



# Five Steps to Improve Bedside Breastfeeding Care

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ospital management of early breastfeeding directly affects the duration and exclusivity of breastfeeding. Improved rates of duration and exclusivity are the hallmark of hospitals that implement the evidence-based *Ten Steps to Successful Breastfeeding* advocated by Baby-Friendly USA (Baby-Friendly USA, n.d.; DiGirolamo, Grummer-Strawn, & Fein, 2008). Feeding only breast milk while in the hospital ranks high among the Baby-Friendly practices associated with exclusive breastfeeding postdischarge (Murray, Ricketts, & Dellaport, 2007; Perrine, Scanlon, Li, Odom, & Grummer-Strawn, 2012).

In recent years, tension has arisen on general maternity units between exclusive breastfeeding and/or breast milk feeding (a mandatory performance measure of the Joint Commission) in the face of the needs of the expanding population of newborns with increased caloric demands, such as late preterm infants, infants of mothers with diabetes, and small-for-gestational-age (SGA) and large-for-gestational-age (LGA) infants. Successful approaches that support breastfeeding term infants who are cared for in the same setting may place vulnerable newborns at risk for suboptimal intake. The escalating use of breastfeeding paraphernalia and double electric pumps (now insurance-covered under the Affordable Care Act) further challenges the concept that breastfeeding is a natural means of providing nourishment to infants. Given that the most common reasons for readmission in the first 2 weeks after discharge involve breastfeeding complications, and because breastfeeding is a major risk factor for readmission among healthy late preterm infants (Reddy, Ko, Raju, & Willinger, 2009), nurses, lactation consultants and physicians must look critically at our approach to lactation support.

We propose a way to reframe lactation support. Although invalidated as yet, reasonable thought suggests that this model could simplify basic staff training while addressing the need for consistently available, evidence-based proactive care.

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**Abstract:** Best postpartum breastfeeding practices must address the caloric needs of all infants, including vulnerable infants, while enabling long-term, exclusive breastfeeding. An adequate subsequent milk supply depends on early, frequent and effective colostrum removal. A combination of hand expression of colostrum, spoon-feeding and unrestricted breastfeeding provide more milk for infants and more stimulation for subsequent breast milk production. A sustainable, preventive practice model for low- and high-risk infants depends on elevating staff expertise and shifting the focus of lactation educators to address staff learning needs. We propose a five-step implementation program to achieve this. DOI: 10.1111/1751-486X.12076

**Keywords:** breastfeeding | breast milk | colostrum | hand expression | milk expression | spoon-feeding

Our observations on breastfeeding management during the postpartum stay are drawn from our collective experience at a university teaching hospital. The first author served as the physician director of the Breastfeeding Medicine Program (2002 to 2007); the second author was the nursing manager of the General Clinical Research Center (GCRC) with an emphasis on maternal-child care; and the third author, whose nursing efforts led to the designation of the first “Baby-Friendly Hospital” in the United States, has been involved in developing and implementing nurse-training programs in breastfeeding management at our center and hundreds of other U.S. hospitals.

Our proposal focuses on two well-recognized risks of suboptimal breastfeeding support—insufficient milk production and inadequate milk intake. We suggest two preventive measures to reduce both of these risks: (1) use of early hand expression and (2) spoon-feeding of colostrum. A shared, sustainable and proactive plan is proposed to incorporate these no-risk, no-cost techniques into the breastfeeding management plan. These techniques are in keeping with the Baby-Friendly *Ten Steps* and the Joint Commission’s goal to increase exclusive breast milk feedings at hospital discharge.

## Insufficient Milk Production and Inadequate Intake

Two possibly related problems may stem from suboptimal lactation management: insufficient milk production and inadequate milk intake. Milk production is the strongest determinant of duration and exclusivity of breastfeeding, and yet a perception of insufficient milk supply remains the most common reason given by mothers who stop breastfeeding during each time period in the first year, with the sharpest drop-off occurring within the first 4 weeks (Li, Fein, Chen, & Grummer-Strawn, 2008; Taveras et al., 2003). Compared with breastfeeding mothers of term infants, pump-dependent mothers of preterm infants are three times more likely to have insufficient production (Hill, Aldag, Zinaman, & Chatterton, 2007).

The most common reasons for rehospitalization after discharge—excessive weight loss, hyperbilirubinemia and hypnatremia—often are related to suboptimal breast milk intake, with late preterm infants being three times more likely

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than term infants (3.8 percent vs. 1.3 percent) to require readmission. Morbidity, commonly related to insufficient intake, doubles for each gestational week earlier than 38 weeks; for example, at 37 weeks morbidity is twice that observed at 38 weeks (McLaurin, Hall, Jackson, Owens, & Mahadevia, 2009; Shapiro-Mendoza et al., 2008). Even infants born early term have a greater risk of breastfeeding complications than those born at term, suggesting the possibility that full neurologic maturity and coordinated breastfeeding are not achieved until approximately 39 to 40 weeks (Hwang et al., 2013).

