

Increased Lactation Risk for Late Preterm Infants and Mothers: Evidence and Management Strategies to Protect Breastfeeding

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Late preterm infants (34 0/7–36 6/7 weeks of gestation) are often cared for in general maternity units by clinicians who have limited experience with the specific needs of these newborns. Although the benefits of human milk are well documented, mothers and their late preterm infants are at risk for poor lactation outcomes. These include early breastfeeding cessation and lactation-associated morbidities, including poor growth, jaundice, and dehydration. Late preterm infants are more likely than term infants to develop temperature instability, hypoglycemia, respiratory distress, jaundice, feeding problems, and to require rehospitalization in the first 2 weeks postbirth. Breastfeeding can exacerbate these problems, because late preterm infants often lack the ability to consume an adequate volume of milk at breast, and their mothers are at risk for delayed lactogenesis. This article reviews strategies to protect breastfeeding for the late preterm infant and mother dyad by establishing and maintaining maternal milk volume while facilitating adequate infant intake. *J Midwifery Womens Health* 2007;52:579–587 © 2007 by the American College of Nurse-Midwives.

keywords: breastfeeding, lactation-associated morbidity, late preterm infant, nipple shields, test-weighing

INTRODUCTION

Late preterm infants (34 0/7–36 6/7 weeks of gestation) are often cared for in the general maternity setting, using breastfeeding guidelines and interventions that are appropriate for term, healthy infants. The rationale for these practices is that late preterm infants look more like term than preterm infants, and thus are often considered “not really premature” or “almost full-term.” Health professionals therefore tend to use Baby-Friendly approaches or other interventions that focus on exclusive at-breast feeding, without either supplementation or the use of temporary breastfeeding aids.¹ However, preliminary studies and clinical experience indicate that late preterm infants and their mothers have risk factors that affect the establishment of successful lactation and are especially susceptible to early breastfeeding failure.^{2–5} Similarly, lactation-associated morbidities such as dehydration, jaundice, and kernicterus are significantly more likely to occur in breastfed late preterm infants, with higher rates of medical care and/or rehospitalization during the first 2 weeks postdischarge in comparison to term breastfed infants and non-breastfed late preterm infants.^{2,4–11}

Late preterm infants represent the most rapidly growing segment of preterm births in the United States, and accounted for 72% of the 12.7% preterm birth rate in 2005.¹² Thus, it is essential to develop innovative strategies for this vulnerable population that establish and

maintain breastfeeding while preventing lactation-associated morbidities.

DEFINITION, EPIDEMIOLOGY AND COSTS ASSOCIATED WITH LATE PRETERM BIRTH

The definition of preterm birth (<37 completed weeks of gestation, counting from the first day of the last menstrual period) has not changed since 1950, when the World Health Organization differentiated low birth-weight infants (i.e., <2500 g) from those born prematurely. However, the “within-preterm” classifications have evolved over time.¹³ Until very recently, the descriptor “near term” was used for infants born between 34 and 37 weeks gestation,¹⁴ because 34 weeks marks a turning point in obstetric management after which antenatal steroids are not typically recommended.¹⁵

In 2005, a National Institute of Child Health and Human Development (NICHD) consensus panel recommended the use of the term “late preterm” to describe infants born at 34 0/7 to 36 6/7 completed weeks of gestation.^{16,17} This new terminology aims to properly communicate that late preterm infants are immature and therefore vulnerable to complications in the immediate newborn period, including the regulation of breathing, temperature control, glucose and bilirubin metabolism, alert-awake behavior, and effective feeding.^{4,5,9–11,18} Additionally, this terminology more appropriately captures the extra health care costs related to late preterm birth. Rehospitalization is expensive: the average daily cost of hospital readmission for previously discharged newborns is \$1163, with an average hospital stay of 3.2 days.¹⁹ When compared to term infants, late preterm infants not only incur an average additional \$2630 in pre-discharge

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hospital costs, but are also significantly more likely to require an observational stay or hospital readmission during the first 2 weeks postbirth.¹⁸

