

Mothers Value and Utilize Early Outpatient Education on Breast Massage and Hand Expression in Their Self-Management of Engorgement

Ann M. Witt,¹⁻³ Maya Bolman,^{1,2} and Sheila Kredit³

Abstract

Background: Breast engorgement is a major cause of pain and weaning in the early postpartum period. While protocols reinforce the need for anticipatory engorgement advice and continued outpatient health professional breastfeeding support, there remains limited information on the efficacy of focused postdischarge engorgement education. This study sought to explore if outpatient postpartum engorgement education changed mothers' home management and if mothers found instruction on specific massage and hand expression techniques helpful.

Materials and Methods: This was a prospective descriptive cohort study. Subjects received engorgement-specific postpartum support from a healthcare professional at the posthospital discharge (PD) newborn visit. Email surveys at 1, 2, and 12 weeks postpartum collected data on engorgement home management, clinical course, and postpartum education.

Results: After the office visit, mothers changed their engorgement home management. Significantly more mothers utilized massage toward the axillae (25% versus 1%, $p \leq 0.001$), reverse pressure softening (18% versus 3%, $p = 0.001$), and feeding more frequently (32% versus 16%, $p = 0.04$). Sixty-one percent would not have used massage and hand expression before education in the office. At 12 weeks, 96% of women reported massage and hand expression instruction as helpful. Mothers reported engorgement peaked at a median of 5 days postpartum, corresponding well to the office visit at a median of 4 days postpartum.

Conclusions: Maternal engorgement symptoms are commonly present at the PD newborn visit. Education on engorgement, massage, and hand expression at this visit significantly changes home management strategies. Mothers find massage and hand expression instruction helpful.

Background

BREASTFEEDING INITIATION RATES have increased with the growing focus on promotion and in-hospital support,¹⁻⁴ yet the rate of premature weaning remains significant.⁵ The literature shows there is a need for greater outpatient health professional support and education in the early weeks postpartum.⁶⁻⁸ Such support could be instrumental in preventing early weaning⁹⁻¹² and is therefore recommended by numerous organizations.^{6,13-17} Of particular importance is face-to-face support,^{9,11,18,19} guidance that is offered as a part of routine primary care,¹⁸⁻²¹ and increased counseling from healthcare providers on how to manage breastfeeding complications.^{20,22-24}

Postpartum breast engorgement is one of the most common early problems for breastfeeding mothers²⁵⁻²⁷ and can lead to premature weaning.²⁸ Typically symptoms, which peak between 3 and 5 days postpartum,²⁹ overlap with the American

Academy of Pediatrics' (AAP) recommended time of the posthospital discharge (PD) newborn visit.¹³

A number of studies have explored treatments that may be useful in relieving the symptoms of engorgement, and currently, the Academy of Breastfeeding Medicine (ABM) recommends that mothers receive prehospital discharge anticipatory guidance on engorgement management, including hand expression and reverse pressure softening.^{15,30} The protocol also recognizes the potential role of massage in engorgement management. A more recent study found that in-office therapeutic breast massage in lactation (TBML), which combines the principles of hand expression and gentle massage toward the axillae, helps relieve acute breast pain in mothers with engorgement.³¹ However, no studies have examined the effect of providing routine postpartum TBML education to mothers for their home self-management of engorgement.

¹Breastfeeding Medicine of Northeast Ohio, Cleveland, Ohio.

²Senders Pediatrics, Cleveland, Ohio.

³Case Western Reserve University, Cleveland, Ohio.

Given that literature demonstrates that mothers benefit from support that addresses their early breastfeeding difficulties^{31,32} and appreciate learning specific skills from professionals,³³ this study sought to examine whether routinely educating mothers on engorgement, hand expression, and TBML massage techniques during the PD-newborn visit would be helpful to mothers and change their home management of engorgement.