In recent years, the numbers of mothers and babies at increased risk for breastfeeding complications have grown significantly related to the rises in cesarean surgical delivery rates, maternal obesity, multiples, advanced maternal ages and other factors associated with preterm birth (Hincz et al., 2009; Mathews, Minino, Osterman, Strobino, & Guyer, 2011; Tita et al., 2009).

Optimal breastfeeding management in the first three postpartum days, beginning within the first hour, builds the foundation for both sufficient milk production and adequate intake. Early, frequent and effective removal of colostrum strongly influences the onset of early milk production (lactogenesis), as well as the quantity of early and subsequent milk production (Morton et al., 2009; Parker, Sullivan, Krueger, Kelechi, & Mueller, 2012). Breastfeeding and milk expression beginning within the first hour versus within the first 6 hours increase subsequent milk production and exclusive breastfeeding postdischarge (DiGirolamo et al., 2008; Parker et al., 2012) as well as decreasing the risk of dysfunctional latch (Dewey, Nommsen-Rivers, Heinig, & Cohen, 2003).

During the first several days of life, the caloric needs of term infants are met primarily by their own internal physiologic reserves (Ward & Deshpande, 2005), not solely from the small volumes of colostrum, which contains only 80 percent of the calories of mature milk (Lawrence & Lawrence, 2005, p. 110). Through a series of well-coordinated metabolic and hormonal adaptive pathways, neonates are provided with energy substrates until feeding is established. Rather than a source of nutrition, colostrum can be viewed as protective, providing passive immunity and bioactive factors that prepare the gut for high lactose, high fat and mature milk (Lawrence & Lawrence, 2005, pp. 114-115, 163). During this period, normal, well-breastfed term infants will lose approximately 7 percent of their birth weight and return to birth weight by around day 8 (Macdonald, Ross, Grant, & Young, 2003).

By contrast, late preterm infants, who are three times more likely to develop low blood sugar (Wang, Dorer, Fleming, & Catlin, 2004), may lack the necessary reserves and maturity to access and adequately manage on only the low volume and caloric content of colostrum available in the first several days after birth (Dollberg, Lahav, & Mimouni, 2001; Naveed, Manjunath, Sreenivas, 1992). The immature neurologic development of



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a 34- to 36-week-gestation infant who has a brain volume of only 65 percent to 80 percent of the term infant (Kinney, 2006) may account for a passivity at the breast. Their relatively large size, chubby appearance, deceptively vigorous nursing behavior and post-feed “contentment” (despite suboptimal intake) may account for their reputation as “the great pretenders” or infants who “masquerade” as term infants (Wang et al., 2004).

Jaundice, commonly a cause for delayed discharge and readmission, also is related to the immaturity and poor milk intake observed in late preterm infants (Wang et al., 2004), with the result sometimes referred to as “breast-non-feeding-jaundice.” Not only do these infants have a relative developmental deficiency in glucuronosyltransferase leading to unconjugated hyperbilirubinemia, but because of suboptimal milk intake and diminished stooling, bilirubin is reabsorbed from the gut instead of being excreted. In this population, it’s a pitfall to rely on ad lib nursing alone to provide either the nutrition needs of the infant or adequate colostrum removal for sufficient, subsequent milk production.

With preterm birth, the effective initiation of a robust milk supply is a critical factor in determining the subsequent percentages of the infant’s intake of breast milk versus preterm

formula. Also, the likelihood of postdischarge transition from bottle- or tube-feeding to breastfeeding correlates with the early establishment of a supply of at least 500 mL/day, significantly above preterm infants’ early needs (Hill et al., 2007). Thus, for mothers with babies born at any gestational age, milk production is key to the duration and exclusivity of breastfeeding (Furman, Minich, & Hack, 2002; Li et al., 2008).

### Preventive Measures

#### *Hand Expression*

Electric breast pumps traditionally have been viewed as the first line of defense for infants with increased caloric needs and/or for mothers at risk for underproduction, for example, in cases such as mother-infant separation, maternal breast surgery and in the presence of latch issues. However, recent research suggests that hand expression is more effective than pump suction in early milk removal, perhaps related to colostrum viscosity (Flaherman et al., 2012; Ohyama Watabe, & Hayasaka, 2010). Frequent hand expression in the first 3 days also has a significant effect on milk volumes, lasting up to 8 weeks postpartum (Morton et al., 2009). Compared to previously reported norms, pump-dependent mothers who combined electric pump expression

with synchronous manual techniques—so-called *hands-on pumping*—were able to sustain higher mean daily volumes of milk with a higher fat content and caloric value (62.5 g/L vs. typical range 25 to 45 g/L; 26.4 cal/oz. vs. 20 cal/oz.; Morton et al., 2012). This further suggests that reliance on pump suction alone may compromise the removal of viscous milk, such as colostrum and fat-rich milk (also known as hind milk) and thereby negatively affect production. High mean daily volumes of milk in mothers combining electric pumping with these two manual techniques (hand expression and hands-on pumping) have been replicated in a recent study in which mothers averaged 817 mL by day 14 (Larkin, Kiehn, Murphy, & Uhryniak, 2013). Video step-by-step demonstration of these two manual techniques can be found on the Stanford University Newborn Breastfeeding web site at <http://newborns.stanford.edu/Breastfeeding>. For a consumer handout, see Merewood and Morton (2013).

