

PART 2: THE MANAGEMENT OF BREASTFEEDING

INCORPORATING BREASTFEEDING CARE INTO DAILY NEWBORN ROUNDS AND PEDIATRIC OFFICE PRACTICE

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"This world, after all our sciences, is still a miracle: wonderful, inscrutable, magical and more, to whoever will think of it."

THOMAS CARLYLE

A pediatrician's daily routine abounds with opportunities to provide appropriate evaluation, intervention, information, and encouragement for breastfeeding infants and their families. Some pediatricians provide prenatal counseling for parents and begin education regarding normal breastfeeding practices in this setting. For pediatricians who are not involved in prenatal guidance, morning rounds on the mother-infant unit is an ideal time to begin this work with a family. Providing breastfeeding education and management in the pediatric office setting is the logical extension of the good breastfeeding care that was begun in the newborn period and is crucial to the ongoing success of breastfeeding. The American Academy of Pediatrics (AAP) statement on Breastfeeding and the Use of Human Milk^[3] discusses the role of the pediatrician in promoting breastfeeding. In the office setting, this role includes enthusiastically supporting breastfeeding and being knowledgeable and skilled in related physiology and clinical management. The key to providing breastfeeding care is effectively integrating the relevant information and skills into existing daily routines without increasing the time required to provide a given service. This integration creates a practice experience that is efficient, enjoyable, and satisfying for the pediatrician and fulfills the need for improving breastfeeding outcomes.

This article distills into a usable format the crucial physiologic principles, evaluation techniques, and management skill that pediatricians need to be effective and efficient in caring for breastfed patients. The information is organized according to two practice environments: (1) the newborn care service and (2) the pediatric office practice. Naturally, there is some overlap of the issues that affect inpatient newborn

care and the early follow-up visits in the office.

THE NEWBORN CARE SERVICE

Physiologic Principles that Guide Appropriate Care of Breastfed Newborn Infants

Successful care for breastfed, transitional newborn infants is based on the physiologic principles of fluid and nutrient metabolism and conservation. From delivery, infants have metabolic reserves available in the form of hepatic glycogen; brown fat; and abundant extracellular, extravascular water. Over the next 2 or 3 days, these reserves are used in combination with the gradually increasing volume of colostrum^[28] to ensure metabolic homeostasis. This transition occurs uneventfully in healthy, term newborn infants unless circumstances exist that (1) abnormally increase a newborn's metabolic expenditures, (2) interfere with or disrupt an infant's acquisition of breastfeeding skill or access to the breast, or (3) delay the onset of stage 2 lactogenesis. Conditions and procedures used in the care of term, newborn infants that have potential to deplete a newborn infant's metabolic reserves more rapidly than physiologically anticipated include:

Insensible water loss

- Dehumidified, air-conditioned environment
- Recurrent or persistent crying
- Extended time on open warmer
- Unnecessary oral and gastric suctioning
- Vomiting
- Sweating
- Increased evaporative losses during and after bath

Nutritional substrate depletion

- Recurrent or persistent crying
- Hypo- or hyperthermia
- Painful procedures with associated increase in crying, aerophagia, vomiting, tachycardia, and tachypnea
- Prolonged catabolic metabolism
- Persistent elevation of stress related hormones
- Frequent startle (Moro) responses
- Scheduled feeds

Factors that are considered potentially disruptive to the acquisition of effective breastfeeding behaviors include:

Separation of mother and infant immediately after birth and repeatedly over the first few days after birth

Unnecessary handling of the infant immediately after birth, including weighing, measuring, and obtaining footprints for the birth record

Placing erythromycin drops in the eyes before the first feeding is accomplished

Unnecessary suctioning or traumatic instrumentation of the mouth and pharynx

Use of artificial nipples and pacifiers

Scheduled feedings

Multiple caregivers

Excessive light and noise

Painful procedures

Inappropriate presentation of the breast

Inappropriate positioning of the infant at the breast

Clinically, disruption of feeding behavior may present in infants as ineffective, brief, or prolonged feedings; irritability; lethargy; excessive weight loss; inadequate urinary output; or hyperbilirubinemia. Infants at increased risk for rapid metabolic depletion in the transitional period are those born at greater than or equal to 37 weeks' gestation, small or large for gestational age, infants of diabetic mothers, and post-term infants. Mothers may display delays in offering breast to infant, decreased responsiveness to infant feeding cues, painful or damaged nipples, delay in milk "coming in," or absence of breast changes (e.g., fullness or leaking of milk) associated with stage 2 lactogenesis. Maternal conditions that may delay stage 2 lactogenesis include any significant maternal illness, gestational diabetes, maternal dehydration, hypothyroidism, retained placental fragments, unidentified history of breast augmentation or reduction, and breast deformities or injuries.