Materials and Methods

Study design

This was a prospective descriptive cohort study. Enrollment occurred at the PD newborn visit, which combined the primary care physician evaluation with a lactation consultant (LC) appointment.¹⁰ The treating provider enrolled mothers at the visit from December 2013 through January 2014. All participants gave written informed consent at enrollment. Inclusion criteria included breastfeeding mothers 18 years or older. Exclusion criteria included a history of preterm delivery and infant neonatal intensive care unit admission. The research study was approved by the University Hospitals' Institutional Review Board.

At enrollment, participants completed a patient questionnaire on demographic information, delivery history, home management of engorgement before the visit, and current engorgement symptoms. The LC provided basic breastfeeding support, as well as specific hand expression, TBML massage, and engorgement education, during the visit. This instruction included verbal review of the TBML principles of gently massaging toward the axillae alternated with hand expression (Appendix A), a written engorgement handout (Fig. 1), and the URL for a video teaching hand expression and massage (<http://bfmedneo.com/resources/videos>).

Follow-up email questionnaires were administered at 1, 2, and 12 weeks postpartum. The survey at 1 week postpartum assessed the change in home management of engorgement pre- and post- the in-office instruction on engorgement and TBML techniques, as well as mothers' impressions of the instruction. The survey at 2 weeks collected data on the clinical course of engorgement. The survey at 12 weeks assessed current breastfeeding practices and mothers' long-term impressions of the helpfulness of the TBML instruction. All data were collected and managed using the REDCap electronic data capture tools hosted at University Hospitals of Cleveland.³⁴

Study population

Enrollment occurred at a private suburban pediatric practice in Cleveland, Ohio that is perceived by the community as breastfeeding friendly. Patients typically deliver at one of two hospitals. One hospital is suburban and designated as Baby-Friendly, while the other is an inner-city teaching hospital that at the time of enrollment was working toward Baby-Friendly designation as part of the Best Fed Beginnings Project.³⁵

Measures

Descriptive variables on demographics, delivery and hospital practices, history of breastfeeding problems, current feeding practices, engorgement symptoms, weaning, and breastfeeding complications were recorded as previously described.^{36,31}

Data on home management of engorgement were collected in response to the question: "If you have needed help relieving engorgement what have you tried?" Responses included: nothing, feeding the baby more frequently, reverse

pressure softening, hand expressing, pumping, massage, cool and warm compresses, cabbage leaves, and ibuprofen.

To better understand the use of TBML massage principles, detailed descriptions of home massage techniques were collected in response to the question: "How do you massage?" Categorical answers included: toward the nipple/areola; toward the armpit/away from the nipple; multiple direction; used finger tips; used whole hands; used oil; it hurt; and it did not hurt.

The clinical course of engorgement was self-recorded by mothers at the 2-week survey. Mothers recorded the postpartum day that engorgement started, peaked, and stopped. Subjects rated engorgement severity at start, peak, and stop day according to the Humenick engorgement scale: (1) soft, no change; (2) slight change; (3) firm, nontender; (4) firm, beginning tenderness; (5) firm, tender; and (6) very firm and very tender.²⁹ Engorgement pain severity for start, peak, and stop day was rated by the patient on a numerical rating scale from 0 to 10, with 0 indicating no pain and 10 indicating the most severe pain.^{36,37}

To evaluate helpfulness of the engorgement and TBML instruction, mothers were asked at the 12-week survey "Was getting instructed on massage and hand expression helpful?" Responses were recorded as no, somewhat helpful, helpful, and very helpful. Mothers were then given room to respond descriptively to "What was helpful about the visit and instruction?" and "What was different from what you heard previously about hand expression and massage?"

Data collection

During the study period, 95 mothers were screened for enrollment. Twelve were ineligible and 10 declined. Seventy-three mothers enrolled.

Analyses

Once collected, the data were exported from REDCap to SPSS software (SPSS, Inc., Chicago, IL) and analyzed under the supervision of the project investigator. Descriptive statistical analyses were performed to examine the distribution and normality of data.

Our primary analysis was to assess home management of engorgement and assess if postpartum education affected home management strategies. A secondary analysis on clinical course of engorgement was also conducted.

