that many mothers cannot see until lactation begins.

The size of a woman's breasts does not affect her ability to breastfeed; women with small breasts produce the same quantity and quality of milk as those with larger breasts. However, a woman's breasts should increase in size from pre-pregnancy to after delivery; typically the breasts double or triple in weight by the time a woman is near term. If a woman expresses concern that there is no change in the size of her breasts during pregnancy, refer her to her health care provider.

### Role of the Brain

When the infant suckles, important nerve endings inside the breast send a message to the brain. The brain then signals the pituitary gland to release two important hormones; Prolactin causes the alveoli to begin making milk, and oxytocin causes the muscles around those cells to contract and squeeze

**Figure 3: How the Breast Makes Milk**

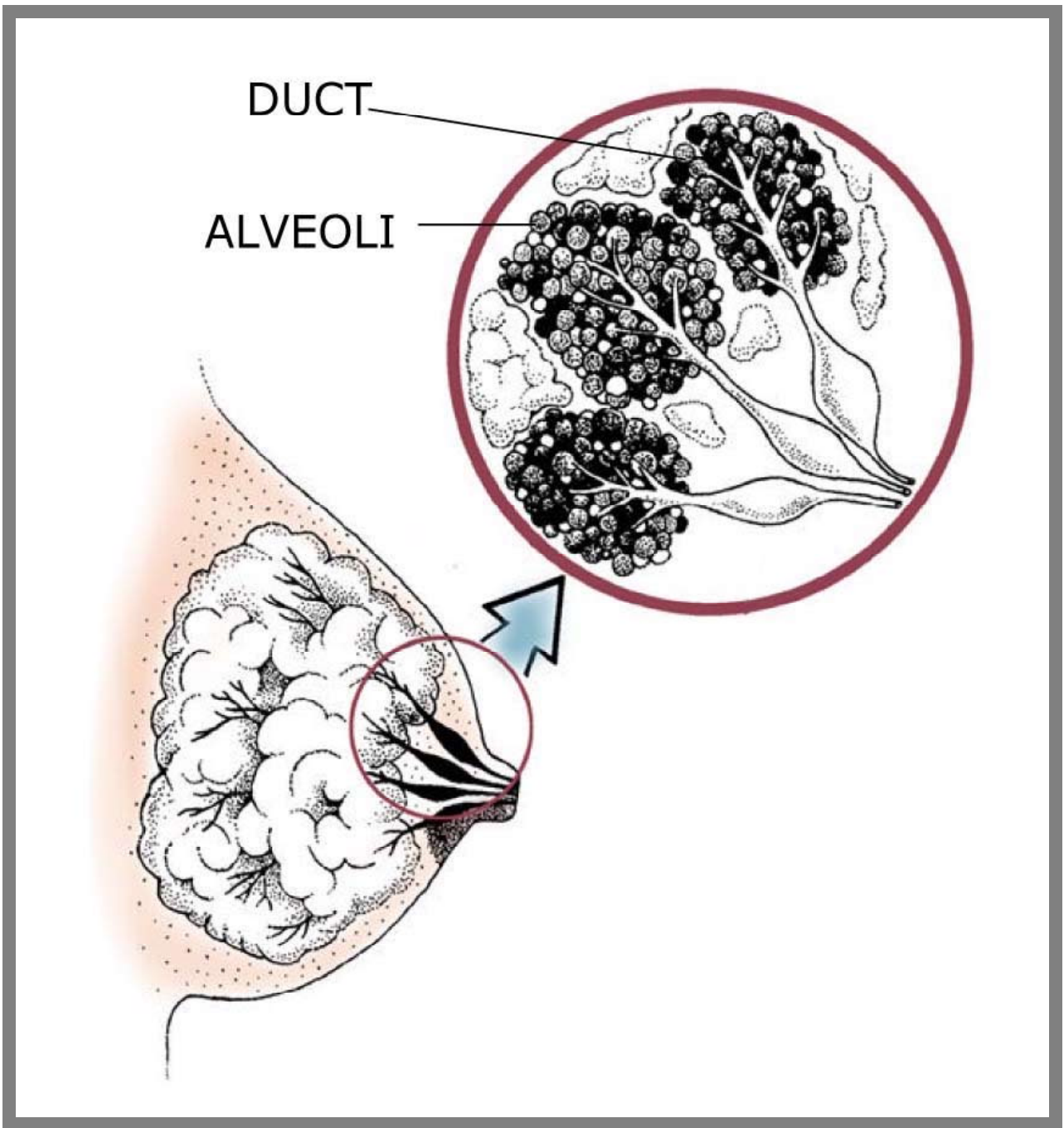


Figure courtesy of Amy Spangler, R.N., M.N., I.B.C.L.C., *Amy Spangler's Breastfeeding, A Parent's Guide*, 7th ed., 2000.

the milk out through the ducts. When milk is released it is called a “Milk Ejection Reflex,” also known as a “let down.” Being relaxed helps oxytocin release milk, so the more relaxed and comfortable mom is, the more milk her infant will receive. See Figure 4: How Mothers Make Milk: Role of the Brain on page 56.

*Signs of the milk ejection reflex include the following:*

- Tingling, fullness, dull ache, or tightening in the breasts (although some mothers do not feel any of these sensations);
- Milk dripping or spurting from the breast not being suckled during breastfeeding; and
- Uterine cramping after the infant is put to the breast during the first few days postpartum.

In the early postpartum period, the milk ejection reflex is primarily triggered by the infant’s suckling on the breast. After breastfeeding is well established, milk ejection reflex can occur due to a variety of other stimuli that the mother associates with the breastfeeding process; e.g., when a mother hears her infant cry, sees or thinks of her infant, or at the usual time of day her infant is breastfed even if the infant is not around. The milk ejection reflex is sensitive to a woman’s psychological state and other factors. For example, the milk ejection reflex may be inhibited if a woman is experiencing stress, fatigue, embarrassment, or pain.

*Methods to encourage the milk ejection reflex include:*<sup>18</sup>

- Relaxation exercises
- Warm compresses before breastfeeding (e.g., a warm washcloth on the breast)
- Breast massage
- Manual expression of a little milk
- Breastfeeding in a calm, undistracted setting or
- Breastfeeding while lying down.

If a woman expresses concern that her milk is not letting down, a person knowledgeable about breastfeeding management (e.g., WIC breastfeeding expert or WIC peer counselor) can

provide assessment, counseling, and follow-up services.

### **Role of the Infant**

The infant also plays an important role in milk production through suckling at the breast and removing milk. When the infant is latched on correctly so that he or she has a mouth full of breast, the special nerve endings that signal the brain to release milk-producing hormones are stimulated. The infant also helps by removing milk. The more milk the infant removes, the more milk the mother will make. Length of time at the breast is not an indicator that the infant is removing milk. Some infants are efficient at removing milk quickly, while others take longer, or are latched on incorrectly so that they are removing very little milk. If the infant cannot go to the breast right away, the milk needs to be removed with a breast pump or through hand expression so the mother can establish a good milk supply. Frequent breastfeeding or milk removal (8 to 12 times every 24 hours) helps mothers make a good milk supply.

### **Characteristics of Breast Milk**

Breast milk is unique in its physical structure and types and concentrations of protein, fat, carbohydrate, vitamins and minerals, enzymes, hormones, growth factors, host resistance factors, inducers and modulators of the immune system, and anti-inflammatory agents. Because it is the sole source of nutrition required for the first 6 months of an infant’s life, its nutrient content has been used by the Institute of Medicine’s Food and Nutrition Board to establish adequate intakes (AIs).<sup>19</sup> Breast milk composition changes during a feeding, through the day, and over time to meet each infant’s nutritional needs.