### Spoon-Feeding

Spoon-feeding of early milk, a practical way of feeding small volumes of milk, is in keeping with the Baby-Friendly guidelines to avoid artificial nipples and formula supplementation.

FIGURE 1  
A Care Provider Assists a Mother  
With Spoon-Feeding to Satiety



Photo courtesy of Dr. Jane Morton, Breastmilk Solutions.

Furthermore, spoon-feeding of expressed milk has been demonstrated to be a safe and efficient mode of delivery, even for low-birth-weight infants (Kumar, Dabas, & Singh, 2010). For the population of at-risk mother-baby dyads, hand expression of colostrum and spoon-feeding can be used to augment the infant's intake while preserving the mother's milk production potential. While there are alternative modes of supplementation that avoid the use of artificial nipples, plastic spoons have the advantage of being inexpensive, nonmedical, reusable, readily available and convenient for both collection and delivery of small volumes of colostrum. In our experience, spoon-feeding of colostrum is not viewed as a "medical intervention" and requires minimal to no teaching of parents or training of staff.

### Implications for Nurses

With greater understanding of the importance of breastfeeding activities during the first several postpartum days, especially the effect on subsequent milk production, health care providers who anticipate and effectively address breastfeeding problems on the first day lessen the likelihood of discontinuation of breastfeeding postdischarge (Flaherman et al., 2012). Many nursing practices that have significantly promoted breastfeeding may be simple, inexpensive interventions, such as the avoidance of early bathing and promotion of skin-to-skin contact (Medoff Cooper et al., 2012). Similarly, nurses can incorporate newer, evidenced-based practices, such as hand expression and spoon-feeding, into routine care. Looking at the big picture, there are opportunities to build a simplified framework to introduce these potentially game-changing practices and expand the effectiveness of lactation care, without overwhelming or adding new demands on nurses' time.

### Suggestions to Improve Outcomes

In the framework of an updated system, we suggest three practices to improve outcomes. First, tailor care to address the individualized maternal and neonatal needs rather than providing one-size-fits-all care. Second, offer preventive rather than problem-based interventions. Third, ensure timely expert care with bedside nurses assuming primary responsibility for breastfeeding.

### Individualized Care

The need for an individualized approach is emphasized in the American Academy of Pediatrics (AAP) guidelines on care of late preterm infants (Engle, Tomashek, Wallman, & Committee on Fetus and Newborn, 2007). Poor breastfeeding outcomes for infants may be associated with decisions about where they'll receive care. In some hospitals this is based solely on gestational age, and late preterm infants are admitted to the neonatal intensive care unit (NICU), where their care may be patterned on the needs of sick babies. Alternatively, and despite their

