NCC Pediatrics Continuity Clinic Curriculum: **Nutrition I: Breastfeeding**

Goal: *Recognize the health benefits of breastfeeding in newborn through toddler.*

- Discuss the nutritional benefits of breastfeeding and its effects on growth & development
- Describe the different compositions of human milk, formula, and cow's milk.
- Understand the current AAP Guidelines for Breastfeeding and learn how to advocate for breastfeeding/human milk in the neonatal period.
- Understand the elements involved in breastfeeding & describe maternal advantages.

Pre-Meeting Preparation:

Please review the following enclosure:

- "The Pediatrician's Role in Encouraging Exclusive Breastfeeding" *(PIR, Aug2017)*

Please explore the following web links:Please explore the following web links:

- *Skim* "Tricare Breastfeeding FAQ"
- *Skim* "What is a Galactogogue" and "Fenugreek Seed" from *Kelly Mom website*
- *Watch* Maximizing Milk Production w/ Hands-on Pumping from *Stanford SOM*

Conference Agenda:

- *Review* Nutrition I Quiz *(10 min)*
- Complete Nutrition I Cases *(20 min)*
- Interactive Labeling of Breastfeeding Latch & Accessories *(15 min)*

Post-Conference: *Board Review Q&A*

Extra Credit:

- Breastfeeding: More Than Just Good Nutrition *(PIR, July 2011)*
- AAP Policy Statement: "Breastfeeding and the Use of Human Milk" *(Pediatrics, March 2012)*
- Transfer of Drugs and Therapeutics into Human Breastmilk *(Pediatrics, 2013)*
- "Your Guide to Breastfeeding" *(womenshealth.gov, DHHS)*
- Maryland Breastfeeding Resources
- LactMed@NIH (app for android) (app for iphone)
- video links, breastfeeding and COVID-19 vaccination, **MHS** and **CHOP**
- Lactation Educational Resource for Families *(Inova Fairfax Oaks Hospital)*

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The Pediatrician's Role in Encouraging Exclusive Breastfeeding

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Practice Gap

Although most pregnant women in the United States plan to breastfeed, there is a clear gap between the proportion of women who prenatally intend to breastfeed and those who actually meet their goals postpartum. (1,2) Pediatricians are often challenged by providing support and management for nursing issues.

Objectives

After completing this article, readers should be able to:

1. Describe differences between human milk and formula and the practice of breastfeeding and formula feeding.
2. Identify the factors that interfere with breastfeeding.
3. Discuss management of maternal nipple pain, low milk supply, late preterm infants, infants with allergic colitis, and problems with maternal milk oversupply.
4. Learn the best ways to support the mother-baby dyad through the birth, hospital, and postpartum periods.
5. Recognize the effects of maternal ingestion of drugs and other substances.

INTRODUCTION

According to the US Centers for Disease Control and Prevention (CDC), many mothers initiate breastfeeding at birth, but only 22% of infants are exclusively breastfed for 6 months, and only 29% experience any breastfeeding in the first 12 months. (3) This falls short of the Healthy People 2020 goals of 25.5% exclusively breastfeeding for 6 months and 34.1% breastfeeding in the first 12 months (Fig 1). (4) Disparities exist, including differences related to race and ethnicity. For example, Hispanics have higher breastfeeding initiation and duration rates than the black population but lower exclusivity rates than the white population. (5) Moreover, lower breastfeeding rates are also associated with socioeconomic disparities, such as lower education level, poverty, young age, high body mass index, not abstaining from alcohol use, smoking within 6 weeks of delivery, and living in rural areas. These disparities in breastfeeding affect subsequent child health.

AUTHOR DISCLOSURE Dr Bunik has disclosed no financial relationships relevant to this article. This commentary does not contain a discussion of an unapproved/investigative use of a commercial product/device.

ABBREVIATIONS

BFHI	Baby-Friendly Hospital Initiative
CDC	Centers for Disease Control and Prevention
THC	tetrahydrocannabinol

The US Preventive Services Task Force recently gave primary care breastfeeding support a "B" recommendation, meaning there is strong evidence that office-based health care promotion should be a priority. (6) Therefore, pediatricians, as advocates and partners for the health of children, should support and promote breastfeeding in mother-infant dyads. Most current intervention efforts are not adequately communicating to families the importance of breastfeeding exclusivity and duration as the norm for all mother-infant dyads. (7,8) Professional education in breastfeeding and helping mothers get access to professional support are provider responsibilities highlighted in the CDC's "Guide to Strategies to Support Breastfeeding Mothers and Babies." (9) In addition, providers should make sure that support for breastfeeding starts in the hospital at birth and then continues with office-based support and peer support at discharge. If a mother is returning to work, she will need support from her employer, as well as her childcare provider.

In this review article, the main objective is to present ways for pediatricians to address the current continued barriers for exclusive breastfeeding, to describe early management challenges, and to provide key tools to foster the rewarding relationship that results when pediatricians and/or staff in their practice play a main role in breastfeeding success.

UNDERSTANDING THE DIFFERENCES BETWEEN HUMAN MILK AND FORMULA

Content Comparison

Human milk is superior to formula because of the immunologic properties that are passed on to the infant and are the basis for disease prevention. Human milk has bioactive factors such as living cells, enzymes, and antibodies that offer immune protection and support the physiological microbes of the gastrointestinal tract. Tow stated in her breastfeeding review that the "most significant inheritance a child will ever receive is the maternal microbiome." (10) Immunoglobulins in human milk are predominantly secretory immunoglobulin A, with smaller amounts of immunoglobulin M and immunoglobulin G. Cells in the breasts interact with maternal plasma from the bronchial tree and intestine to produce immunoglobulin A antibodies that offer specific protection against pathogens in the mother's environment.

High concentration and structural diversity of human milk oligosaccharides, as a group of more than 200 identified complex and diverse glycans, are resistant to gastrointestinal digestion and reach the colon as the first prebiotics. Many human milk oligosaccharides are known to directly interact with the surface of pathogenic bacteria, such as *Haemophilus influenzae* and *Streptococcus pneumoniae*, and inhibit binding and toxins to the host receptors. (11)

In this way, human milk oligosaccharides act as decoys to protect infants from infectious diseases. They are also responsible for a diverse spectrum of functions that include the compositional development of gut microbiota, prevention of intestinal infections, and development of the brain. (12) Lactoferrin, lysozyme, complement, α-lactalbumin, and casein are other important bioactive proteins that act in concert with the complex immune framework. (13)

The composition of human milk varies somewhat from feeding to feeding but usually ranges from 19 to 21 calories per ounce. Volumes can vary throughout the day and also from mother to mother.