### **Infant’s First Milk**

The first milk that is produced by the breast for an infant right after birth is thick, yellow-colored fluid called colostrum. The yellow color results from colostrum’s high concentration of carotene (vitamin A precursor). Although colostrum is produced in limited quantity, it is rich in nutrients and substances the infant needs in the

**Figure 4: How Mothers Make Milk: Role of the Brain**

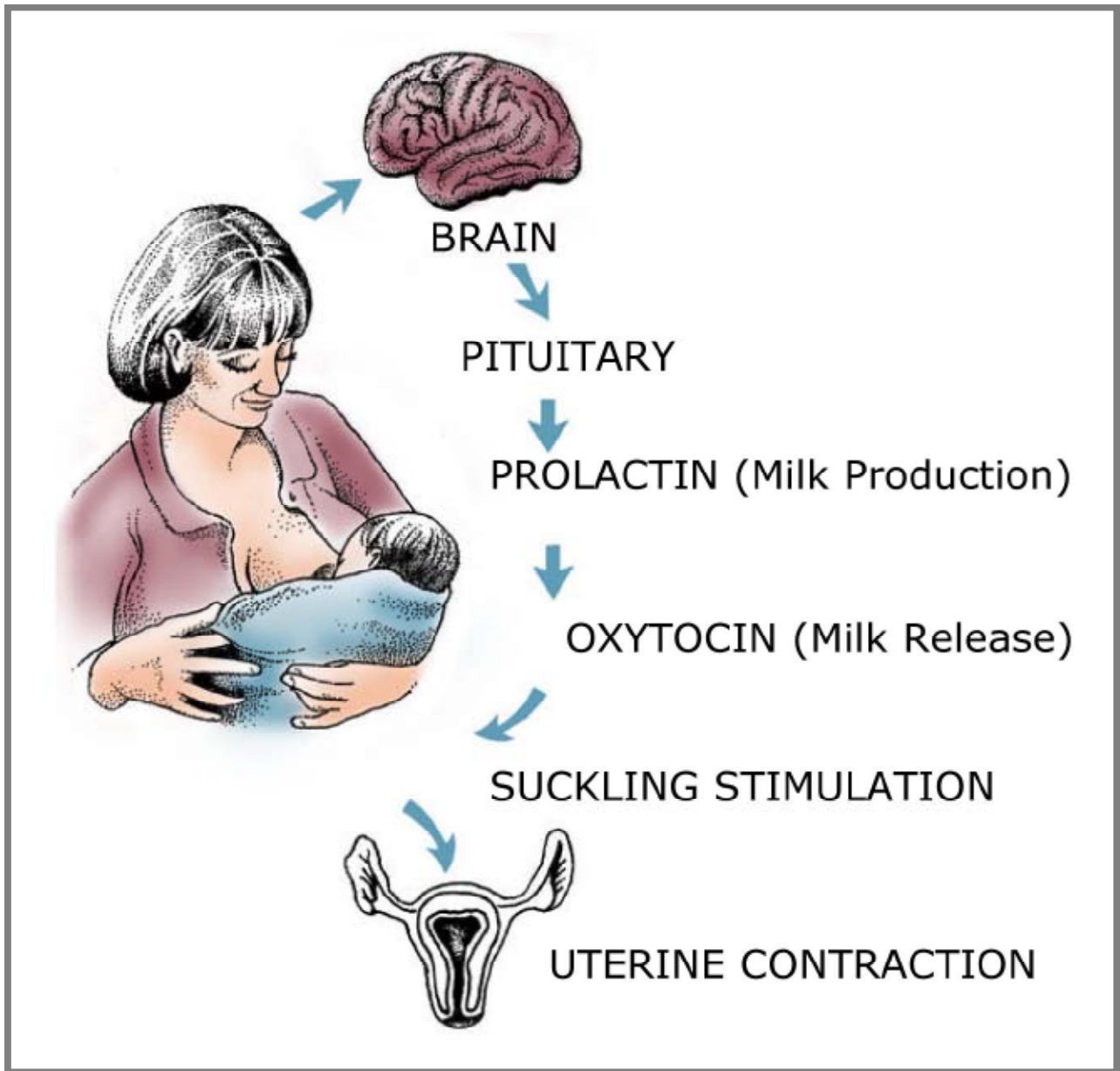


Figure courtesy of Amy Spangler, RN, MN, IBCLC, *Amy Spangler's Breastfeeding, A Parent's Guide*, 7th ed., 2000.

initial days following birth. It offers the following advantages for mother and infant:<sup>18, 20, 21</sup>

- Nutrition high in protein and low in fat that is easily digested by the newborn infant;
- Antibodies, primarily secretory immunoglobulin A (sIgA), which protect the infant's immune system by identifying and destroying foreign objects such as bacteria and viruses; and
- Postpartum uterine contractions stimulated in

the mother; the mother will have less blood loss because the infant's sucking causes the uterus to contract.

Mothers should not express any colostrum from their breasts before their infant's birth because the pumping of the breasts may stimulate uterine contractions, risking premature delivery. All the available colostrum should be saved for the infant.<sup>20</sup>

Over the first 2–3 weeks after birth, the colostrum is gradually replaced by mature breast milk. The intermediate or transitional milk is produced from about day 2–5 postpartum to 2 weeks postpartum. During the transition to mature milk, concentrations of fat, lactose, water-soluble vitamins, and total calories increase in the milk, while those of protein, immunoglobulins, fat-soluble vitamins, and minerals decrease.

### **Mature Milk**

Mature breast milk looks thinner than colostrum. It is produced about 10 to 15 days after birth. Foremilk, the first milk available at the beginning of a feeding, is watery or pale in appearance. Hind milk, the richer milk available toward the latter part of a feeding, is more opaque and creamy white in color. This thicker part of the milk is high in fat and helps the infant feel full and sleepy. Some mothers may need reassurance that although their milk looks thinner than the richer-looking colostrum, mature milk is still full of nutrients for the infant.

### **Practical Breastfeeding Techniques and Tips**

This section reviews basic information and techniques that can help mothers have a successful breastfeeding experience. Once a mother knows what to expect and how to handle common concerns in advance, she can better prevent and cope with most breastfeeding problems that might occur.

#### **Comfort During Breastfeeding**

Breastfeeding is easier and more enjoyable when the mother and infant are able to breastfeed in a relaxed setting. Encourage mothers to find a comfortable place for breastfeeding. Special equipment is not necessary, but pillows and a footstool may help the mother get into a comfortable position and bring her infant closer to her breasts. In the early weeks postpartum, a mother may be more comfortable during breastfeeding if she has privacy and can relax with her infant. During this period, encourage mothers to take time to interact and learn about their infants.

### **Feeding Positions**

The way a mother holds her infant and the position of the infant on the breast can influence successful breastfeeding. Incorrect positioning can make it difficult for an infant to suckle properly on the breast, result in inadequate milk consumption by the infant, and lead to sore nipples. To help a mother learn feeding positions, try demonstrating them using a doll.

There are three commonly used positions that allow an infant and mother to breastfeed comfortably. In these positions, the infant's ear, shoulder, and hip should be in a straight line to enhance swallowing. When instructing a mother on these positions, it may be helpful to tell her that one guideline is to position her infant “chest to chest, chin to breast.”

#### *Lying down or side-lying*

In this position, the mother lies on her side with pillows under her head and behind her back. The infant lies on his or her side facing the mother with his or her chest to the mother's chest and with the infant's mouth level with the nipple. Small pillows can be placed either under the infant's head to bring the infant's mouth to nipple level or under the mother's arm that is holding the infant. It is possible for a mother to breastfeed her infant from either breast in a reclining position without turning over. However, mothers may wish to roll to the other side and reposition the infant during the feeding. This position is typically recommended for a mother who has had a cesarean birth because it allows her to breastfeed without putting pressure on her incision.

#### *Across the lap or cradle hold*

In this position, the mother sits upright in a chair or couch with her back supported while holding her infant securely. The mother supports the infant's head with her arm and places the infant on his or her side with the infant's chest facing the mother's chest. It is easier for the mother to support

her infant up to the level of her nipples if she places one or more pillows on her lap under the infant. Alternately, she could cross her legs and bring the infant up to nipple level with her raised leg. To prevent straining her back, the mother should avoid leaning down to the infant and instead bring the infant to her. This position may be useful for the infant who has difficulty latching on because the mother can easily guide the infant's mouth to the breast.

#### *Football hold or clutch hold*

In this position, the infant's torso is held on the side of the mother's body and supported by a pillow. The mother's forearm supports the infant's back and head. The infant's head is facing the mother's nipple and is supported by the mother's hand, which can raise the infant's head to the breast. It is best for the mother to avoid leaning down toward the infant (this could strain her back) or pushing his or her head into her breast.

### **Attachment (“Latch-On”)**

Before positioning the infant to start breastfeeding, it is advisable for mothers to wash their hands. It is recommended that mothers support the breast while breastfeeding by using the C-hold or Palmar grasp. This hand position involves placing only the thumb on the top of the breast well behind the areola, with the other four fingers on the bottom of the breast to lift and support it. With the breast well supported, the nipple and breast can be easily directed into the infant's mouth. It is especially helpful for the mother to support the breast in this manner while breastfeeding the young infant.

A mother can initiate breastfeeding by aiming the infant's mouth so his or her chin is touching the mother's breast and the nose is aimed toward the top of the mother's nipple. Then by stroking the lower lip of the infant with the nipple of the breast she is holding, the infant will respond by opening his or her mouth, ready to accept the nipple. When the mouth is wide open and

the infant's tongue is down on the floor of the mouth, the mother should move the infant quickly onto the breast. It is important to make sure that the infant has both the nipple and a large part of the areola in his or her mouth with his or her lips sealed around the areola. When the infant suckles in this position, the infant's gums press against the base of the areola causing the milk to eject into the mouth.

When attached properly, the infant's nose should be touching the skin of the breast (the infant's nose is designed to permit breathing during breastfeeding). The infant's lips should be flanged out (curved outward) and relaxed with neither the upper or lower lip curled inward.

