

Overcoming Clinical Barriers to Exclusive Breastfeeding

Marianne Neifert, MD, MTS^{a,b}, Maya Bunik, MD, MSPH^{c,*}

KEYWORDS

- Exclusive • Breastfeeding • Perceived insufficient milk (PIM)
- Breastfeeding support • Combination feeding

KEY POINTS

- Barriers to exclusive breastfeeding include lack of prenatal education, comfort and ease with formula feeding, perception of insufficient milk, misinterpretation/understanding of normal infant crying, inadequate support, maternal employment, and early introduction of solids.
- Despite the brevity of the postbirth hospitalization, the provision of supportive maternity care practices, especially exclusive breast milk feeding, represents an evidence-based intervention to increase exclusive and extended breastfeeding.
- When supplementation is required for a breastfed newborn, using mother's own expressed milk provides the health benefits of exclusive breast milk feeding and helps ensure an abundant milk supply.
- Potential sources of essential support to help mothers increase breastfeeding exclusivity in the first 6 months postpartum include the federal WIC program, Nurse-Family Partnership (NFP), families, mother-peers, health care professionals, and employers.
- A newborn follow-up visit at 3 to 5 days and a second ambulatory visit at 2 weeks are critical to evaluate the onset of breastfeeding, monitor infant weight gain, discuss infant feeding cues, and provide ongoing support to the mother.

THE CASE FOR EXCLUSIVE BREASTFEEDING

In their most recent breastfeeding policy statement, the American Academy of Pediatrics (AAP) reaffirmed their long-standing recommendation of exclusive breastfeeding for about the first 6 months of life, with continued breastfeeding through 12 months and beyond, as appropriate complementary foods are introduced.¹ The World Health Organization (WHO) similarly recommends that infants worldwide be

^a Department of Pediatrics, Children's Hospital Colorado, University of Colorado Denver, 13123 East 16th Avenue, B065, Aurora, CO 80045, USA; ^b Dr. Mom® Presentations LLC, PO Box 880, Parker, CO 80134, USA; ^c Children's Outcomes Research, Department of Pediatrics, Children's Hospital Colorado, University of Colorado Denver, 13123 East 16th Avenue, B032, Aurora, CO 80045, USA

* Corresponding author.

E-mail address: maya.bunik@childrenscolorado.org

exclusively breastfed for the first 6 months, with breastfeeding continuing for up to 2 years or beyond, as safe and nutritionally adequate complementary foods are added.²

Exclusive breastfeeding is defined as an infant receiving only breast milk and no other liquids or solids except for drops or syrups consisting of vitamins, minerals, or medicines.³ Although being ever breastfed, compared with never breastfed, is linked with numerous improved infant and maternal health outcomes, mounting research evidence confirms that the health benefits of breastfeeding are dose-related, with exclusive breastfeeding conferring the maximum health benefits for infants and mothers.^{1,4} The promotion of breastfeeding is a recognized public health strategy for preventing childhood obesity,^{5,6} based on the documented dose-related, protective effect of breastfeeding in reducing childhood overweight.⁷

Whereas some infant feeding experts have argued that solid foods can be introduced safely after 4 months of exclusive breastfeeding,⁸ the AAP recommends exclusive breastfeeding for about 6 months rather than 4 months because the longer recommendation extends the period of lactational amenorrhea and provides greater infant protection against lower respiratory tract illnesses, otitis media, and diarrheal disease.^{1,9} Not only does exclusive breastfeeding for about 6 months provide ideal infant nutrition and the maximum short- and long-term health benefits for infants and mothers, it has long been observed that shortened exclusive breastfeeding owing to supplementation with infant formula is linked with a shortened duration of breastfeeding.^{10–14} As soon as regular formula feedings are started, breastfeeding frequency and suckling duration decrease sharply.¹³ Thus, the younger infants are when regular formula feeds are introduced, the younger they are at cessation of breastfeeding.

EXCLUSIVE BREASTFEEDING RATES IN THE UNITED STATES

Fortunately, decades of ongoing breastfeeding promotion efforts have been successful in steadily raising national breastfeeding rates. Among 2009 US births, breastfeeding initiation has risen to 76.9%,¹⁵ achieving the Healthy People 2010 (HP2010) national objective of 75% and representing the highest initiation rate in nearly 7 decades.¹⁶ In 2007, following the HP2010 midcourse review, target goals for exclusive breastfeeding at 3 and 6 months were added to the HP2010 objectives for breastfeeding initiation and duration.¹⁷ The new HP2020 objectives reflect even higher targets for all breastfeeding outcome measures (**Table 1**).

Although more than three-quarters of US mothers begin breastfeeding, the current low rates of breastfeeding continuation and exclusivity indicate that most US infants and mothers are not receiving the maximum health benefits associated with full and

	Ever Breastfed, %	Breastfeeding at 6 mo, %	Breastfeeding at 12 mo, %	Exclusively Breastfeeding at 3 mo, %	Exclusively Breastfeeding at 6 mo, %
2009 ^a US	76.9	47.2	25.5	36.0	16.3
HP2010 objectives	75.0	50.0	25.0	40.0	17.0
HP2020 objectives	81.9	60.6	34.1	46.2	25.5

Abbreviation: HP, Healthy People.

^a Centers for Disease Control and Prevention National Immunization Survey, Provisional Data, 2009 births.

extended breastfeeding. In addition, the substantial racial and economic differences in breastfeeding contribute to infant and maternal health disparities. Similar to the socio-demographic disparities in breastfeeding initiation and duration, for children born in 2007, rates of exclusive breastfeeding through 3 and 6 months were lowest among black infants and infants of mothers who were young, unmarried, had lower incomes, were less educated, or who were living in rural areas.¹⁷ Raising exclusive breastfeeding rates remains a critical public health strategy to improve infant and maternal health, especially among populations at risk.

BARRIERS TO EXCLUSIVE BREASTFEEDING

More than 85% of expectant mothers recruited for the national 2005–2007 Infant Feeding Practices Study II¹⁸ (IFPS II) intended to exclusively breastfeed for 3 months or longer¹⁹; yet, only 32% of mothers achieved their intended exclusive breastfeeding goal.¹⁹ Although the study mothers, who were drawn from a nationally distributed, self-selected consumer opinion panel, were not nationally representative, they characterized the population of US women most likely to succeed with breastfeeding,¹⁸ thus underscoring the need for effective strategies to enable more women to reach their exclusive breastfeeding goals.

The *2011 Surgeon General's Call to Action to Support Breastfeeding* identifies diverse personal and societal barriers to breastfeeding, including lack of knowledge, embarrassment, widespread exposure to infant formula, inappropriate maternity care practices, lactation difficulties and concerns about insufficient milk, employment and child care, insufficient family and social support, and inadequate physician knowledge and support.²⁰ The *Call to Action* appropriately shifts the emphasis in breastfeeding promotion from an individual woman's personal choice to the essential need to make society-wide institutional changes that reduce women's barriers to successful breastfeeding.²⁰ The numerous and varied factors that create barriers to exclusive breastfeeding (**Box 1**) call for multifaceted, society-wide approaches, involving families, communities, clinicians, hospitals and health care systems, employers, and others, to ensure that expectant and new mothers receive the necessary information, clinical services, and ongoing support to achieve exclusive and sustained breastfeeding.

PRENATAL PREPARATION FOR EXCLUSIVE BREASTFEEDING

Prenatal breastfeeding education is critically important to inform pregnant women about the infant and maternal health benefits of breastfeeding, strengthen their intention to breastfeed, elicit and address perceived barriers, and identify key sources of support. Although most expectant mothers are aware that breastfeeding trumps infant formula in nutritional quality and immune benefits, few know that the health benefits are dose-related or that the small quantities of colostrum available in the first day or two after birth are sufficient to meet the needs of term, healthy newborns. A 2005 Cochrane review of intervention trials to promote the initiation of breastfeeding found that health education, especially needs-based, informal, repeat sessions, and peer support interventions, significantly increase breastfeeding initiation rates among US economically disadvantaged mothers.²¹

Relevant topics to be addressed in prenatal breastfeeding education include the nutritional superiority of human milk; why exclusive breastfeeding is recommended; how to get an optimal start breastfeeding in the hospital; reasons to avoid formula supplementation; the importance of an early follow-up visit; practical aspects of breastfeeding, including strategies for combining breastfeeding and employment; sources of support and clinical lactation services; and the timing of the introduction

Box 1**Personal and societal barriers to exclusive breastfeeding**

Lack of information
 Low attendance at prenatal breastfeeding classes
 Ambivalence
 Embarrassment
 Breastfeeding myths
 Inappropriate maternity care practices
 Lack of timely follow-up after hospital discharge
 Maternal employment and child care practices
 Early introduction of complementary foods
 Misinterpretation of normal infant behaviors
 Inadequate family and social support
 Lack of breastfeeding role models
 Real and perceived insufficient milk
 Comfort level with formula feeding
 WIC formula availability
 Inappropriate formula marketing practices
 Inadequate availability of banked donor human milk
 Lack of access to and availability of clinical breastfeeding services
 Delayed intervention for breastfeeding difficulties
 Inadequate clinician knowledge and support

of complementary foods. Because relatively few expectant mothers currently attend a prenatal breastfeeding class, breastfeeding information needs to be integrated into childbirth education curricula and reinforced by prenatal providers. The recent addition of 8 categories of women's preventive services, mandated without cost sharing under The Patient Protection and Affordable Care Act, includes comprehensive lactation support and counseling from trained providers, as well as breastfeeding equipment.²² These new lactation benefits may help reduce breastfeeding disparities by improving socially and economically disadvantaged women's access to prenatal breastfeeding classes, breast pumps, and counseling.

Unfortunately, many of the infant-feeding messages that pregnant women receive come from formula company promotional materials that target expectant and new mothers through prenatal offices, the Internet, and parenting magazines.^{23,24} Pregnant women often receive unsolicited "gifts" from formula manufacturers through the mail or at their physician's office, which implies a medical endorsement. These new mother, infant-feeding kits include powdered formula samples and formula coupons, which encourage the early supplementation of breastfeeding. Handouts and market materials that begin with "for breastfeeding and supplementing moms"²⁵ or "whether you decide to breastfeed, supplement, or formula feed"²⁶ serve to undermine exclusive breastfeeding and normalize the use of formula in infant feeding. Prenatal and pediatric providers should decline to partner with infant formula manufacturers under the guise of providing "gifts" for their patients.

Preparing Expectant Mothers for an Optimal Hospital Breastfeeding Experience

Pediatricians, obstetric care providers, staff from the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), public health nurses, childbirth educators, doulas, and others who interact with expectant mothers should help prepare families for an optimal hospital breastfeeding experience. Even when hospitals offer supportive maternity practices, staff often find it difficult to implement optimal breastfeeding policies, such as mother-infant skin-to-skin contact immediately after birth or round-the-clock rooming-in, when ideal practices conflict with parental expectations of allowing eager family members to hold the newborn immediately after birth or having the baby cared for in the nursery at night. Lack of preparation for what the early postpartum period will be like, including unrealistic expectations about newborn crying, waking, and feeding behaviors and mothers' own need for rest, has been identified as a key trigger for low-income breastfeeding mothers' in-hospital use of supplemental formula.²⁷ The Joint Commission national public education Speak Up campaign²⁸ includes free breastfeeding educational materials in English and Spanish, endorsed by the AAP and other organizations, to prepare expectant and new mothers for the successful initiation of breastfeeding, including exclusive breastfeeding in the hospital.²⁹

PROMOTING EXCLUSIVE BREASTFEEDING IN THE HOSPITAL

Despite the brevity of the postbirth hospitalization, the maternity care experience is recognized as a critical period in the establishment of breastfeeding. The provision of supportive maternity care practices, especially exclusive breast milk feeding, represents an important evidence-based intervention to increase exclusive and extended breastfeeding.