In the past, this constellation of problems was managed by providing newborn infants with human-milk substitutes, such as glucose water or formula. Now the literature supports that this practice compromises the eventual success of breastfeeding.^{[23] [27] [31] [47] [48]} The appropriate approach is to (1) design newborn care practices that conserve infants' metabolic resources and optimize the breastfeeding interaction between mother and infant, (2) monitor the mother and infant for appropriate progression of breastfeeding behaviors and breast changes, and (3) intervene when necessary to maintain appropriate nutritional status in the infant and stimulate an ample supply of human milk.

Newborn care that is consistent with current knowledge regarding the physiologic and behavioral requirements of transitional newborn infants provides (1) uninterrupted skin-to-skin contact with mother immediately after delivery and until the first breastfeed is accomplished^{[1] [46]}; (2) elimination of painful or disruptive procedures that provide doubtful benefit to the infant; (3) rescheduling of necessary procedures to not interfere with transitional behavior and the initial feeding; and (4) the elimination or minimization of crying episodes, which deplete metabolic reserves and disrupt early breastfeeding behavior. This constellation of practices affords newly born infants a rapid and smooth transition into conservative anabolic metabolism; stimulates gastric emptying and intestinal motility^[49]; minimizes unnecessary evaporative fluid losses; and minimizes depletion of metabolic reserves caused by crying, startling, and agitation.

Newborn Rounding Activities

Using these physiologic principles, an efficient, effective routine to evaluate breastfeeding newborn infants and identify those in need of additional monitoring can be developed. Review of the maternal and newborn chart provides valuable details of the events surrounding birth and the following hours. This information, together with the findings from a targeted history, the newborn examination, maternal breast examination, and observation of a feeding, allows pediatricians to develop a care plan that (1) addresses the appropriate concerns for each mother-infant pair and (2) prevents spending time on issues that are not relevant in a given situation. The newborn infant's weight, urine output, and stooling are the primary outcome variables that indicate the success of the breastfeeding process; however, when making decisions regarding the well-being of the breastfed newborn infant, physicians should consider the various sources for error in measuring and recording these values.

Weight

Term newborn infants gradually lose weight between delivery and the development and consumption of an ample milk supply. This loss gradually occurs over the first 3 or 4 days after delivery. The initial weight loss should be no more than 7% to 8% of the birth weight,^[36] and the nadir should occur on day 3 or 4 after delivery. The weight should stabilize in the 24 to 48 hours after the mother's milk "comes in," and the infant should begin to steadily regain the lost weight and return to birth weight by days 7 to 10 after birth. If the infant is 3 or 4 days old, the weight loss is 8% to 10%, and the mother has no breast changes indicative of stage 2 lactogenesis,^[28] identification and correction of the problem plus appropriate supplemental nutrition usually are indicated. Infants whose weight rapidly decreases by 7% or 8% in the first 24 to 48 hours require early intervention to minimize catabolic expenditures and provide supplemental nutrition to prevent excessive weight loss. Infants who pass several large meconium stools during the first 24 hours may seem to have excessive weight loss. If other parameters are acceptable, these infants may not be in need of intervention. If an infant's weight is not consistent with other findings, the child should be reweighed before any decision is made. Test weights in the first 24 to 48 hours of life should be interpreted cautiously. Intake at this time is small and is not reflective of the progress of milk production and transfer after stage 2 lactogenesis occurs.