The risk of rehospitalization for the late preterm infant appears to increase with each decreasing week of gestation, with the highest risk being for relatively healthy late preterm infants who are cared for in the general maternity setting.^{10,20} A series of case-control trials on rehospitalization suggested that exclusively breastfed infants with gestational ages less than 39 weeks were significantly more likely to be readmitted for jaundice and dehydration than the general newborn population.^{2,6,7,20} More recent studies found that breastfeeding status at hospital discharge is the primary predictor of rehospitalization in late preterm infants.^{4,5} A breastfed late preterm infant is 2.2 times more likely than a breastfed term infant to require hospital readmission, whereas bottle-fed late preterm infants are no more likely than term infants to require hospital readmission.²⁻⁵ Although few studies have focused on continued breastfeeding after hospital readmission for lactation-related problems, anecdotal reports suggest that some parents are traumatized by rehospitalization because of lactation-related morbidities, and may instead elect to formula-feed,^{21,22} while other parents may receive medical advice to discontinue breastfeeding in this situation. The prevention of lactation-associated morbidities is key to optimizing the duration of breastfeeding for this population.

POSTBIRTH MORBIDITIES

The relative risk of medical morbidities is higher for late preterm than for term infants. When compared with the term healthy infant, the late preterm infant is significantly more likely to have temperature instability, respiratory distress, hypoglycemia, require an intravenous infusion, or have clinical jaundice.^{18,23} The brain tissue of the late preterm infant is also incompletely developed. At 34 and 36 weeks of gestation, respectively, the brain weighs only 65% and 80% of its projected weight at term, an immaturity that affects arousal, sleep-wake behavior, and other bodily functions.²⁴ Effective milk removal during breastfeeding may be affected by immature sleep-wake behavior and temperature regulation, which in turn can exacerbate morbidities such as hypoglycemia and hyperbilirubinemia.

Conceptually, the first 2 weeks postbirth pose the

greatest risk for early breastfeeding failure and lactation-associated morbidities in the late preterm infant and mother. In the healthy mother who delivers at term, approximately 30 mL of milk is available to the infant during the first 24 hours postbirth.²⁵ If lactation progresses normally, the infant has access to 100 mL of milk at 48 hours, which increases to about 700 mL at the end of the first week.²⁵ The term, healthy infant is physiologically equipped to consume these small volumes of milk during the first days postbirth because term infants have fat and glycogen stores that can be rapidly converted to needed calories.²⁶ In contrast, the late preterm infant has a higher metabolic rate and limited energy stores.²⁷ Even brief episodes of temperature instability deplete brown fat and other energy reserves, which sets the stage for hypoglycemia.²⁶ Thus, relatively small available milk volumes, even if adequately removed by the late preterm infant, may not be sufficient to prevent the onset of hyperbilirubinemia.

Jaundice

Regardless of feeding method, the late preterm infant is at greater risk for clinical jaundice than the term, healthy infant, and breastfeeding at the time of discharge is a major predictor of pathologic jaundice in the late preterm infant.^{28,29} Although many clinicians interpret this greater risk of jaundice in the breastfed late preterm infant as “breast milk jaundice,” this descriptor is incorrect. Instead, clinical jaundice in this situation results from inadequate milk intake, better termed “lack of breast milk” jaundice or “starvation jaundice,” which leads to infrequent stooling, exaggerated enterohepatic recirculation of bilirubin, and increased intestinal reabsorption of bilirubin.^{28,30} These factors increase bilirubin levels and thereby increase the risk for exaggerated jaundice and kernicterus.^{23,31,32} Clinical jaundice is usually accompanied by slow weight gain or dehydration, underscoring the primary etiologic factor as limited milk intake during the first days postbirth.^{23,28,30}

Data from the Pilot Kernicterus Registry (1992–2003) revealed that breastfed late preterm infants, especially those who were large for gestational age, developed kernicterus significantly more frequently than term infants.²³ The affected late preterm infants were generally admitted within 7 days postbirth, with peak readmission times of 4.1 to 5.0 days postbirth; nearly all infants presented to the hospital emergency room or physician offices with severe jaundice and suboptimal intake.^{28,29} However, before the infant’s rehospitalization, parents had received telephone reassurance from their primary care providers despite parental concerns that infants were feeding poorly, sleeping excessively, and appearing more jaundiced.²³