The Baby-Friendly Hospital Initiative

In 1991, the United Nations International Children's Emergency Fund (UNICEF) and WHO jointly launched the global Baby-Friendly Hospital Initiative (BFHI), to promote, protect, and support breastfeeding by recognizing hospitals and birthing centers that implement the evidence-based, ideal practice standards, known as the Ten Steps to Successful Breastfeeding (**Box 2**).³⁰ Baby-Friendly designated hospitals, compared with non-Baby-Friendly facilities, consistently have been linked with increases in breastfeeding initiation, duration, and exclusivity.^{31–33} Despite the evidence that supportive breastfeeding maternity practices affect breastfeeding outcomes well beyond the hospital stay, only a small percentage of US maternity hospitals and birthing centers have pursued the Baby-Friendly designation.³⁴ Results of the Centers for Disease Control and Prevention's (CDC's) biennial National Survey of Maternity Practices in Infant Nutrition and Care (mPINC) survey show that few US hospitals have implemented policies that fully support and encourage mothers to breastfeed.³⁵

Although implementing all Ten Steps represents the gold standard for breastfeeding support in maternity facilities, making incremental changes in Baby-Friendly practices has been linked with significant improvements in breastfeeding outcomes.^{11,12,36} In a large, nationally representative survey of new mothers, primiparas who delivered in hospitals that practiced 6 or 7 of the Ten Steps were 6 times more likely to be exclusively breastfeeding at 1 week, as intended, compared with those in hospitals that practiced none or 1.³⁶ A large, population-based study in Colorado found that 5 of the Ten Steps were linked with a longer duration of breastfeeding: breastfeeding within the first hour, breast milk only, infant rooming-in, no pacifier use, and receipt of a telephone number for postdischarge help.¹² The combined effect of the 5 practices had

Box 2**WHO/UNICEF Ten Steps to Successful Breastfeeding**

1. Have a written breastfeeding policy that is routinely communicated to all health care staff.
2. Train all health care staff in skills necessary to implement this policy.
3. Inform all pregnant women about the benefits and management of breastfeeding.
4. Help mothers initiate breastfeeding within one hour of birth.
5. Show mothers how to breastfeed and how to maintain lactation even if they are separated from their infants.
6. Give newborn infants no food or drink other than breast milk, unless medically indicated.
7. Practice rooming-in (allow mothers and infants to remain together) 24 hours a day.
8. Encourage breastfeeding on demand.
9. Give no artificial nipples or pacifiers to breastfeeding infants.
10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic.

From World Health Organization. Evidence for the ten steps to successful breastfeeding. Available at: http://whqlibdoc.who.int/publications/2004/9241591544_eng.pdf. Accessed August 31, 2012.

the strongest impact, with breastfeeding duration being significantly longer among mothers, independent of socioeconomic status, who reported all 5 successful maternity practices compared with those who did not.

Reducing In-Hospital Formula Supplementation of Breastfed Infants

Numerous studies have found a significant link between exclusive breastfeeding during the postbirth hospitalization and subsequent breastfeeding duration and exclusivity,^{11,12,19,37} including the likelihood of achieving mothers' exclusive breastfeeding intention.^{19,36} Giving formula supplements to breastfed newborns in the hospital has been linked with a decreased likelihood of full breastfeeding at 6 months of age.^{10,19,37} Yet, results of the 2009 national mPINC survey show that 24.6% of US hospitals routinely supplement healthy breastfed newborns with formula.³⁵

Optimal maternity practices require that formula supplementation of breastfed infants be used only for a valid medical indication (or on specific maternal request after appropriate education).^{1,30,35,38,39} Nevertheless, much of the in-hospital use of formula supplements for breastfed newborns is by maternal request, particularly among low-income mothers who have not attended a prenatal breastfeeding class.²⁷ A recent survey of low-income, African American mothers found that 60% initiated breastfeeding, and 78% of the breastfed newborns received formula supplementation in the hospital, predominantly because of maternal request.⁴⁰ Although nurses recognize that formula use should be rare, knowledge deficits and lack of teaching time, maternal complaints of fatigue, insufficient colostrum or sore nipples, and infant challenges, such as fussiness, sleepiness, or latch difficulties, contribute to frequent formula use on the part of nursing staff.^{27,41–43} Because mothers tend to continue at home the infant care practices begun in the hospital, those using in-hospital formula supplements require close follow-up and monitoring to transition to full breastfeeding as quickly as possible.

To improve maternity care practices, optimize breastfeeding initiation, and highlight the health benefits of exclusive breastfeeding, the Joint Commission recently

added measurement of exclusive breast milk feeding among term newborns during the birth hospitalization as a Core Quality Measure of a hospital's performance.^{38,44,45} This step has helped to change the long-standing paradigm among clinicians that supplementing a breastfed baby necessarily means using infant formula. More clinicians now appreciate the feasibility and desirability of using mother's own breast milk, whether expressed by hand or with a pump, to supplement an infant who is unable to obtain sufficient milk by direct breastfeeding. Alternatively, screened, processed donor milk may be prescribed, if available.^{1,38,44} Expressing mother's own milk when an infant is unable to obtain sufficient quantities by nursing ensures that the mother establishes an abundant milk supply and the infant accrues all the health benefits of exclusive breast milk feeding. In addition, the preferential use of mother's own milk conveys a powerful message that human milk represents ideal infant nutrition and is highly valued.

Immediate skin-to-skin contact has been shown to facilitate the early initiation of exclusive breastfeeding and extend breastfeeding duration.^{46,47} A recent, large, prospective study of the duration of skin-to-skin mother-infant contact during the first 3 hours following birth demonstrated a dose-response relationship between early skin-to-skin contact and exclusive breastfeeding during the maternity hospital stay.⁴⁶ Instituting extended, uninterrupted skin-to-skin contact during the early postpartum period should be a key strategy in promoting exclusive breastfeeding behaviors.

Continuous, round-the-clock rooming-in of mother and infant potentially creates a private, intimate atmosphere that supports the new mother in learning to recognize and respond to her infant's feeding cues, continue skin-to-skin contact, become comfortable latching her baby and breastfeeding, and gain confidence in her ability to care for her infant. However, these would-be benefits of rooming-in can be undermined when frequent, erratic, and lengthy interruptions by visitors and diverse hospital personnel take precedence over breastfeeding and essential self-care. A study of healthy mother-infant dyads recorded a mean of 54 interruptions (people entering the mother's room or phone calls), averaging 17 minutes each, between 8 AM and 8 PM on postpartum day 1.⁴⁸

A steady stream of visitors may interfere with skin-to-skin contact and cue-based breastfeeding, promote the use of a pacifier to appease a hungry baby while guests are present, prevent the lactation consultant from offering one-on-one instruction, or so deplete a new mother that she asks to have her baby cared for in the nursery at night, increasing the risk of formula supplementation. Many hospitals have implemented a designated afternoon "quiet time" or "nap time" to give new mothers more time alone with their newborns and the opportunity to rest and renew.⁴⁸ Counseling expectant parents to limit the number of postpartum visitors and their length of stay may be a simple strategy to help promote early exclusive breastfeeding.

Being given a phone number to call for help with breastfeeding after discharge is another Baby-Friendly practice that helps promote exclusive breastfeeding. Thirty-four percent of breastfeeding mothers in a prospective study reported having 1 or more problems with breastfeeding in the first 4 weeks.⁴⁹ Women who experienced early breastfeeding difficulties were significantly more likely to discontinue full breastfeeding before 6 months and to have a shorter duration of any breastfeeding. In a retrospective, cohort study of infant-feeding practices at 6 months of age, infants of mothers who were given a telephone number for breastfeeding help, compared to infants whose mothers were not, had 6 times the odds of being almost exclusively breastfed at 6 months (some infants were infrequently fed water, juice, or solid food).³⁷

For decades, maternity hospitals routinely have distributed formula company discharge bags to new mothers, unwittingly implying their endorsement of the

products and indirectly serving as marketing agents for formula manufacturers. Multiple studies show that receiving a commercial discharge pack containing formula samples and promotional materials reduces the duration of exclusive breastfeeding.^{50,51} This long-standing and seemingly innocuous practice is in violation of the WHO International Code of Marketing of Breastmilk Substitutes and undermines a hospital's mission to promote optimal health.⁵² As hospitals reevaluate the ethics of their relationships with industry, more than a third nationwide, including all maternity hospitals in Rhode Island and Massachusetts, have discontinued the practice of distributing formula gift bags, and this trend is gaining momentum.^{53,54}

NEWBORNS AT-RISK FOR INEFFECTIVE BREASTFEEDING

Many infant biologic variables, including birth weight, gestational age, labor medications, oral anatomic variables, neurologic status, and medical conditions, can influence an infant's ability to latch on to the breast, suckle effectively, extract milk, and promote ongoing milk production.^{55,56} Late-preterm infants, born at 34^{0/7} through 36^{6/7} weeks' gestation, represent the largest subgroup of at-risk newborns managed in level 1 (basic) nurseries. In 2010, the proportion of all US births that were late preterm was 8.49%, representing nearly 340,000 infants.⁵⁷ Late-preterm infants are physiologically and metabolically immature and are at increased risk, compared with term infants, for infant mortality, morbidity during the birth hospitalization, and hospital readmission, most commonly for jaundice, suspected sepsis, and feeding difficulties.⁵⁸

Breastfeeding may initially appear successful during the birth hospitalization, but not be sustained after discharge when the mother's milk comes in. Many factors contribute to the late-preterm infant's impaired ability to extract milk from the breast, including fewer awake-alert periods, immature oromotor skills, weak intraoral suction pressures, difficulty attaching to the breast effectively, and immature suck-swallow-breathe cycles.⁵⁹ Although the use of an ultrathin silicone nipple shield may enable late-preterm infants to transfer milk more effectively, most will temporarily require supplemental feedings with expressed breast milk in addition to direct breastfeeding.

If the late-preterm infant does not nurse actively for at least 15 minutes 8 to 10 times in 24 hours, the mother should begin prevention pumping with a hospital-grade breast pump to ensure regular, effective breast stimulation and drainage.⁵⁹ As with other newborns at risk for inadequate breastfeeding (**Box 3**), the primary goals during the critical first 2 weeks after birth are to ensure that the mother establishes an abundant milk supply and that the infant is adequately nourished, ideally with exclusive breast milk feedings.^{56,59} This triple-feeding regimen (breastfeeding 5–10 minutes per side, supplementing the infant with ad libitum expressed milk, pumping residual milk until the breasts are well drained) is continued as the infant matures and progressively takes more milk with direct breastfeeding. The mother can discontinue pumping when the infant consistently gains appropriate weight with exclusive breastfeeding. Periodically weighing the identically clothed infant before and after feeding ("test weighing" procedure) can help document the infant's ability to transfer milk with direct breastfeeding (**Fig. 1**).^{56,59,60}

Alternative feeding methods, such as a plastic spoon or medicine cup, can be used in the hospital to offer small quantities of expressed colostrum/breast milk or donor milk (or formula, if required), and avoid the use of a bottle and nipple while the infant learns to latch and nurse effectively.⁶⁰ Once the infant is discharged, however, the most expedient method of "triple feeding" typically involves using a bottle. With ongoing skin-to-skin contact, frequent opportunities to latch on to the breast, and an abundant maternal milk supply, chances are good that the infant will successfully transition to full breastfeeding.