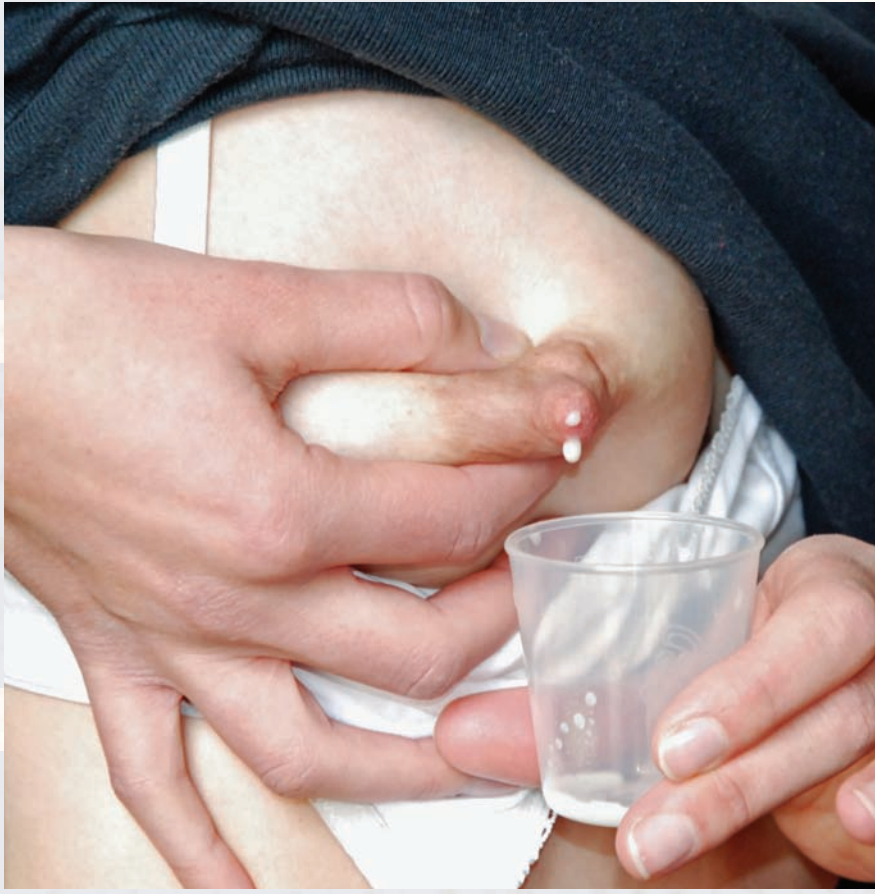


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to the mother that breastfeeding has compromised her baby all conspire against a successful breastfeeding outcome. Within hours of delivery, when oxytocin levels are high and hand-expression is simple, proactively initiating hand-expression and spoon-feeding after each breastfeeding may avert or minimize complications.

### *Timely Expert Nursing Care*

Most mothers need substantial breastfeeding teaching and support, especially those breastfeeding for the first time. As discharge approaches, maternal anxiety increases when women are faced with the possibility of failure in this most basic of maternal roles. With so many at-risk couples, lactation staff often are able to address the needs of only a small percentage of patients, leading to the stress and frustration of all parties, escalating minor issues into major ones and allowing other problems to escape unnoticed. In some settings, it's a case of asking too few to do too little too late.

## Recent research suggests that hand expression is more effective than pump suction in early milk removal, perhaps related to colostrum viscosity

physiologic differences, care may be provided in a postpartum unit by the same staff and with the same approach used for healthy term infants. Both approaches may compromise breastfeeding outcomes by either over- or underestimating the vulnerability of these infants. All nurses caring for mother-baby dyads in the postpartum period can affect breastfeeding outcomes positively by adequately assessing and addressing maternal and neonatal needs, irrespective of the physical location where care is given.

### *Preventive Care*

Given often brief hospital stays, preventive rather than problem-based interventions can help to reduce the challenges of poor milk production problems and infant morbidity. Excessive weight loss or hyperbilirubinemia, common secondary complications of suboptimal breast milk intake, reflexively trigger physician orders to begin electric pumping and bottle supplementation and for lactation consultation. Unnecessary delay, a remedial rather than preventive intervention, reliance on a less effective means of colostrum removal (electric pumping versus hand expression) and the unintended message

An alternative, preventive strategy is needed for all infants, but especially those with borderline caloric reserves, who receive care in a maternal-infant unit.

### *Perceived Weaknesses in Breastfeeding Care*

Mothers and their babies are dependent upon early, accessible and skilled assistance to implement time-sensitive interventions. Nurses play a pivotal role in breastfeeding outcomes given their role during the critical postpartum hours. To revise a care plan to ensure timely expert bedside attention, we examined current lactation management for perceived shortcomings. We thought it best to address the needs of both mothers and staff when considering any reorganization of lactation support.

To understand the challenges, we first developed two informal questionnaires focusing on bedside breastfeeding care in the postpartum unit. One questionnaire gathered the perceptions of staff (physicians, nurses and lactation consultants) and the other was created for mothers. Postdischarge, mothers



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were invited to return an anonymous, self-addressed, stamped questionnaire describing, in their own words, insufficiencies in breastfeeding care they would have liked the staff to address. Staff members were invited to complete a similar anonymous query regarding their perspectives on the challenges of delivering lactation care.

### *Insufficient Time*

The responses showed agreement among both staff and mothers on three shortcomings in lactation teaching and support. The most frequently described shortcoming was insufficient time. Unquestionably, lactation support demands time at the bedside, and affects the compressed schedules of nursing professionals. For mothers, the leading frustration was the lack of available help with breastfeeding when they felt the need, a scenario that could recur frequently throughout the hospital stay.

### *Insufficient Provider Skill and Knowledge*

The second deficiency was insufficient provider skill and knowledge. Numerous sources have documented a deficiency

of physician and nurse breastfeeding management training (Lu, Lange, Slusser, Hamilton, & Halfon, 2001; Walton & Edwards, 2002). Evidence-based basic training programs are available, with outcome studies demonstrating the beneficial impact on breastfeeding rates (Feldman-Winter et al., 2010). Yet, despite a strong, initial staff-training program at our center, mothers continued to voice their perception of inconsistent quality care as “everyone tells me something different,” and mothers therefore questioned the veracity of the advice received.

### *Lack of Accountability*

The third weakness was lack of accountability. For some, insufficient training and a lack of confidence led to the preference to rely on the skills of lactation experts. Physicians, feeling under-trained in lactation management, are particularly susceptible to adopting this posture (Freed et al., 1995). The perspective that lactation problems should be referred to specialists dovetailed with mothers’ perceptions that each day brought more complex and poorly coordinated and managed issues. Knowing that their physician and nurses recommended a lactation spe-

cialist, mothers appreciated the seriousness of their difficulty; however, the referral could result in uncertainty about whom to ask for on-the-spot assistance.