Urine Output

Infants' urine output in the first 3 days is another helpful indicator of adequate fluid reserves or intake. The commonly quoted normal parameters can be misleading. Urine output in the first 2 or 3 days reflects excretion of water and electrolytes from an infant's extravascular-extracellular reserve. Urine output gradually decreases as extravascular-extracellular fluid is depleted. Urine output does not begin to increase until the volume of human milk intake displaces the infant's need to use stored reserves. Therefore, urine output is expected to gradually decrease over the first 2 or 3 days and then increase as the intake of milk increases. For this reason, it is common for 3-day-old, breastfed infants to urinate only once in the 24 hours before the mother's milk "comes in." When an infant is appropriately breastfeeding and stage 2 lactogenesis occurs normally, urine output should steadily and rapidly increase after the third or fourth day postpartum to the stated three or four wet diapers per 24 hours, and the urine should be pale and the diaper wet and heavy. A lower urine output at 3 or 4 days of age is acceptable if the infant is feeding appropriately, has moist mucous membranes and an acceptable weight, and the mother has definite signs of increasing milk production. Infants who are ready to be discharged and have this constellation of findings should be re-evaluated 24 hours later by a physician or by a nurse skilled in lactation and newborn infant assessment. Urine output in the first 24 hours may be misleading if the infant urinated shortly before or during birth.

Stool Pattern

Stool output is a useful and reliable indicator of the adequacy of breast milk intake. The thick, **black** meconium characteristic of the first several days should change to a transitional stool of mixed consistency ranging from yellow to green-black shortly after an adequate milk supply is available (the third or fourth day after birth). As a reflection of appropriate intake, the stool should change rapidly to the characteristic fairly large, loose, watery,

yellow stool of the thriving breastfed newborn infant who will pass three or more of these per day and may have one or more with each feed. Stools that are consistently green or scant after the fifth or sixth day after birth indicate inadequate milk intake and a need for evaluation and intervention.

Early Breastfeeding Skills

Many breastfeeding problems can be prevented or corrected by studying and adjusting the position or support for the mother and infant's body in preparation for and during breastfeeding. In the United States, the problems with positioning for breastfeeding may be rooted in the lack of opportunity that women of childbearing age have to routinely observe other women nursing infants. The opportunity to observe and imitate species-appropriate breastfeeding behavior during the early childhood years when many instinctive skills are integrated into the behavioral repertoire could be crucial. A description of a similar behavioral distortion has been observed in nonhuman primates. The description can be found in Middlemore's 1953 book, *The Nursing Couple*.^[34A] Female chimpanzees raised in captivity with no exposure to adult females with nursing chimps had to be taught to breastfeed by zookeepers. On the other hand, female chimpanzees who were captured after they reached maturity in their natural tribal setting breastfed normally and without instruction. This finding also is intriguing given the relative absence of significant breastfeeding problems in cultures where breastfeeding is still culturally normal behavior.

Observation and evaluation of breastfeeding is a physical assessment skill. The aspects of a feeding to be observed and assessed are (1) the infant's "hunger cues" and the mother's response; (2) positioning and support of the infant for a feed; (3) mother's body position and posture for latch-on and feeding; (4) the infant's body position and oral motor technique for attachment to the breast and milk removal (i.e., suckling); (5) the duration of rapid suckling (2 sucks/s) before the milk lets down when suckling slows to accommodate milk flow (1 suck/s), at which time rhythmic swallowing is heard; (6) duration of the complete feed; (7) how the feeding is terminated; (8) the appearance of the mother's nipple, including shape, color, and perfusion after the infant detaches; and (9) the infant's appearance at the conclusion of the feeding. A concise, informative description of the breastfeeding process with clear photographs and drawings can be found in *BESTFEEDING: Getting Breastfeeding Right for You* by Renfrew et al.^[44] It is sometimes difficult for mothers to breastfeed their infants in a hospital bed because of problems with posture and position.

Discharge Planning

Because of the multiple variables in the breastfeeding couple occurring 48 to 72 hours after delivery, the follow-up plan is important and must be communicated to the family. Many hospitals, communities, and health plans have identified this vulnerable period and developed programs that ensure reliable follow-up provided by telephone, home visits, or as hospital-based newborn follow-up services. The AAP breastfeeding policy statement^[3] recommends, "When discharged < 48 hours after delivery, all breastfeeding mothers and their newborn infants should be seen by a pediatrician or other knowledgeable health care practitioner when the newborn infant is 2 to 4 days of age." The health care provider must adjust this follow-up schedule according to the condition of the infant, mother, and breastfeeding process.