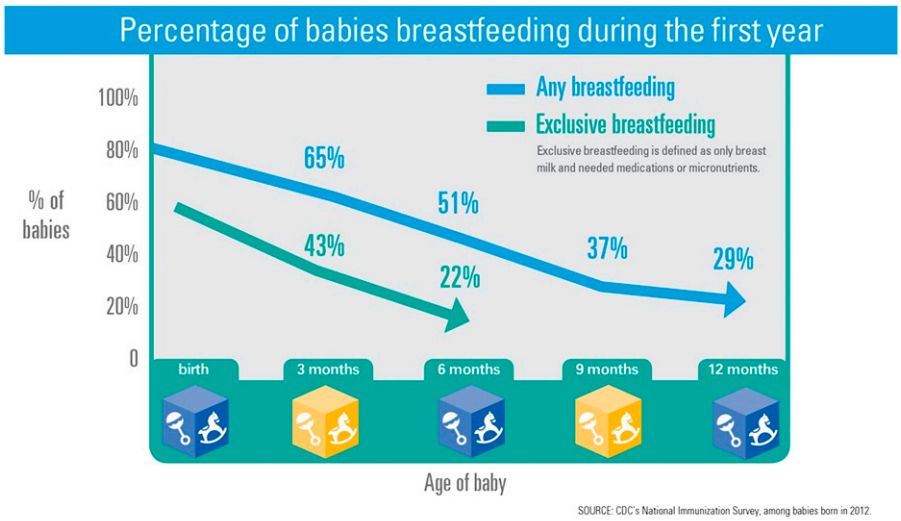


Figure 1. CDC graph of the percentage of babies breastfeeding during the first year.

Formula companies are constantly improving on nutritional content to make formula closer to human milk—for example, by adding docosahexaenoic acid and probiotics. Unfortunately, various labeling and advertising on their products can lead families to believe that certain formulas can eliminate infants' gastrointestinal symptoms, such as gas and reflux. In terms of other nutritional components, formulas contain slightly higher levels of protein than human milk (1.5 g vs 1.1 g per 110 mL, respectively).

Infant Early Weight Loss Nomograms

In a large Kaiser study, investigators found that 5% of exclusively breastfed, vaginally delivered newborns and 10% of cesarean-delivered newborns lost 10% or more of their birth weight 48 hours after delivery. Formula-fed newborns had much lower weight loss rates of 2.9% and 3.5%, respectively. These nomograms (see Fig 2) should be used for early identification of newborns on a trajectory of greater weight loss and follow-up for associated morbidities. (14,15)

Return to Birth Weight and Weight Gain

Some exclusively breastfed newborns may require slightly longer than 2 weeks to return to their birth weight. (16) Close monitoring with frequent weight checks is preferable in this situation because the addition of supplementation may cause more morbidity than watchful waiting.

Infant Temperament and Maternal Bonding

Mothers often report that breastfeeding is an enjoyable bonding time with their infants. (17) Functional brain magnetic resonance imaging has been used to compare exclusively breastfeeding mothers with exclusively formula-feeding mothers as they listened to their infants' own cries versus a control infant's cry. Breastfeeding mothers showed greater brain activations on images while listening to their own baby cry. Studies have also supported the fact that breastfeeding mothers have a higher-rated sensitivity score and are more in tune with infant temperament than mothers who are formula feeding. (18,19)

Milk Volumes

Volume intake varies somewhat with breastfed infants because of the diurnal nature of maternal milk supply (with higher prolactin levels at night). In formula-fed infants, the bottle feedings are controlled by the parent or caregiver, who determines volume, frequency, hunger, and satiety cues. Conversely, infants who are actively feeding and are not sleepy at the breast are in control of the volume of the milk that they transfer from the mother.

Stool Production Patterns

Stool production patterns depend on adequate human milk intake and age of a baby. Expect one stool for each day of life until day 4, when a mother's milk is fully in, leading to a transition in stool color, from meconium black to green to yellow during this time. In the first few weeks, stools commonly occur with every feeding or every other feeding. The "breastfed stool variant" occurs in about one-third of breastfed infants starting at 4 to 6 weeks of age. (20) One soft, voluminous stool occurs usually every 3 to 4 days (but can take up to 12–14 days), and this is thought to be due to almost complete absorption of human milk. At times, the infant can appear uncomfortable, but more commonly, the infant is asymptomatic. It is not known why this occurs in only some breastfed infants.

Vitamin D Supplementation

Vitamin D is generated through the skin from exposure to the sun, and owing to concurrent recommendations for judicious use of sunscreen and sun avoidance, breastfeeding infants require 400 IU of vitamin D supplementation per day. However, adherence to these recommendations has been low. (21,22) Recent work suggests that maternal vitamin D at levels of 6400 IU per day are adequate for transfer of vitamin D to the infant. (23) Most infant formulas contain the added 400 IU of vitamin D with an intake range of 26 to 32 oz.

Developmental Phases

Developmental phases can sometimes interfere with breastfeeding and may differ from infants who are bottle-fed human milk or formula fed. At 4 to 5 months of age, when the infant's vision improves, most infants can become distracted during a feeding, and it can be challenging to keep the infant on the task of completing a full feeding. This may result in more hunger, more frequent feedings, more feeding in the nighttime, and, in rare cases, slower weight gain. Nursing in a quiet, dark room with minimal distractions can help. When infants begin teething, biting can also become a problem. Mechanically, the infant cannot bite and ingest milk at the same time. Infants who bite at the breast when the breast is offered are usually not ready to feed, and biting at the end of the nursing session may mean that they are full. Anticipating this biting behavior may be helpful, and disengaging the infant quickly and ending the feeding usually sends the message that this is an undesirable behavior. Again, perception that the infant is not satisfied by breast milk alone is cited consistently as one of the top reasons for stopping breastfeeding, regardless of weaning