If the infant is not attached correctly the first time, a mother may need to repeat the attachment procedure until her infant is latched on properly. Reassure her that sometimes she may have to try several times to get a good latch-on. If a mother experiences any pain or tenderness during latch-on in the early weeks of breastfeeding, it should subside after the first 30 seconds to 1 minute if the infant is properly attached to the breast.

An infant will not receive enough milk if suckling occurs while only the nipple is in his or her mouth. This is because an infant's mouth needs to rhythmically compress the milk-containing lactiferous sinuses, located under the mother's areola, in order to both draw the milk out and to provide the stimulation needed to bring on the milk ejection reflex. An infant's attempts at trying to breastfeed when attached only to the nipple may result in inadequate milk production and nipple soreness.

### **Coming Off the Breast**

Some infants will automatically come off the breast when they are finished breastfeeding. At the end of a feed, the infant will slow or stop suckling and his or her fists will relax. Some infants fall asleep. A mother can either wait until the infant stops suckling and comes off the breast, or she may break the suction between the mouth



and breast by slipping a finger down into the corner of the infant's mouth alongside the gums until the release can be felt or heard. If a mother just pulls her infant off without breaking the suction first, she could hurt her nipple.

## Characteristics of Feedings

### Feeding Cues

Breastfed infants should be fed when they show signs of hunger. Crying is considered to be a late sign of hunger; mothers should be encouraged to begin feeding when the infant shows any of the following signs:

- Rooting reflex (see page 44 for the definition)
- Hand-to-mouth activity (e.g., sucking on hands)
- Small fussing sounds
- Pre-cry facial grimaces (i.e., the infant looks like he or she is about to cry) and
- Smacking lips.

Healthy, full-term infants express signs of hunger and satiety, learn trust, and feel secure when their mothers respond to these cues. Thus, putting healthy, exclusively breastfed infants on a strict feeding schedule is generally not recommended. Encourage mothers to watch their infants for signs indicating hunger and to put them to the breast when they see those signs. Remind mothers that it is normal for infants to have fussy times and cry when they are not hungry. They may cry because they need a diaper change, want to be held, or want to suck. (See page 59 for more information regarding non-nutritive sucking.)

### Frequency and Duration

Frequent breastfeeding helps to maintain and increase a mother's breast milk supply. Exclusively breastfed newborn infants usually breastfeed 8 to 12 times in 24 hours (or about every 1½ to 3 hours).<sup>22,23</sup> A newborn infant should not go longer than 2 to 3 hours during the day or 4 hours at night without breastfeeding. If a newborn sleeps longer than 4 hours at night, she or he should be awakened to breastfeed. As an infant grows older, the amount of time between feedings will increase. Each infant establishes his

own feeding pattern. Some infants breastfeed for shorter periods at more frequent intervals, while others feed longer and less often. After a usual pattern of breastfeeding is established, an infant may suddenly demand to be fed more frequently, e.g., during appetite spurts (resulting from growth spurts) or when teething. Also, the longer an infant sleeps at night, the more frequently the infant may demand to be fed during the day.

Daily breastfeeding patterns will vary from infant to infant, and an individual infant's breastfeeding pattern may change from day to day as he grows.<sup>20</sup> Infants should be fed on demand, i.e., fed when they indicate hunger. Mothers should learn and follow their infants' feeding cues (e.g., comes off the breast spontaneously, falls asleep) in determining the length of each feeding. An infant's feeding period should not be restricted by time. Infants should be allowed to breastfeed for as long as they indicate the desire.

The time period between hospital discharge and the first well infant visit is critical for successfully establishing breastfeeding. If a newborn infant is breastfeeding fewer than 10 times per day and is not gaining weight properly, encourage the mother to breastfeed more frequently and offer both breasts at each feeding.<sup>22</sup> The infant should be referred to a health care provider for assessment.

### Waking Sleepy or Placid Infants To Feed

An exception to using the demand feeding approach is for a young breastfed infant who is lethargic, sleepy, or placid. Some infants are sleepy and may not be interested in feeding every 2 to 3 hours. Infants who display these characteristics are primarily newborns recently discharged from the hospital. Nondemanding breastfed infants, who fail to "act hungry," may not gain weight adequately because they are not fed often enough. Mothers of sleepy or placid infants who are not displaying feeding cues or waking to feed should be advised not to wait more than 3 hours between feedings until the infant's first well infant check-up (within 2 weeks of birth). During this visit, the infant's health care

provider should recommend whether to continue the practice based on the infant's weight gain. If an infant is not interested in feeding, refer the mother to a health care provider for further assessment of the infant immediately.

*To wake a sleepy infant, a mother can try these methods:*

- Stroking the infant's cheek with the nipple
- Holding the infant in an upright position (sitting or standing) while supporting the chin with one hand, several times
- Rubbing or stroking the infant's hands and feet
- Unwrapping or loosening blankets
- Giving the infant a gentle massage
- Undressing or changing the infant's clothing or diaper or
- Playing with and talking to the infant.

### **Normal Fullness of Breasts**

It is normal for a mother of a newborn infant to experience her breasts becoming larger, heavier, and tender a few days after birth. This normal postpartum fullness is caused by an increased volume of milk and blood flow to the breasts as well as temporary swelling of the breast tissue. Breastfeeding 8 to 12 times every 24 hours (about every 1½ to 3 hours) during the first few weeks after birth removes the colostrum and incoming milk so that painful engorgement will not develop. Engorgement hampers the infant's ability to latch on and breastfeed and may lead to poor weight gain in the infant. Normal fullness usually decreases within the first 2 or 3 weeks after birth if the infant breastfeeds frequently and unrestrictedly after birth.<sup>20</sup>

When the infant stops suckling, the mother should gently remove the infant from the breast, burp the infant, and switch the infant to the other breast. Breastfed infants ingest less air during feeding than bottle-fed infants. However, it is generally recommended that breastfed infants be burped at least once between feedings on each breast and after a feeding is over. The infant may breastfeed on the second side as long as she or he is sucking effectively. Over the first 4 months, the

average exclusively breastfed infant feeds between 10 and 20 minutes per breast for a total period of 20 to 40 minutes. Some infants are very efficient and will spend less time at the breast while others are slower and tend to spend more time at the breast. Limiting breastfeeding to specific times is not recommended.

Milk production by both breasts is stimulated by offering both breasts at every feeding. It may be beneficial to alternate which breast is offered first, if the infant does not equally stimulate both breasts. The breast is never truly "empty" because the secretory cells in the alveoli continue to produce milk. Frequent feedings at each breast will stimulate greater milk production. As the demand increases, so will the milk production.

The sucking patterns and needs of breastfeeding infants vary. While some infants' sucking needs are met primarily during feedings, other infants may need additional sucking at the breast soon after feeding even though they are not hungry. They may have the desire to suck for various reasons, such as when they are lonely, frightened, or in pain. This is referred to as non-nutritive sucking.

### **Bowel Movements of Breastfed Infants**

The bowel movements of breastfed infants are different in color, consistency, and frequency from those of formula-fed infants. In the first few days after birth, all infants eliminate the meconium; this is the first stool the infant passes and is sticky and a very dark color (greenish black). After that, the stools of an exclusively breastfed infant generally look like mustard-colored cottage cheese (although stools may be a darker brown or green color) and have a mild odor. In comparison, the stools of formula-fed infants are darker, more formed, and infrequent compared to those of breastfed infants.

### **Indicators of Whether an Infant Is Getting Enough Milk**

A breastfeeding mother may ask how to tell if her infant is obtaining sufficient breast milk. This question may occur because mothers cannot

see how much breast milk their infants are consuming. During the first few weeks after birth, they may also notice their breast size decreasing from their initially enlarged size (this slight shrinking of breast size is normal).

To reassure mothers that their milk supply is adequate and that their infants are consuming a sufficient amount of milk, specific indicators can be examined. *An exclusively breastfed infant is probably consuming a sufficient amount of breast milk if he or she:*

- Gains weight consistently. Weight gain is the most important indicator of whether an infant is receiving sufficient milk and breastfeeding effectively. Infants generally double their birth weight by 6 months of age and triple their birth weight by 12 months of age;
- Breastfeeds frequently and is satisfied after each feeding;
- Wakes to feed;
- Can be heard swallowing consistently while breastfeeding (in a quiet room); and
- Has plenty of wet and soiled diapers, with pale yellow or nearly colorless urine, while not being given any extra fluids besides breast milk. The infant should have:
  - At least 4–8 wet and 3 soiled diapers per day in the first 3–5 days of life<sup>2</sup>
  - 6 or more wet and 3–4 soiled diapers per day by 5–7 days of age<sup>2</sup> and
  - After 6 weeks, the number of bowel movements can vary from less than once a day to many per day.