Thus, the most important consideration in managing lactation for the late preterm infant is to recognize that

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ineffective breastfeeding may be a manifestation of an underlying morbidity to which the infant is susceptible. The clinician must not focus exclusively on “fixing” the breastfeeding problem, but instead should retain a high index of suspicion for the presence of coexisting morbidities. For example, the late preterm infant who presents with the typical scenario of not waking to feed and falling asleep after a few minutes at the breast is often referred to as a “snacker” or a “sleepy baby,” for whom the clinician might recommend removing blankets or other practices to stimulate wakefulness. In fact, although appearing to present as a breastfeeding management problem, in the late preterm infant these symptoms may be a result of temperature instability or hypoglycemia, which require directed medical evaluation and treatment.

LATE PRETERM INFANTS AND MOTHERS BRING RISK FACTORS TO SUCCESSFUL LACTATION

Late preterm infants and their mothers each bring risks to the establishment of successful lactation that predispose the infant to inadequate milk intake during the first week postbirth. For the mother who delivers late preterm, these risks include delayed lactogenesis—or the milk “coming in” after day 3,^{33–35} compromising the availability of milk. For the late preterm infant, ineffective sucking during breastfeeding limits the removal of available milk. This typical scenario adversely affects the intricate interplay between the systemic lactation hormones prolactin and oxytocin and the autocrine control of lactation at the level of the individual breast through the feedback inhibitor of lactation mechanism. Ineffective milk removal over several days down-regulates milk volume through both systemic and local responses involving prolactin and feedback inhibitor of lactation. Thus, milk production is adversely affected.

Delayed Lactogenesis

The maternal factors associated with delayed lactogenesis are often overlooked in the mother of the late preterm infant because they may not have occurred in the immediate past. For example, a mother who has diabetes with pregnancy complications at 30 weeks of gestation may have been treated successfully with tocolytics, anti-hypertensives, and bedrest, such that the pregnancy progressed to 34 to 37 weeks of gestation, at which time she experienced a cesarean birth. These maternal complications can delay the onset of lactogenesis II (the change from small quantities of colostrum to copious milk production),^{33–35} such that the infant has access to little or no available milk. In the mother who feeds directly from the breast rather than visualizing milk output with a breast pump, these small volumes may go undetected.

The scant evidence on delayed lactogenesis suggests that these women will eventually “catch up,” usually by 7 to 10 days postbirth, if the breasts are stimulated and available milk is removed adequately.^{33,36} Thus, management strategies for the mother of the late preterm infant should focus on creating an adequate milk volume, so that lactation can be preserved during the critical period that the mother is at risk for delayed lactogenesis.

EFFECTIVENESS OF MILK REMOVAL DURING BREASTFEEDING

Although no research has specifically addressed the breastfeeding mechanics and milk intake patterns of late preterm infants, data from more prematurely born infants who reached comparable gestational ages are helpful in understanding why the late preterm infant has breastfeeding challenges.^{37–39} Additionally, some studies of bottle feeding in premature infants have included longitudinal designs and instruments that focused on measuring the changes in sucking mechanics over time, providing perspectives on how one might “typically” expect a late preterm infant to feed at the breast. In combination, the breast- and bottle-feeding literature suggests that the late preterm infant is vulnerable with respect to consuming an inadequate volume of milk during exclusive feeding at the breast.

A number of studies conducted with bottle feeding premature and late preterm infants indicate that sucking efficiency and total milk consumed increases through 40 weeks postconceptional age.^{37–42} Gewolb³⁷ reported that sucking is dysfunctional among late preterm infants, and Medoff-Cooper,³⁸ who studied infants at weekly intervals using the Kron Nutritive Sucking Apparatus, demonstrated quantitatively significant differences in all measures of sucking between 34 weeks and term, including the intensity of suction pressures. Maturity of suction pressures is of utmost importance for breastfeeding, because the infant uses suction to draw the maternal nipple into the oral cavity and to create the nipple shape that is essential for effective breastfeeding.⁴³ Similarly, during pauses in breastfeeding, the term infant maintains an average of 50 mm of (negative) suction pressure during pauses in sucking bursts,³⁹ apparently to prevent “slipping off” the breast, a maturity-dependent factor that facilitates breast stimulation, milk removal, and adequate intake.