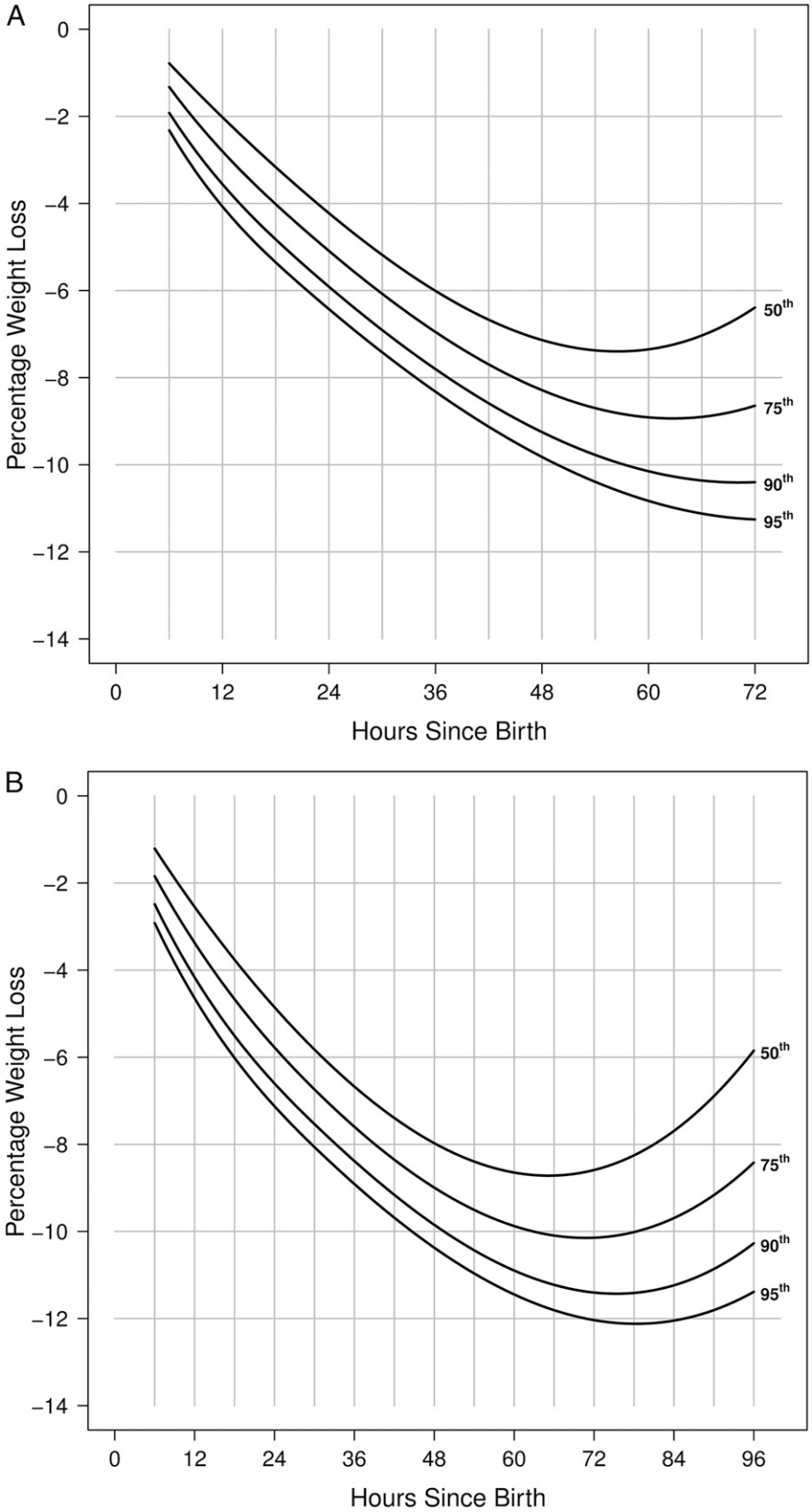


Figure 2. Nomograms for early neonate weight loss (14). A. Estimated percentile curves of percentage weight loss according to time after birth for vaginal deliveries. B. Estimated percentile curves of percentage weight loss according to time after birth for cesarean deliveries.

age. (24) As infants become older, they are usually more effective at breastfeeding and can transfer milk in less than 5 minutes. Mothers' breasts feel emptier, too, but the infant can usually extract the milk even if the suckling seems less effective. This concern about decrease in milk supply is a common misconception with older infants at the 9-month milestone. Providing reassurance at all of these phases can be comforting to the mother and prevent early cessation of breastfeeding.

Risk of not Breastfeeding for Infant and Mother

The dose-responsive benefits of breastfeeding for both the infant and mother are well known and well established and should be the basis for encouraging mothers to breastfeed exclusively. (25,26) The Surgeon General's Report in 2011 and others suggest reframing this argument as the "risk of not breastfeeding." (27,28) The risks of not breastfeeding for infants are shown in Table 1. Mothers who do not breastfeed do not return to prepregnancy weight as quickly and do not have the associated decreased incidence of type 2 diabetes, osteoporosis, hypertension, heart attack, stroke, postpartum depression, breast cancer, and ovarian cancer, as do mothers who breastfeed. (29–34)

TABLE 1. **Highlighted Risks of Not Breastfeeding for Infants**

OUTCOME	EXCESS RISK, %
Full-term infants	
Acute ear infection (otitis media)	100
Eczema (atopic dermatitis)	47
Diarrhea and vomiting (gastrointestinal infection)	178
Hospitalization for lower respiratory tract diseases in the first year	257
Asthma, with family history	67
Asthma, no family history	35
Childhood obesity	32
Type 2 diabetes mellitus	64
Acute lymphocytic leukemia	23
Acute myelogenous leukemia	18
Sudden infant death syndrome	56
Preterm infants	
Necrotizing enterocolitis	138

Adapted from US Department of Health & Human Services. The Surgeon General's Call to Action to Support Breastfeeding. Accessed at http://www.surgeongeneral.gov/library/calls/breastfeeding/ on June 15, 2016 (27)

ADDRESSING BARRIERS TO EXCLUSIVE BREASTFEEDING

Pain and Low Milk Supply

Pain, sore nipples, and perceived or real insufficient milk supply are the main reasons for early cessation of breastfeeding. (24,35) Sore nipples occur in about one-third of mothers. (36) To avoid pain and trauma, it is best to ensure proper latching by encouraging the newborn to open the mouth wide by tickling his or her lips with a finger or nipple. The mother should pull the baby in close to the mother's abdomen and support the back, so that the newborn's chin dives into the breast and the newborn's nose touches the breast at the nipple. Once latched, the baby's lips should be untucked and flared, like "fish lips." (Fig 3). Although neonates may spend up to 45 to 60 minutes nursing at a time, some of this time may not be nutritive, which is referred to as sleepy "flutter feeding." Prolonged time spent suckling can result in nipple soreness in the early days of breastfeeding, so limiting the time to 30 minutes total, while keeping the neonate on task by tickling or keeping his or her arm up in the air, helps. (20) The mother should break the newborn's strong mouth suction by putting her finger in the corner of the baby's mouth. If the mother has nipple redness or cracks, she should find some relief by applying lanolin, as well as hydrogel or soothing pads. Most postpartum nipple discomfort usually improves by day 7 to day 10. A quick list of common causes of sore nipples is shown in Table 2. (20)

Many mothers perceive that human milk coming from the breasts is not enough to exclusively feed or satisfy an infant. Pediatricians should address this concern early on. At first, human milk comes in small yellow volumes as colostrum, and then in 3 to 4 days, the milk becomes more white and watery in appearance. Most women have a hard time believing that all the nutrition a baby needs can come from her breast, and formula is a readily available option when there is maternal doubt. (37,38) Causes for irreversible low milk production include primary glandular insufficiency (<5% of women), previous breast surgeries and associated scarring, and severe postpartum birth complications, which usually involve hypertension or blood loss. Evaluation for poor latch, sleepy behavior at the breast, and inadequate milk removal will help identify the most likely reversible causes for milk supply concerns. Occasionally, oral contraceptives or pseudoephedrine decongestants

can cause a decrease in milk supply. Frequent weight checks in the office, pre- and postfeeding weight checks on a sensitive scale (a scale made to weigh to the nearest gram), and an early-morning pumping session are ways to assess and reassure mothers about milk supply. It is critical to address all of these milk supply issues so as to not unnecessarily disrupt the path toward exclusive breastfeeding.

Breastfeeding Intention and Self-efficacy

Studies continue to show that mothers who have a strong intention to breastfeed prenatally are more likely to achieve their breastfeeding goals. They are more likely to overcome some variables that could affect their success, such as pain, fear of difficulty, birth method, partner support, and even medical complications. However, according to the latest infant feeding study, two-thirds of mothers who intend to exclusively breastfeed are not meeting their intended duration. (39) Increased Baby-Friendly Hospital Initiative (BFHI) practices, particularly giving neonates only breast milk in the hospital, may help more mothers achieve their exclusive breastfeeding intentions. (39) Prenatal maternal knowledge about infant health benefits and developing a level of comfort with breastfeeding in social settings was found to be directly related to the intention to exclusively breastfeed. (40,41) Numerous studies by Dennis and colleagues in the past decade have shown that having early breastfeeding confidence in the first weeks is associated with longer breastfeeding duration. The validated short form, 14-item Breastfeeding Self-Efficacy Scale (42), includes statements such as, "I can always successfully cope with breastfeeding like I have other challenging tasks," and can be used to evaluate maternal level of confidence with breastfeeding.

Figure 3. A good, wide, open latch is shown with flared lips.