PEDIATRIC OFFICE PRACTICE

The supervision of children's health care during well-child visits is the cornerstone of good pediatric care. Effectively supporting breastfeeding is an integral part of well-child care and as important to preventive care as promoting immunizations, car seat use, and proper infant sleep position. It is difficult for a busy pediatrician to stop and think through his or her daily routine and identify all of the potential opportunities for offering guidance regarding breastfeeding concerns. The AAP Breastfeeding Promotion in Pediatric Office Practice program has been designed to help pediatricians to efficiently integrate breastfeeding care into the office routine. The Maternal and Child Health Bureau of the US Department of Health and Human Services and the

AAP Friends of Children Fund finance this project. The multiple opportunities in the general pediatric practice to support breastfeeding are described in the program's document, "Ten Steps to Supporting Parents' Choice to Breastfeed Their Infant,"^[4] which is reproduced in Appendix A of this issue (p. 533). It describes how to create an environment that is inviting, encouraging, informative, flexible, and supportive for families who are breastfeeding their infants. Transforming the pediatric office into a setting where breastfeeding is the societal norm creates an influential educational experience for parents and children in the community. Any pediatrician can adopt the practices summarized in this document. The transformation need not occur all at the same time because this change can cause resistance and confusion. The changes are more rewarding and enduring if they are gradually adopted over time at the pediatrician's and office staff's own pace.

Breastfeeding Health Supervision During Well-Child Visits

The soul of the pediatric breastfeeding advocacy in the office practice is the verbal and nonverbal message communicated by the pediatrician to families during each well-child visit. Physicians' storehouse of information, advice, and intervention must be offered regularly and in a manner that senses the family's anxiety or exuberance regarding their infant and their decisions. As always, the parents are the experts on their infants and their lives, and pediatricians are their consultants and mentors. The pediatrician's job is to provide accurate information and viable options. Their job is to select that which best suits the image and aspirations they have for themselves as parents and their children. Pediatricians have no control over what parents choose to do and how they choose to feel about their decisions. No matter what the eventual outcome of advocating breastfeeding, many rich and memorable conversations and clinical experiences center on these encounters.

Issues covered at well-child visits regarding breastfeeding change over time and according to the needs of the family. The mother breastfeeding her first infant will have different concerns than the mother nursing her third child. Two aspects of identifying important concerns are (1) efficient information gathering and (2) targeted sharing of information. A few opening questions can put the pediatrician on the right road quickly:

1. How is your breastfeeding going?
2. Do you have questions about breastfeeding?
3. Do you need help with any aspect of breastfeeding?

To increase efficiency, pediatricians also can provide anticipatory information while asking assessment questions, for example:

1. Many mothers think their 4-month-old infants are getting tired of breastfeeding because they are so easily distracted by other things happening around them. Have you wondered this about your infant?
2. When the infant is breastfeeding, some fathers feel somewhat left out because they can't feed the infant. What are your husband's feelings about this?
3. Many parents feel pressure from family or friends to introduce solid foods earlier than approximately 6 months. How about you and your family?

Table 1 (Table Not Available) organizes anticipatory guidance issues related to breastfeeding according to the health maintenance visit, in which it is recommended that the topics be assessed or introduced. Important information is best offered before the time when the issue usually presents itself and when the family is not overwhelmed with other concerns. If a family inquires about a topic, it should be explained to their satisfaction even if it does not seem to be an appropriate time for this to be a concern. Table 1 (Table Not Available) is adapted from the AAP Checklists for Breastfeeding Health Supervision that was designed in conjunction with the Breastfeeding Promotion in Pediatric Office Practice program.^[2]

TABLE 1 -- OVERVIEW OF BREASTFEEDING HEALTH SUPERVISION: PRENATAL T

(Not Available)

Excerpted from American Academy of Pediatrics Breastfeeding Health Supervision and Checklists for Breastfeeding Grove Village, IL, American Academy of Pediatrics; copyright American Academy of Pediatrics; with permission