Although studies of bottle feeding cannot be adapted indiscriminately to the mechanics of breastfeeding, Lau et al.³⁹ have conducted elegantly designed longitudinal studies of premature infants that examine the relative contributions of suction and expression pressures to the extraction of milk during bottle feeding. These studies resulted in the development of five ordinal categories (stage 1 = lowest; stage 5 = highest) of sucking maturity based on the relative contributions of suction and expression to milk removal.³⁹ Overall, the less mature the

infant, the greater the dependence on expression to extract milk, with suction pressures absent until stage 4, and maturing with respect to strength and integration with expression only by stage 5. Achievement of stage 5 in Lau's sucking categorization corresponded to a mean postconceptional age of 36 weeks (range, 34–44 weeks), underscoring the variability with which suction pressures mature.

Although these studies were not conducted with late preterm infants during feeding at breast, the findings that suction pressures are relatively weak for gestational ages that correspond to late preterm birth are consistent with clinicians' observations for this population. Weak suction pressures would both explain why infants do not maintain an effective "latch" at the breast and why they slip off of the breast during pauses between sucks. Similarly, the wide variability in maturity with which infants achieve stage 5 of sucking would explain why some infants born at 34 gestational weeks can effectively remove milk during feeding at the breast, whereas some born at 37 weeks cannot.

One additional study adds further evidence to the poor ability of late preterm infants to extract milk from the breast even when it is available. As a part of a randomized clinical trial focused on the measurement of milk intake in the home, an experimental group of 24 mothers measured milk intake during feeding at breast of their preterm infants over the first 4 weeks post-neonatal intensive care (NICU) discharge, using test-weights.^{44–46} Although at NICU discharge, the mean postconceptional age and weight (36 ± 2 wks and 2248 ± 97 g, respectively) approximated those typical of the late preterm infant, there was one major difference: all mothers in this study had an established milk supply that exceeded infant intake requirements. Even with adequate available milk, the infants consumed a mean of only 30% of daily intake from the breast during the first week at home, gradually increasing to 52% of daily intake during breastfeeding over week 4⁴⁷ (Figure 1). Extra mothers' milk was given by bottle to supplement and complement feeds at breast. Infants made the final transition to taking all feedings at breast at approximately 42 weeks postconceptional age, or at approximately 6 weeks after NICU discharge. These findings suggest that the ability to extract available milk from the breast improves with increasing maturity. However, the data also underscore the fact that milk is not consumed by late preterm infants simply because it is "available" in the breast.

Thus, the cumulative literature suggests that immature oromotor skills, specifically weak suction pressures, predispose the late preterm infant to inadequate milk intake from the breast related to ineffective milk removal, even in the presence of adequate available milk. Similarly, mothers who deliver late preterm infants are at risk for delayed lactogenesis and other conditions that limit the volume of milk available to the infant. These

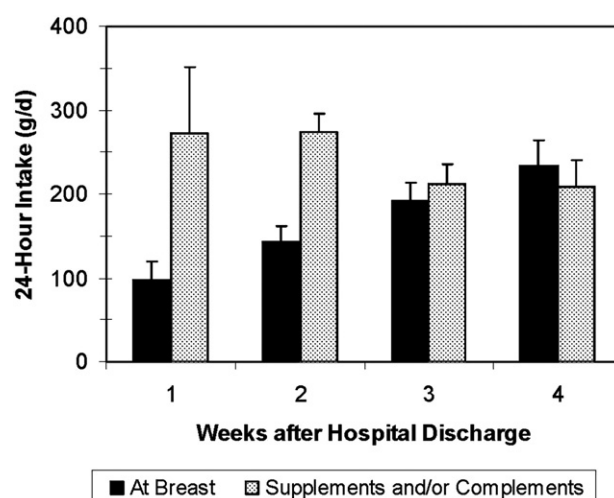


Figure 1. Volume of milk consumed at the breast and as supplements and complements in the first 4 weeks post-NICU discharge for premature infants. (© Nancy Hurst, Paula Meier, and Janet Engstrom. Used with permission.)

problems are cyclic, in that immature sucking further reduces available milk, which in turn, limits infant intake. Over the course of a day or two, the late preterm infant can become lethargic, dehydrated, and jaundiced, and sucking becomes even more ineffective, setting the stage for poor lactation outcomes in this population. This cascading series of risks is depicted in Figure 2.