IMPROVING ACCESS TO PROFESSIONAL SUPPORT

Birth Hospital Practices Matter

Hospital practices supportive of breastfeeding in the hours and days after birth make a difference in breastfeeding rates. Currently, 18% of US births occur in 11% of BFHI–designated facilities. (43) Yotebieng et al (44) showed that the number of specific BFHI practices had a cumulative effect on exclusivity of breastfeeding. To achieve breastfeeding exclusivity, hospitals should be encouraged to adopt some of these BFHI practices, if not all of them.

The following are the BFHI Ten Steps associated with increased breastfeeding exclusivity:

Written breastfeeding policy. The process of developing policy brings clarification to all staff levels. One example of this success is the decline in distribution of infant formula company discharge bags and sample packs over the past 9 years. (45)

Staff competency assessment. All staff should be trained in the skills and messaging necessary to support new mothers and breastfeeding.

Prenatal breastfeeding education. To affect maternal knowledge and intent as described previously, providing education prior to delivery can help mothers overcome the unexpected challenges of early latch and breastfeeding. One study indicated that 17% of mothers reported that their physician, nurse, or other health care worker missed the opportunity to talk about breastfeeding during any of their prenatal visits. (46)

Early initiation for latch, skin-to-skin kangaroo care, and nursing immediately after birth. Newborns who nurse in the first hours after birth appear to be more successful with latching and nursing later on, and putting the newborn on the mother skin to skin cues the mother and newborn to nurse. (47) Early work on skin-to-skin contact indicates that it may lead to exclusive breastfeeding. (48)

Teaching breastfeeding techniques. Whenever possible, the hospital staff should review what mothers learned prenatally. Observing the mother and practicing latch and

TABLE 2. **Quick Reference for Pain with Breastfeeding (20)**

INQUIRY	CAUSE OF PAIN	RECOMMENDATION
Lips tucked under—"grandpa lips"? Not opening the mouth wide enough and getting only the nipple in the mouth?	Poor latch	Untuck the lips Wait for a wide-open mouth; may need the baby to start feeding before becoming too awake and hungry to increase cooperation
Early days' discomfort from baby's vacuum suction? Any blanching?	Discomfort in the first weeks vs high suckling pressure	Lanolin Deep breathing Review of good latch
Blister-like lesions on breast?	Herpes	Avoid nursing on the affected side
Pink-tinged nipples? Itching? Shooting pain in the breast?	*Candida* infection	Simultaneous antifungal treatment of mother and baby (all-purpose nipple ointment[a] not adequate)
Does baby's tongue extend beyond the gums? Does baby's tongue move up and sideways when you rub the gums?	Tongue-tie, other mouth abnormalities	If any suspicion, get a formal evaluation (The author's experience is that tongue-tie is currently a popular overdiagnosis)
Shiny white dot on the tip of the nipple?	Bleb	Open up with a sterile needle; has a high rate of reoccurrence
Dry, flaky rash? History of allergies or eczema?	Eczema or irritant dermatitis	Apply over-the-counter hydrocortisone and, if there's no improvement, may need a more potent version via prescription May have allergy to lanolin, detergents/bleach, soaps
Sensitivity of nipples to cold or stimulation? Color change of nipple after nursing?	Vasospasm of nipple/Raynaud phenomenon	Needs evaluation, will likely need prescription for nifedipine
Plentiful milk supply? Baby pulls off with squirts of milk a few minutes into a nursing session?	Clamping down due to oversupply	Lean back with nursing, because it affords baby better control of fast flow
Soreness beyond the nipple? Area of redness of the breast? Fever?	Mastitis	Needs evaluation, will likely need antibiotics

[a]*All-purpose nipple ointment consists of compounded antibiotic, antifungal, and anti-inflammatory ointments.*

techniques to keep the newborn on task when breastfeeding empowers the mother to continue nursing after discharge from the hospital.

Limiting non–human milk feedings. Modeling the hospital use of mother's own milk whenever possible sends a strong message to families, such that they are less likely to use formula supplementation when they go home from the hospital. Although some birth hospitals are providing donor milk to term neonates, (49) there are no studies to support this practice, which is costly and not covered by insurance. In high-risk neonates, donor human milk is best provided from an established not-for-profit milk bank that is part of the Human Milk Banking Association of North America. (50) Donors are not paid and are carefully screened. Milk is collected according to guidelines and pasteurized. Although pasteurization provided by milk banks may affect some of the immune properties of human milk, much is still preserved. Milk sharing or purchasing on the Internet should be avoided, since there is potential for infections or contamination of milk with drugs. (51–54)

Rooming-in, including performing milk expression with the newborn nearby. Newborns and their mothers should be kept in close proximity for as much time as possible in the

early breastfeeding days. (55) The newborn should also be close by when the mother uses a breast pump. (56) Neonate safety should be considered when there are medical issues with the maternal-infant dyad.

Teaching feeding cues. Getting the newborn to the breast early, usually every 1.5 to 2 hours, can help the latch process be less stressful for both mother and baby. Crying is a late hunger cue that can add to everyone's frustrations and desire to stop the crying with bottle feeding, thereby giving the newborn unnecessary supplementation.

Limiting pacifier use. The American Academy of Pediatrics suggests that there are exceptions to limiting pacifier use, such as when an infant has to undergo painful procedures and when an infant needs calming. It is best to introduce pacifiers after breastfeeding is established, so that feedings are not missed in the early weeks. (57)

Postdischarge support. After hospital discharge, mothers need to know who to call if they have questions, as well as have a plan for routine follow-up checks and breastfeeding problems. Postdischarge support is an important "outpatient extension" of BFHI.

Peer-to-Peer Support

Peer support by "mentor mothers" who have breastfed and are from the same community or ethnic group can be provided in several ways, including support groups (eg, La Leche League International or the birth hospital) and one-on-one support through telephone calls or visits in a home or clinical setting. Systematic reviews have demonstrated peer counselor programs to be effective in increasing breastfeeding exclusivity. (58,59) Women who provide peer support receive specific training for the best ways to offer emotional support, encouragement, education, and help with breastfeeding problems. (60,61)

Breastfeeding-Friendly Office Practice

The steps for creating a breastfeeding-friendly office practice are shown in Fig 4.

Evaluate early and often in the first weeks. Maternal milk supply is established in the first 3 to 4 weeks postpartum, thereby mandating close evaluation and follow-up to ensure continued breastfeeding. Screening questions (Fig 5) were developed for telephone triage and can be used to determine the level of concern for urgent evaluation. Breastfeeding difficulties usually cause substantial distress in a new family, so determining the level of urgency can help with scheduling an earlier assessment if needed. If there is uncertainty about milk supply or problems with latch, the mother should be seen in the pediatric office or by an outside lactation specialist.

Decide about supplementation. Supplementation with human milk is preferable to formula in times when there is concern about infant weight gain, because even a small amount of cow milk can disrupt the intestinal microbe environment. (62) Moreover, some infants can develop a preference early on in the feeding process, since the bottle method of feeding has a faster flow than the breast. "Slow-flow" nipples (which do not drip when the bottle is turned upside down) can help, but feeding from the breast is commonly slower than any bottle system.