Box 3**Examples of potential newborn risk factors for ineffective breastfeeding**

1. Preterm, late-preterm, or early term (37^{0/7} to 38^{6/7} weeks of gestation)
2. Birth weight less than 6 pounds
3. Multiple birth
4. Oral anatomic variations (eg, ankyloglossia, micrognathia, cleft defects)
5. Jaundice
6. Systemic illness, such as oxygen requirement, cardiac defect, or infection
7. Neuromotor abnormality, such as Down syndrome or impaired sucking ability
8. Difficulty latching correctly or using a nipple shield
9. Weight loss >7% or continued weight loss after "milk comes in"
10. Maternal risk factors for delayed lactogenesis or lactation failure (such as diabetes mellitus, obesity, perinatal stress, older maternal age, postpartum hemorrhage, breast variations, or breast surgery)

Clinicians need to identify other newborns at risk for ineffective breastfeeding (see **Box 3**), so that an appropriate feeding plan can be tailored prior to discharge and close follow-up ensured. Whenever a breastfed infant is unable to extract milk effectively, the mother's milk supply will down regulate within a few days unless regular milk removal is accomplished. When recognized early, potential problems in the initiation of lactation can be addressed in a way that supports exclusive and extended breastfeeding.

ESTABLISHING AN ABUNDANT MILK SUPPLY

Because insufficient milk is a chief reason that breastfeeding women begin supplementing with formula or wean early,^{13,61,62} helping women establish an abundant milk supply is a critical strategy in promoting exclusive and extended breastfeeding. In a study comparing milk output among mothers of preterm and term infants, mean milk output at days 6 and 7 was highly associated with week 2 milk output and moderately associated with week 6 output for both gestation groups.⁶³ For both mothers of



Fig. 1. Infant on scale, accurate to 2 grams, for prefeeding and postfeeding test weights. (Courtesy of M. Bunik, MD, Aurora, CO.)

term and preterm infants, mean milk volumes produced by day 6 and 7 predicted whether the mother would achieve adequate milk production at week 6 postpartum. These data emphasize the importance of the first 1 to 2 weeks postpartum in establishing a plentiful milk supply that will facilitate exclusive breastfeeding.

Endocrine and Autocrine Control of Lactation

Prolactin, secreted by the anterior pituitary gland, is the key lactogenic hormone necessary for the establishment and maintenance of lactation.⁶⁴ Prolactin secretion is promoted by infant suckling and regular milk removal. Blood levels are highest in early lactation, with basal levels declining and postfeeding spikes continuing as lactation progresses.⁶⁵ Oxytocin is the essential hormone involved in the milk ejection reflex, which is critical to successful lactation.⁶⁶ Infant suckling triggers oxytocin release from the posterior pituitary, causing contraction of myoepithelial cells surrounding the mammary alveoli and ducts. This squeezing action expels stored milk into the collecting ducts and propels it toward the nipple, where it is removed by the suckling infant. Noxious stimuli, including pain, stress, or embarrassment, can partially inhibit the milk ejection reflex, reducing the volume of milk transferred to the infant.⁶⁶

Hormones alone do not fully explain how milk synthesis is regulated in the breastfeeding woman or account for the variability in milk production in each breast. Lactating mothers regulate milk secretion independently in each breast, according to the proportion of stored milk that the infant removes at a feeding.^{67,68} This regulatory mechanism is believed to involve a chemical inhibitor of milk secretion that increases in concentration as milk accumulates in the breast and decreases as milk is removed. Frequent, effective breastfeeding stimulates milk secretion by limiting the accumulation of inhibitory protein, whereas infrequent, or ineffective, breastfeeding decreases milk production, as the concentration of the inhibitor rises in stored milk. This locally regulated negative feedback mechanism is known as autocrine control of lactation.⁶⁵ After a mother's milk "comes in" (lactogenesis II), the frequency and efficacy of milk removal appears to be the most powerful determinant of the milk volume produced in each breast.⁶⁷

Lactogenesis II

The onset of copious milk production (lactogenesis II or secretory activation), typically occurring between day 2 and 3 postpartum, is a critical stage of lactation, during which the concentration of milk components changes rapidly as milk volume dramatically increases.^{64,65} Mothers perceive their "milk coming in" as breast enlargement, fullness, firmness, and the leakage of colostrum/breast milk. Milk volumes consumed by term infants rapidly increase from 36 to 96 hours postpartum, after which infant milk intake tends to plateau at an average volume of 750 to 800 mL per 24 hours by 1 month postpartum.^{65,69} Clinicians need to screen and intervene for early breastfeeding problems that limit milk removal, such as infants who breastfeed ineffectively, severe maternal nipple pain that impairs milk let-down, or long intervals without breastfeeding or expressing milk, to prevent a significant decrease in mother's milk supply once lactogenesis II has occurred.

Risk factors associated with delayed lactogenesis II include primiparity, urgent cesarean delivery, prolonged stage 2 labor, maternal diabetes, maternal obesity, older maternal age, and an infant who is not breastfeeding well.⁷⁰⁻⁷³ Among mothers who intend to breastfeed for at least 6 months, delayed onset of lactation beyond 72 hours postpartum is linked with a shorter duration of breastfeeding, compared with women who report an earlier onset of lactation.⁷⁴ With frequent breast stimulation and milk removal, mothers with delayed lactogenesis may be able to produce an

adequate milk supply by 7 to 10 days postpartum. However, such women require ongoing support and close monitoring of infant weight gain until full breastfeeding is established.

Women's breasts vary widely in their capacity to store milk that is available to the infant.⁶⁷ Once breastfeeding is well established, a mother with a larger breast storage capacity has greater flexibility in breastfeeding patterns compared with a mother with a smaller breast storage capacity, who will need to breastfeed or express milk more often. The longest interval between breastfeeds or milk expression may be a more important determinant of milk production than the total number of times milk is removed from the breasts daily.⁶⁷

DECREASING COMMON BARRIERS TO EXCLUSIVE BREASTFEEDING

Despite high breastfeeding initiation rates, the vast majority of US infants also are fed formula during their first year. Among breastfeeding mothers in the IFPS II, 42% were supplementing with formula at 1 month.⁷⁵ Formula feeding is highly visible in US society, and comfort with formula feeding is widespread among expectant first-time mothers, who often have no knowledge of the practical aspects of breastfeeding.⁷⁶ Formula is widely viewed by mothers and practitioners alike as the solution to breastfeeding problems rather than a cause or contributor to breastfeeding problems.⁷⁷ Among low-income breastfeeding mothers, formula use is not typically considered detrimental nor associated with regret.⁷⁸

Perceived Insufficient Milk

Although breastfeeding mothers supplement their babies with formula for many reasons (convenience, mother-baby separations, breastfeeding challenges, the father's desire to feed, or the choice to begin weaning) the belief that her milk is insufficient for her infant's needs is the major reason mothers start regular formula feeds.¹³ Respondents in the IFPS II cited "I didn't have enough milk" as 1 of the top 3 reasons in their decision to stop breastfeeding through 8 months, and "breast milk alone did not satisfy my infant" was consistently ranked among the top 3 reasons why mothers discontinued breastfeeding regardless of weaning age.⁶² Perceived insufficient milk (PIM) is well documented as one of the most common and influential deterrents to breastfeeding duration and exclusivity.^{61,62,79}

Potential strategies to prevent PIM include reinforcing appropriate early infant feeding routines and closely monitoring breastfeeding dyads during the first postpartum weeks to ensure that breastfeeding is well established. Frequent infant weight checks and periodic test weighing (prenursing weight compared with a postnursing weight) can provide concrete evidence for breastfeeding mothers concerned about the adequacy of their milk supply.⁸⁰ Education about normal infant feeding volumes also can reassure mothers of thriving infants who lack confidence about their milk production.

To help lactating mothers maintain an abundant milk supply, clinicians should counsel breastfeeding women to avoid allowing their breasts to remain overly full.⁶⁷ If an infant begins sleeping through the night, the mother can express milk before she retires to shorten the nighttime interval that her breasts go without being drained. Similarly, if both breasts have not softened after the morning feeding, she can remove extra milk to help keep her supply plentiful. Because a large majority of breastfeeding mothers in the United States use a breast pump, expressing and storing surplus milk can ensure that a mother continues to produce a plentiful supply, and the frozen reserves can serve as a visual reminder that she has more than enough milk.

Combination Breast and Formula Feeding

Combination breast and formula feeding (CBFF) is defined as breastfeeding and offering daily supplemental formula from the first week of life.⁸¹ CBFF, also known as “los dos,” is a common cultural practice among Latinas. This practice is also prevalent among African American mothers and WIC enrollees.⁸¹ In a national representative sample, CBFF was found to be associated with a significantly shorter duration of breastfeeding.⁸¹ Among the study children, CBFF and formula feeding, when compared with 4 months of exclusive breastfeeding, were associated with an increased risk for overweight/obesity between ages 2 and 6 years.⁸¹

A recent randomized controlled trial investigated the impact of daily telephone education and support on the use of elective supplementation in the first 2 weeks postpartum among low-income primiparous, primarily Latina breastfeeding women.⁷⁸ None of the 300 Latina subjects breastfed exclusively, and few study mothers received any prenatal breastfeeding education. Mothers with a prior intent to “only breastfeed” were more likely to be in the “predominant breastfeeding” category, feeding less than 4 ounces of formula per day, underscoring the importance of prenatal education, especially for low-income mothers, to strengthen women’s breastfeeding knowledge and intent.⁷⁸

A qualitative study among low-income Latina women and their families found that Latina mothers assumed they could have “the best of both worlds” by combination feeding, even if they knew that breastfeeding was healthier and more convenient.⁸² Universal exposure to formula feeding in the United States and strategic advertising of new formula additives to expectant and new mothers have a powerful influence, particularly among Latinas, who desire to provide both the benefits of breastfeeding and the highly touted “innovations” in infant formula. Believing that any breastfeeding confers all the health advantages, formula use is seen as enhancing breastfeeding, rather than diminishing the health benefits of exclusive breastfeeding.

In another qualitative study using structured interviews with expectant and new Latina mothers, the investigators explored beliefs surrounding “las dos cosas.”⁸³ None of the women interviewed expressed familiarity with medical recommendations around breastfeeding exclusivity or duration,⁸³ thus highlighting the need to educate expectant and new mothers about the dose-related health benefits of breastfeeding and the negative dose-response effect of formula use on breastfeeding benefits and duration.^{82,83}

Parents’ Misinterpretation of Infant Crying

Many common infant health and behavior symptoms are mistakenly attributed to breastfeeding, both by parents and providers. Breastfeeding often gets the blame for infant spitting, frequent feeding, gassiness, and especially unexplained fussiness and crying. Low-income breastfeeding mothers with fussy infants often introduce solids or formula in an attempt to calm their baby or increase sleep duration.⁸⁴ Breastfeeding mothers also may restrict their own diets, try to manipulate the balance of fore milk and hind milk, or offer a specialty formula that claims to ease infant fussiness and gas. Infant crying is a common concern raised at pediatric medical visits, and the complaint often gets “medicalized” with diagnostic labels, such as colic or gastroesophageal reflux.