INTERVENTIONS TO PREVENT BREASTFEEDING FAILURE AND LACTATION-ASSOCIATED MORBIDITIES

Interventions for the late preterm infant and mother during the critical first 2 weeks postbirth should focus on: 1) establishing the mother's milk supply and 2) ensuring that the late preterm infant is adequately fed. For the term healthy infant, frequent and unrestricted breastfeeding accomplishes both goals, and is the basis for the Baby-Friendly 10 steps.⁴⁸ However, this is not the case for the late preterm infant–mother dyad, for whom the most important first step is recognition of significantly greater risk for poor lactation outcomes. The clinician who cares for late preterm infants and their mothers should not assume that breastfeeding will proceed effectively. Instead, a cautious approach that incorporates additional lactation assessment and intervention during the early postbirth period both in the hospital and after discharge home is essential for this population.

The Immediate Postbirth Hospital Stay

Some late preterm infants are capable of stimulating the mother's breasts sufficiently in the immediate postpartum period, but many are not. If the infant does not sustain at least 15 minutes of effective suckling 8 to 10 times in a 24-hour period, the mother should use a

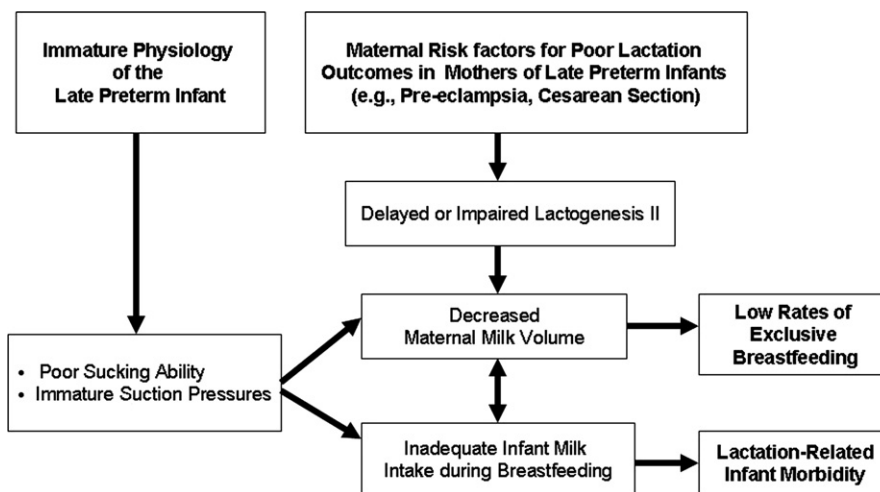


Figure 2. Conceptual framework for poor lactation outcomes in late preterm infants. Reprinted with permission from Lydia Furman and Paula Meier.

hospital-grade breast pump to provide this stimulation. Although many women will have purchased a smaller electric or battery-operated pump to use in combination with feeds at breast, this pump will probably be ineffective in establishing an optimal milk volume during the critical first weeks postbirth. These smaller, more portable pumps are intended for use during brief mother–infant separations (e.g., the workplace or for mothers whose infants provide the primary stimulation to the breast). In contrast, for mothers of late preterm infants, the pump is used to stimulate the breasts optimally because the infant is unable to do so. The more powerful suction–release cycling of a hospital grade electric pump is best equipped to compensate for the infant’s ineffective suck in establishing the mother’s milk supply.