Categorical variables were described with frequency and percentages. Continuous variables were described as mean and standard deviation (SD), or median and range as appropriate. Paired *t* test was used to compare home management pre- and postoffice visit.

Results

Sample characteristics

Study population sample characteristics were recorded (Table 1). Inquiry of Baby-Friendly Hospital Initiative (BFHI) steps¹ found that 62% of mothers had been taught hand expression in the hospital and 83% received information about community breastfeeding resources from the hospital.

Engorgement home management preoffice visit

At the visit, 63% reported that they had already experienced engorgement since hospital discharge. Mothers reported already trying a wide variety of strategies to manage their



Breastfeeding Medicine of Northeast Ohio

Coping with Engorgement

After birth, your baby receives colostrum when he or she breastfeeds. Colostrum is a liquid gold breast milk concentrate. It is packed with antibodies to boost your baby's normally immature immune system and is often called nature's first vaccination. Colostrum is high in protein and low in volume; the small volume allows your baby to practice his or her early feedings on a soft breast. The tiny amounts are easy for your baby's 1-2 tsp size stomach to handle.

Breast fullness occurs when the milk comes in. It is a normal part of lactation that usually happens 3 to 5 days after birth. Mothers experience fullness, warmth, and tenderness as the blood supply to their breasts increases along with their milk. Usually this normal fullness is not a big problem. The worst of the discomfort and heaviness is usually resolved in 24-48 hours. To help, it's important to feed your baby frequently during this period. Be sure to take advantage of normal cluster feeding to keep your breasts comfortable and your nipples soft and graspable.

When does engorgement occur? Engorgement typically peaks at postpartum day 5. On average it lasts about 4 days. It can be more severe if the baby does not nurse very frequently or is having trouble removing milk. Engorged breasts may be very firm, hard, hot and painful. The swelling may extend into your underarm. Engorgement is caused by milk and fluid build-up. The breast skin can become taut and shiny, and the breast swelling can flatten the nipple making it difficult for the baby to latch.

How can I lessen engorgement? You can avoid severe engorgement with some of these simple steps:

- The best way to prevent engorgement is to nurse frequently!
- If latching difficulty, soften the areola with hand expression and massage before the baby latches.
- Prior to latching: massage the breast toward the arm pit (this decreases swelling) and soften the areola with reverse pressure softening and/or hand expression.
- Check out the Breastfeeding Medicine of Northeast Ohio video online for our hand expression and massage demonstration: (<http://bfmedneo.com/resources/videos>)
- Express milk only for comfort (not to drain the breasts, but for a few minutes to relieve the pressure).
- Apply cold compresses to your breasts between feedings (ice packs, bags of frozen vegetables).
- Apply moist heat before feeding (warm shower, wet wash cloth, diaper with warm water in it) to help the milk let down.
- Ask your provider about the use of an anti-inflammatory drug such as ibuprofen.
- Call your provider immediately if you develop a fever over 101, flu-like symptoms or redness and pain in the breast.
- See a lactation consultant if the symptoms are not improving in 2 days.

Breastfeeding Medicine of Northeast Ohio, 2014©

FIG. 1. Coping with engorgement.

engorgement symptoms. The most commonly tried home treatments were massage (38%), pumping (21%), warm compresses (18%), and feeding the baby more frequently (16%) (Table 2). Eleven percent of mothers reported not trying any home treatments. Although 62% of mothers reported being taught hand expression in the hospital, only 14% said that

they tried using hand expression at home to relieve their engorgement symptoms.