## Characteristics of a Successful Model

To address these issues, we concluded that a successful action plan must combine science with best practices and tackle the needs of both low- and high-risk infants in the same environment. It must ensure a sustainable, highly skilled level of bedside care without relying on the costly investments of periodic training programs. Ongoing nurse training is supported by a team approach that includes mothers, nurses and lactation consultants, as well as daily bedside rounds with a focused agenda. Simple, consistent, shared goals can be achieved by utilizing a variety of teaching venues and tools, with reliance on sharing the care. Finally, these goals must be achieved despite the constraints of time, skills and resources. That said, a successful model depends on both the support of hospital decision-making bodies, with an emphasis on nursing leadership, as well as an initial financial investment in staff education. The expense should be measured against the value of a sustainable system with improved breastfeeding outcomes and patient satisfaction.

## The Five Steps

Based on the aforementioned characteristics, we propose the following five steps (see Box 1).

### Step 1

Step 1 is to revise or replace a generic breastfeeding hospital policy with one based on the *Ten Steps to Successful Breastfeeding* (Baby-Friendly USA, n.d.), which is endorsed by the Centers for Disease Control and Prevention (CDC), United States Breastfeeding Committee (USBC) and the Joint Commission. The AAP's (n.d.) *Sample Hospital Breastfeeding Policy for Newborns* is an example.

### Step 2

Step 2 is to adopt a focused, streamlined curriculum with information and core competencies critical during the first postpartum week. Prioritize consistency in language, techniques and goals across all teaching settings whether given by nurses, physicians or lactation consultants, for example, prenatal, inpatient group breastfeeding classes, one-on-one bedside care, as well as teaching videos and handouts. This addresses the complaint of “everybody tells me something different.”

The AAP developed and evaluated a focused curriculum emphasizing precisely the issues that make or break breastfeeding, targeting three goals for bedside management (Feldman-Winter et al., 2010). For mother-infant dyads with no risk factors, the three goals are: *Attachment*, *Breast milk production* and *Caloric parameters*. Using this simple ABC mnemonic makes the goals easy to remember and underscores simplicity.

*Attachment* (latch and milk transfer) may take time to master, even under ideal circumstances (Dewey et al., 2003).

*Breast milk production* is the key to long-term breastfeeding, and requires early, frequent and effective removal of colostrum. Hand expression is a simple, risk-free technique to remove as much milk as possible from the breasts, a recommendation for every new mother by many professional health care groups. Hand expression stimulates production, can ease the pressure on perfecting attachment and can be used throughout the months of breastfeeding when other options are less effective or unavailable.

*Caloric/nutritional parameters* provide mothers with realistic expectations. Understanding the normalcy of low-volume early feeds, anticipated weight loss, the timeframe for expected birth-weight recovery as well as simple indicators of normal intake, for example, yellow stools by day 5 (Shrago, Reifsnider, & Insel, 2006), allows mothers to recognize important differences between bottle- and breastfed infants.

### Step 3

Step 3 is to reprioritize goals and change the simple mnemonic for mother/infant dyads with risk factors to CBA (calories/breast milk production/attachment) instead of ABC (see Box 2). Hand expression and spoon-feeding after each breastfeeding offer more volume and calories to the infant and increases breast stimulation, both of which are critical interventions to avert

#### BOX 1

#### Five Steps to Improve Bedside Breastfeeding Care

**Step 1.** Revise or replace a generic breastfeeding hospital policy with one based on the *Ten Steps to Successful Breastfeeding*.

**Step 2.** Adopt a focused, streamlined curriculum with information and core competencies critical during the first postpartum week.

**Step 3.** Reprioritize goals and change the simple mnemonic for mother/infant dyads with risk factors to CBA (calories/breast milk production/attachment) instead of ABC.

**Step 4.** Require every maternity nurse and physician to develop and demonstrate the core competencies essential to teach this simplified curriculum.

**Step 5.** Conduct daily, brief bedside rounds with the mother, her nurse and the lactation consultant.



suboptimal intake and insufficient breast milk production. Easing the emphasis on attachment is defensible, given the knowledge that when production is high, postdischarge transition to effective breastfeeding is more likely (Hill, 2007).

#### Step 4

Step 4 is to require every maternity nurse and physician to develop and demonstrate the core competencies essential to teach this simplified curriculum. This step offers ongoing opportunities for improving and updating knowledge and skills. Such opportunities include daily bedside responsibilities, shadowing lactation consultants, helping in group classes and mandatory written and practical demonstrations of competencies (see Figures 1 and 2).