[Table 2](#) , Breastfeeding Developmental Milestones, on the other hand, illustrates how the parameters and issues relative to breastfeeding change over the first year of an infant's life and when the transitions are anticipated. As can be seen in [Table 2](#) , the first 2 months of the breastfeeding relationship are dynamic. Usually after 2 or 3 months, the infant and family have established a more predictable routine^[19] and are more comfortable with the breastfeeding process. Between 2 and approximately 6 months, there usually is time for everyone, including the pediatrician, to relax and enjoy the rewards and ease of breastfeeding and the engaging charm of the infant. At the 6-month visit, praise and congratulations are important, and special attention should be paid to achieving the goal of exclusive breastfeeding for approximately 6 months. Also, at approximately 6 months, the issues surrounding the introduction of solid foods become a priority, and the pediatrician addresses the importance of dietary iron and any need for iron, fluoride, or vitamin D supplements. In the second half of the first year, the issues are more behavioral and social. The focus is on the infant's developing personality and behavior regarding breastfeeding. The pediatrician will want to respond to the social pressures to wean the infant that many women experience from friends, spouse, or family members. At the conclusion of the first year their appropriate contribution from the pediatrician is to *celebrate*. Families deserve pediatricians' applause and acknowledgment for their breastfeeding accomplishments.

TABLE 2 -- BREASTFEEDING DEVELOPMENTAL MILESTONES: THE FIRST

Parameter	Birth	2 Wk	1 Mo	2 Mo	4 Mo	6 Mo
Weight	May loose \approx 8% of birth weight in first 3-4 d	Regains birth weight	Gains 140-196 g/wk, growth follows std chart	--	--	Gains 84-140 g/wk, growth may follow lower percentile on std chart
Stools	Meconium changing to yellow/greenish black by day 3 or 4	3-4/d, possibly one every feed, color yellow Can be watery	Frequency \downarrow if formula offered	Stools may decrease to one every 3-7 d	--	Stools change when start solid food
Feeding	Variable, at least 8-12 per 24 h	--	\uparrow Predictability 8-12 per 24 h	8 to \geq 10 feeds per 24 h	--	--
Night feeding	Wake baby to feed every 3-4 h	Feed on cue, wake for night feeding if sleeps > 5 h	--	Feed on cue if gaining well	--	--
Feeding devices	Avoid artificial nipples	Discourage pacifiers, may introduce bottle nipple	--	--	After 4-6 mo offer supplemental fluids in cup	--

		if indicated				
Vitamins and minerals	Vit. D 400 IU/d at any age if indicated	--	--	--	--	Fluoride indicated Consider iron sources
Solid foods	--	Effects of mother's diet on infant	--	The effect of what the neighbors fed their infant	The infant looks at what mom is eating	The right time to give the infant solid food
Sleep issues	Unpredictable pattern Importance of night feedings "He wakes up every time I put him down"	Options of where infant will sleep Sleep safety counseling Father can help at night	--	--	--	Usually content to wake once night
Behavior issues	Sleeps too much Infant cues	Doesn't sleep enough Fussiness Colic Appetite spurts	--	Distractibility Teething behavior "The baby likes the bottle better"	--	Focus on developmental tasks may change breastfeeding behavior
Maternal issues	Adequacy of milk supply Sleep Fluids and nutrition Changing relationship with partner Visitors Help with house and sibs Engorgement Sore nipples	Nutrition Postpartum depression Balancing with other children Prescription medications	Milk supply Breast size returns to prepregnancy appearance Dietary restrictions Nursing in public Contraception	Return to work Child care Exercise Dieting OTC meds	Return of ovulation and menstrual cycle	Referral for routine breast exam by mother's physician

OTC = Over-the-counter; Hgb = hemoglobin at 9-15 mo, mean 12.3, lower limit 11.0; Hct = hematocrit at 9-15 33.0.

The following discussion provides detail on certain aspects of anticipatory guidance for the breastfed infant. Regarding supplemental feedings, nutritional supplements, introduction of solid foods, dental hygiene, and maternal concerns, the reader is referred to the other articles in this issue.