Mothers of breastfed infants report more challenging temperaments at 3 months of age compared with mothers of formula-fed infants.⁸⁵ It is possible that breastfeeding mothers are more attuned to their infants’ behaviors owing to the intimacy of the nursing relationship. Although the perception of infant distress can be taxing and

unsettling for parents, irritability among offspring of a variety of bird and mammalian species is a normal component of signaling to parents that helps ensure the nutritional needs of the young are met.⁸⁵ Yet, excessive or unexplained infant crying can undermine a breastfeeding mother's confidence and lead her to believe that there is something wrong with her milk or her baby, or that breastfeeding alone does not satisfy her infant. Pediatric providers can help mothers of fussy babies maintain exclusive breastfeeding by providing empathic support, educating parents concerning normal crying patterns in early infancy, offering effective coping strategies, and reassuring mothers that the period of increased crying will come to an end. Helpful national resources include The Period of PURPLE Crying, www.purplecrying.info/, and The Fussy Baby Network, www.fussybabynetwork.com.

The common misinterpretation of infant behaviors among WIC staff and clients contributes to low exclusive breastfeeding rates among WIC enrollees, but may be a modifiable factor. The widespread perception that crying, night-waking, and other normal infant behaviors are a result of hunger contributes to the early introduction of solids and formula. The FitWIC Baby Behavior Study investigated whether randomly training WIC staff and participants to better understand normal infant behavior and promote positive caregiver-infant interactions would affect infant feeding practices and the distribution of the exclusive breastfeeding food package.⁸⁶ The study found that providing education about normal infant behavior improved compliance with infant-feeding recommendations. Combination feeding in the first 4 months postpartum decreased among WIC participants at intervention sites, compared with those in the control group, and significantly fewer infants in the intervention group were above the 95th percentile for weight-for-age at the end of the study.⁸⁶

Early Introduction of Complementary Foods

Many breastfeeding mothers introduce solid foods to their infants before 6 months based on cultural practices and the advice of female relatives, the belief that cereal will help an infant sleep longer at night or reduce spitting up, or the conviction that eating solids represents an important developmental milestone.⁸⁷ Among respondents in the national IFPS II, 41% reported that their infants were consuming solid foods at 4 months.⁸⁸ Mothers who began feeding their infants solids by 4 months, compared with those who did not, were more likely to have discontinued breastfeeding at 6 months.⁸⁸ Clinicians may help achieve greater compliance with delaying the introduction of complementary foods until about 6 months by providing ongoing consistent messaging, including an explanation of the scientific basis for exclusive breastfeeding recommendations, and helping mothers sort through conflicting infant feeding advice.

Maternal Employment

More than half of all new mothers become employed during their infant's first year.⁸⁹ Although more mothers today continue to breastfeed after returning to work than a decade ago, duration of breastfeeding is significantly shorter for employed mothers, and simply anticipating returning to work or school may prompt mothers to begin supplementing with formula.^{90,91} A longer maternity leave increases breastfeeding duration and exclusivity.⁹⁰⁻⁹³ In a large, longitudinal, nationally representative sample, women returning to work at 13 or more weeks had the highest proportion of predominant breastfeeding beyond 3 months, whereas those returning within 1 to 6 weeks had the lowest proportion.⁹⁰ Regularly pumping the breasts during the work day is associated with longer breastfeeding duration and intensity than not removing milk during working hours.⁹⁴ Working part time versus full time and having a flexible work schedule

also are linked with a longer duration of breastfeeding.^{91,95} Breastfeeding mothers who return to work full time are most likely to wean between the month before and 2 months after they become employed.⁹¹ To promote exclusive breastfeeding, providers can encourage expectant and new mothers to delay their return to work as long as possible, and, if feasible, work part time before resuming full-time employment. Affirming and encouraging employed breastfeeding mothers at each well-baby visit may help women persevere in their efforts.

Diminished milk production is a major obstacle among employed breastfeeding women and often leads to breast refusal by the infant and the need for formula supplementation. Suggested strategies to help employed mothers maintain an abundant milk supply and breastfeed exclusively include (1) early initiation of milk expression, ideally within the first 2 weeks postpartum, after 1 or 2 morning feedings to establish a generous milk supply and accumulate frozen stores of expressed milk as a buffer against a dwindling supply,⁹⁶ and (2) using the “Magic Number” teaching tool to ensure that mothers maintain their daily frequency of draining their breasts after returning to work.⁹⁷ In addition, having opportunities during the work day to breastfeed directly (for example, by telecommuting, using onsite child care, or having a child care provider or family member bring the infant to the mother to nurse) has been shown to maintain breastfeeding “intensity” and increase breastfeeding duration.⁹⁴

Child care providers often offer a breastfed infant larger volumes of milk by bottle than the infant would receive when nursing directly at the breast. This practice may cause the infant to lose interest in nursing and the mother to perceive that her milk supply is inadequate.⁹⁸ Communicating with the child care provider about typical feeding volumes for breastfed infants, how to read infant satiety cues, use of a slow flow nipple, and the acceptability of discarding unused expressed milk at the end of a feeding can create a collaborative partnership that promotes exclusive breastfeeding.

The Business Care for Breastfeeding is a comprehensive, national, government-sponsored initiative designed to educate employers about the economic benefits of supporting breastfeeding employees in the workplace and offer toolkits for the creation of workplace lactation programs.⁹⁹ The 2010 workplace breastfeeding support provision in the Patient Protection and Affordable Care Act grants new rights to lactating mothers in the workplace by amending the Fair Labor Standards Act. Under the new provision, employers are required to provide reasonable, unpaid break time and a private location (other than a bathroom) for an employee to express breast milk for her nursing child as often as needed for 1 year after the child’s birth.¹⁰⁰ Both of these strategies provide hope for changing the workplace culture to better support breastfeeding employees to maintain exclusive breastfeeding.^{99,100} A mother should meet with her employer, preferably during pregnancy or before returning to work, to clarify the location of the lactation space and anticipated break times. Expedient milk expression is best accomplished using an automatic-cycling electrical pump with a double collection system every 3 to 4 hours while mother is separated from her infant, depending on the infant’s age and the mother’s breast storage capacity.^{96,101} The use of a hands-free pumping bra allows the mother to multitask during milk expression.

SOURCES OF SUPPORT AND CONFIDENCE FOR BREASTFEEDING MOTHERS

A 2012 Cochrane Review of the effectiveness of support for breastfeeding mothers found that all forms of extra support, including lay and professional, analyzed together, show an increase in breastfeeding duration and exclusivity.¹⁰² The most effective support is provided in person and on a recurring basis at regular scheduled visits.

The Special Supplemental Nutrition Program for Women, Infants and Children

Over half of all newborns in the United States are enrolled in WIC, which represents a major source of support and practical assistance for the nation's most vulnerable population of breastfeeding mothers.¹⁰³ WIC promotes breastfeeding as the optimal source of nutrition for infants and offers many incentives for breastfeeding mothers, who receive a greater amount and variety of foods than those who feed only formula, with fully breastfeeding mothers receiving the most substantial food package. Breastfeeding mothers are eligible to participate in WIC longer than nonbreastfeeding mothers, and they may receive follow-up support through peer counselors, in addition to breast pumps and other aides to help support the initiation and continuation of breastfeeding. As of August 2009, WIC promotes exclusive breastfeeding by no longer routinely issuing infant formula in the first month to breastfeeding mothers to support the establishment of successful breastfeeding. Moreover, compelling evidence shows that WIC Breastfeeding Peer Counselors effectively improve rates of breastfeeding initiation, duration, and exclusivity.¹⁰⁴

However, individual WIC agencies differ widely in their breastfeeding services, as well as in staff knowledge and attitudes concerning breastfeeding.¹⁰⁵ Although breastfeeding rates among WIC mothers have steadily increased, breastfeeding initiation, duration, and exclusivity among WIC participants remain significantly lower than non-WIC mothers.¹⁰⁶ Counseling challenges for WIC staff and nutritionists include the contradiction of WIC as both supporting breastfeeding and providing free formula, clients' perception that free formula is more valuable than the exclusive breastfeeding food package, and the belief in having a critical reserve of formula "just in case."¹⁰⁷ Encouraging WIC clients to accumulate frozen stores of their own milk by expressing milk remaining after breastfeeding (particularly in the morning when milk production is higher) may increase mothers' confidence about the adequacy of their milk supply and reduce requests for "just in case" formula. The trend toward including international board-certified lactation consultants (IBCLC) as part of WIC staffing shows promise in raising exclusive breastfeeding rates by providing timely intervention for clinical lactation challenges.¹⁰⁸

The Baby's Father

Fathers should be considered vital members of a mother's "breastfeeding team," providing essential physical help and emotional support.¹⁰⁹ Qualitative data from mothers and fathers with breastfeeding infants confirm that a father's support makes a big difference, and fathers want to be empowered to fulfill this support role.¹¹⁰ A controlled clinical intervention trial found that teaching new fathers about managing common breastfeeding difficulties, including fear of insufficient milk, significantly increased full breastfeeding at 6 months and reduced PIM.¹¹¹ In a study exploring maternal and paternal attitudes toward breastfeeding, fathers planning exclusive breastfeeding described breastfeeding as more natural and responded more strongly that breastfeeding helped mothers feel closer to their infants, compared with peers planning mixed feeding.¹¹² Health professionals should educate fathers about ways to help their breastfeeding partners and promote frank discussion among partners to strengthen their exclusive breastfeeding intention.

Mother-to-Mother Support

The importance of mother-to-mother support is reflected in the CDC's ongoing monitoring of the number of La Leche League Leaders per 1000 live births as a measure of comprehensive breastfeeding support included in each state's annual Breastfeeding

Report Card.¹⁵ Established in 1956, at the height of the US formula-feeding era, La Leche League International provides mother-to-mother support, empowering information, and modeling of breastfeeding norms through group meetings, telephone counseling, publications, and the Internet.¹¹³

Today, many additional sources of mother-to-mother support are available through WIC Breastfeeding Peer Counselors, the growing number of hospital-based follow-up support groups, breastfeeding boutiques, postnatal yoga studios, and, more recently, Breastfeeding Cafés (Fig. 2).¹¹⁴ Internet breastfeeding support groups, Mommy Blogs, and other social media communities now overcome problems of geographic isolation for new mothers. The emergence of breastfeeding support groups specifically targeting black mothers represents a promising grass-roots movement to raise African American breastfeeding rates by providing community breastfeeding role models and culturally competent information to help women of color begin and sustain breastfeeding.^{115–118} Similar to undertaking other life challenges, when new mothers share their insecurities and learn that others feel the same way, they gain confidence in taking on the difficult challenge of breastfeeding. Task mastery and mutual empowerment are at the center of the mother-to mother support and confidence-building movement.¹¹⁹

Nurse-Family Partnership

The Nurse-Family Partnership (NFP) is a long-standing, evidence-based, nurse-home visitation program for low-income, first-time mothers, with proven long-term positive health and psychosocial outcomes for both the mother and child.^{120,121} This federally funded, national program currently provides services in 41 states. Bi-weekly home visits by specially trained public health nurses begin during the mother's pregnancy and continue until her child is 2, creating a strong therapeutic relationship with the registered nurse that fosters maternal self-efficacy. Although the goals of NFP are to improve pregnancy outcome, child health and development, and the economic self-sufficiency of the family, a recent study found breastfeeding rates were higher for at-risk NFP clients than for similar WIC enrolled and eligible counterparts.¹²² With more frequent home visits during the early postpartum period and ongoing regular contacts throughout infancy, NFP nurses are in a unique position to offer



Fig. 2. Community-based breastfeeding support group. (Courtesy of M. Neifert, MD, Aurora, CO.)

strategic assessment, education, and support to help at-risk mothers successfully establish and maintain exclusive breastfeeding. Evaluation of the NFP's role in positively affecting breastfeeding outcomes among low-income, at-risk mothers warrants further investigation as a key strategy to improve infant health and development and increase child spacing.