#### Step 5

Step 5 is to conduct daily, brief bedside rounds with three participants: the mother, her nurse and the lactation consultant. Assess and discuss the following:

- (1) Infant nutritional parameters, for example, weight loss, elimination, etc.
- (2) The part(s) of the curriculum requiring additional tutoring.
- (3) How, where and by whom services will be provided, for example, group classes, frequent one-on-one help from the bedside nurse with support, if necessary, from the

Simple, consistent, shared goals can be achieved by utilizing a variety of teaching venues and tools, with reliance on sharing the care

lactation consultant, and visual aids, such as those available at [newborns.stanford.edu/Breastfeeding/index.html](http://newborns.stanford.edu/Breastfeeding/index.html) (Stanford University School of Medicine, 2013).

- (4) Determination of postdischarge needs and referral of mothers to appropriate postdischarge care and support resources (step ten of the *Ten Steps to Successful Breastfeeding*).

### Building a Sustainable Program

This model and the five steps address the three identified shortcomings by supporting efficiency, an expanded skill base and accountability. Long-term maintenance of this model is based



on the availability of consistent, evidence-based mother-baby care, with continual improvement of nursing knowledge and skills. Efficiency improves with competent nursing skills, use of a simplified, uniform curriculum and high-quality teaching tools. Time constraints diminish when the focus is on prevention, rather than on remediation. Accountability is clarified when nurses take ownership and care is a partnership. The emphasis must be on sharing breastfeeding care, rather than deferring care to the expert. All staff members need to be experts in infant feeding. Daily bedside rounds are essential for program sustainability.

Nurses and other health care providers need to dispel the notion that breastfeeding care is complicated. Adopt the well-tested model of “see one, do one, teach one.” A focused curriculum, such as ABC or CBA, is central to success. It’s simple to learn and teach, and easy to remember. Reinforce learning with frequent practice. When bedside nurses accept the primary responsibility for helping mothers, and lactation consultants support nurses, and physicians support nurses and lactation consultants, the skill base expands.

### Conclusion

It’s time to rethink the care provided to women breastfeeding in the hospital to avoid preventable postdischarge problems. By incorporating new research on hand expression and spoon-feeding into a management plan, adequate breast milk produc-

## BOX 2

### Mnemonics for Breastfeeding Care: Reframing A-B-C or C-B-A

A-B-C is for low-risk mother-infant dyads and C-B-A is for at-risk dyads. Reframing A-B-C to C-B-A creates a more preventive, realistic, safe and unpressured plan to enable exclusive breastfeeding in the at-risk population.

*Curriculum for low-risk dyads to begin teaching on first postpartum day:*

#### PRIORITIZE A-B-C\*

- 1st: Attachment (latch-on and milk transfer)
- 2nd: Breastmilk production/expression (hand expression)
- 3rd: Caloric needs of infant to attain normal nutritional parameters (wt. loss/gain)

*Curriculum for at-risk dyads (infants with high nutritional needs and/or mothers at risk for under production) to begin prevention on first postpartum day:*

#### PRIORITIZE C-B-A

- 1st: Caloric needs of the infant with suboptimal reserves and/or higher needs: After each breastfeed, spoon-feed to satiety with hand-expressed colostrum, donor milk and, if needed, formula. Consider an individualized, structured feeding plan with stated volumes for highest risk infants.
- 2nd: Breastmilk production/expression: Hand express  $\geq 8$  times/24 hours and, if needed, electric pumping.
- 3rd: Attachment: Early, unlimited, unrestricted breastfeeds. Reassure mother she can anticipate progress once the milk volume increases when the flow is higher. Eliminate the pressure for milk transfer to occur with breastfeeds.

Source: Stanford University School of Medicine (2013).

\*Note: For a video step-by-step demonstration of A, B and C, visit <http://newborns.stanford.edu/Breastfeeding/> and watch “A Perfect Latch,” “Hand Expression of Breastmilk” and “Maximizing Milk Production with Hands-on Pumping.”

tion, the cornerstone of long-term, exclusive breastfeeding, can be achieved and preserved without jeopardizing the health of at-risk infants.

The five steps we have proposed address the three identified limitations of traditional care by supporting efficiency, an expanded skill base and accountability. Elevating and supporting staff expertise to manage foreseeable challenges shifts the focus of the hospital-based lactation consultants from one-on-one patient care to addressing staff learning needs. With this five-step model, the beneficial impact of lactation consultants can be increased exponentially, the expanded body of staff knowledge will be sustainable, and, best of all, mothers and babies will receive timely and consistent expert care. **NWH**