The 48- to 72-Hour Visit: Dynamic Preventive Health Care

Early follow-up after hospital discharge may be the most effective intervention to ensure the ongoing success of breastfeeding. At this juncture, the mother may need reassurance that everything is coming together and working beautifully or may need a few minor alterations to make the difference between success and failure. Some mother-infant pairs need intensive intervention and support. The issues to be covered in the first office

visit are the natural extension of the process that started in the hospital during the first 24 to 48 hours. It is useful to view the evaluation as a breastfeeding *system* analysis. Reaching appropriate conclusions requires analyzing the equipment, process, product, and outcome of the system. Therefore, it is appropriate to determine (1) the well-being of the mother, (2) condition of the breast, (3) success of the milk-production process, (4) well-being of the infant, (5) condition of the oral-motor mechanism, (6) effectiveness of attachment to the breast, (7) suckling capability, (8) success of milk transfer, (9) and milk use. Some pediatricians choose to evaluate the breastfeeding process and the mother's breast themselves, and others choose to train their office nurses to assist with these evaluations. Some pediatricians have a lactation specialist on their staff or have established a cooperative relationship with a lactation specialist in their community to assist in the evaluation, support, and follow-up of early breastfeeding. The pediatrician, however, must retain responsibility for the well-being of the infant and oversee the care provided.

Feeding Routines and Behaviors

Breastfeeding has a wide range of physiologic and emotional effects on infants, so an infant's request to breastfeed represents various needs. The standard comments that a mother should not put her infant to breast because "he is just using you for a pacifier" or "he couldn't need to nurse already" rarely appropriately interpret the infant's signals, effectively solve the possible breastfeeding problem, or alleviate the mother's associated concern. The normal range for the frequency and duration of breastfeeds is wide. When, after carefully evaluating the situation, it is determined that an infant is not feeding often enough or is feeding too often, the cause usually is a solvable problem with mother's milk supply or the infant's feeding technique. Usually, the early introduction of supplemental feedings with human milk substitutes is not needed when lactation is going well and may aggravate an existing problem.^[28]

After the newborn infant achieves physiologic homeostasis, the frequency of breastfeeding most likely is related to the drive to obtain nutrition, develop effective feeding behavior, and ensure adequate milk production through breast stimulation, breast emptying, and prevention of maternal engorgement.^{[12] [13] [37] [38]} During the first 4 to 6 weeks after birth, feeding frequency and duration gradually become more predictable, but there continue to be periods of frequent or prolonged feedings. These commonly are referred to as "feeding marathons," "growth spurts," or "appetite spurts."^[36] These periods are marked by the baby's desire to nurse longer and more frequently. The infant may be fussier than usual. If the mother allows the infant to breastfeed *ad libitum* in response to these signals, the behaviors gradually diminish over 2 to 4 days. The consensus of opinion is that the mother's milk production increases in response to this increased stimulation, and, with the increase in milk availability, the infant again becomes satisfied and returns to a more predictable feeding pattern. Many mothers understandably interpret these signals to mean that their milk supply is failing and that the infant is in need of supplemental feedings. This solution interrupts the physiologic communication system between the infant and mother's body and prevents the necessary stimulation to increase the available milk supply. After the first 2 or 3 months, these appetite spurts become less frequent, shorter, and less pronounced.

As infants mature, developmental and behavioral issues become the most significant factor affecting feeding pattern. Four-month-old infants are notorious for being easily distracted from nursing by the things going on around them. These infants repeatedly pull away from the breast to look around. This behavior can be frustrating and uncomfortable for the mother. Distractibility can be misinterpreted easily as lack of interest in breastfeeding and result in premature weaning. The more accurate interpretation is that the infant is confident that the milk supply is reliable and that it is safe to spend some energy checking out the environment while he or she is enjoying a leisurely dining experience. It can become necessary for the mother to find a secluded place to breastfeed that will afford minimal distractions. During the latter part of the first year and in the toddler years, breastfeeding provides nutritional support and becomes integrated into the child's process for resolving issues surrounding security, attachment, and independence. Older infants may increase or decrease the frequency of breastfeeding during acquisition of new developmental skills or times of stress. Nursing for comfort is an anticipated, normal behavior of older infants. Because of the complex behavioral interactions, older infants nurse from less than 6 to more than 12 times a day, and this number varies from day to day.

Elimination Patterns

At the risk of overemphasizing the infant's excretory activities, it is useful to keep track of the urine and stool outputs of breastfed infants until their mothers' milk supply is well established. After the crucial period of transition, breastfed infants usually have six to eight wet diapers per day and four or more large, loose or watery, yellow stools per day. Many infants produce a stool with each feeding until 6 to 8 weeks of age, at which time the stool pattern may change fairly dramatically to one voluminous stool every 5 to 7 days. Some mothers observe increased fussiness in their infants during this transition that may or may not be related to the change in bowel-evacuation pattern. Treatments usually used for constipation, such as the addition of fruit juice or the use of suppositories, are not indicated and may prolong the interval between stools. The introduction of human-milk substitutes and foods also results in changes in stool patterns among breastfed infants.