THE ROLE OF THE PRIMARY CARE PROVIDER IN PROMOTING EXCLUSIVE AND EXTENDED BREASTFEEDING

Pediatricians and other pediatric care providers have a key role to play in the promotion of exclusive breastfeeding, ideally beginning in the prenatal period.^{123,124} Taking advantage of training opportunities to improve breastfeeding knowledge, problem solving, and counseling can increase clinicians' effectiveness and comfort in providing breastfeeding management and support.¹²⁵ A targeted breastfeeding curriculum for residents in pediatrics, family medicine, and obstetrics and gynecology was effective in increasing physician knowledge, confidence, and practices and significantly increased exclusive breastfeeding at 6 months.¹²⁴

Pediatricians can work with their local hospitals to promote breastfeeding-friendly maternity practices,¹ and consider taking the lead in their hospital's pursuit of the Baby-Friendly designation.³⁴ Pediatricians and their team should screen newborns for breastfeeding risk factors, and tailor an initial feeding plan that ensures that an at-risk infant is adequately nourished and the mother establishes an abundant milk supply.

The AAP recommends that newborn postdischarge visits be scheduled at 3 to 5 days (within 48–72 hours of hospital discharge).¹ The provider or lactation-trained office staff should observe and evaluate the onset of breastfeeding (ie, lactogenesis II has occurred, latch is effective and comfortable, infant's weight and elimination patterns are appropriate).¹ Recognizing that problems in the initiation of breastfeeding often lead to insufficient milk and excessive infant weight loss, pediatricians need to identify and ensure timely intervention for early breastfeeding complaints that impair milk transfer, such as latch-on difficulties, marked postpartum breast engorgement, or severe nipple soreness, to ensure the establishment of an abundant milk supply in the critical first weeks after birth (**Figs. 3 and 4**).^{56,63} Yet, compliance with AAP recommendations for early follow-up after birth hospitalization remains inconsistent, and delayed follow-up of newborns commonly occurs.^{126,127} Encouraging new mothers to complete a daily infant feeding and elimination log during the postbirth hospitalization and the first weeks at home helps facilitate the physician's assessment of breastfeeding. In addition, completing a breastfeeding log for at least 3 weeks has been linked with an increased likelihood of full breastfeeding at 6 months.¹²⁸

A second, early follow-up ambulatory visit at 2 weeks is recommended to monitor infant weight gain and provide ongoing support to the mother during the challenging first weeks of breastfeeding and new parenthood.¹²⁹ In a prospective, randomized trial, mothers whose infants received a routine, preventive, outpatient visit between 4 days and 2 weeks in the office of a primary care physician trained to support breastfeeding were significantly more likely to report exclusive breastfeeding at 4 weeks and a longer duration of breastfeeding, when compared with mothers whose infants received usual care at 1 month with an untrained physician.¹²⁵

Because the busy office practice cannot realistically address all breastfeeding challenges,¹³⁰ physicians should know their local IBCLCs or breastfeeding counselors and communicate closely with these individuals when referring clients for help.¹³¹ They should keep informed about and refer mothers to available community breastfeeding resources, including hospital outpatient lactation services and WIC breastfeeding



Fig. 3. Using breast compressions while breastfeeding to deliver a spray of milk and entice a sleepy baby to resume nursing effectively. (Courtesy of M. Neifert, MD, Aurora, CO.)

support. This role is facilitated when local WIC agencies, hospitals, and/or breastfeeding coalitions take on the task of compiling and making available to practitioners a current resource list for local breastfeeding clinical services and support.

Breastfeeding mothers commonly report that a health care professional recommended formula supplement for their infant in response to maternal complaints, such as breast and nipple pain, fatigue, apparent infant hunger, and problems with infant latching-on.^{77,130} With appropriate clinical management and extra counseling, however, such common breastfeeding concerns usually can be resolved while maintaining exclusive breast milk feeding. Pediatricians also should ensure that breastfeeding continues in the context of diagnoses such as hyperbilirubinemia, gastroesophageal reflux, allergic colitis, transient gassiness with certain maternally ingested foods or overactive let-down of milk that temporarily causes infant distress during feeding.¹³² The Academy of Breastfeeding Medicine has developed numerous peer-reviewed, evidence-based clinical protocols that can guide the practitioner in the management of various breastfeeding problems and medical issues affected by breastfeeding.¹³³

Physicians often underestimate the power of their words to promote breastfeeding by enthusiastically affirming, informing, and encouraging breastfeeding mothers at each office visit. In a large prospective cohort study, mothers who reported receiving

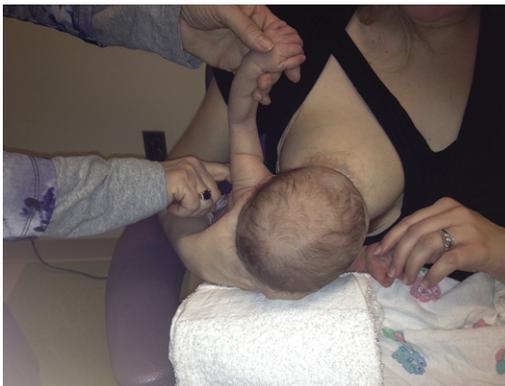


Fig. 4. Using tactile stimulation to keep a sleepy infant awake and actively breastfeeding. (Courtesy of M. Bunik, MD, Aurora, CO.)

clinician support were about half as likely to discontinue breastfeeding by 12 weeks as those who did not.¹²³ Physicians can help strengthen mothers' commitment to breastfeeding by regularly complimenting them on continuing to nurse their baby, and increase mothers' confidence in the adequacy of their milk supply by reassuring them about their infant's well-being and rate of weight gain. Primary care providers should repeatedly remind breastfeeding mothers to schedule an infant weight check between visits whenever they are concerned about their milk supply or are considering starting supplemental formula.

Additional strategies to promote exclusive breastfeeding in the pediatric office include reinforcing the value of exclusive breastfeeding at well-baby visits and routinely inquiring about the introduction of supplemental formula or solids (**Box 4**). Pediatric providers should incorporate age-related breastfeeding anticipatory guidance at each visit, including information about normal infant crying, expressing and storing breast milk, infant appetite spurts, maternal employment, infant teething, and delaying solid foods (**Table 2**).¹³⁴

Box 4

Evidence-based strategies to promote exclusive breastfeeding

1. Strengthen health professionals' commitment to promote and support breastfeeding.
2. Educate expectant mothers about breastfeeding, including the nutritional superiority of human milk, why exclusive breastfeeding is recommended, how to get an optimal breastfeeding start in the hospital, reasons to avoid formula supplementation, sources of support and clinical lactation services, strategies for combining breastfeeding and employment, and the timing of the introduction of complementary foods.
3. Widely implement supportive maternity care practices, including immediate skin-to-skin mother-baby contact; continuous rooming-in of mother and infant; unrestricted, cue-based breastfeeding; avoidance of formula supplementation of breastfed newborns; avoidance of routine pacifier use; and postdischarge access to support and professional services to overcome breastfeeding challenges.
4. Change the traditional paradigm that supplementation of breastfed infants requires the use of formula; instead, begin milk expression and preferentially supplement with mother's own milk when a medical indication exists.
5. Help breastfeeding mothers establish and maintain an abundant milk supply in the critical first postpartum weeks.
6. Identify infants at risk for ineffective breastfeeding, and begin "prevention pumping" to ensure that the mother establishes an abundant milk supply and the infant is adequately nourished with exclusive breast milk feedings.
7. Restrict formula distribution in hospitals and ambulatory facilities.
8. Ensure timely follow-up and evaluation of breastfeeding dyads within 48 hours of hospital discharge and again at 2 weeks postpartum by knowledgeable and supportive providers.
9. Provide ongoing breastfeeding anticipatory guidance and support from pediatricians and other health professionals.
10. Know about and refer nursing mothers to local breastfeeding resources, and promote collaboration and communication among primary care providers, hospital and community-based lactation consultants, and WIC and public health staff.
11. Promote maternal self-efficacy through broad social support systems, including WIC Breastfeeding Peer Counselors, NFP nurses, hospital-based and community breastfeeding support groups, and family and partner support.
12. Encourage adequate maternity leave and workplace lactation programs.

Table 2
Breastfeeding touchpoints for overcoming obstacles to exclusivity

Breastfeeding Touchpoint	Parental Concern	Main Obstacles	Provider Advice
Prenatal	"I want to breastfeed, but since I am going to work, I need to be able to give formula too."	<ul style="list-style-type: none"> • Lack of information about combining breastfeeding and working • Lack of information about milk expression and access to pumps 	<ul style="list-style-type: none"> • Strongly encourage attendance at a prenatal breastfeeding class (deserves equal time to birthing class education). • Consider a longer maternity leave, if possible. • Prepare to simplify life during the transition to parenting.
	"My husband and other family members will want to help feed the baby. Won't they feel excluded if I only breastfeed?"	<ul style="list-style-type: none"> • Family members wanting to feed the baby 	<ul style="list-style-type: none"> • Enlist father's help in supporting his nursing partner. Fathers can interact with their infant by holding baby skin-to-skin or taking baby out while mother sleeps. • After breastfeeding is well established, others can feed expressed milk by bottle.
	"I want to do combination feeding, or Los Dos."	<ul style="list-style-type: none"> • Desire for "the best of both worlds" by combination feeding • Lack of knowledge about the importance of frequent and exclusive breastfeeding during the early postpartum weeks for establishing mother's milk supply 	<ul style="list-style-type: none"> • "Puro pecho," or only mother's own milk, provides greater health benefits and helps maintain an abundant milk supply. • If eligible, enrollment in WIC offers breastfeeding mothers a substantial food package, counseling, breast pumps, and peer counselors.
Birth	"My friend says it is a good idea to ask the nurses to care for my baby at night, so I can get some sleep."	<ul style="list-style-type: none"> • Unrealistic expectations for the postbirth hospital stay • Lack of prenatal education • Frequent interruptions and excessive visitors deplete new mothers. • Increased risk of formula supplements for nighttime births from 9 PM to 6 AM 	<ul style="list-style-type: none"> • Promote immediate skin-to-skin contact after birth to facilitate initiation of breastfeeding within the first hour. • Teach mother to interpret her infant's feeding cues and breastfeed as often as baby wants. Advocate for no routine formula use in the system of care. • Advise mother to request help in the hospital with breastfeeding to promote task mastery. • Encourage continuous rooming-in, where mother can practice being with her baby in a controlled setting and learn to latch baby comfortably and effectively.
	"The yellow milk does not look like much. A little formula won't hurt, will it?"	<ul style="list-style-type: none"> • Belief that the small amount of colostrum is insufficient until "milk comes in" 	<ul style="list-style-type: none"> • Explain the potency and adequacy of colostrum and the rapid increase in milk production from 36 to 96 h.