Engorgement home treatments postoffice visit

When assessing changes in home management following the office visit, we found significantly more mothers tried

TABLE 1. PATIENT CHARACTERISTICS AND BIRTH HISTORY

Sample characteristic, birth history, and Baby-Friendly hospital measures	Total (n=73), N (%)
Maternal age, median in years (range)	31 (23–42)
Private insurance	66 (90)
College graduate	62 (85)
Caucasian	60 (81)
Returning to work	56 (77)
Multiparous	35 (48)
Breastfeeding goal >12 months	43 (60)
Delivery information	
Vaginal delivery	59 (81)
Antibiotics during delivery	21 (29)
Epidural	51 (73)
Intravenous fluids during delivery	68 (93)
Baby-Friendly hospital experience	
Pacifier in hospital	21 (29)
Formula supplementation in hospital	10 (14)
Taught hand expression	45 (62)
Given community resources	59 (83)

the following treatments after the office visit compared to before the visit: reverse pressure softening (18% versus 3%, $p=0.001$), feeding the baby more frequently (32% versus 16%, $p=0.04$), and cool compresses (21% versus 10%, $p=0.018$) (Table 2).

The number of mothers using massage as a home treatment did not significantly change after the office visit (50% versus 38%, $p=0.145$). However, the massage techniques that mothers used did change (Table 2). Significantly more mothers massaged toward the axilla (25% versus 1%, $p<0.001$), in multiple directions (29% versus 15%, $p=0.007$), and were able to massage without pain (29% versus 7%, $p<0.001$). Sixty-one percent of mothers said they would not have used massage and hand expression to treat their engorgement before learning about it in the office.

Timing of office visit in relation to the clinical course of engorgement

The office visit occurred at a median of 4 days postpartum (range 3–9). At the office visit, 38% of mothers had periareolar swelling. On the Humenick engorgement scale,²⁹ mothers reported: firm, beginning tenderness (11%); firm, tender (18%); and very firm, very tender (10%).

Engorgement symptoms began a median of 3 days postpartum (range 2–16), peaked at 5 days (range 2–16), and resolved at 8 days (range 3–18). When engorgement peaked, mean pain level was 5.41 (SD 2.9). On the Humenick engorgement scale, mothers reported firm, beginning tenderness (12%); firm, tender (35%); and very firm, very tender (37%). Median length of engorgement symptoms was 4 days (range 1–13).

Mothers' impressions

When asked in the 12-week survey to look back at the office visit, 96% of mothers reported that the instruction on hand expression and massage was helpful. Twenty-nine reported the instruction to be somewhat helpful, 36% helpful, and 31% very helpful. Mothers also qualitatively reported what they found helpful about the office instruction (Table 3). Mothers appreciated learning specific massage techniques, seeing the techniques modeled, discovering how massage could provide pain relief, feeling supported by their providers, and becoming empowered to self-manage their symptoms.

TABLE 2. CHANGES IN HOME MANAGEMENT OF ENGORGEMENT PRE- AND POSTOFFICE VISIT

	Previsit (n=73), N (%)	Postvisit (n=68), N (%)	p^a
Home engorgement treatments			
None	8 (11)	7 (10)	0.765
Feeding the baby more frequently	12 (16)	22 (32)	0.04
Reverse pressure softening	2 (3)	12 (18)	<0.001
Hand expressing	10 (14)	16 (24)	0.135
Pumping	15 (21)	19 (28)	0.159
Massage	28 (38)	34 (50)	0.145
Cool compresses	7 (10)	14 (21)	0.018
Warm compresses	13 (18)	12 (18)	1.00
Cabbage leaves	0 (0)	3 (4)	0.083
Ibuprofen	6 (8)	13 (19)	0.07
How do you massage?			
Toward nipple/areola	18 (25)	18 (27)	0.829
Toward armpit/away from nipple	1 (1)	17 (25)	<0.001
Multiple directions	11 (15)	20 (29)	0.007
Used finger tips	17 (23)	29 (43)	0.008
Used whole hands	9 (12)	17 (25)	0.031
Used oil	0 (0)	3 (4)	0.083
It hurt	10 (14)	6 (9)	0.208
It did not hurt	5 (7)	20 (29)	<0.001

^aPaired t test.

When asked what was different about the teaching they received in the office visit compared to what they had learned previously about massage and hand expression, mothers often reflected that they had not learned anything in the past. Another notable theme was that the education clarified questions of technique, in particular, the benefit of massaging toward the axilla and with gentler pressure. Mothers appreciated when these techniques were demonstrated.