In the immediate postbirth period, the mother who delivers late preterm is often exhausted and may be recovering from pregnancy and birth-related complications such as pregnancy-induced hypertension and/or treatment of preterm labor. The mother may therefore be physically unable to feed her late preterm infant eight to 10 times daily and use the breast pump following the feedings. In these situations, the mother should be encouraged to pump instead of trying to breastfeed for every feeding. A good approach is to breastfeed when the infant is able to sustain periods of wakefulness and to pump when the infant is sleepy or difficult to arouse. The mother can be reassured that the infant will eventually consume all feedings at breast, especially if the milk supply and the rapid flow of milk are established. The pump is often more effective than the late preterm infant in accomplishing these objectives early on.

The importance of prioritizing maternal milk supply during the first days postbirth is especially important for mothers of late preterm multiples, who will need to produce at least 600 mL of milk daily per infant in order to exclusively breastfeed.⁴⁹ Rather than trying to teach the mother a variety of positions for simultaneous breast-

feeding, the clinician should emphasize that feeding two infants at once will be very difficult until the infants approach their due date and the milk supply is abundant.⁵⁰ The use of a breast pump in-hospital is even more important for the mother with late preterm twins or higher-order multiples.

Breastfeeding Positions for the Newborn

Breastfeeding positions that provide head support for the late preterm infant will help the infant feed more effectively.^{51,52} The head of a late preterm infant is heavy in relation to the relatively weak neck musculature; many of the traditional breastfeeding positions allow the head to fall forward or backward, and the infant cannot maintain the latch on the breast because of immature suction pressures.^{51,52} The football (Figure 3) or cross-cradle (Figure 4) holds are especially useful with this population, because they provide the necessary head support that allows the mother to bring the baby to the breast, not vice-versa. To provide this head support, the mother encircles the infant’s head with her hand and supports the shoulders with her wrist and forearm. Gentle pressure from her hand maintains the infant’s head in an appropriate position, compensating for the weak neck musculature and helping the infant maintain the latch on the breast. The clinician should ensure that the torso, shoulders, and head are in a straight-line alignment, as demonstrated in Figures 3 and 4.

Nipple Shields

If the infant cannot sustain an effective latch on the mother’s breast with these specialized positioning techniques, the clinician should consider introducing a nipple shield to facilitate milk intake and breast stimulation. Although the use of nipple shields remains controversial in the clinical literature,^{53,54} a series of studies with term

and preterm infants indicate that the newer ultra-thin silicone nipple shields increase rather than decrease milk transfer to the infant,^{54–56} and lengthen rather than shorten duration of breastfeeding.⁵⁵

The nipple shield functions by compensating for the relatively weak suction pressures of the late preterm infant that result in “slipping off” of the breast during pauses or falling asleep after a few minutes of sucking.⁵⁵ It can serve as a temporary breastfeeding aid until the infant’s suction pressures strengthen, and the ability to stay awake and consume an entire feeding at breast is consistent. In one study of preterm NICU infants, duration of nipple shield use coincided with infants reaching approximately term, corrected age.⁵⁵ Thus, the in-hospital clinician can introduce the nipple shield, ensure its proper fit and use, and establish a discharge plan that includes nipple shield use until the infant can transfer an adequate volume of milk during breastfeeding.

To use the nipple shield effectively, it should fit the mother’s breast properly, and the infant should be latched



Figure 4. Infant breastfeeding in the cross-cradle position. Note that the infant’s torso, shoulders, and head are in alignment. (Used with the permission of Medela, Inc., McHenry, IL.)

onto the entire areola, not just the tip of the shield. Most late preterm infants should use a size “small” (20-mm) nipple shield, because the 16-mm and 24-mm sizes will be too small and large, respectively. **Figure 5** depicts the proper position of the mother’s nipple elongated into the tunnel of shield. To achieve this fit, the shield should be placed over the center of the nipple. The nipple should then be guided into the shield tunnel through a series of clockwise movements while at the same time stretching the base of the shield around the areola. Each stretch of the shield is accompanied by more nipple tissue being drawn into the shield. The edges of the shield circumference can be secured in place over the areola with a few drops of sterile water.

Using one of the positions depicted in **Figures 3** and **4**, the infant is guided onto the shield so that the tip of the



Figure 3. Infant breastfeeding in the football position. Note how the mother encircles the infant’s head with her hand and supports the shoulders with her wrist and forearm. (Used with the permission of Medela, Inc., McHenry, IL.)