Breastfeeding mothers also have their own physiological indicators as to whether their infant is consuming an adequate amount. An exclusively breastfed infant is probably consuming a sufficient amount of breast milk if his mother has:

- Full and tender breasts at feeding times, which soften after a feeding
- A tingly sensation of the milk ejection reflex during the feeding or
- Cramping in her lower abdomen; some mothers feel these uterine contractions in the early post-partum period.<sup>22</sup>

If there is any question whether the infant is receiving adequate nourishment, it would be appropriate to assess the infant's breastfeeding history, feeding patterns, and growth (using CDC growth charts). *Refer the infant to his health care provider or a WIC breastfeeding expert for further assessment.*

## Common Concerns

### Flat or Inverted Nipples

Flat or inverted nipples do not protrude properly when stimulated. Inverted nipples pull inward instead of protruding out when pressure is applied to the areola. Flat nipples neither retract nor protrude, but remain flat when the areola is gently squeezed.<sup>23</sup> Some infants may have difficulty latching on to flat or inverted nipples. Some experts believe that a woman can correct these conditions by wearing breast shells or milk cups (see page 66 for more information regarding breast shells) in her bra towards the end of her pregnancy and, if still needed, between feedings during the postpartum period. However, the use of breast shells has not proven to be effective in the limited studies done to date.<sup>2</sup> If a woman has or thinks she has flat or inverted nipples refer her to a health care provider or a WIC breastfeeding expert for assistance.

### Sore Nipples

Some women may experience nipple sensitivity or tenderness during the early postpartum period as they are learning and adapting to breastfeeding. However, this sensitivity usually diminishes after the first week or two. It does not require medical intervention nor does it cause visible damage to the breast or the nipples. A mother should not feel pain during breastfeeding. Sore nipples beyond 2 weeks postpartum or soreness accompanied by visible damage to the breast or nipples may be caused by several factors, including the following:

- **Incorrect positioning and latch-on to the breast** – If an infant is not positioned appropriately for breastfeeding or his or her mouth is not attached to the breast with a good portion of the areola in the mouth, the

nipple can become irritated. The infant's grasp on the nipple should not feel painful to the mother if the infant is properly attached to her breast. The appropriate feeding positions, are described on page 57-58, and proper attachment is described on pages 58.

- **Inappropriate breast care practices** – Mothers should be instructed to avoid harsh soaps, use a properly fitting nursing bra, and use breast pads. A more detailed description of recommended breast care practices is found on page 66-67.
- **Inappropriate frequency and duration of breastfeeding** – An infant who is allowed to become overly hungry may traumatize the nipple by suckling too vigorously. Also, if the mother's breasts are engorged from infrequent feedings, the infant may not be able to grasp the nipple and areola properly in the mouth and thus increase irritation to the nipple. See page 59 regarding appropriate breastfeeding frequency and duration.

Nipples that suddenly become sore and cracked can also be caused by an infection called thrush.<sup>22</sup> A woman with a thrush infection on the nipples will usually complain of itching or burning nipples and the skin may become pink and flaky. Thrush may also appear as white spots on the inside of the infant's cheeks, tongue, or gums. *A health care provider should be consulted; medication or other treatment may be prescribed for both the mother and infant.*

Expressing some milk onto the nipples at the end of a feeding and letting it dry may help sore nipples to heal. If a mother complains of sore nipples, the cause of the soreness needs to be determined in order to treat the condition and prevent it from recurring. A WIC breastfeeding expert can provide assessment, counseling, and follow-up services to mothers complaining of sore nipples.

## Engorgement

Engorgement refers to the firm and painful overfilling and edema of the breasts.<sup>2</sup> Normal fullness, common in the first weeks of lactation, is the result of milk production beginning along with increased blood flow to the breasts. By the second or third week postpartum, this normal fullness decreases and the breasts will feel softer, even when the milk supply is plentiful.<sup>22</sup>

Engorgement may occur due to infrequent or ineffective removal of milk from the breast. When engorgement occurs, the breasts will feel full, hard, warm, tender, and painful. It may be difficult to attach the infant to the breast because the nipple and areola become very taut and hard to grasp. Cases of severe engorgement are associated with abrupt changes in breastfeeding frequency, such as when a mother skips several feedings in a day. *Common recommendations to relieve engorgement include the following:*

- Apply moist heat (hold a washcloth soaked in warm water to the breasts or stand under a warm or hot shower) for 10–20 minutes before a feeding to facilitate the milk ejection reflex.
- Express some milk to soften the areola and breast and allow the nipple to protrude easily.
- Massage the breasts to encourage the flow of milk and to relieve fullness.
- Apply cold compresses to the breasts after feedings to reduce swelling and pain. For years, some women have applied clean, refrigerated, or room-temperature cabbage leaves to their breasts to relieve engorgement.<sup>22, 23</sup> It is not clear whether cabbage leaves contain a substance that makes this technique effective or if the cold simply provides relief, but the practice is believed to be both effective and harmless.<sup>18</sup>

The best management for engorgement is prevention by having the infant breastfeed frequently and effectively every 1 to 3 hours. A WIC breastfeeding expert can provide assessment, counseling, and follow-up services to women complaining of engorgement.

## Plugged Milk Ducts

A plugged milk duct can occur when a milk duct becomes clogged with milk. A mother with a plugged milk duct will commonly complain of a localized tender area on her breast or a lump she can feel in her breast (but does not have fever or other flu-like symptoms). Plugged ducts can be caused by improper positioning of the infant on the breast, severe engorgement, consistently breastfeeding on one breast only, infrequent or skipped feedings, or pressure applied on the breast (e.g., by a tight bra or other constricting clothing, or certain sleeping positions).

*To release a plugged milk duct, a mother can take these steps:*

- Take a hot shower or apply warm, moist cloths to the area where the plugged duct is located and the rest of the breast.
- Massage the breast from the plugged area down to the nipple before and during breastfeeding.
- Breastfeed frequently (at least every 2 hours) and use different positions.
- Position the infant's chin toward the plugged duct and empty the affected breast first.
- Loosen tight clothing, especially the bra.
- Get plenty of rest.

*Because mastitis can result if plugged milk ducts are not relieved, a mother should contact her health care provider if the plugged duct does not go away or if she starts developing symptoms of mastitis. See below for more information regarding mastitis.*

## Mastitis

Mastitis is an infection of the breast. It can occur if a mother does not breastfeed frequently and effectively, and thus often appears following engorgement or plugged ducts. This condition frequently occurs at times of stress or change in usual routine (e.g., guests are visiting, holiday time, returning to work). Frequent and effective breastfeeding (which empties the milk from the breasts regularly) can prevent most cases of mastitis from developing. A mother with

mastitis may have any of the following symptoms: tenderness and/or redness of the breast or flu-like symptoms such as body aches, headache, nausea, fever, chills, malaise, or fatigue. A breastfeeding mother complaining of any of these symptoms should contact or be referred to her health care provider immediately. The treatment is the same as for plugged ducts: apply heat, get plenty of rest, drink adequate fluids, and breastfeed often. Antibiotics will usually be prescribed to cure the infection. To prevent the recurrence of mastitis, it is important that a mother take the entire course of prescribed medication, even if her symptoms have disappeared before the medication is finished. It is recommended that mothers continue breastfeeding, using both breasts at each feeding, and breastfeed frequently to remedy and prevent this condition. If mastitis is not quickly or completely treated, a more serious condition such as a breast abscess may result.<sup>18</sup>

## Poor Suckling

An infant who does not appear to be correctly attached to the breast, chews on the nipple, or pushes the nipple out of his or her mouth may not be suckling effectively. Poor suckling may result from improperly positioning an infant, incorrect use of the tongue while breastfeeding, nipple preference, and other problems. An infant who suckles poorly may be breastfeeding often but ineffectively and thus not necessarily receiving sufficient milk from the breasts. Ultimately, poor suckling can result in a decrease in the mother's milk supply as well as an infant who is frustrated, gaining weight inadequately, has a low urinary output, and has abnormally infrequent stools. If a mother complains that her infant has any of these symptoms, refer the infant to a health care provider or WIC breastfeeding expert. A WIC breastfeeding expert can provide assessment, counseling, and follow-up services to correct suckling problems.

## Appetite/Growth Spurts

Appetite or growth spurts are short periods of time when the infant breastfeeds more frequently than normal.<sup>2,16</sup> Around 8 to 12 days of age, mothers may notice the infant acts hungrier than

normal and may not seem satisfied.<sup>2</sup> During this time, the fullness of the mother's breasts may have also subsided. Consequently, a mother may feel these signs indicate that she is not producing enough milk for her infant.<sup>2,16</sup> Many mothers begin to supplement their feedings with infant formula, try to feed their infant complementary foods, or even stop breastfeeding completely.<sup>2,16</sup>

Although a mother may feel that she has an insufficient milk supply, what is actually happening is the infant is signaling the mother's body to produce more milk to meet his growing needs.<sup>16</sup> Encourage the mother to keep the infant at the breast as often as the infant demands to feed during this period.<sup>2,16</sup> Frequent feeding will increase her milk supply to meet her infant's increased needs and eventually he or she will resume a more normal feeding pattern.<sup>2,24</sup>

Other periods when appetite spurts can occur are 6 weeks, 3 months, and 6 months.<sup>2,16</sup> However, the time period an infant goes through an appetite spurt may vary. Anticipatory guidance to breastfeeding mothers regarding infant feeding patterns often eliminates supplementation and premature weaning.<sup>2</sup> If a mother expresses concern that an appetite spurt lasts longer than a few days, refer her to a WIC breastfeeding expert.