## References

- American Academy of Pediatrics. (n.d.). *Sample hospital breastfeeding policy for newborns*. Washington, DC: Author. Retrieved from [www2.aap.org/breastfeeding/curriculum/documents/pdf/Hospital%20Breastfeeding%20Policy\\_FINAL.pdf](http://www2.aap.org/breastfeeding/curriculum/documents/pdf/Hospital%20Breastfeeding%20Policy_FINAL.pdf)
- Baby-Friendly USA. (n.d.). *The ten steps to successful breastfeeding*. Albany, NY: Author. Retrieved from [www.babyfriendlyusa.org/about-us/baby-friendly-hospital-initiative/the-ten-steps](http://www.babyfriendlyusa.org/about-us/baby-friendly-hospital-initiative/the-ten-steps)
- Dewey, K. G., Nommsen-Rivers, L. A., Heinig, M. J., & Cohen, R. J. (2003). Risk factors for suboptimal infant breastfeeding behavior, delayed onset of lactation, and excess neonatal weight loss. *Pediatrics, 112*, 607–619.
- DiGirolamo, A. M., Grummer-Strawn, L. M., & Fein, S. B. (2008). Effect of maternity-care practices on breastfeeding. *Pediatrics, 122*(Suppl. 2), S43–S49. doi:10.1542/peds.2008-1315e
- Dollberg, S., Lahav, S., & Mimouni, F. B. (2001). A comparison of intakes of breast-fed and bottle-fed infants during the first two days of life. *Journal of the American College of Nutrition, 20*(3), 209–211.
- Engle, W. A., Tomashek, K. M., Wallman, C., & the Committee on Fetus and Newborn. (2007). “Late Preterm” infants: A population at risk. *Pediatrics, 120*, 1390–1401.
- Feldman-Winter, L., Barone, L., Milcarek, B., Hunter, K., Meek, J., Morton, J., ... Lawrence, R. A. (2010). Residency curriculum improves breastfeeding care. *Pediatrics, 126*(2), 289–297. doi:10.1542/peds.2009-3250
- Flaherman, V. J., Gay, B., Scott, C., Avins, A., Lee, K. A., & Newman, T. B. (2012). Randomised trial comparing hand expression with breast pumping for mothers of term newborns feeding poorly. *Archives of Diseases of Children: Fetal and Neonatal Edition, 97*(1), F18–F23. doi:10.1136/adc.2010.209213
- Freed, G. L., Clark, S. J., Sorenson, J., Lohr, J. A., Cefalo, R., & Curtis, P. (1995). National assessment of physicians’ breast-feeding knowledge, attitudes, training, and experience. *Journal of the American Medical Association, 273*(6), 472–476.
- Furman, L., Minich, N., & Hack, M. (2002). Correlates of lactation in mothers of very low birth weight infants. *Pediatrics, 109*, e57.
- Hill, P. D., Aldag, J. C., Zinaman, M., & Chatterton, R. T. (2007). Predictors of preterm infant feeding methods and perceived insufficient milk supply at week 12 postpartum. *Journal of Human Lactation, 23*(1), 32–38.