Figure 5. Size small (20-mm) ultra-thin silicone nipple shield in place. Note that the mother’s nipple is elongated into the tunnel of the shield. (Used with the permission of the Rush Mothers’ Milk Club, Chicago, IL.)

infant's nose almost touches the nipple shield rim. Most infants will start sucking immediately. The mother should apply gentle pressure to the infant's head to ensure that the infant's lips and gums encircle the base, not just the tip, of the nipple shield. If the infant is correctly latched onto the nipple shield, each suck will result in visible movement in the area of the breast distal to the shield (Figure 6). Each infant suck will elicit this same movement in the breast. If the infant is placed only on the tip of the nipple shield, little or no breast movement with sucking is visible.

The nipple shield is an effective milk transfer device if there is milk available in the breast for the infant. If the mother experiences delayed lactogenesis, especially during the in-hospital period, the clinician can combine the nipple shield with a milk delivery device, such as the supplemental nursing system. The infant can consume all feedings at breast if the mother desires. The nipple shield compensates for weak suction pressures, and the supple-



ultra-thin
silicone
nipple shield

Figure 6. Late preterm infant properly latched onto nipple shield. Note that the infant's lips and gums encircle the base of the nipple shield, the nose is almost touching the shield, and the shield shows an indentation distal to the upper lip, reflecting breast movement from the infant's suck. (Used with the permission of Medela, Inc., McHenry, IL.)

mental nursing system provides available milk if sucking is effective. Parents can be discharged using this breast-feeding technique, provided that milk transfer is adequate, which can be assessed by test-weighing.^{45–47,57}

TRANSITIONING TO EXCLUSIVE BREASTFEEDING

Many parents and health professionals assume that once the late preterm infant is discharged from the hospital, the need for continued assessment and intervention ends. However, the available evidence suggests that all preterm infants are vulnerable to underconsumption of milk during exclusive breastfeeding until they achieve approximately term, corrected age.^{45,51,52} This evidence suggests that mothers of late preterm infants continue breast pump use to protect maternal milk volume and continue nipple shield use to facilitate adequate infant intake. The clinician can share the graph in Figure 1 with the mother to underscore the fact that the transition to exclusive feeds at breast takes over one month, on average. Whereas some clinical programs include families returning on a daily basis to a nurse-managed clinic during this critical time period,⁵⁸ most of these mothers and infants are discharged without referral to lactation specialists or other health care providers until the end of the first week postbirth.

In-home test-weights may be especially helpful in the detection of inadequate infant intake and weight gain for this population during the first weeks at home. Test-weights using the commercially-available BabyWeigh (Medela, Inc., McHenry, IL) scale can be performed accurately and easily by mothers,^{45,57} and do not increase maternal stress or anxiety when used in the home following discharge of preterm infants.⁴⁴

Using this small portable scale, which can be rented on a weekly or monthly basis, mothers can either measure milk intake at each feeding or a nude weight each day.⁵² These measures can guide the use of supplements and/or complements of either the mother's own expressed milk or of formula, if the mother's milk volume has not been completely established. The discharging clinician can provide the mothers with targets for daily infant milk intake and weight gain, and can consult with the mother by telephone concerning these measures on a daily basis during the first week post-discharge.⁵² The use of in-home test-weights eliminates the need for the family to go to a pediatrician or lactation specialist's office solely for a "weight check," which can be expensive for the family and exposes the infant to other pediatric illnesses in the care provider's office.

CONCLUSION

As the late preterm infant approaches term, corrected age, the mother will note that the infant wakes predictably to feed, stays awake longer at the breast, draws the nipple further into the tunnel of the nipple shield, and

gains the expected amount of weight from exclusive feeds at the breast. Only when all of these indicators are present should the mother gradually decrease the frequency of pumping and discontinue the use of the nipple shield. As these breastfeeding aids are discontinued, the mother should be encouraged to weigh her infant daily to ensure that these changes do not result in compromised milk transfer for the infant. Once the infant gains the expected amount of weight on exclusive feeds at breast after the mother has discontinued pumping, the clinician can be assured that breastfeeding can now be managed as it would for a healthy term infant.

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