Address combination feeding. In some cultures, the issues of combination feeding are widely accepted and associated with acculturation in the United States. "Las dos cosas" (literally, "those two things," or both breast milk and bottle formula) has been a well-described practice, particularly in Latinas, because mothers want their infants to have the "best of both worlds." (63) In addition, there is a common perception that breast milk is not enough for the infant after 3 months of age. (64,65) Meta-analyses have demonstrated that interventions to encourage exclusive breastfeeding among Latinas should ideally begin in the prenatal setting and involve frequent contact, especially with an International Board-Certified Lactation Consultant. (66)

Advocate for maternity leave and support the return-to-work transition. Studies show that women who intend to return to work within a year of their child's birth are less likely to initiate breastfeeding, and those who work full-time tend to breastfeed for shorter periods than those who work part-time or do not work out of the home. (67,68) Not surprisingly, women in salaried jobs and those with longer maternity leaves are more likely to breastfeed. (69) Unfortunately, planning for return to work seems to affect mothers' decision-making early in the postpartum period. (70) Many women worry about having enough milk stored and having to express milk at work. A double-sided pump is the best choice for a working mother because of its efficiency. Under the Affordable Care Act of 2014, insurance companies provide pumps as a covered benefit, but anecdotal experience suggests that these pumps may not always be of the best caliber. (71) Mothers should be encouraged to talk to their employers early during pregnancy and try to take at least 6 postpartum weeks off of work, if possible. Maternity leave of up to 6 weeks compared to 6 to 12 weeks after delivery was associated with higher odds of failure to establish breastfeeding. (72) Under the Affordable Care Act, working mothers should be provided with accommodations,

OFFERING BREASTFEEDING SUPPORT IN YOUR OFFICE IS AS EASY AS 1-2-3

#1 Train internal staff or provide early referral for breastfeeding management and support. This is also known as extending the Baby-Friendly Hospital Initiative to your office.

#2 Provide resources for mothers, such as hospital-based drop-in clinics or groups or other mother support groups. It is always a good idea to attend or have one of your staff attend these sites so that you are sure that the advice and any concerns raised are addressed appropriately and in line with general American Academy of Pediatrics recommendations.

#3 Avoid storing and giving out formula samples in your office. It may seem supportive, but it gives the wrong message about breastfeeding exclusivity. Providing information about pumps, pump rental stations, or hand expression is a better idea.

Figure 4. Offering breastfeeding support in your office is as easy as "1-2-3."

such as time and a private 4-foot by 6-foot space in which to pump. (73)

OTHER BREASTFEEDING CHALLENGES THAT PROVIDERS NEED TO ADDRESS

Oversupply

Most newborns, even when they are older, only ingest a maximum of 3.0 to 3.5 oz of milk at the breast, (74) so mothers who are producing more than that amount usually have a state of oversupply. Not only does oversupply cause uncomfortable fullness and leakage for the mother, but milk could be continuously "leftover" in the breast, leading to possible stasis, plugged ducts, and even mastitis. Mothers with milk oversupply should lean back as much as possible when nursing so that the infant has some ability to respond better to the fast flow, which occurs with let-down. In this position, the infant is less likely to pull off of the breast. The process of slowly and carefully down-regulating the milk supply, with less pumping and trending toward one-sided

1. **What is your baby's age and gestational age? Was your baby born early or on time? If early, how early? Do you have discharge sheets at home? Did the hospital tell you your newborn's gestational age?** (Late preterm is high risk.)
2. **Is your baby acting sick or abnormal in any way (eg, weak, decreased activity)?** Rule out sepsis, particularly in babies 4 weeks of age and younger.
3. **Is breastfeeding going well?** If not perceived as going well, mother and baby may need to be seen in the office today or tomorrow (within 24 hours).
4. **How many times have you breastfed in the past day?** Ten to 12 times per 24 hours is optimal; 8 times is minimal. Suboptimal nursing sessions require evaluation.
5. **How long is your baby awake and actively suckling and swallowing at the breast during a feeding?** Baby should be actively feeding at the breast without long pauses or flutter feeding for at least 10 minutes. Just as with microwave popcorn, pauses or extended time (ie, "cooking the popcorn" too long) are not effective (analogy courtesy of Sheela Geraghty, MD, MS, IBCLC, FAAP). The mother may need assistance with latch and keeping baby on task for nursing sessions.
6. **What color are your baby's stools?** By day 4, stools should be yellow and seedy, not black or green transitional stools.
7. **How many stools has your baby had in the past day?** The goal is 1 stool per day of life up to day 4 (ie, by day 4, the baby should have at least 4 stools daily). A suboptimal stool pattern requires evaluation.
8. **How many wet urine diapers has your baby had in the past day?** Seven to 8 wet urine diapers is normal (exception: 3 wet diapers per day can be normal for the first 5 days). A suboptimal urine pattern requires evaluation.
9. **Do your breasts feel full before feedings and softer afterward?** The optimal answer is yes. Before the milk is in, most mothers will not notice any change. If baby is close to 2 weeks of age, the mother's breasts may be adjusting to what the baby's needs are, and she may experience only mild symptoms of engorgement.
10. **How many times have you supplemented with formula in the past day?** Supplementation more than once in 24 hours can affect milk supply or may indicate breastfeeding difficulties.

Figure 5. Triage assessment questions are given for the early postpartum period—the first 2 weeks. When using these advice topics, it is best to begin each call with the following 10 screening questions and then ask, "What is your main breastfeeding question or concern?" Adapted from the Screening Form for Early Follow-Up of Breastfed Newborns on the Dr. Mom Web site at http://www.dr-mom.com. Reproduced with permission.

TABLE 3. **Touch Points for Overcoming Obstacles to Breastfeeding Exclusivity (20)**

TIME POINT	PARENTAL CONCERN	MAIN OBSTACLE	PROVIDER ADVICE
Prenatal	"I want to breastfeed, but since I am going to work, I need to be able to formula feed, too."	Lack of information about combining breastfeeding and working Lack of information about milk expression and access to breast pumps	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/partner and other family members will want to help feed the baby. Won't they feel excluded if I only breastfeed?"	Family members wanting to feed the baby	Enlist father's/partner's help in supporting the nursing partner; fathers/partners can interact with their newborn by holding the baby skin to skin or taking the baby out while mom sleeps After breastfeeding is well established, others can feed the baby expressed milk by bottle
	"I want to do combination feeding, or las dos cosas."	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	"Puro pecho," or only mother's own milk, provides greater health benefits and helps maintain an abundant milk supply If eligible, enrollment in the Special Supplemental Nutrition Program for Women, Infants, and Children (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."	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	Promote immediate skin-to-skin contact after birth to facilitate the initiation of breastfeeding within the first hour Teach the mother to interpret her newborn's feeding cues and breastfeed as often as baby wants; advocate for no routine formula use in the system of care Advise the mother to request help in the hospital with breastfeeding to promote task mastery Encourage continuous rooming-in, where the 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?"	Belief that the small amount of colostrum is insufficient until the "milk comes in"	Explain the potency and adequacy of colostrum and the rapid increase in milk production from 36 to 96 h
3–5 d	"Now that we are home from the hospital, the baby seems to be feeding every hour. She or he doesn't seem satisfied with breast milk alone."	Lack of knowledge about normal frequency of feedings for breastfed newborns Newborns typically begin feeding more frequently the second night after birth, when the baby is at home Concern about whether the newborn is getting enough milk, due to the mother's inability to see what the newborn takes at the breast Sleepy newborn	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 the mother can see that she has milk Explain normal newborn elimination patterns once the 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 newborn test weights (before and after feeding) to reassure the mother about baby's milk intake at a feeding Teach the mother the difference between newborn "flutter sucking" or "nibbling" that results in only a trickle of milk at the breast versus "drinking" milk, with active sucking and regular swallowing Tickling under the axilla or holding a hand up can help keep baby on task at the 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 Anticipate newborn appetite spurt at about 10–14 d of age