- Hincz, P., Borowski, D., Krekora, M., Podciechowski, L., Horzelski, W., & Wilczynski, J. (2009). Maternal obesity as a perinatal risk factor. *Ginekologia Polska*, 80(5), 334–337.
- Hwang, S. S., Barfield, W. D., Smith, R. A., Morrow, B., Shapiro-Mendoza, C. K., Prince, C. B., ... McCormick, M. C. (2013). Discharge Timing, Outpatient follow-up and home care of late preterm and early term infants. *Pediatrics*, 132, 101–108.
- Kinney, H. C. (2006). The near-term (late preterm) human brain and risk for periventricular leukomalacia: A review. *Seminars in Perinatology*, 30, 81–88.
- Kumar, A., Dabas, P., & Singh, B. (2010). Spoon feeding results in early hospital discharge of low birth weight babies. *Journal of Perinatology*, 30(3), 209–217. doi:10.1038/jp.2009.125
- Larkin, T., Kiehn T., Murphy P. K., & Uhryniak, J. (2013). Examining the use and outcomes of a new hospital-grade breast pump in exclusively pumping NICU mothers. *Advances in Neonatal Care*, 13(1), 75–82. doi:10.1097/ANC.0b013e31827d4ce3
- Lawrence, R. A., & Lawrence, R. M. (2005). *Breastfeeding, a guide for the medical profession* (6th ed., pp. 110–148). Maryland Heights, MO: Elsevier Mosby.
- Li, R., Fein, S. B., Chen, J., & Grummer-Strawn, L. M. (2008). Why mothers stop breastfeeding: Mothers' self-reported reasons for stopping during the first year. *Pediatrics*, 122, S69–S76. doi:10.1542/peds.2008-1315i
- Lu, M. C., Lange, L., Slusser, W., Hamilton, J., & Halfon, N. (2001). Provider encouragement of breast-feeding: Evidence from a national survey. *Obstetrics & Gynecology*, 97(2), 290–295.
- Macdonald, P. D., Ross, S. R., Grant, L., & Young, D. (2003). Neonatal weight loss in breast and formula fed infants. *Archives of Disease in Childhood: Fetal and Neonatal Edition*, 88, F472–F476.
- Mathews, T. J., Minino, A. M., Osterman, M. J., Strobino, D. M., & Guyer, B. (2011). Annual summary of vital statistics: 2008. *Pediatrics*, 127(1), 146–157. doi:10.1542/peds.2010-3175
- McLaurin, K. K., Hall, C. B., Jackson, E. A., Owens, O. V., & Mahadevia, P. J. (2009). Persistence of morbidity and cost differences between late-preterm and term infants during the first year of life. *Pediatrics*, 123(2), 653–659. doi:10.1542/peds.2008-1439
- Medoff Cooper, B., Holditch-Davis, D., Verklan, M. T., Fraser-Askin, D., Lamp, J., Santa-Donato, A., ... Bingham, D. (2012). Newborn clinical outcomes of the AWHONN late preterm infant research-based practice project. *Journal of Obstetric, Gynecologic, & Neonatal Nursing*, 41(6), 774–785. doi:10.1111/j.1552-6909.2012.01401.x
- Merewood, A., & Morton, J. (2013). Using your hands to express your milk. A publication of the International Lactation Consultant Association. *Journal of Human Lactation*, 29, 635. doi:10.1177/0890334413504642. Retrieved from [jhl.sagepub.com/content/29/4/635.citation](http://jhl.sagepub.com/content/29/4/635.citation)
- Morton, J., Hall, J. Y., Wong, R. J., Thairu, L., Benitz, W. E., & Rhine, W. D. (2009). Combining hand techniques with electric pumping increases milk production in mothers of preterm infants. *Journal of Perinatology*, 29(11), 757–764. doi:10.1038/jp.2009.87
- Morton, J., Wong, R. J., Hall, J. Y., Pang, W. W., Lai, C., Hartmann, P., & Rhine, W. (2012). Combining hand techniques with electric pumping increases the caloric content of milk in mothers of preterm infants. *Journal of Perinatology*, 32(10), 791–796. doi:10.1038/jp.2011.195
- Murray, E. K., Ricketts, S., & Dellaport, J. (2007). Hospital practices that increase breastfeeding duration: Results from a population-based study. *Birth*, 34(3), 202–211.
- Naveed, M., Manjunath, C. S., & Sreenivas, V. (1992). An autopsy study of stomach capacity and birth weight. *Indian Journal of Gastroenterology*, 11, 156–158.
- Ohyama, M., Watabe, H., & Hayasaka, Y. (2010). Manual expression and electric breast pumping in the first 48 h after delivery. *Pediatrics International*, 52(1), 39–43.
- Parker, L. A., Sullivan, S., Krueger, C., Kelechi, T., & Mueller, M. (2012). Effect of early breast milk expression on milk volume and timing of lactogenesis stage II among mothers of very low birth weight infants: A pilot study. *Journal of Perinatology*, 32(3), 205–209.
- Perrine, C. G., Scanlon, K. S., Li, R., Odom, E., & Grummer-Strawn, L. M. (2012). Baby-Friendly hospital practices and meeting exclusive breastfeeding intention. *Pediatrics*, 130(1), 54–60. doi:10.1542/peds.2011-3633.
- Reddy, U. M., Ko, C. W., Raju, T. N. K., & Willinger, M. (2009). Delivery indications at late preterm gestation and infant mortality rates in the United States. *Pediatrics*, 124, 234–240.
- Shapiro-Mendoza, C. K., Tomashek, K. M., Kotelchuck, M., Barfield, W., Nannini, A., Weiss, J., & Declercq, E. (2008). Effect of late-preterm birth and maternal medical conditions on newborn morbidity risk. *Pediatrics*, 121(2), e223–e232.
- Shrago, L. C., Reifsnider, E., & Insel, K. (2006). The neonatal bowel output study: Indicators of adequate breast milk intake in neonates. *Pediatric Nursing*, 32(3), 195–201.
- Stanford University School of Medicine. (2013). Getting started with breastfeeding. Stanford, CA: Author. Retrieved from [newborns.stanford.edu/Breastfeeding/index.html](http://newborns.stanford.edu/Breastfeeding/index.html)
- Taveras, E. M., Capra, A. M., Braveman, P. A., Jensvold, N. G., Escobar, G. J., & Lieu, T. A. (2003). Clinician support and psychosocial risk factors associated with breastfeeding discontinuation. *Pediatrics*, 112, 108–115.
- Tita, A. T., Landon, M. B., Spong, C. Y., Lai, Y., Leveno, K. J., Varner, M. W., ... Mercer, B. M. (2009). Timing of elective repeat cesarean delivery at term and neonatal outcomes. *New England Journal of Medicine*, 360(2), 111–120.
- Walton, D. M., & Edwards, M. C. (2002). Nationwide survey of pediatric residency training in newborn medicine: Preparation for primary care practice. *Pediatrics*, 110(6), 1081–1087.
- Wang, M. L., Dorer, D. J., Fleming, M. P., & Catlin, E. A. (2004). Clinical outcomes in near-term infants. *Pediatrics*, 114, 372–376.
- Ward, P. M., & Deshpande, S. (2005). Metabolic adaptation at birth. *Seminars in Fetal Neonatal Medicine*, 10(4), 341–350.