3–5 d	<p>“Now that we are home, the baby seems to be feeding every hour. She or he doesn’t seem satisfied.”</p> <p>“My nipples are sore and cracked. Can I take a break and give my baby a little formula?”</p>	<ul style="list-style-type: none"> • Lack of knowledge about normal frequency of feedings for breastfed newborns • Infants typically begin feeding more frequently the second night after birth, when baby is at home. • Concern about whether the infant is getting enough milk, due to mother’s inability to see what the infant takes at the breast • Sleepy infant • Sore nipples usually are attributable to incorrect latch-on technique and are a common reason that mothers discontinue breastfeeding early or start supplements. 	<ul style="list-style-type: none"> • Explain that 8–12 feedings in 24 h are typical and necessary to establish an abundant milk supply. • Provide a hand-pump, or teach hand expression, so mother can see that she has milk. • Explain normal infant elimination patterns once mother’s milk comes in (3–5 voids and 3–4 stools per day by 3–5 d; onset of yellow, seedy milk stools by 4–5 d). • Perform infant test weights (before and after feeding) to reassure mother about baby’s milk intake at a feeding. • Teach mother the difference between infant “flutter sucking” or “nibbling” that results in only a trickle of milk at breast versus “drinking” milk, with active sucking and regular swallowing. • Tickling under axilla or holding hand up can help keep baby on task at breast. Or, compressing the breast when the baby stops slow, deep sucking can deliver a spray of milk to entice him or her to start drinking again (see Figs. 3 and 4). • Anticipate infant appetite spurt at about 10–14 d of age. • Observe a nursing session to evaluate latch. Consider referring mother to a lactation consultant for one-on-one assistance with latch.
2 wk	<p>“My breasts do not feel very full anymore. I’m afraid my milk went away.”</p> <p>“How can I know my baby is getting enough?”</p>	<ul style="list-style-type: none"> • As postpartum breast engorgement resolves, and the breasts adjust to making and releasing milk, mothers may perceive they have insufficient milk. • The 10–14-d appetite spurt can cause mother to doubt the adequacy of her milk supply. 	<ul style="list-style-type: none"> • Expect infant to be above birth weight by 10–14 d, and reassure mother about infant’s rate of weight gain since the 3–5-d visit. • Although mother’s breasts are less swollen than during postpartum engorgement, they should feel fuller before feedings and softer afterward. • Consider performing test weights (before and after feeding) to reassure mother about her infant’s intake. • Anticipate another appetite spurt at about 3 wk of age.

(continued on next page)

Table 2
(continued)

Breastfeeding	Parental Concern	Main Obstacles	Provider Advice
1 mo	<p>"My baby is crying a lot, and I am tired and need sleep."</p> <p>"Nothing seems to calm her/him except the bottle."</p>	<ul style="list-style-type: none"> • Normal infant crying peaks at about 6 wk (3–5 h in 24 h). • Mother may attribute infant crying to hunger or an adverse reaction to her milk. • If infant drinks milk from a bottle that is offered, mother may assume infant is not satisfied by breastfeeding. 	<ul style="list-style-type: none"> • Congratulate mother on a full month of breastfeeding! • If infant has gained weight appropriately, reassure mother about the adequacy of her milk supply. • Offer coping strategies for infant crying, including holding baby skin-to-skin; 5 Ss (however, swaddling with hands up near head to help assess feeding cues); use of infant carrier; stroller or car ride; Period of PURPLE Crying. • Explain that infant sucking is reflexive, and drinking from an offered bottle doesn't always mean that the baby was hungry. Baby "can't scream and suck at the same time," so the bottle may appear to calm baby, just as a pacifier might. • If mom desires to offer a bottle, use expressed milk as the supplement. • Forewarn mother about cluster feeds (late afternoon/ evening) and upcoming appetite spurts, occurring about 6 wk and 3 mo.
2 mo	<p>"My mother said that, if I give rice cereal in a bottle before bedtime, the baby may sleep longer at night."</p> <p>"I am going back to work, and am worried that I do not have enough frozen stores of milk. Are there any herbs I can take to keep my milk supply strong?"</p>	<ul style="list-style-type: none"> • Parental sleep deprivation • Mother may already have returned to work, which often increases fatigue and leads to a decrease in milk supply. • Lack of knowledge about the principles of milk production and unrealistic beliefs about the efficacy of galactagogues 	<ul style="list-style-type: none"> • Explain the lack of evidence that rice cereal or other solid foods increase infant sleep. • Remind mother that adding complementary foods is a project and increases workload for parents. • Reinforce the benefits of exclusive breastfeeding for maternal-infant health and mother's milk supply. • Enlist help from others, including support for returning to work. • Explain that there is no "magic pill" or special tea to increase mother's milk supply. The key to ongoing milk production is frequent, effective milk removal (every 3–4 h). • Caution mother to avoid going long intervals without draining her breasts.

4 mo	<p>“My baby seems to only eat for a few minutes, and when I try to put her/him back to the breast, she/he refuses.”</p>	<ul style="list-style-type: none"> • Misinterpretation of infant’s efficiency in nursing causes concern about infant milk intake. 	<ul style="list-style-type: none"> • Explain that infants become more efficient at breastfeeding, and by 3 mo, they may drain the breast in 4–7 min. • Reinforce continuing to delay the introduction of solid foods.
	<p>“My baby seems more interested in everything around him/her than in nursing at the breast.”</p>	<ul style="list-style-type: none"> • Normal infant distractibility causes mother to believe her infant is self-weaning. 	<ul style="list-style-type: none"> • Explain that distractibility is a normal developmental behavior at this age, and that short, efficient feeds are common. • Nurse in a quiet, darkened room.
6 mo	<p>“My baby is drooling and rubbing on her/his gums all the time. I do not think that I can continue to breastfeed because my baby might bite me.”</p>	<ul style="list-style-type: none"> • Common myth that a mother needs to wean when her baby gets teeth to avoid being bitten while breastfeeding 	<ul style="list-style-type: none"> • Congratulate mother on 6 mo of exclusive breastfeeding! • Explain that infants cannot bite and actively breastfeed at the same time. Biting tends to occur if the breast is offered when the infant is not interested or at the end of the feeding. • If the infant bites, say “No biting,” touch the infant’s lips, set the baby down, and briefly leave the room.
	<p>“My baby has refused to breastfeed for almost a whole day now. Is she/he ready to wean?”</p>	<ul style="list-style-type: none"> • Misinterpretation of sudden breastfeeding refusal (“Nursing Strike”) to mean that a baby is self-weaning. 	<ul style="list-style-type: none"> • Explain that some babies may suddenly refuse the breast between 4 and 7 mo of age for no apparent reason. Common causes include an upper respiratory infection, ear infection, teething, regular exposure to bottle-feeding, use of a new soap/perfume, maternal stress, or a decrease in milk supply. • Because many babies will nurse while asleep, try offering the breast when the baby is drowsy or asleep. • Regularly express milk if the baby won’t nurse, and feed the pumped milk until the infant resumes breastfeeding.

Courtesy of M. Bunik, MD, Aurora, CO.

SUMMARY

Most US infants and mothers are not receiving the maximum, short-term and long-term health benefits associated with exclusive breastfeeding, and substantial racial and economic differences in breastfeeding contribute to infant and maternal health disparities. Women's personal and societal barriers to exclusive breastfeeding include lack of prenatal education, inappropriate maternity practices, being comfortable with formula feeding, perception of insufficient milk, misinterpretation of normal infant crying, early introduction of complementary foods, maternal employment, inadequate support, and lack of access to clinical breastfeeding services. Despite the brevity of the postbirth hospitalization, substantial evidence confirms the role of supportive maternity care practices in increasing breastfeeding duration and exclusivity. Because perceived insufficient milk is a chief reason that breastfeeding mothers begin supplementing with formula or wean early, helping women establish and maintain an abundant milk supply, and feel confident that they have enough milk, is a critical strategy in promoting exclusive and extended breastfeeding. A newborn postdischarge visit at 3 to 5 days of life and a second, early follow-up appointment at 2 weeks are essential to monitor infant weight and provide support and encouragement to the mother during the establishment of breastfeeding. Potential sources of essential support to help mothers increase breastfeeding duration and exclusivity include the federal WIC program, NFP nurses, families, mother-peers, health care professionals, and employers. All practitioners need to increase their own breastfeeding knowledge, problem solving, and counseling, as well as work closely with their hospital-based and community lactation consultants and WIC agencies to best support exclusive breastfeeding for the first 6 months.

REFERENCES

1. Eidelman AI, Schanler RJ. Breastfeeding and the use of human milk. *Pediatrics* 2012;129:e827–41 PM:22371471.
2. World Health Organization. Infant and child nutrition: global strategy on infant and young child feeding. Available at: http://apps.who.int/gb/archive/pdf_files/WHA55/ea5515.pdf. Accessed August 31, 2012.
3. World Health Organization. Indicators for assessing infant and young child feeding practices. Available at: <http://www.ifpri.org/sites/default/files/publications/childfeeding.pdf>. Accessed August 31, 2012.
4. Ip S, Chung M, Raman G, et al. Breastfeeding and maternal and infant health outcomes in developed countries. *Evid Rep Technol Assess (Full Rep)* 2007;(153):1–186 PM:17764214.
5. White House Task Force on Childhood Obesity. Solving the problem of childhood obesity within a generation. Available at: <http://www.letsmove.gov/white-house-task-force-childhood-obesity-report-president>. Accessed August 31, 2012.
6. Accelerating Progress in Obesity Web site. Available at: <http://www.iom.edu/Reports/2012/Acclerating-Progress-in-Obesity-Prevention.aspx>. Accessed September 19, 2012.
7. Harder T, Bergmann R, Kallischnigg G, et al. Duration of breastfeeding and risk of overweight: a meta-analysis. *Am J Epidemiol* 2005;162:397–403 PM:16076830.
8. Fewtrell M, Wilson DC, Booth I, et al. Six months of exclusive breast feeding: how good is the evidence? *BMJ* 2011;342:c5955 PM:21233152.
9. Kramer MS, Kakuma R. Optimal duration of exclusive breastfeeding. *Cochrane Database Syst Rev* 2012;(8):CD003517. PM:22895934.