Continued

TABLE 3. (Continued)

TIME POINT	PARENTAL CONCERN	MAIN OBSTACLE	PROVIDER ADVICE
	"My nipples are sore and cracked. Can I take a break and give my baby a little formula?"	Sore nipples are usually attributable to incorrect latch-on technique and are a common reason that mothers discontinue breastfeeding early or start supplements	Observe a nursing session to evaluate latch; consider referring the mother to a lactation consultant for one-on-one assistance with latch
2 wk	"My breasts do not feel very full anymore. I'm afraid my milk went away."	As postpartum breast engorgement resolves and the breasts adjust to making and releasing milk, mothers may perceive that they have insufficient milk supply	Expect the newborn to be above birth weight by 10–14 d and reassure the mother about the newborn's rate of weight gain since the 3–5-d visit Although the mother's breasts are less swollen than during postpartum engorgement, they should feel fuller before feedings and softer afterward
	"How can I know my baby is getting enough?"	The 10–14-d appetite spurt can cause the mother to doubt the adequacy of her milk supply	Consider performing test weights (before and after feeding) to reassure the mother about her newborn's intake Anticipate another appetite spurt at about 3 wk of age
1 mo	"My baby is crying a lot, and I am tired and need sleep."	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	Congratulate the mother on a full month of breastfeeding! If infant has gained weight appropriately, reassure the mother about the adequacy of her milk supply Offer coping strategies for infant crying, including holding the baby skin to skin; the 5 S's[a] (however, swaddle with the baby's hands up near the head to help assess feeding cues); use of an infant carrier; going for a stroller or car ride; observing a period of "purple crying"
	"Nothing seems to calm her/him except the bottle."	If the infant drinks milk from a bottle that is offered, the mother may assume that her infant is not satisfied by breastfeeding	Explain that infant sucking is reflexive, and drinking from an offered bottle doesn't always mean that the baby is 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 the mother about cluster feedings (late afternoon/evening) and upcoming appetite spurts, occurring at about 6 wk and 3 mo
2 mo	"My mother said that, if I give my baby rice cereal in a bottle before bedtime, he or she may sleep longer at night."	Parental sleep deprivation The mother may have already returned to work, which often increases fatigue and leads to a decrease in milk supply	Explain the lack of evidence that rice cereal or other solid foods increase infant sleep Remind the mother that adding complementary foods is a project and increases the workload for parents Reinforce the benefits of exclusive breastfeeding for maternal-infant health and mother's milk supply
	"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?"	Lack of knowledge about the principles of milk production and unrealistic beliefs about the effectiveness of galactogogues	Enlist help from others, including support for returning to work Explain that there is no "magic pill" or special tea to increase the mother's milk supply; the key to ongoing milk production is frequent, effective milk removal (every 3–4 h) Caution the mother to avoid going long intervals without draining her breasts
4 mo	"My baby seems to only eat for a few minutes, and when I try to put her/him back to the breast, she or he refuses."	Misinterpretation of infant's efficiency in nursing causes concern about infant milk intake	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

Continued

TABLE 3. (Continued)

TIME POINT	PARENTAL CONCERN	MAIN OBSTACLE	PROVIDER ADVICE
	"My baby seems more interested in everything around him or her than in nursing at the breast."	Normal infant distractibility causes the mother to believe her infant is self-weaning	Explain that distractibility is a normal developmental behavior at this age and that short, efficient feedings are common Nurse in a quiet, darkened room
6 mo	"My baby is drooling and rubbing on her or his gums all the time. I do not think that I can continue to breastfeed because my baby might bite me."	Common myth that a mother needs to wean when her baby gets teeth to avoid being bitten while breastfeeding	Congratulate the 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
	"My baby has refused to breastfeed for almost a whole day now. Is she or he ready to wean?"	Misinterpretation of sudden breastfeeding refusal ("nursing strike") to mean that a baby is self-weaning	Explain that some babies may suddenly refuse the breast between 4 and 7 mo of age for no apparent reason; common causes include 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

[a]*The 5 S's consist of swaddling, side lying, swaying, shushing, and sucking. From: Karp, Harvey.* The Happiest Baby on the Block, 2nd Ed. *New York: NY: Bantam Books; 2015.*

feeding, is recommended but can be challenging because it seems counterintuitive to want to make less milk.

Tongue-Tie

It has become increasingly common for infants to have their tongue- or lip-tie diagnosed and clipped as part of a breastfeeding consultation. (75) Despite little evidence for these procedures, tongue and lip clipping have become widely accepted. (76)

Anterior tongue-tie, which causes the tongue to have decreased lateral movement and decreased frontal movement up and over the gums, can cause pain and ineffective latch when breastfeeding. Anterior tongue-tie can be associated with ineffective nursing and decreasing milk supply. (77) With posterior tongue-tie, the tongue is tacked down at the back of the mouth—a condition that is difficult to diagnose. This anatomic condition is not universally accepted by otolaryngologists and is not easily corrected with surgery, which involves releasing tissue at the base of the tongue. (78) Any infant who has undergone the procedure, by means of either incision or laser (now performed by many dentists and others), should be followed up closely. If breastfeeding does not improve after the procedure, more feeding evaluation and assistance may be needed.

Allergic Colitis

Allergic colitis is a cell-mediated hypersensitivity disorder that affects the large intestinal tract in less than 1% of exclusively breastfed infants. The most common symptom associated with food allergy in the infant is bloody stools. (79) Dietary proteins in the mother's milk are responsible, which are usually due to maternal ingestion of dairy products. Breastfed infants with allergic colitis are typically well appearing and rarely have reflux symptoms, such as vomiting, diarrhea, and abdominal distention. Elimination of cow milk from the maternal diet is the first step in treatment, and in most cases, symptoms in the infant should improve within 3 to 4 days. If continued mucus and blood are detected, then mothers need to eliminate soy products next, followed by the remaining causal agents: eggs, nuts, wheat, corn, strawberries, citrus, and chocolate. Compliance with these elimination diets is challenging initially and even more difficult to maintain, so mothers should be cautioned to eliminate only one item at a time to be sure that eliminating one particular food from the diet is necessary. Interestingly, most infants with allergic colitis tolerate cow milk after their first birthday. (80)

Fussiness

Just as breastfeeding is established at the end of the first month of life, many infants manifest common fussy behaviors that may be misinterpreted as gastroesophageal reflux or food allergies. Discussion about the normal crying curve that peaks at 6 weeks and about ways to soothe a crying

infant should be part of anticipatory guidance for the breastfed infant. (81)(82) Mothers and family members (and medical providers) may erroneously blame breastfeeding in some way (diet, milk supply, medications) as a reason for the fussiness.

Reflux

Reflux symptoms, such as increased spitting up and fussiness, can cause unnecessary supplementation in the infant. Reflux can cause abdominal pain when the infant is not upright during nursing, which could mistakenly lead to elimination diets in the mother. About 50% of infants experience effortless spitting up of small amounts of breast milk (1–2 teaspoons). This spitting up should be distinguished from vomiting, which is forcefully throwing up more volume. It can be helpful to instruct the family that the stomach is like an "untied water balloon" and that any abrupt movement can cause "leakage." Providing the mother with reassurance that reflux will improve with age in most infants can help prevent the mother and infant from taking unnecessary paths toward medication use.