### **Teething and Biting**

Teething and biting are not reasons to wean an infant from the breast. Infants can continue to breastfeed while growing teeth without causing pain to the mother. References such as La Leche League (2003)<sup>20</sup> and Meek (2002)<sup>23</sup> include useful tips on coping with teething and biting in breastfeeding infants. See page 134 for tips regarding soothing an infant who is teething.

### **Refusing To Breastfeed**

An infant's sudden refusal to breastfeed is often referred to as a "nursing strike" and may occur at any time. Mothers may perceive this as a personal rejection, and a nursing strike may lead to early or unplanned weaning. Many mothers never figure out what caused the nursing strike but some common causes include:

- Onset of a mother's menses;
- Maternal stress;
- Change in maternal diet;
- Change in maternal soap, deodorant, or perfume;
- Infant nasal congestion;
- A mother returning to work, or a period of separation of the dyad (mother and infant); and
- Infant nasal obstruction or gastroesophageal reflux disease.

Efforts to restore or continue breastfeeding may take several days. Mothers will need reassurance to continue the breastfeeding relationship. Encourage mothers to continue putting infant to breast especially when he shows signs of hunger or when he is just awakening or sleepy; increase the amount of time holding or cuddling, including skin-to-skin contact; and minimize distractions. Mothers should be advised to maintain their milk supply by pumping or hand expression to assure continued adequate milk production. Instruct mothers to provide pumped breast milk in a cup, spoon, or dropper until breastfeeding resumes.

### **Slow Weight Gain**

An infant's weight gain is the most reliable sign of breastfeeding success. When an infant does not gain weight adequately, appropriate action should be taken to increase the infant's weight as well as ensure that premature weaning does not occur. It is common for infants, both breastfed or formula-fed, to lose a few ounces of weight in the first 3 or 4 days of life. During this period, infants pass their first stools and eliminate extra fluids that they are born with. This weight loss should stop as the mother's milk production increases. At this time, an infant who is breastfeeding effectively should begin gaining weight and ultimately exceed his or her birth weight by 14 days after birth.<sup>23</sup> After infants experience the typical early weight loss and regain their birth weight, they usually gain around 6 ounces per week during the first 6 months. See pages 60-61 for signs indicating the infant is getting enough milk.

*If an infant is under birth weight by 2 weeks of age or a mother is concerned about her infant's weight, advise her to consult her infant's health care provider.*

### **Sleeping Through the Night**

Although many mothers worry about getting their infant to sleep through the night, the reality is that an infant's digestive system is not designed to go an extended amount of time without food.

Mothers have different definitions of what "through the night" means. Researchers use midnight to 5 a.m. as the standard definition; however, many mothers consider it to be much longer.<sup>16</sup>

Infants need the important nutrition that night feedings can provide for growth and development. Night feedings are also important for the breastfeeding mother because they help maintain a healthy milk supply and prevent the mother's breasts from becoming overly full. Mothers may feel pressure from family members and friends who indicate that their infant slept through the night at an early age; however, it is important to remind mothers that infants have different feeding patterns and feed at different time intervals. Some infants cluster feed in the late evening and sleep longer at night. Other infants continue to feed every 2 to 3 hours through the night.<sup>16</sup>

Sleep deprivation is natural in the early weeks after childbirth. Getting to know an infant's feeding and sleeping patterns is a learning process for mothers whether they breastfeed or formula-feed. Both feeding methods may disrupt sleep but breastfeeding eliminates having to get up and prepare a bottle of infant formula. Mothers can use strategies such as keeping the infant close to the bed in a bassinet, sleeping when the infant sleeps, and accepting help from others to get adequate rest. Assure the mother that as her infant grows he/she will sleep for longer intervals.

### **Complementary Bottles and Pacifier Use**

In order to establish a good breast milk supply, advise mothers to avoid feeding complementary bottles of infant formula and water or using

pacifiers for the first 2 to 4 weeks of an infant's life. Supplementation with fluids other than breast milk as well as pacifier use can interfere with establishing effective breastfeeding and have been associated with early weaning.<sup>25, 26, 27</sup> Some of the problems that may be caused or aggravated by feeding complementary bottles or using a pacifier include:

- **Nipple preference** – Artificial nipples on bottles and pacifiers require different movements of the infant's tongue, lips, and jaw and may make it difficult for infants to easily go back to the mother's nipple and breast.
- **Engorgement** – Bottles and pacifiers decrease the amount of time the infant spends breastfeeding. Breastfeeding immediately postpartum, and frequently, helps prevent engorgement.<sup>20</sup>
- **Refusal of the breast** – After being on a bottle, the infant may become frustrated and not express as much interest in suckling from the breast.
- **Early weaning** – Because the infant fills up on infant formula and suckles less on the breast, a reduction in milk production occurs.

*Mothers who report any of the above problems can be referred to a WIC breastfeeding expert for assistance.*

Some mothers may wish to partially breastfeed and feed some infant formula. It is possible to combine both breastfeeding and formula feeding. However, as a mother increases the amount of infant formula fed and decreases the number of feedings, her breast milk production will decrease, possibly resulting in total weaning. If a mother desires to wean her infant from the breast over the first few weeks of life, complementary bottles of infant formula can be given gradually as she weans. See pages 74-75 for guidelines on weaning.

## Breastfeeding Aids and Devices

Elaborate equipment is not needed in order to breastfeed. However, there are some aids that can assist in avoiding breastfeeding problems. Items that can help mothers include:

### Nursing Bra

Nursing bras are specially designed to allow a mother to open a flap of the bra over each breast separately so that she can easily feed her infant with one breast at a time. When choosing a nursing bra, the mother should shop for one a week or two before delivery when her breasts will be close to the size they will be during breastfeeding (after delivery, she can select additional bras to fit her size). The bra should be comfortable and nonconstraining, made with cotton cups (permitting adequate air circulation), and made with nonelastic adjustable straps for sufficient support.

Ideally, the bra should allow room inside for nursing pads and, if used, breast shells. Generally, underwire bras are not recommended during the lactation period. Wearing a bra is not necessary when a mother is sleeping; however, if a mother chooses to wear a bra while sleeping, it should be loose fitting and as nonbinding as possible.

### Nursing Pad

Nursing pads are placed in a bra to soak up leaking milk. Washable or disposable nursing pads without plastic or waterproof liners are recommended because they allow air circulation. It is best to change nursing pads frequently to assure that moisture is not sitting on the nipples. Alternatives to commercial nursing pads include cotton handkerchiefs or squares cut from terry cloth, cotton diapers, or cotton T-shirts. Using toilet paper or facial tissue is not recommended because they dampen easily, fall apart, and hold liquid against the nipple.

### Breast Shell (Milk Cup)

A breast shell (milk cup) is a two-piece hard plastic device that contains two parts: an inner center ring and an attached overlying dome.

These may be used to correct inverted or flat nipples (nipples that do not protrude properly; see page 61 for more information regarding inverted nipples). The shells may be used during the end of pregnancy or for 30 minutes prior to each feeding. Milk that collects in the shell should not be fed to the infant and should be discarded. Mothers should follow advice from a WIC breastfeeding expert on the proper use of breast shells. If a woman has inverted or flat nipples, refer her to the *WIC breastfeeding expert for assistance*.

### Nipple Shield

A nipple shield is an artificial rubber latex or silicone nipple that rests on a mother's nipple while she is breastfeeding. Although previously not recommended because they were believed to interfere with milk supply, newer silicone nipple shields may be used in certain situations. *With the guidance of the WIC breastfeeding expert, using nipple shields for a period of a few days to a few weeks may be appropriate to.*<sup>2</sup>

- Help an infant latch on to a flat or inverted nipple
- Help an infant latch onto an engorged breast
- Protect sore nipples
- Reduce an excessively rapid milk flow and
- Help an infant learn to latch on during the process of relactation (see page 75 for information regarding relactation).

Nipple shields have been used by some women who believe they relieve sore nipples; however, they do not prevent sore nipples, nor correct their underlying cause. *If a mother is using the nipple shields and having trouble weaning her infant off them, refer her to a WIC breastfeeding expert, healthcare provider, or lactation management expert for assistance.*

### Breast Care

Mothers can take simple steps when caring for their breasts to minimize the development of some common breastfeeding-related breast and nipple problems.