Twelve-week breastfeeding practices

At 12 weeks, 8% of mothers had weaned. Sixty-seven percent of mothers were still exclusively breastfeeding.

Discussion

This is the first known study to examine mothers' home management of engorgement, the effect of postpartum in-office education on home management strategies, and mothers' impressions of engorgement, massage, and hand expression education.

Our study shows that the majority of mothers utilize some form of home management to relieve their engorgement symptoms. There is wide variety in the types of home treatments mothers choose to try, including massage, pumping, feeding more frequently, hand expressing, warm and cool compresses, and ibuprofen. Massage is the most commonly used.

Our results suggest that education provided solely in the hospital on the home management of breastfeeding complications may not be remembered after discharge. Despite the fact that protocols recommend education on hand expression as a management strategy for engorgement¹⁵ and that the majority of mothers learned about hand expression during their postpartum stay in the hospital, only 13% used it when

TABLE 3. MOTHERS' IMPRESSIONS

<i>Themes</i>	<i>Patient response</i>
Q: What was helpful about the visit and about the instruction on breast massage and hand expression?	
Learning techniques	“Did not know that technique would help, this was new information for me.” “The different ways to massage.” “Directing massage toward armpit was helpful.” “Knowing that it is effective, one can massage in different directions.” “Intuitively would have tried massage on own, but helpful learning how to do technique.”
Teaching method	“Modeling instruction was extremely beneficial.” “It is helpful to be guided by professional, compared to just simply reading about it and follow picture instruction.”
Pain relief	“Taught me what to do when I was in pain. And it worked!” “It made me feel more comfortable and confident.” “Helped relieve discomfort. Was easy to do in the middle of the night after feedings in bed. And it helped!”
Support	“I really appreciated the staff and the way that they taught me the techniques. I was not looking forward to breastfeeding when the engorgement began, but ended up having a very pleasant and rewarding experience that I will always cherish.” “Without support, education, and modeling, I would have bottle fed only.” “It helped alleviate some of the discomfort.”
Empowerment and independence	“I can successfully massage and express milk independently. I know the tools necessary to fix problems without seeing the doctor.” “The general support and knowing that I could relieve my own pain from the engorgement.”
Q: What was different about what you had heard previously about hand expression and massage and what you learned through the practice?	
No prior knowledge	“I never heard anything about it. Took a breastfeeding class, but it was not covered.” “Most of this was new.” “I was not aware it could help.”
Refined technique	“Nothing different, but I wasn’t sure of proper techniques until my visit.” “I had not heard much about technique.”
In-person demonstration	“Obviously it’s easier to understand when you’re given a demonstration! I really appreciated the lactation consultant’s visual description of the breast.” “It’s easier to learn by someone showing you what to do versus reading.”
Gentle massage	“I had heard to massage the breast vigorously with lots of pressure. I learned not to do that and to treat the breast very gently and delicately.” “Limited prior knowledge and unsure as to best motions and amount of pressure.”
Massage toward axilla	“First to massage toward the axilla, using cold compresses to decrease inflammation.” “I learned you could massage away from the nipple as well. I think the support and education was critical to my breastfeeding success.”

they developed engorgement symptoms after discharge. Furthermore, our study suggests that mothers may find other strategies more helpful.

In our study, when mothers received engorgement education at the PD newborn visit, it increased their use of self-management strategies for engorgement symptoms, including feeding the baby more frequently, cool compresses, and reverse pressure softening. In addition, both mothers who had and had not previously tried massage as a home treatment found the specific TBML counseling on hand expression and massage toward the axillae helpful and changed their massage techniques accordingly. Their comments highlighted how much they valued learning specific massage techniques, seeing the techniques modeled, and being empowered with an additional tool they could use at home to manage their symptoms without requiring further office visits.