Sleep and Nighttime Feeding

Sleep, or the lack thereof, is a major concern for new mothers and is commonly presented to pediatricians. The literature on infant sleep and related expectations is vast, technologically sophisticated, and diverse. To complicate the picture, parental and physician expectations regarding infant sleep are firmly rooted in cultural beliefs, personal sleep requirements, and personal child-rearing experience and preferences that may not be scientifically sound. Although proponents of the different approaches for managing sleep in infants are commonly dogmatic, persuasive, and sometimes intimidating, there are no long-term studies regarding the psychologic or emotional outcome of different infant sleep practices. Satisfying and useful anticipatory guidance regarding infant sleep and nighttime feeding results from providing information regarding the numerous acceptable options available for establishing nighttime routines and responses and any associated risks or benefits.

In the early days of establishing breastfeeding, infants should nurse at least 8 to 12 times every 24 hours, and these feedings should occur at a minimal interval of every 3 or 4 hours. During the first 2 or 3 weeks after birth, infants must be aroused for feeding throughout the night. After the mother's milk supply is well established and the infant has regained birth weight, the nighttime feeding interval can be extended to 5 hours. Between ages 1 and 2 months, it is acceptable to allow infants to wake on their own for the feedings they need at night. Pediatricians and mothers should be aware that, if the mother's milk supply seems to be diminishing, it might be useful to reinstitute a nighttime feeding.

Several studies have shown that breastfed infants have a different sleep pattern than do artificially fed infants. In one study,^[43] a significant difference was shown between breastfed and bottle-fed infants regarding the number of awakenings and the hours of night sleep, with breastfed infants awakening more and sleeping less at night. No significant difference was found in the hours of total sleep diurnally, however. Mothers exhibited corresponding differences in sleep patterns, with a statistically significant increase in night waking for breastfeeding mothers. Butte et al^[8] found that, at 4 months of age, sleep parameters vary according to how an infant is fed. In this study, the total number and duration of sleep cycles, rapid eye movement (REM) latency, number of non-REM (NREM) and REM epochs, and duration of NREM epochs were similar for breastfed and artificially fed infants. On the other hand, sleep latency was shorter and duration of REM epochs longer in the formula-fed group, and artificially fed infants spent more sleep time in REM compared with breastfed infants. Conversely, breastfed infants spent more sleep time in NREM sleep, and their heart rates during sleep were lower (114 versus 126 bpm). Infants who were breastfed into the second year developed sleep-wake patterns that were different than usually expected in this age group. Instead of having long, unbroken night sleep, they continued to sleep in short bouts with frequent waking. Their total sleep in 24 hours was less than that of weaned infants.^[16] The sleep-wake development accepted as the physiologic norm for infants in Western cultures is more consistent with the pattern of artificially fed infants. This expected pattern results in mothers of breastfed infants feeling confused and sometimes inadequate when their infants persist in requesting nighttime feedings. Pediatricians can alleviate much of this angst by providing accurate explanations and realistic expectations regarding the sleep behavior of breastfed infants.

It is suggested commonly that more support for dealing with night waking might prevent early termination of breastfeeding. In an effort to address this issue, Pinilla and Birch^[40] found that exclusively breastfed infants could be taught to sleep through the night (defined as 12 AM to 5 AM) during the first 8 weeks of life. In the study, treatment-group parents were instructed to offer a "focal feed" (between 10 PM and 12 AM) to their infants every night, to gradually lengthen intervals between middle-of-the-night feeds by carrying out alternative caretaking behaviors (e.g., reswaddling, diapering, or walking), and to maximize environmental differences between daytime and nighttime. By age 8 weeks, 100% of treatment-group infants were sleeping through the night compared with 23% of control-group infants. Treatment-group infants were feeding less frequently at night but compensated for the relatively long nighttime interval without a feed by consuming more milk in the early morning. Milk intake for 24-hour periods did not differ significantly between groups.^[40] This type of intervention may be attractive to some families, whereas others may prefer to nurse the infant back to sleep. Other sleep-training techniques have been published^{[17] [53]} that are helpful to some families but are not particularly suited for use in the first 2 or 3 months, when it is important for infants to maintain appropriate nighttime feedings to support an adequate milk volume.