## Recommended breast care practices:

- **Keep nipples dry between feedings** – Nipples should be air dried after each feeding and breast pads should be replaced frequently (when moist) to reduce the likelihood of bacterial or fungal growth. Expressing some milk onto the nipples at the end of a feeding and letting it dry may help sore nipples to heal.
- **Do not dry the nipples with a hair dryer or heat lamp after breastfeeding** – Drying the nipples with a hair dryer or heat lamp removes the internal moisture in the skin, which may cause drying and cracking of the nipples.
- **Avoid using harsh soaps and detergents on nipples and areolae** – Soap, shampoo, detergents, or alcohol used on the nipples and areolae remove natural lubricants and dry them out. Soap or shampoo that drips onto the nipples or areolae during a bath or shower can be rinsed off with clean water. Excessive washing or rubbing may remove the protective outer layer of cells on the nipples and areolae, contributing to soreness.
- **Avoid “toughening” the nipples by rubbing them with a towel/cloth or otherwise “preparing the nipples” for breastfeeding before delivery** – This practice can remove natural lubricants and some of the outer cell layer from the breast and increase irritation to the nipple.
- **Do not use creams, ointments, or oils on the nipples or areolae on a routine basis to heal sore nipples, abrasions, or cracks** – The Montgomery’s glands in the areola secrete oils that naturally cleanse, lubricate, and protect the nipple and the areola during breastfeeding. This process eliminates the need for routine application of creams, ointments, or oils. However, there are circumstances when pure lanolin cream is recommended to occasionally soothe sore nipples. Creams and ointments do not prevent nipple soreness and should not be used as a substitute for determining and correcting the cause of a mother’s sore nipples.

## Expressing Breast Milk

*A woman may need or want to express some of her breast milk under these circumstances:*

- Her breasts are engorged
- Mother and infant are separated (e.g., if milk is needed while the infant is with a babysitter or in day care) or
- Mother or infant is sick or hospitalized.

All breastfeeding mothers can benefit from knowing how to express their breast milk. Breast milk can either be expressed manually or by breast pump (hand or electric). A variety of resources include instructions on hand expression of breast milk (see La Leche League (2004)<sup>22</sup> or Meek (2002)<sup>23</sup> for examples).

*The basic steps for manual milk expression:<sup>2</sup>*

- Wash hands thoroughly with soap and warm water.
- Gently massage the breast from the outside quadrants toward the areola; avoid applying deep pressure or friction.
- A washcloth with warm water may be placed on the breast about 5 minutes before milk expression.
- Place the hand with the fingers below and the thumb above about 1¼ inch away from the nipple base so they form a “C.” Press toward the chest wall and then compress the thumb and fingers together, rolling them toward the nipple. Move the hand around the areola to reach all of the areas that cover the pooled milk in the lactiferous sinuses. Use the free hand to massage the breast from the outer quadrants toward the nipple. Do not squeeze the nipple.
- The manual method can take 20 to 30 minutes for adequate draining of both breasts.

*Refer mother to a WIC breastfeeding expert for more information concerning manual breast milk expression.*

*General guidelines for breast pump milk expression:<sup>2</sup>*

- Wash hands before beginning to express milk.
- Ten minutes of pumping each breast should

be sufficient for maintenance of adequate milk production, preferably from both breasts simultaneously.

- Develop relaxation techniques, such as sitting in a comfortable environment. Think about the infant or look at a photograph of the infant. Gently massage the breast before and during the milk expression.

*Mother should refer to the manufacturer's instructions for the specific pump. If instructions are not available, refer her to a WIC breastfeeding expert.*

Breast milk should always be collected in a very clean container (rigid plastic or glass containers are generally recommended). See pages 68–69 for guidelines on safe storage and preparation of expressed breast milk for feeding.

Since breast milk is not homogenized, the fat in it will separate and come to the top. Also, if breast milk sits for a while, there may be small lumps of cream that do not dissolve. These characteristics are all normal.

## Storing Expressed Breast Milk

Expressed breast milk is a perishable food which must be stored properly for safe consumption.

*The following guidelines are recommended to prevent contamination of breast milk:*

- Store expressed breast milk in clean glass bottles, rigid plastic bottles, or disposable plastic nursing bags tightly capped after filling (sterilized bottles and parts should be used for infants less than 3 months old) (see page 91 regarding sterilization of bottles). Do not use ordinary plastic bags or infant formula bottle bags since they may crack and leak.<sup>23</sup>
- Breast milk can be frozen immediately after collection in portions generally needed for a single feeding (e.g., 2 to 3 ounce portions for most infants less than 3 months old; 3 to 4 ounce portions for infants 3 to 5 months old; 4 ounce or larger portions for infants 6 months and older). Also, some 1 ounce portions can be frozen for times when the infant wants some extra milk. When filling a

bottle, leave room (about 1 inch) at the top for expansion. Never add fresh breast milk to already frozen breast milk.

- Store bottles of breast milk in a properly functioning refrigerator at 39 degrees Fahrenheit (F) or below after collection.<sup>2</sup> Breast milk is remarkably resistant to bacterial growth but, to be safe, use refrigerated breast milk within 48 hours from the time it is collected.<sup>2, 24</sup> Since refrigerators may be opened regularly, it is advisable to store the milk in the back section of the refrigerator, which tends to be colder than the front or door.
- Breast milk that will not be fed within 48 hours of collection should be frozen.<sup>24</sup> Frozen breast milk should be stored in the rear of a properly functioning refrigerator freezer, where the temperature is at 0 degrees F, and can be stored for as long as 3 to 6 months.<sup>24</sup> If the freezer is not working or if there is a power failure, frozen milk may thaw out and become rancid and spoil sooner. Label the container of milk for storage with the collection date. Use the oldest milk first.
- Once frozen breast milk is thawed, it should be refrigerated at 39 degrees F or below, used within 24 hours, and should not be refrozen.<sup>2</sup> If the milk has an offensive odor when thawed, it may have spoiled and should be discarded. Also, do not add warm milk to cold or frozen milk. While breast milk is very resistant to bacterial growth when fresh, it is much less resistant after it has been frozen. Each time a liquid is added to frozen milk, a thin layer of milk thaws which is a potential area for bacterial growth. While the risk is small, the best practice is not to open stored milk until feeding time.
- If traveling with bottles of expressed breast milk, store them in a cooler with ice or an ice pack.
- Clean used bottles and their parts with soap and hot water. If the infant is less than 3 months old, sterilize those items in boiling water, as shown in Figure 6a-c, pages 93–95, or wash in a dishwasher before reusing.

## Warming Expressed Breast Milk

The following guidelines are recommended to thaw and warm breast milk:

- Milk should be thawed quickly. To thaw and warm a container of frozen expressed breast milk:
  - Hold the bottle under running lukewarm water.<sup>2</sup>
  - Shake the bottle gently to mix (breast milk separates into a fatty layer and a watery layer when it is stored).
  - Avoid too much heat or shaking because heat will damage the protective substances in the milk and very vigorous shaking will cause the milk fat to separate out.
- Test the temperature before feeding to make sure that it is not too hot or cold (test by squirting a couple of drops onto the back of your hand). Use the milk immediately after warming to avoid breakdown of the milk fat, the development of rancidity, and bacterial growth.
- Thaw and/or warm only as much breast milk as you think will be needed for a feeding. Thawed breast milk must be used within 24 hours or discarded.<sup>2</sup> Do not refreeze breast milk that has been thawed.
- Never use a microwave oven to thaw or warm breast milk.<sup>2</sup> Liquid in a bottle may become very hot when heated in a microwave oven and remain hot after removal from the oven even though the bottle feels cool. Infants have been seriously burned while being fed liquids warmed in microwave ovens. Covered bottles can explode when heated in a microwave oven. Also, many of the immunities in breast milk can be destroyed if the milk is heated in a microwave oven.

## Planning for Time Away From the Infant

Many mothers need or want to return to work or school outside their home shortly after their infant's birth. Mothers who are temporarily separated from their infants can successfully continue to breastfeed them. The following tips may improve a mother's ability to continue breastfeeding whether she chooses to work, go

to school, or leave her infant temporarily in someone else's care:

***If possible, delay the return to work or school until the infant is at least 4 to 6 weeks old.*** The period from birth to 4 to 6 weeks is critical for establishing a mother's milk supply. If a mother returns to work or school before that time and is away from her infant for long periods, she may have difficulty maintaining her milk supply.

**Learn how to express breast milk.** A mother who is comfortable expressing breast milk manually (by hand) or mechanically (using a breast pump) can collect her milk while away from her infant. Mothers who begin expressing, collecting, and freezing small amounts of milk each day are able to build up a stored supply of milk. Thus, some recommend pumping twice a day, in addition to breastfeeding the infant, beginning several weeks before they return to work or school. This allows the milk supply to increase gradually over the weeks. See page 67 on milk expression.