Our study affirms that the clinical course of engorgement remains similar to that described previously,^{29,26,38,39} peaking at postpartum day 5, despite changes in hospital birthing practices and BFHI measures. Given that engorgement peaks

at median of postpartum day 5, this implies that engorged mothers will often be experiencing near peak symptoms during their newborns’ PD visit.

Clearly, mothers change their home management strategies and gain increased confidence in their ability to mitigate engorgement symptoms when specific engorgement education, including TBML instruction, is provided at this visit. This is in alignment with the literature on the health belief model, which describes how individuals are most likely to learn skills when those skills are taught at the time they are needed.⁴⁰ Our study therefore supports the idea that lactation support with engorgement education at the PD newborn visit has an important role to play in facilitating breastfeeding success. This implies that engorgement education that includes hand expression and a TBML overview could be a beneficial addition to the routine outpatient support provided by family physicians, pediatricians, and other health professionals to early postpartum mothers.

We cannot comment on the long-term ramifications of providing support and postpartum TBML education at the PD

newborn visit. While 92% of the mothers in this study were still breastfeeding at 12 weeks, our study was not designed to evaluate if the specific engorgement education contributed to this success. Future studies will also need to evaluate if mothers use these tools to troubleshoot future breastfeeding complications as suggested by Witt et al.³¹ and whether this affects breastfeeding duration in the long term. In addition, we cannot extrapolate our results to other populations. However, since general professional support on lactation has been found to be helpful in varied populations, further study on the effect of engorgement and TBML-specific educational interventions would be worthwhile.

Conclusions

Breastfeeding mothers use a variety of home management strategies when they experience symptoms of engorgement. Maternal engorgement peaks at postpartum day 5, which corresponds with the AAP's recommended timing of the PD newborn visit. Mothers find it helpful when education on engorgement and the TBML techniques of hand expression and massage are provided at this visit. This education provides targeted breastfeeding support and specific skills that empower mothers to self-manage their engorgement symptoms.

Acknowledgments

Special thanks to Shelly Senders, MD, and the staff at Senders Pediatrics for their continued support in improving breastfeeding practices. The authors thank Kristen Auletta, Anne Vanic, and Mara Uguccini for their assistance with data collection.

Disclosure Statement

No competing financial interests exist.