Maternal Medications

The need to prescribe almost any type of maternal medication can lead to erroneous early cessation of breastfeeding. The decision-making process around medication use while breastfeeding should be one of joint negotiation between mother and provider. (83) In general, the mother should avoid taking long-acting forms of medications and should watch her infant for any unusual signs and symptoms, such as sleepiness, irritability, or other known side effects of the prescribed medication. Acetaminophen and ibuprofen are well studied and safe. Some allergy medications can be sedating, so less sedating choices are better. Drugs contraindicated during breastfeeding include anti-cancer drugs, lithium, oral retinoids, iodine, amiodarone, and gold salts. (84) Online resources for guidance, such as LactMed, (85) InfantRisk Center (telephone 806/352-2519), (86) and the Postpartum Support International Warmline (telephone 800/944-4773) can help prevent giving incorrect advice about discontinuing a medication or discontinuing breastfeeding.

Herbs or Supplements

Lactation specialists have recommended herbs such as fenugreek and blessed thistle, usually as a last resort when other nonpharmacologic measures do not result in an increase in milk volume. (87) However, milk expression is the only successful, evidence-based method for increasing milk supply. During inquiry about maternal medication use, providers should question the mother about the use of herbal remedies or natural supplements. Appropriate counseling should be given to avoid the desire to take "magic bullets for milk supply."

Maternal Mental Health

Pregnancy-related depression and postpartum depression are associated with difficulty breastfeeding and shorter breastfeeding duration. Premature cessation of breastfeeding is also a risk factor for developing increased maternal anxiety. Women with high levels of anxiety and depression during pregnancy who stop breastfeeding early are at an additional multiplicative risk for postpartum anxiety and depression. (88) Best practice during a clinical visit is to screen the mother with a validated tool, such as the Edinburgh Postnatal Depression Scale, to ensure that maternal mental health is addressed adequately and objectively. (89)

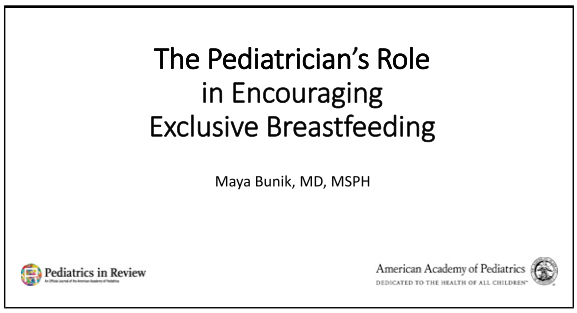
Alcohol, Tobacco, and Marijuana Use

Alcohol is transferred readily into human milk at levels that match the mother's blood alcohol level. A safe rule, similar to the rule for safe drinking and driving a motor vehicle, is 1 drink consumed in 2 hours. Although alcohol test strips for breast milk are available for purchase, careful and limited consumption of alcohol is the best approach when breastfeeding. Tobacco smoking is not a contraindication to breastfeeding because the effects of smoking tobacco on the risk of sudden infant death syndrome and respiratory illness are almost negated if the infant has been breastfeeding. (90) However, nicotine can make an infant jittery, can interfere with let-down, and is associated with lower milk supply. Therefore, mothers who smoke should delay nursing as long as possible after smoking, and providers should provide motivational interviewing for smoking cessation assistance and/or suggest that a mother decrease the number of cigarettes she smokes or switch to cigarettes with lower nicotine content. Limited research is available on breastfeeding and marijuana use, including the amount of tetrahydrocannabinol (THC) in human milk, the length of time THC remains in the human milk after exposure, and the effects of THC on the infant. In a survey of more than 1,700 mothers in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) in Colorado, 6% reported using THC during pregnancy for symptoms of nausea, depression, and anxiety. (91) Because of concern for the developing brain in infants, mothers should abstain from using marijuana while breastfeeding. (92,93)

Summary

- On the basis of strong evidence, the dose-responsive benefits of breastfeeding for both the infant and the mother are well established and should be the basis for recommending mothers to breastfeed exclusively. (25,26)
- On the basis of strong evidence, pain, sore nipples, and insufficient milk supply are the main reasons for early cessation of breastfeeding. (24,35)
- On the basis of strong evidence, hospital practices supportive of breastfeeding in the hours and days after birth make a difference in breastfeeding rates. However, currently, less than 20% of US births occur in Baby-Friendly Hospital Initiative–designated facilities.
- On the basis of consensus, in the first few weeks, stools commonly occur with every feeding or every other feeding. The "breastfed stool variant" occurs in about one-third of breastfed infants at about 4 to 6 weeks. One soft, voluminous stool occurs usually every 3 to 4 days, thought to be due to almost complete absorption of human milk.
- On the basis of consensus, developmental phases bring challenges for the breastfeeding dyad. Just when breastfeeding is getting established, infants go through a period of crying that may be misinterpreted as hunger and can lead to unnecessary supplementation. At about 4 months of age, most infants can become distracted during a feeding and are challenging to keep on the task of completing a full feeding. Nursing in a quiet, dark room with minimal distractions can help.
- On the basis of strong evidence and consensus, because milk supply is established in the first few weeks postpartum, access to trained internal staff or early referral for breastfeeding management and support is essential to ensure breastfeeding exclusivity. Hospital-based clinics or other maternal support groups provide additional support. (58,59)
- The breastfeeding touch points in Table 3 offer guidance for common issues that arise when supporting exclusive breastfeeding in the first 6 months postpartum and beyond.

To view teaching slides that accompany this article, visit http://pedsinreview.aappublications.org/content/38/8/353.supplemental.



References for this article are at http://pedsinreview.aappublications.org/content/38/8/353.

Table 2. **Comparison of Human Milk, Cow Milk, and Infant Formula**

Component	Human Milk	Similac®/Enfamil® Formulas	Cow Milk
Calories (kcal/L)	747	700	701
Protein (g/100 mL)	1.1	1.5	2.8
Casein	3.7		25.0
Taurine (mM/100 mL)	25 to 30	Added artificially	<1.0
Phenylalanine (mg/100 mL)	48	390 mM/100 mL	172
Tyrosine	61		179
Fat (g/1,000 mL)	4.5	2.6	4.4
Cholesterol (mg/L)	139	0	120
Carbohydrate (g/1,000 mL)	6.8	7.2	4.7
Minerals ash (weight %)	0.2	0.33	0.7
Calcium (mg/dL)	34	55	118
Phosphorus (mg/dL)	14	44	93
Calcium/phosphorus ratio	2.4:1	1.2:1	1.3:1
Sodium (g/L)	0.512 (7 mL Eq/L)	1.1 (6 mL Eq/L)	0.768 g/L
Vitamin D	4 to 40 IU/L	400 IU	47 to 100 IU
Vitamin K	0.9 to 6.9 mg/L	4 mg/100 kcal	19 mg/L

Similac® is a product of Abbot Laboratories, North Chicago, IL, Enfamil® is a product of Mead Johnson & Co, Evansville, IN.
Data from American Academy of Pediatrics. *Pediatric Nutrition Handbook*. 6th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2009; Walker WA, Watkins JB. *Nutrition in Pediatrics*. Boston, MA: Little, Brown and Co; 1985; and Jensen RG. *Handbook of Milk Composition*. New York, NY: Academic Press; 1995.