Across many cultures and many years mothers have solved the problem of nighttime feedings by sleeping with their baby so that the baby can nurse intermittently throughout the night, and the mother's sleep is fairly undisturbed. Families who choose this type of sleeping arrangement need reassurance that this is a common behavior.^[34] There is current research that supports the safety of cosleeping^{[33] [34] [45]} and its potential benefits for successful breastfeeding.^[33A] Other families choose to have the baby sleep beside the parents' bed in a bassinet or crib. Others place the baby in a crib in a separate room from the parent, and mother or father get up and get the baby for nighttime feedings. Wherever the family chooses to have the baby sleep, it is important that the current AAP guidelines for safe infant sleep be communicated to the parents.^[33B] This includes placing the otherwise healthy baby in a supine position for sleep and avoiding soft sleep surfaces, loose bedding, and arrangements that present a risk for entrapment.

Feeding Devices and Artificial Nipples

Nipple confusion has been attributed to various factors in the immediate newborn period, none of which are proved.^[35] Regardless of the underlying cause, the introduction of an artificial nipple has the potential to disrupt effective breastfeeding behavior, especially if introduced before the mother's milk supply is well established. The practice is best avoided. On the other hand, when appropriate assessment indicates that supplemental feedings are indicated for a breastfed infant, and alternative techniques, such as cup-feeding, are not feasible or appropriate, the use of an artificial nipple is a reasonable alternative^[10] that may facilitate eventual success in breastfeeding.

After breastfeeding is going well, some mothers wish to introduce bottle-feeding because they have occasion to be separated from the infant or the father wishes to feed the infant. This practice should not be a routine recommendation from pediatricians because it is not necessary in all cases or desirable to all mothers and has the potential to interfere with successful breastfeeding. It usually is acceptable at approximately 4 weeks of age. Mothers need to be aware of signs that their infants are developing nipple confusion, such as (1) becoming easily frustrated or fussy at the breast, (2) development of nipple pain, or (3) frequently pulling off of the breast and crying. If these things occur, it is recommended to discontinue the bottle or pacifier until the infant is again breastfeeding effectively. Many infants are such dedicated breastfeeders that they refuse any other type of milk-delivery system from early on and defend this preference vigorously. This preference is understandable from an infant's point of view but can be frustrating to some mothers. Various techniques for introducing a bottle to a breastfed infant are listed in the box (Box Not Available) . After 4 to 6 months of age, it is not necessary to introduce a bottle if the family is starting the infant on supplemental human milk substitutes or other fluids. At this age, fluids are best offered in a cup to prevent the complications associated with bottle-feeding and to eliminate the necessity of eventually having to wean the infant from the bottle.

SUGGESTIONS FOR INTRODUCING A BOTTLE TO A BREASTFED INFANT
From Mohrbacher N, Stock J: The Breastfeeding Answer Book, revised. Schaumburg, IL, La Leche League International, 1997, p 211; with permission.

(Not Available)

SUMMARY

Integrating breastfeeding care into pediatric practice and thought process results in improved breastfeeding outcomes for patients and significant professional satisfaction for pediatricians. Meeting a family's expectation to help them succeed in their desire to breastfeed their infants is rewarding. Current knowledge regarding the appropriate care of the breastfed infant immediately after birth provides an engaging opportunity to reframe ideas regarding good newborn care. Whatever may have previously been thought regarding newborn care, the true objectives are to maintain optimal physiologic parameters and optimize neurophysiologic and behavioral homeostasis in transitional infants. The goal is a thriving, eagerly breastfeeding newborn infant and a comfortable mother with an abundant milk supply within the physiologically anticipated time frame. In the office setting, supporting the ongoing success of the breastfeeding is a natural extension of the preventive health care activities that are the cornerstone of general pediatrics. Facilitating parents' plan to breastfeed their infants by incorporating good breastfeeding care into daily practice routines is professionally satisfying, enhances the well-being of pediatric patients, and enriches the experience of practicing general pediatrics.

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