**Inquire about breastfeeding support at the workplace/school.** Some workplaces or schools may feature supportive policies (e.g., allowing breaks or flexible work hours for pumping or breastfeeding) and facilities for breastfeeding mothers (e.g., special rooms or areas for breastfeeding with privacy, an electric breast pump for employees' use, and a refrigerator to store expressed milk).

**Make child care arrangements for the infant.** The arrangements families make for their children can vary including care by relatives, center-based care, family child care provided in the caregiver's home, and care provided in the child's home by babysitters. Encourage mothers to choose an arrangement that is supportive of breastfeeding and, in the case of a child care center, allows her to breastfeed if she visits. The temporary caregiver needs to be instructed on:

- How to use frozen breast milk (see pages 68–69 for instructions on how to handle frozen breast milk) and

- How much expressed breast milk (or infant formula) the infant usually consumes and how often he or she usually eats (this will depend on the infant's stage of development and other factors); The temporary caregiver should still be encouraged to follow the infant's hunger and satiety cues in deciding when and how much to feed.

**Make arrangements for safely storing expressed breast milk while away from home.**

It helps if a refrigerator is available for storage at the worksite or school. If not, some mothers store their milk in coolers packed with ice or ice packs. See pages 68 for information regarding storage of expressed milk. Encourage the mother to label the container of milk for storage with the collection date. The oldest milk should always be used first.

**Prepare the infant for being fed by someone other than the mother.** An infant who will be fed by someone else needs to be introduced to a bottle before his or her mother starts going to work or school – some recommend 2 weeks before she returns and preferably no sooner than when the infant is 3 to 4 weeks old. By that age, the mother's milk supply should be established and there will be less chance of causing nipple preference in the infant. An older infant may take breast milk from a cup.

**Maintain a good milk supply.**

The easiest time to express milk to build up a supply is in the morning. Most mothers have more milk in the morning and find that it is easiest to express then. One technique that works well for many mothers is as follows:

- Breastfeed the infant from one breast after waking up in the morning.
- Put the infant down, pump the milk from the other breast, and store it.
- As soon as the pumping is finished, let the infant breastfeed on the side that was just pumped.

Infants will usually consume the remaining milk that the pump did not extract. The extra suckling will also increase the mother's milk supply.

- Breastfeed the infant when home; express milk during the day if possible. In order to maintain her milk supply and avoid engorgement and breast infections, a mother should breastfeed her infant before leaving for work or school, after coming home for the day, and in the evening, and, if possible, express her milk during the day. Mothers often express their milk during breaks and/or lunch hour. Some mothers go to their infants or have their infants brought to them for breastfeeding at lunch time. Alternately, when milk expression is not possible, infant formula can be provided while the mother is away. Some infants may wait until their mothers arrive home to do most of their feeding; this is not a problem as long as the infant is consuming an adequate amount to maintain proper growth.

- Breastfeed regularly on weekends and evenings. Breastfeeding mothers decrease their chances of experiencing discomfort, engorgement, and a lower milk supply if they breastfeed frequently at times when they may not be expressing their milk (i.e. evenings and weekends). As the week progresses, some mothers may find that there seems to be less milk to express. A mother can maintain and increase her milk supply if she breastfeeds (or pumps) often (6 or more times a day during the week and more on weekends), gets adequate rest, and consumes a nutritionally adequate diet.

Although additional planning and scheduling is required when breastfeeding while working or attending school, continuing to breastfeed, to whatever degree, benefits both the mother and her infant.

## Use of Cigarettes, Alcohol, Other Drugs, and Certain Beverages During Breastfeeding

This section provides guidelines and background information on the use of cigarettes, alcohol, other drugs, caffeine-containing products, and herbal teas during breastfeeding.

### Cigarettes

A mother who smokes cigarettes can still provide her infant the benefits of breastfeeding. However, breastfeeding mothers should be actively discouraged from smoking. Smoking is associated with a poor milk supply and has harmful effects on the mother and her infant.<sup>18</sup>

### Effects of Cigarette Smoking on Breastfeeding Infants

Nicotine and other compounds such as cyanide and carbon dioxide from cigarettes can enter an infant's system through breast milk.<sup>2</sup> Nicotine, the addictive substance inhaled when smoking cigarettes, does not disrupt lactation but may interfere with the milk ejection reflex and milk production. The nicotine content of the milk is correlated with the number of cigarettes smoked per day and how recently the mother smoked before a feeding. Maternal smoking has been associated with:<sup>18</sup>

- Decreased infant growth
- Increased number of infant respiratory illnesses and
- Increased rates of infantile colic.

### Sudden Infant Death Syndrome is more common in infants of smokers.<sup>18</sup>

The Environmental Protection Agency<sup>28</sup> has concluded that second-hand smoke (cigarette smoke exhaled by smokers and given off by the burning ends of cigarettes) is a human lung carcinogen and that exposure to such smoke has these harmful effects on infants and children:

- Increases the risk of lower respiratory tract infections such as bronchitis and pneumonia

- Increases the prevalence of fluid in the middle ear, a sign of chronic middle ear disease
- Irritates the upper respiratory tract and is associated with a small but significant reduction in lung function
- Increases the frequency of episodes and severity of symptoms in asthmatic children and
- Is a risk factor for new cases of asthma in children who have not previously displayed symptoms.

### Effects of Cigarette Smoking on the Mother

The U.S. Surgeon General has concluded that cigarette smoking increases a woman's risk of developing cardiovascular diseases (including atherosclerosis, stroke, and coronary heart disease), respiratory diseases (including chronic obstructive pulmonary disease and asthma), infertility, cataracts, hip fractures and low bone density postmenopausal, peptic ulcer, cancers (of the lung, larynx, oral cavity, esophagus, stomach, pancreas, urinary bladder, cervix, and kidney), and risk of dying prematurely in general, and is a major threat to the outcome of pregnancy and the well-being of the newborn infant.<sup>29</sup>

### Smoking Cessation

Refer breastfeeding mothers who smoke, and are having difficulty quitting, to smoking cessation programs in your area. Refer to the U.S. Department of Agriculture, Food and Nutrition Information Center resource list entitled "Alcohol and Substance Abuse During Pregnancy and Breastfeeding, September 2003" available at [http://www.nal.usda.gov/fnic/pubs/bibs/topics/pregnancy/substance\\_abuse\\_resourcelist.pdf](http://www.nal.usda.gov/fnic/pubs/bibs/topics/pregnancy/substance_abuse_resourcelist.pdf) for guidance and publications appropriate to counsel pregnant or breastfeeding mothers about smoking cessation.

*If a breastfeeding mother is unable to totally quit smoking, recommend that she do the following:<sup>23</sup>*

- Cut down on the number of cigarettes smoked
- Refrain from smoking while breastfeeding her infant

- Avoid smoking in her infant's presence (nicotine, via cigarette smoke, can also enter an infant's system from the air) and
- Refrain from smoking until right after a feeding so that nicotine levels will have time to decrease before the next feeding.

*Nicotine patches or gums are often promoted for use to help smoking cessation; however, mothers should consult their health care provider before using these products.*

Given the effects of second-hand smoke on children, advise mothers to also ask other smokers they know to avoid smoking around the infant or other children.

## Alcohol

Contrary to popular belief, consumption of alcoholic beverages has not been shown to have any beneficial effects on breastfeeding (i.e., drinking beer does not increase your milk supply). Alcohol consumed by a mother can enter her infant's body through breast milk; levels have been shown to peak in breast milk<sup>30</sup> to 90 minutes after alcohol consumption by the mother. It is recommended that mothers avoid habitual use of alcohol while breastfeeding.

### Effects of Alcohol on Mother and Infant

Excessive alcohol intake is associated with failure to initiate the milk ejection reflex, high alcohol levels in milk,<sup>30</sup> lower volumes of breast milk ingested by the infant,<sup>31</sup> and disturbances in the infant's sleep-wake pattern.<sup>32</sup> The amount of alcohol that may impair the milk ejection reflex is more than about two alcoholic drinks (0.5 grams of alcohol per kilogram body weight) per day for the average woman.<sup>30</sup> Two drinks are equivalent to about 3 ounces of liquor, two 12 ounce cans of beer, or 8 ounces of table wine. Also, a mother who drinks excessively may not be able to think and act normally and could accidentally take actions that endanger her infant.

### Recommendations on Alcohol

The Dietary Guidelines for Americans, 2005 recommends that alcoholic beverages should

not be consumed by breastfeeding women.<sup>33</sup> If a breastfeeding mother will not or is unable to stop drinking alcohol, recommend that she limit her intake as much as possible. Breastfeeding mothers who consume alcohol should wait at least 2 hours before breastfeeding their infant.<sup>18</sup> Refer breastfeeding mothers who drink excessively to alcohol assessment, treatment, and counseling services in your community. Refer to the U.S. Department of Agriculture, Food and Nutrition Information Center resource list entitled "Alcohol and Substance Abuse During Pregnancy and Breastfeeding, September 2003" available at [http://www.nal.usda.gov/fnic/pubs/bibs/topics/pregnancy/substance\\_abuse\\_resourcelist.pdf](http://www.nal.usda.gov/fnic/pubs/bibs/topics/pregnancy/substance_abuse_resourcelist.pdf) for guidance and publications appropriate to counsel pregnant or breastfeeding mothers about alcohol abuse.