Nutrition I Quiz

1. **Breastmilk vs. Formula**: Complete the following comparisons *(use Table 2 from PIR)*.
   a. Which has the most kcal/L and fat? _____
   b. Which has the most protein and what are these proteins? _____
   c. Which has the most carbs? _____
   d. Which requires Vitamin D supplementation for the neonate? _____

2. **Breastfeeding has been associated with the following health benefits**:
   a. A reduction in otitis media
   b. A reduction in hospitaliations for lower respiratory illness
   c. A reduction in gastroenteritis
   d. A reduction in sudden infant death syndrome
   e. All of the above

3. **Breastfeeding is contraindicated in which of the following conditions**:
   a. Infants with galactosemia
   b. Maternal Hepatitis B
   c. Maternal Hepatitis C
   d. Maternal mastitis
   e. Infants with Cystic Fibrosis

4. **Name 3 maternal conditions which are absolute contraindications to breastfeeding**:

5. **What are the "10 steps" of the BFHI?** Do we meet this standard? Are there other considerations (see Pediatrics commentary)?

6. **What are the "3 steps" to get a Tricare-approved breast pump?**

Nutrition I Cases:

Case 1:
You are the MICC intern, rounding on SPC Jones, an 18-year-old G1P1, 2 hours after delivery. Her female infant was born at 37 weeks via SVD after a short labor with an epidural. APGARs were 7 and 9. She has not decided how she wants to feed, but was leaning towards formula since that is what her friend chose. The infant already received one feed with 2 oz of formula. SPC Jones has a PMHx of asthma and frequent otitis media.

How will you approach breastfeeding with this mother? What additional social history might you want to elicit to help her make the best decision for her and her baby?

During your discussion, you learn that SPC Jones has 6 weeks of maternity leave. FOB is not involved. She has no family within 400 mile radius of current duty station, but her mother will be visiting in 2 weeks and she has a supportive community at her church. She was not breastfed as a baby. You also observe that she seems immature and even afraid to hold her baby girl.

What additional support resources are available for this single active duty mother?

After considering all of the benefits you discussed, SPC Jones is open to breastfeeding. "But how will I know if she's getting anything?" she asks. **How do you respond?**

When she begins pumping in preparation for her return to work, how long her milk will be good at room temperature vs. the refrigerator vs. the freezer?

Case 2:

Mrs. Thomas is a 24-year-old first time mom who comes in for evaluation of low milk supply. Her 7-week-old son had gained weight well until the last 2 weeks when she noticed fewer wet diapers and a decrease in the volume she was able to pump. You observe breastfeeding in clinic and note that Mrs. Thomas holds her son in a neutral position with his head slightly extended. The baby has an asymmetric latch with a wide-angle of the jaw and a coordinated suck and swallow. Mrs. Thomas returned to work full time 1 week ago.

In a lactating women, which is more common— true or perceived low milk supply? Why?

What is your working diagnosis for Mrs. Thomas—true or perceived low milk supply?

What additional maternal history should you obtain to confirm your working diagnosis?

In addition to observing a breastfeeding attempt, what elements of the physical exam for this dyad are needed to confirm your working diagnosis?

What are some ways to help Mrs. Thomas increase her milk supply?

Considering that the baby shows poor weight-gain, how else should you counsel mom?

Breastfeeding Paraphernalia: Interactive Exercise

1. **Which picture shows an appropriate latch?** What are signs of a poor latch? Where should mother's nipple be positioned during a good latch?

2. **Breast-pumps:** Find the **hospital-grade, portable electric,** and **manual hand pumps.**

   (a) Can you identify all of the parts? How fast can you put them together to make a functional pump?

   (b) Turn the pumps on—What is the difference between hospital-grade, electric, and manual options?

3. **Breastfeeding Accessories:** Please identify the following items and answer the following questions: What is their purpose? How are they used? Where are they located in the clinic?

   (a) Nipple Shields:

   (b) Nipple/Breast Shells:

4. **Supplementation Options:** Please identify the following items and explain/show how each is used for supplementation.

   (a) Curved-tip syringe

   (b) Supplemental Nursing System:

   (c) Show how a syringe and butterfly tubing can be used to make a DIY supplementer

Nutrition I Board Review

1. You are meeting with a pregnant woman who has received a liver transplant and is taking chronic immunosuppression therapy. She asks you if the drugs she takes will preclude breastfeeding her infant.

Of the following, the immunosuppressive drug that has the BEST safety profile for lactating women:
A. cyclophosphamide
B. cyclosporin A
C. methotrexate
D. prednisone
E. tacrolimus

2. You are addressing a group of expectant mothers who are due to deliver their infants in the next few weeks. You discuss the benefits of breastfeeding and explain that it is the best nutrition for most babies. One woman asks you if it is acceptable to breastfeed if she has had hepatitis in the past. You explain that there are only a few infections that would prevent a mother from being able to breastfeed her baby.

Of the following, breastfeeding is MOST likely to be contraindicated if a mother
A. has active untreated pulmonary tuberculosis
B. has genital herpes without breast lesions
C. is a cytomegalovirus carrier
D. is hepatitis B surface antigen-positive
E. is hepatitis C antibody-positive

3. A 3-month-old infant who has a history of renal dysplasia associated with obstructive uropathy has marked polyuria. He is breastfeeding and receiving supplemental cow milk-based formula. In an effort to reduce the high urine output, you consider reducing the renal solute load by changing feedings from the milk-based formula currently being used.

Of the following, the MOST appropriate change is to
A. a hydrolyzed formula containing medium-chain triglycerides
B. a more concentrated (24-kcal) milk-based formula
C. human milk exclusively
D. soy milk-based formula
E. whole cow milk

4. Hypoglycemia, both symptomatic and asymptomatic, is a common concern in healthy term breastfed neonates. While glucose monitoring should be performed only in high-risk infants and those who are symptomatic, the management strategies employed to prevent and treat hypoglycemia should support breastfeeding.

Which one of the following strategies is the BEST method to prevent symptomatic hypoglycemia:

A. Glucose monitoring every thirty minutes following delivery
B. Oral glucose solution by mouth immediately following birth, followed by breastfeeding on demand
C. Early initiation of breastfeeding on demand, within 30–60 minutes after delivery
D. Define hypoglycemia <45 mg/dL (<2.5 mmol/L) within the first 3 hours after delivery
E. All of the above

5. **All of the following medications given during a nursing mother's hospitalization are compatible with uninterrupted breastfeeding EXCEPT:**
A. Acetaminophen
B. Technetium-99m (for nuclear medicine scans)
C. Cefoxitin
D. Prednisone
E. Ibuprofen

6. The mother of a breastfed 3-month-old will be away from her baby overnight for a business trip. She has an electric pump, but will not have a refrigerator available to her during the trip.

Of the following, which is the BEST advice to give her regarding pumping and storing of her breast milk during the time of separation?
A. She should pump the milk and save it to take home with her; it's okay for 24 hours without refrigeration
B. She should pump and dump her milk; she won't be able to save the milk, but at least she can maintain her supply
C. She doesn't need to bring the pump; with such short separation, she won't need to pump at all
D. She should pump the milk and store it with ice in a cooler at approximately refrigerator temperature (<40°F)

7. **The hormone primarily responsible for milk ejection ("let-down") is:**
A. Estrogen
B. Progesterone
C. Prolactin
D. Oxytocin
E. Transferrin

8. **Breast milk jaundice is BEST characterized by:**
A. Weight loss
B. Poor feeding
C. Brick dust urine
D. A high direct bilirubin
E. A thriving infant with persistent jaundice