10. Bolton TA, Chow T, Benton PA, et al. Characteristics associated with longer breastfeeding duration: an analysis of a peer counseling support program. *J Hum Lact* 2009;25:18–27 PM:18971503.
11. DiGirolamo AM, Grummer-Strawn LM, Fein SB. Effect of maternity-care practices on breastfeeding. *Pediatrics* 2008;122(Suppl 2):S43–9 PM:18829830.
12. Murray EK, Ricketts S, Dellaport J. Hospital practices that increase breastfeeding duration: results from a population-based study. *Birth* 2007;34:202–11 PM:17718870.
13. Hornell A, Hofvander Y, Kylberg E. Solids and formula: association with pattern and duration of breastfeeding. *Pediatrics* 2001;107:E38 PM:11230619.
14. Feinstein JM, Berkelhamer JE, Gruszka ME, et al. Factors related to early termination of breast-feeding in an urban population. *Pediatrics* 1986;78:210–5.
15. Centers for Disease Control and Prevention. Breastfeeding report card—United States. 2012. Available at: <http://www.cdc.gov/breastfeeding/pdf/2012BreastfeedingReportCard.pdf>. Accessed August 31, 2012.
16. Bain K. The incidence of breast feeding in hospitals in the United States. *Pediatrics* 1948;2:313–20 PM:18880101.
17. Breastfeeding trends and updated national health objectives for exclusive breastfeeding—United States, birth years 2000–2004. *Morb Mortal Wkly Rep* 2007;56:760–3 PM:17673896.
18. Fein SB, Labiner-Wolfe J, Shealy KR, et al. Infant feeding practices study II: study methods. *Pediatrics* 2008;122(Suppl 2):S28–35 PM:18829828.
19. Perrine CG, Scanlon KS, Li R, et al. Baby-Friendly hospital practices and meeting exclusive breastfeeding intention. *Pediatrics* 2012;130:54–60 PM:22665406.
20. Surgeon General's report: US Department of Health and Human Services. The Surgeon General's call to action to support breastfeeding. Washington, DC: US Department of Health and Human Services, Office of the Surgeon General; 2011.
21. Dyson L, McCormick F, Renfrew MJ. Interventions for promoting the initiation of breastfeeding. *Cochrane Database Syst Rev* 2005:CD001688. PM:15846621.
22. US Department of Health and Human Services. Women's preventive services: Required health plan coverage guidelines. Available at: <http://www.hrsa.gov/womensguidelines/>. Accessed August 31, 2012.
23. Dusdieker LB, Dungy CI, Losch ME. Prenatal office practices regarding infant feeding choices. *Clin Pediatr (Phila)* 2006;45:841–5 PM:17041172.
24. Wright CM, Waterston AJ. Relationships between paediatricians and infant formula milk companies. *Arch Dis Child* 2006;91:383–5 PM:16632663.
25. Enfamil. Certificate for Free Breastfeeding Kit. Available at: http://www.enfamil.com/app/iwp/enfamil/certificate.do?dm=enf&id=/Consumer_Home3/Offers/BreastfeedingKit&iwpst=B2C&ls=0&csred=1&r=3523980718. Accessed September 2, 2012.
26. Abbott Laboratories. Similac Homepage. Available at: <https://similac.com/>. Accessed September 2, 2012.
27. Damota K, Banuelos J, Goldbronn J, et al. Maternal request for in-hospital supplementation of healthy breastfed infants among low-income women. *J Hum Lact* 2012;28:476–82.
28. The Joint Commission. Speak up initiatives. Available at: <http://www.jointcommission.org/speakup.aspx>. Accessed August 31, 2012.
29. The Joint Commission. Speak Up: What you need to know about breastfeeding. Available at: http://www.jointcommission.org/speakup_breastfeeding/. Accessed August 31, 2012.

30. World Health Organization. Evidence for the ten steps to successful breastfeeding. Available at: http://whqlibdoc.who.int/publications/2004/9241591544_eng.pdf. Accessed August 31, 2012. 2012.
31. Braun ML, Giugliani ER, Soares ME, et al. Evaluation of the impact of the baby-friendly hospital initiative on rates of breastfeeding. *Am J Public Health* 2003;93:1277–9 PM:12893612.
32. Kramer MS, Chalmers B, Hodnett ED, et al. Promotion of Breastfeeding Intervention Trial (PROBIT): a randomized trial in the Republic of Belarus. *JAMA* 2001;285:413–20 PM:11242425.
33. Merewood A, Mehta SD, Chamberlain LB, et al. Breastfeeding rates in US Baby-Friendly hospitals: results of a national survey. *Pediatrics* 2005;116:628–34 PM:16140702.
34. Baby Friendly USA. Available at: <http://www.babyfriendlyusa.org/eng/index.html>. Accessed August 31, 2012.
35. Vital signs: hospital practices to support breastfeeding—United States, 2007 and 2009. *Morb Mortal Wkly Rep* 2011;60:1020–5 PM:21814166.
36. Declercq E, Lobbok MH, Sakala C, et al. Hospital practices and women's likelihood of fulfilling their intention to exclusively breastfeed. *Am J Public Health* 2009;99:929–35 PM:19299680.
37. Dabritz HA, Hinton BG, Babb J. Maternal hospital experiences associated with breastfeeding at 6 months in a northern California county. *J Hum Lact* 2010;26:274–85 PM:20484659.
38. The Joint Commission. Perinatal care. Available at: http://www.jointcommission.org/perinatal_care/. Accessed August 31, 2012.
39. Philipp BL. ABM clinical protocol #7: model breastfeeding policy (revision 2010). *Breastfeed Med* 2010;5:173–7 PM:20590476.
40. Tender JA, Janakiram J, Arce E, et al. Reasons for in-hospital formula supplementation of breastfed infants from low-income families. *J Hum Lact* 2009;25:11–7 PM:18971505.
41. Gagnon AJ, Leduc G, Waghorn K, et al. In-hospital formula supplementation of healthy breastfeeding newborns. *J Hum Lact* 2005;21:397–405 PM:16280555.
42. Akuse RM, Obinya EA. Why healthcare workers give prelacteal feeds. *Eur J Clin Nutr* 2002;56:729–34 PM:12122548.
43. Reiff MI, Essock-Vitale SM. Hospital influences on early infant-feeding practices. *Pediatrics* 1985;76:872–9 PM:4069855.
44. United States Breastfeeding Committee. Implementing The Joint Commission perinatal care core measure on exclusive breast milk feeding. Available at: <http://www.usbreastfeeding.org/Portals/0/Coalitions/2010-NCSBC/BTT-Handouts/BTT-29-Handout.pdf>. Accessed August 31, 2012.
45. The Joint Commission. Specifications Manual for Joint Commission National Quality Measures (v2010B2): Perinatal Care. Available at: <http://manual.jointcommission.org/releases/TJC2010B/MIF0170.html>. Accessed September 2, 2012.
46. Bramson L, Lee JW, Moore E, et al. Effect of early skin-to-skin mother–infant contact during the first 3 hours following birth on exclusive breastfeeding during the maternity hospital stay. *J Hum Lact* 2010;26:130–7 PM:20110561.
47. Moore ER, Anderson GC, Bergman N, et al. Early skin-to-skin contact for mothers and their healthy newborn infants. *Cochrane Database Syst Rev* 2012;(5):CD003519. PM:22592691.
48. Morrison B, Ludington-Hoe S, Anderson GC. Interruptions to breastfeeding dyads on postpartum day 1 in a university hospital. *J Obstet Gynecol Neonatal Nurs* 2006;35:709–16 PM:17105635.

49. Scott JA, Binns CW, Oddy WH, et al. Predictors of breastfeeding duration: evidence from a cohort study. *Pediatrics* 2006;117:e646–55 PM:16585281.
50. Rosenberg KD, Eastham CA, Kasehagen LJ, et al. Marketing infant formula through hospitals: the impact of commercial hospital discharge packs on breastfeeding. *Am J Public Health* 2008;98:290–5 PM:18172152.
51. Snell BJ, Krantz M, Keeton R, et al. The association of formula samples given at hospital discharge with the early duration of breastfeeding. *J Hum Lact* 1992;8: 67–72 PM:1605843.
52. Merewood A, Grossman X, Cook J, et al. US hospitals violate WHO policy on the distribution of formula sample packs: results of a national survey. *J Hum Lact* 2010;26:363–7 PM:20871089.
53. Sadacharan R, Grossman X, Sanchez E, et al. Trends in US hospital distribution of industry-sponsored infant formula sample packs. *Pediatrics* 2011;128:702–5 PM:21949146.
54. Centers for Disease Control and Prevention. CDC National survey of maternity care practices in infant nutrition and care (mPINC). Available at: http://www.cdc.gov/breastfeeding/pdf/mpinc_overview.pdf. Accessed August 31, 2012.
55. Dewey KG. Maternal and fetal stress are associated with impaired lactogenesis in humans. *J Nutr* 2001;131:3012S–5S PM:11694638.
56. Neifert MR. Prevention of breastfeeding tragedies. *Pediatr Clin North Am* 2001; 48:273–97 PM:11339153.
57. Hamilton BA, Martin JA, Ventura SJ. Births: preliminary data for 2010. *Natl Vital Stat Rep*. 2011;60:1–26. Available at: http://www.cdc.gov/nchs/data/nvsr/nvsr60/nvsr60_02.pdf. Accessed August 31, 2012.
58. Engle WA, Tomashek KM, Wallman C. “Late-preterm” infants: a population at risk. *Pediatrics* 2007;120:1390–401 PM:18055691.
59. Meier PP, Furman LM, Degenhardt M. Increased lactation risk for late preterm infants and mothers: evidence and management strategies to protect breastfeeding. *J Midwifery Womens Health* 2007;52:579–87 PM:17983995.
60. ABM clinical protocol #10: breastfeeding the late preterm infant (34(0/7) to 36(6/7) weeks gestation). *Breastfeed Med* 2011;6:151–6 PM:21631254.
61. Gatti L. Maternal perceptions of insufficient milk supply in breastfeeding. *J Nurs Scholarsh* 2008;40:355–63 PM:19094151.
62. Li R, Fein SB, Chen J, et al. Why mothers stop breastfeeding: mothers’ self-reported reasons for stopping during the first year. *Pediatrics* 2008; 122(Suppl 2):S69–76 PM:18829834.
63. Hill PD, Aldag JC, Chatterton RT, et al. Comparison of milk output between mothers of preterm and term infants: the first 6 weeks after birth. *J Hum Lact* 2005;21:22–30 PM:15681632.
64. Neville MC. Anatomy and physiology of lactation. *Pediatr Clin North Am* 2001; 48:13–34 PM:11236721.
65. Czank C, Henderson JJ, Kent JC, et al. Hormonal control of the lactation cycle. In: Hale TW, Hartmann PE, editors. *Textbook of human lactation*. 1st edition. Amarillo (TX): Hale Publishing, LP; 2007. p. 89–111.
66. Prime DK, Geddes DT, Hartmann PE. Oxytocin: milk ejection and maternal-infant well-being. In: Hale TW, Hartmann PE, editors. *Textbook of human lactation*. 1st edition. Amarillo (TX): Hale Publishing, LP; 2007. p. 141–55.
67. Daly SE, Hartmann PE. Infant demand and milk supply. Part 2: the short-term control of milk synthesis in lactating women. *J Hum Lact* 1995;11:27–37 PM: 7718103.