## Caffeine-Containing Products

Moderate caffeine intake in the form of coffee, tea, or caffeinated sodas is acceptable while breastfeeding. The amount of caffeine in breast milk is usually less than 1 percent of the amount ingested by the mother.<sup>2</sup> Caffeine is not detected in infants' urine whose mothers consume up to 3 cups of coffee a day.

### Recommendations on Caffeine-Containing Products

The AAP Committee on Drugs states that no effect of caffeine has been observed in breastfeeding infants of mothers with moderate intake of caffeinated beverages (2–3 cups per day).<sup>34</sup> However, excessive intake (>5 caffeinated beverages per day) may result in a more fussy and irritable infant. If an infant exhibits these symptoms, decreasing caffeine intake is recommended for the mother.

Caffeine-containing medications (e.g., certain varieties of stimulants, pain relievers, cold remedies, and weight-control aids) should also be avoided. Breastfeeding mothers on these medications should consult their health care providers.

## Herbal Teas

Use of herbs and herbal teas continues to increase; however, little research on the safety and efficacy of herbal therapies exists and herbal preparations remain unregulated by the Food and Drug Administration. Herbs contain compounds that may have pharmaceutical effects similar to drugs and, like drugs, may pass into breast milk. Concern has been expressed regarding the effects of some herbal teas consumed by breastfeeding mothers on their infants. Many herbal teas are benign and serve as flavorful alternatives to caffeinated beverages; these include chicory, orange spice, peppermint, raspberry, red bush, and rose hip teas.<sup>18</sup> However, components in some herbal teas made with buckhorn bark, senna, star anise, comfrey, chamomile, and a tea called “Mother’s Milk Tea” (available in specialty food stores) may have undesirable effects on a breastfed infant when the tea is consumed by the mother.<sup>18</sup> Lawrence<sup>18</sup> and Hale<sup>34</sup> provide information on the effects of different herbs used in herbal teas on the body. *Generally, herbal preparations should be avoided while breastfeeding; use of any herbal teas should be discussed with the mother’s health care provider.*

## Other Drugs

Most nonprescription, prescription, and recreational or illicit drugs (e.g., marijuana, heroin, cocaine) used by a breastfeeding mother are absorbed and excreted into her breast milk. However, not all drugs are excreted into breast milk at concentrations that are harmful to the infant.

## Nonprescription and Prescription Drugs

Some drugs that may not harm the breastfed infant may have a detrimental effect on the mother’s ability to produce or secrete milk. The AAP Committee on Drugs publishes guidance regarding the transfer of drugs and medications, radiopharmaceuticals (radioactive drugs), and food and environmental agents into breast milk and reported effects on lactation or on the infant when a mother ingests or is exposed to these

substances.<sup>34</sup> Extensive and detailed information on medications and mothers milk is also available in Hale (2004).<sup>35</sup> Breastfeeding is contraindicated when drugs, medications, or other substances taken by the mother and transmitted to the infant in the breast milk may harm the infant.

## Recreational or Illicit Drugs

Use of illicit drugs is contraindicated because of the potential effects on the infant as well as hazards to the mother. Thus, the use of illicit drugs by breastfeeding mothers should be actively discouraged and affected mothers, regardless of their mode of feeding, should be assisted to enter a rehabilitative program that makes provision for infants.

Remind all breastfeeding mothers to inform their health care providers that they are breastfeeding and consult with their providers before taking any type of drug or vitamin/mineral supplements. Any decisions regarding drug use during lactation should be made between the mother and her health care provider.

## Contraindications to Breastfeeding

In general, there are very few true contraindications to breastfeeding. Most women who desire to breastfeed can do so without problems. Breastfeeding may not be possible if a mother is an alcoholic or an intravenous drug user, has a serious infectious or other illness, or has an illness in which the medication or treatment prescribed is contraindicated during breastfeeding (e.g., when chemotherapeutic or radioactive drugs are prescribed during an illness).

## Infectious Diseases

Acute infectious illnesses, such as colds or gastrointestinal and urinary tract infections, are not contraindications to breastfeeding. More significant infectious diseases must be evaluated for their risk to transmit the infection to the infant. Research has conclusively demonstrated that the human immunodeficiency virus (HIV) can be transmitted by breast feeding and/or breast

milk.<sup>36</sup> In the United States, the AAP and the Centers for Disease Control and Prevention (CDC) recommend that HIV-positive mothers should not breastfeed their infants.<sup>37, 38</sup> Because of the lack of unsafe water supplies or nutritious alternatives in developing countries, breastfeeding is recommended for infants of HIV mothers in some other parts of the world. Breastfeeding is also contraindicated for infants of mothers with human T-cell leukemia virus type 1 or type 2 (HTLV-1, HTLV-2) in the United States.<sup>37</sup> Other infectious diseases for which breastfeeding may need to be temporarily discontinued while therapy is initiated or the risk of transmission is passed include hepatitis, cytomegalovirus (CMV), herpes simplex virus, varicella-zoster virus, tuberculosis, and Lyme disease.<sup>39</sup> *In all cases of nonroutine infectious illness, the mother's health care provider should be consulted for appropriate therapy and guidance on continuation of breastfeeding.*

### **Metabolic Disorders**

If an infant has a metabolic disease that requires a specialized infant formula, breastfeeding may be contraindicated (e.g., in the case of infants with galactosemia, a rare medical condition). Infants with the metabolic disorder phenylketonuria (PKU) can breastfeed on a limited basis as long as their diet is supplemented with a special low-phenylalanine infant formula and they are carefully monitored by their health care provider.<sup>39</sup>

### **Breast Surgery or Piercing**

Medically indicated or cosmetic breast surgery and nipple piercing have become more common in recent years, but generally do not interfere with breastfeeding.<sup>23</sup> Women with a history of breast cancer may successfully breastfeed. Previous radiation or lumpectomy does not preclude breastfeeding; those who have had a single mastectomy can breastfeed from the remaining breast. Mothers who have undergone breast enlargement with silicone or saline implants can also safely breastfeed their infants. Breast reduction surgery is more likely to interfere with successful breastfeeding since milk ducts and nerves may have been cut. Pierced nipples do not

interfere with breastfeeding but rings or studs should be removed to prevent the infant from choking. If a pierced nipple was infected at any time, scar tissue may have developed that could make breastfeeding more difficult.

If a woman questions whether breastfeeding is recommended during certain illnesses or medical or drug treatments, refer her to a qualified health care provider for advice.

### **Weaning the Breastfed Infant**

The AAP recommends that breastfeeding be continued through the infant's first year and for as long after as is mutually desired by the mother and child.<sup>1</sup> Research demonstrates that the benefits of breastfeeding are dose-responsive; the longer a mother breastfeeds, the more benefit her infant will receive. Healthy People 2010 goals call for an increase in breastfeeding rates at 1 year to 25 percent of all infants.<sup>7</sup> The decision of when to begin weaning an infant from the breast is up to each mother and infant. However, the weaning process begins in part when complementary foods are introduced and the infant begins breastfeeding less frequently.

### **Approach to Gradual Weaning**

Mothers who wish to wean their exclusively breastfed infants onto infant formula tend to experience less discomfort if the weaning process is gradual (e.g., over several weeks or longer). Gradual weaning also allows infants time to adjust to both the taste of infant formula and to drinking from a bottle or cup. Mothers can formally start weaning from the breast by replacing a feeding of breast milk with a feeding of infant formula (or whole cow's milk if the infant is over 12 months old). The first feeding to replace could be the one the infant is least interested in or when the breasts do not feel full. Gradually, over several days or even weeks, additional feedings can be eliminated. When down to one feeding per day, the infant can be breastfed every other day. Some mothers and infants may still want to breastfeed once in a while just for comfort or to relax.



## **Weaning to a Bottle or a Cup**

Mothers who wish to discontinue breastfeeding can wean their infants, over 6 months old, to infant formula in a bottle and/or cup, depending on the infant's developmental ability. Some older infants may need to be weaned to a bottle because they are not developmentally ready to drink significant quantities of liquid from a cup. It is advisable to wean infants entirely off the bottle and onto a cup by about 12 months old. Weaning to infant formula may be easier if powdered infant formula is used – this type of infant formula allows the caregiver to prepare a limited number of bottles, if necessary, without wasting infant formula.

## **Relactation**

A mother who has mostly or totally weaned and then decides she wants to resume breastfeeding for reasons such as her infant is intolerant to infant formula, can consult with a person trained in lactation management for assistance. Relactation is rebuilding a birth mother's milk supply after it has been reduced or dried up. Refer the mother to a WIC breastfeeding expert or lactation expert for assistance with relactation.

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