References

1. Baby-Friendly USA. Baby-friendly hospital initiative. Baby. Available at www.babyfriendlyusa.org/about-us/baby-friendly-hospital-initiative (accessed March 4, 2016).
2. Merewood A, Philipp BL, Chawla N, et al. The Baby-Friendly Hospital Initiative increases breastfeeding rates in a US neonatal intensive care unit. *J Hum Lact* 2003;19:166–171.
3. Merewood A, Mehta S, LB C, et al. Breastfeeding rates in US baby-friendly hospitals: Results of a national survey. *Pediatrics* 2005;116:628–634.
4. Philipp BL, Merewood A, Miller LW, et al. Baby-friendly hospital initiative improves breastfeeding initiation rates in a US hospital setting. *Pediatrics* 2001;108:677–681.
5. Centers for Disease Control and Prevention. Division of Nutrition, Physical Activity, and Obesity. Breastfeeding among US children born 2002–2012, CDC national immunization surveys. Available at www.cdc.gov/breastfeeding/data/nis_data/ (accessed March 2, 2016).
6. US Department of Health and Human Services. Executive Summary: The Surgeon General's Call to Action to Support Breastfeeding. Washington, DC: US Dept of Health and Human Services, Office of the Surgeon General, 2011.
7. Hawkins SS, Stern AD, Baum CF, et al. Evaluating the impact of the baby-friendly hospital initiative on breast-feeding rates: A multi-state analysis. *Public Health Nutr* 2014;18:1–9.
8. New Jersey Baby-Friendly Hospital Initiative evaluation report. Updated 2012. Available at www.state.nj.us/health/fhs/shapingnj/documents/work/publications/NJ_BFHI_Eval_w.Exec_Summ_FINAL.pdf (accessed March 3, 2016).
9. Chung M, Raman G, Trikalinod T, et al. Interventions in primary care to promote breastfeeding: An evidence review for the US Preventive Services Task Force. *Ann Intern Med* 2008;149:565–582.
10. Witt AM, Smith S, Mason MJ, et al. Integrating routine lactation consultant support into a pediatric practice. *Breastfeed Med* 2012;7:38–42.
11. Coutinho S, Lira P, Lima M, et al. Comparison of the effect of two systems for the promotion of exclusive breastfeeding. *Lancet* 2005;366:1094–1100.
12. Kramer M. Promotion of breastfeeding intervention trial (PROBIT): A randomized trial in the Republic of Belarus. *JAMA* 2001;285:413–420.
13. American Academy of Pediatrics. Breastfeeding and the use of human milk. *Pediatr Sect Breastfeed* 2012;129:e827–e841.
14. US Preventive Services Task Force. Primary care interventions to promote breastfeeding: US Preventive Services Task Force recommendation statement. *Ann Intern Med* 2008;149:560–564.
15. Evans A, Marinelli KA, Taylor JS, et al. ABM clinical protocol #2: Guidelines for hospital discharge of the breastfeeding term newborn and mother: "The going home protocol," revised 2014. *Breastfeed Med* 2014;9:3–8.
16. World Health Organization: Division of Child Health and Development. Evidence for the Ten Steps to Successful Breastfeeding. Geneva: World Health Organization, 1998.
17. AAFP Breastfeeding Advisory Committee. Family physicians supporting breastfeeding (position paper). *Am Acad Fam Physicians* 2012:1–39.
18. De Oliveira MI, Camacho LA, Tedstone AE. Extending breastfeeding duration through primary care: A systematic review of prenatal and postnatal interventions. *J Hum Lact* 2001;17:326–343.
19. Renfrew MJ, McCormick FM, Wade A, et al. Support for healthy breastfeeding mothers with healthy term babies (review). *Cochrane Database Syst Rev* 2012:CD001141.
20. Labarere J. Efficacy of breastfeeding support provided by trained clinicians during an early, routine, preventive visit: A prospective, randomized, open trial of 226 mother-infant pairs. *Pediatrics* 2005;115:e139–e146.
21. Bonuck K, Stuebe A, Barnett J, et al. Effect of primary care intervention on breastfeeding duration and intensity. *Am J Public Health* 2014;104(Suppl. 1):119–127.
22. Feldman-Winter L, Barone L, Milcarek B, et al. Residency curriculum improves breastfeeding care. *Pediatrics* 2010;126:289–297.
23. Kulka T, Jensen E, McLaurin S, et al. Community based participatory research of breastfeeding disparities in African American women. *Infant Child Adolesc Nutr* 2011;3:233–239.
24. Taveras EM, Li R, Grummer-Strawn L, et al. Opinions and practices of clinicians associated with continuation of exclusive breastfeeding. *Pediatrics* 2004;113:e283–e290.
25. Graef P, McGhee K, Rozycki J, et al. Postpartum concerns of breastfeeding mothers. *J Nurse Midwifery* 1988;33:62–66.
26. Gans B. Breast and nipple pain in early stages of lactation. *Br Med J* 1958;2:830–832.
27. Humenick SS, Hill PD, Anderson MA. Breast engorgement: Patterns and selected outcomes. *J Hum Lact* 1994;10:87–93.
28. Schwartz K, D'Arcy HJS, Gillespie B, et al. Factors associated with weaning in the first 3 months postpartum. *J Fam Pract* 2002;51:439–444.
29. Hill PD, Humenick SS. The occurrence of breast engorgement. *J Hum Lact* 1994;10:79–86.

30. The Academy of Breastfeeding Medicine Protocol Committee. ABM clinical protocol #20: Engorgement. *Breastfeed Med* 2009;4:111–113.

31. Witt AM, Bolman M, Kredit S, et al. Therapeutic breast massage in lactation for the management of engorgement, plugged ducts, and mastitis. *J Hum Lact* 2016;32:123–131.