68. Daly SE, Hartmann PE. Infant demand and milk supply. Part 1: infant demand and milk production in lactating women. *J Hum Lact* 1995;11:21–6 PM:7718102.
69. Neville MC, Allen JC, Archer PC, et al. Studies in human lactation: milk volume and nutrient composition during weaning and lactogenesis. *Am J Clin Nutr* 1991;54:81–92 PM:2058592.
70. Chapman DJ, Perez-Escamilla R. Identification of risk factors for delayed onset of lactation. *J Am Diet Assoc* 1999;99:450–4 PM:10207398.
71. Nommsen-Rivers LA, Chantry CJ, Peerson JM, et al. Delayed onset of lactogenesis among first-time mothers is related to maternal obesity and factors associated with ineffective breastfeeding. *Am J Clin Nutr* 2010;92:574–84 PM:20573792.
72. Dewey KG, Nommsen-Rivers LA, Heinig MJ, et al. Risk factors for suboptimal infant breastfeeding behavior, delayed onset of lactation, and excess neonatal weight loss. *Pediatrics* 2003;112:607–19 PM:12949292.
73. Hartmann PE, Cregan M. Lactogenesis and the effects of insulin-dependent diabetes mellitus and prematurity. *J Nutr* 2001;131:3016S–20S.
74. Chapman DJ, Perez-Escamilla R. Does delayed perception of the onset of lactation shorten breastfeeding duration? *J Hum Lact* 1999;15:107–11 PM:10578785.
75. Shealy KR, Scanlon KS, Labiner-Wolfe J, et al. Characteristics of breastfeeding practices among US mothers. *Pediatrics* 2008;122(Suppl 2):S50–5 PM:18829831.
76. Nommsen-Rivers LA, Chantry CJ, Cohen RJ, et al. Comfort with the idea of formula feeding helps explain ethnic disparity in breastfeeding intentions among expectant first-time mothers. *Breastfeed Med* 2010;5:25–33 PM:20043707.
77. Taveras EM, Li R, Grummer-Strawn L, et al. Mothers' and clinicians' perspectives on breastfeeding counseling during routine preventive visits. *Pediatrics* 2004;113:405–11 PMID:15121981.
78. Bunik M, Shobe P, O'Connor ME, et al. Are 2 weeks of daily breastfeeding support insufficient to overcome the influences of formula? *Acad Pediatr* 2010;10:21–8 PM:20129478.
79. Ahluwalia IB, Morrow B, Hsia J. Why do women stop breastfeeding? Findings from the Pregnancy Risk Assessment and Monitoring System. *Pediatrics* 2005;116:1408–12 PM:16322165.
80. Wilhelm S, Rodehorst-Weber TK, Flanders Stepan MB, et al. The relationship between breastfeeding test weights and postpartum breastfeeding rates. *J Hum Lact* 2010;26:168–74 PM:20015841.
81. Holmes AV, Auinger P, Howard CR. Combination feeding of breast milk and formula: evidence for shorter breast-feeding duration from the National Health and Nutrition Examination Survey. *J Pediatr* 2011;159:186–91 PM:21429512.
82. Bunik M, Clark L, Zimmer LM, et al. Early infant feeding decisions in low-income Latinas. *Breastfeed Med* 2006;1:225–35 PMID: 17661603.
83. Bartick M, Reyes C. Las dos cosas: an analysis of attitudes of Latina women on non-exclusive breastfeeding. *Breastfeed Med* 2012;7:19–24 PM:22007765.
84. Heinig MJ, Follett JR, Ishii KD, et al. Barriers to compliance with infant-feeding recommendations among low-income women. *J Hum Lact* 2006;22:27–38 PM:16467285.
85. Lauzon-Guillain B, Wijndaele K, Clark M, et al. Breastfeeding and infant temperament at age three months. *PLoS One* 2012;7:e29326 PM:22253712.

86. Heinig MJ, Banuelos J, Goldbronn J, et al. Fit WIC baby behavior study: Helping you understand your baby. Available at: http://www.nal.usda.gov/wicworks/Sharing_Center/spg/CA_report2006.pdf. Accessed August 31, 2012.
87. Olson BH, Horodynski MA, Brophy-Herb H, et al. Health professionals' perspectives on the infant feeding practices of low income mothers. *Matern Child Health J* 2010;14:75–85 PM:18982434.
88. Grummer-Strawn LM, Scanlon KS, Fein SB. Infant feeding and feeding transitions during the first year of life. *Pediatrics* 2008;122(Suppl 2):S36–42 PM:18829829.
89. Bureau of Labor Statistics, US Department of Labor. Employment characteristics of families–2011. Available at: <http://www.bls.gov/news.release/pdf/famee.pdf>. Accessed August 31, 2012.
90. Ogbuanu C, Glover S, Probst J, et al. The effect of maternity leave length and time of return to work on breastfeeding. *Pediatrics* 2011;127:e1414–27 PM:21624878.
91. Guendelman S, Kosa JL, Pearl M, et al. Juggling work and breastfeeding: effects of maternity leave and occupational characteristics. *Pediatrics* 2009;123:e38–46 PM:19117845.
92. Erkkola M, Salmenhaara M, Kronberg-Kippila C, et al. Determinants of breastfeeding in a Finnish birth cohort. *Public Health Nutr* 2010;13:504–13 PM:19825208.
93. Kristiansen AL, Lande B, Overby NC, et al. Factors associated with exclusive breast-feeding and breast-feeding in Norway. *Public Health Nutr* 2010;13:2087–96 PM:20707948.
94. Fein SB, Mandal B, Roe BE. Success of strategies for combining employment and breastfeeding. *Pediatrics* 2008;122(Suppl 2):S56–62 PM:18829832.
95. Mandal B, Roe BE, Fein SB. The differential effects of full-time and part-time work status on breastfeeding. *Health Policy* 2010;97:79–86 PM:20400199.
96. Neifert M. Great expectations: essential guide to breastfeeding. New York: Sterling Publishing; 2009.
97. Mohrbacher N. The magic number and long-term milk production. *Clinical Lactation* 2011;2:15–8.
98. Batan M, Li R, Scanlon K. Association of child care providers breastfeeding support with breastfeeding duration at 6 months. *Matern Child Health J* 2012 [Epub ahead of print]. PM:22706997.
99. womenshealth.gov. Breastfeeding. Available at: <http://www.womenshealth.gov/breastfeeding/government-in-action/business-case-for-breastfeeding/>. Accessed August 31, 2012.
100. The Patient Protection and Affordable Care Act. Available at: <http://www.gpo.gov/fdsys/pkg/PLAW-111publ148/pdf/PLAW-111publ148.pdf>. Accessed August 31, 2012.
101. Lawrence RA, Lawrence RM. Breastfeeding, a guide for the medical professional. 7th edition. Maryland Height (MO): Elsevier Mosby; 2011.
102. Renfrew MJ, McCormick FM, Wade A, et al. Support for healthy breastfeeding mothers with healthy term babies. *Cochrane Database Syst Rev* 2012;(5):CD001141. PM:22592675.
103. USDA Food and Nutrition Service. WIC at a glance. Available at: <http://www.fns.usda.gov/wic/aboutwic/wicataglance.htm>. Accessed August 31, 2012.
104. Chapman DJ, Morel K, Anderson AK, et al. Breastfeeding peer counseling: from efficacy through scale-up. *J Hum Lact* 2010;26:314–26 PM:20715336.
105. Suitor CW. Planning a WIC research agenda: workshop summary. Washington, DC: National Academy Press; 2011.

106. Centers for Disease Control and Prevention. Provisional breastfeeding rates by socio-demographic factors, among children born in 2007. Available at: http://www.cdc.gov/breastfeeding/data/NIS_data/2007/socio-demographic_any.htm. Accessed August 31, 2012.
107. Holmes AV, Chin NP, Kaczorowski J, et al. A barrier to exclusive breastfeeding for WIC enrollees: limited use of exclusive breastfeeding food package for mothers. *Breastfeed Med* 2009;4:25–30 PM:19196037.
108. Yun S, Liu Q, Mertzlufft K, et al. Evaluation of the Missouri WIC (Special Supplemental Nutrition Program for Women, Infants, and Children) breastfeeding peer counselling programme. *Public Health Nutr* 2010;13:229–37 PM:19607746.
109. Rempel LA, Rempel JK. The breastfeeding team: the role of involved fathers in the breastfeeding family. *J Hum Lact* 2011;27:115–21 PM:21173422.
110. Tohotoa J, Maycock B, Hauck Y, et al. Supporting mothers to breastfeed: the development and process evaluation of a father inclusive perinatal education support program in Perth, Western Australia. *Health Promot Int* 2011;26:351–61 PM:21156662.
111. Pisacane A, Continisio GI, Aldinucci M, et al. A controlled trial of the father's role in breastfeeding promotion. *Pediatrics* 2005;116:e494–8 PM:16199676.
112. Chezem JC. Breastfeeding attitudes among couples planning exclusive breastfeeding or mixed feeding. *Breastfeed Med* 2012;7:155–62 PM:22224507.
113. La Leche League International. Available at: <http://www.llli.org/ab.html?m=1>. Accessed August 31, 2012.
114. Parkes A. A breastfeeding cafe: could it work for you? Available at: www.llli.org/llleaderweb/lv/lvoctnov05p112.html. Accessed August 17, 2012.
115. Green K. 10 must-dos for successful breastfeeding support groups. *Breastfeed Med* 2012;7:346–7 PM:22857643.
116. Black Mothers' Breastfeeding Association. Available at: <http://www.blackmothersbreastfeeding.org/HOME.html>. Accessed August 31, 2012.
117. US Department of Health and Human Services, Office on Women's Health. Your guide to breastfeeding for African American women. Available at: <http://www.womenshealth.gov/publications/our-publications/breastfeeding-guide/breastfeedingguide-africanamerican-english.pdf>. Accessed August 31, 2012.
118. Mattox KK. African American mothers: bringing the case for breastfeeding home. *Breastfeed Med* 2012;7:343–5 PM:22924942.
119. McQueen KA, Dennis CL, Stremler R, et al. A pilot randomized controlled trial of a breastfeeding self-efficacy intervention with primiparous mothers. *J Obstet Gynecol Neonatal Nurs* 2011;40:35–46 PM:21244493.
120. Olds DL, Robinson J, Pettitt L, et al. Effects of home visits by paraprofessionals and by nurses: age 4 follow-up results of a randomized trial. *Pediatrics* 2004;114:1560–8 PM:15574615.
121. Nurse-Family Partnership. Available at: <http://www.nursefamilypartnership.org/>. Accessed August 31, 2012.
122. Bunik M, Krebs NF, Beaty B, et al. Breastfeeding and WIC enrollment in the Nurse Family Partnership Program. *Breastfeed Med* 2009;4:145–9 PM:19243262.
123. Taveras EM, Capra AM, Braveman PA, et al. Clinician support and psychosocial risk factors associated with breastfeeding discontinuation. *Pediatrics* 2003;112:108–15 PM:12837875.
124. Feldman-Winter L, Barone L, Milcarek B, et al. Residency curriculum improves breastfeeding care. *Pediatrics* 2010;126:289–97 PM:20603262.

125. Labarere J, Gelbert-Baudino N, Ayrat AS, et al. Efficacy of breastfeeding support provided by trained clinicians during an early, routine, preventive visit: a prospective, randomized, open trial of 226 mother-infant pairs. *Pediatrics* 2005;115:e139–46 PM:15687421.
126. Profit J, Cambric-Hargrove AJ, Tittle KO, et al. Delayed pediatric office follow-up of newborns after birth hospitalization. *Pediatrics* 2009;124:548–54 PM:19651578.
127. Feldman-Winter LB, Schanler RJ, O'Connor KG, et al. Pediatricians and the promotion and support of breastfeeding. *Arch Pediatr Adolesc Med* 2008;162:1142–9 PM:19047541.
128. Pollard DL. Impact of a feeding log on breastfeeding duration and exclusivity. *Matern Child Health J* 2011;15:395–400 PM:20177755.
129. American Academy of Pediatrics. Bright Futures. Available at: <http://brightfutures.aap.org>. Accessed September 1, 2012.
130. Taveras EM, Li R, Grummer-Strawn L, et al. Opinions and practices of clinicians associated with continuation of exclusive breastfeeding. *Pediatrics* 2004;113:e283–90 PM:15060254.
131. International Lactation Consultant Association. Available at: <http://www.ilca.org/i4a/pages/index.cfm?pageid=1>. Accessed August 31, 2012.
132. Cloherty M, Alexander J, Holloway I. Supplementing breast-fed babies in the UK to protect their mothers from tiredness or distress. *Midwifery* 2004;20:194–204 PM:15177864.
133. Academy of Breastfeeding Medicine. Available at: <http://www.bfmed.org/Resources/Protocols.aspx>. Accessed August 31, 2012.
134. Brazelton TB. *Touchpoints—birth to three*. 2nd edition. Cambridge (MA): Perus Book Group; 2006.