32. Brent NB, Redd B, Dworetz A, et al. Breast-feeding in a low-income population. Program to increase incidence and duration. *Arch Pediatr Adolesc Med* 1995;149:798–803.

33. First 5 LA. Baby-Friendly Hospital Initiative evaluation report. Updated 2013. Available at www.first5la.org/files/08300_8.2_BFH_Evaluation_Report_FINAL_100413.pdf (accessed March 3, 2016).

34. Harris PA, Taylor R, Thielke R, et al. Research Electronic Data Capture (REDCap) – A metadata driven methodology and workflow process for providing translational research informatic support. *J Biomed Inform* 2009;42:377–381.

35. National Institute for Children’s Health Quality. Best fed beginnings. Available at www.nichq.org/sitecore/content/breastfeeding/breastfeeding/solutions/best-fed-beginnings (accessed March 3, 2016).

36. Witt A, Mason MJ, Burgess K, et al. A case control study of bacterial species and colony count in milk of breastfeeding women with chronic pain. *Breastfeed Med* 2014;9:29–34.

37. Ferreira-Valente MA, Pais-Ribeiro JL, Jensen MP. Validity of four pain intensity rating scales. *Pain* 2011;152:2399–2404.

38. Hjermstad MJ, Fayers PM, Haugen DF, et al. Studies comparing numerical rating scales, verbal rating scales, and visual analogue scales for assessment of pain intensity in adults: A systematic literature review. *J Pain Symptom Manage* 2011;41:1073–1093.

39. L’Esperance CM. Pain or pleasure: The dilemma of early breastfeeding. *Birth* 1980;7:21–26.

40. Becker M. Health belief model and personal health behavior. *Health Educ Q* 1974;2:2–3.

Address correspondence to:
 Ann Witt, MD
 Breastfeeding Medicine of Northeast Ohio
 2054 South Green Road
 South Euclid, OH 44121

E-mail: awitt@bfmedneo.com

Appendix: Therapeutic Breast Massage in Lactation Technique Overview

For All Conditions

1. Mother is comfortably positioned, preferably in reclining position.
2. Baby can feed while massage is occurring either on the affected breast to help facilitate milk removal during massage or on the opposite breast.
3. Throughout the massage, frequently check the mother’s comfort level. If there is discomfort, the massage pressure used should be lessened.
4. All massage techniques are gentle.

Engorgement

Start with gentle fingertip massage within the areola to reduce swelling and facilitate infant latch.

To soften the areola: alternate very gentle fingertip massage of the areola with reverse pressure softening. General gentle stroking breast massage directed from the areola toward armpit. An oil, such as olive oil, is optional and can help reduce friction.

Once the areola is softened, the baby can latch and nurse while gentle massage continues.

Gentle hand movements can include soft vibration or circular movements.

During the massage as the swelling goes down and the breasts are softened, massage is alternated with hand expression to facilitate drainage and resolution of milk stasis.

Plugged Duct

Start this massage close to the axillae. Initiate with gentle stroking massage from the plugged area toward axillae.

Start hand expression between the areola and the plugged area. Start close to the nipple and then work toward the plugged area slowly.

Alternate massage and hand expression.

To prevent tissue damage, avoid direct hard pressure on the plugged area.

Mastitis

Start with a light, gentle stroking massage from the areola toward the armpit.

If there is a focal area of swelling then start the massage from the affected area as described for plugged ducts.

Alternate massage and hand expression.

Hand Expression

Position fingers in one line with the nipple. The fingers are gently brought together behind the base of the nipple, feeling for a “stem of tissue fullness,” and moved forward in a rolling motion toward the nipple. Milk flow is evaluated and finger placement adjusted based on response. The hand placement is closer to the nipple, often within the areola, compared to other techniques with less focus placed on firm pressure backward toward the chest wall and more focus placed on gentle compression and rolling the fingers together forward toward the nipple base. The finger placement is adjusted to the location on the individual mother that facilitates milk expression. See www.bfmedneo.com for a video demonstration of hand expression.