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Baby-Friendly Hospital Initiative Improves Breastfeeding Initiation Rates in a US Hospital Setting

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ABSTRACT. *Objective.* Breastfeeding initiation rates were compared at Boston Medical Center before (1995), during (1998), and after (1999) Baby-Friendly policies were in place. Boston Medical Center, an inner-city teaching hospital that provides care primarily to poor, minority, and immigrant families, achieved Baby-Friendly status in 1999.

Methods. Two hundred complete medical records, randomly selected by a computer, were reviewed from each of 3 years: 1995, 1998, and 1999. Infants were excluded for medical records missing feeding data, human immunodeficiency virus-positive parent, neonatal intensive care unit admission, maternal substance abuse, adoption, incarceration, or hepatitis C-positive mother. All infant feedings during the hospital postpartum stay were tallied, and each infant was categorized into 1 of 4 groups: exclusive breast milk, mostly breast milk, mostly formula, and exclusive formula.

Results. Maternal and infant demographics for all 3 years were comparable. The breastfeeding initiation rate increased from 58% (1995) to 77.5% (1998) to 86.5% (1999). Infants exclusively breastfed increased from 5.5% (1995) to 28.5% (1998) to 33.5% (1999). Initiation rates increased among US-born black mothers in this population from 34% (1995) to 64% (1998) to 74% (1999).

Conclusions. Full implementation of the Ten Steps to Successful Breastfeeding leading to Baby-Friendly designation is an effective strategy to increase breastfeeding initiation rates in the US hospital setting. *Pediatrics* 2001; 108:677–681; *breastfeeding, baby-friendly.*

ABBREVIATIONS. BMC, Boston Medical Center; BFHI, Baby-Friendly Hospital Initiative; NICU, neonatal intensive care unit.

Breastfeeding goals for the United States are well-defined. The American Academy of Pediatrics, recognizing breast milk as the “optimal form of nutrition for infants,” recommends exclusive breastfeeding for approximately the first 6 months of life, continuing to a year or beyond with the addition of complementary foods at about 6 months of age.¹ Healthy People 2010 breastfeeding goals include 75% of mothers initiating breastfeeding, 50% breastfeeding at 6 months of age, and 25% continuing to breast-

feed at 1 year of life.² In October 2000, US Surgeon General David Satcher identified breastfeeding as a national health priority and released the strategic *Health and Human Services Blueprint for Action on Breastfeeding*.³

Unfortunately, our ability as a nation to substantially improve breastfeeding rates remains elusive. In 1998, 64% of all mothers initiated breastfeeding, 29% were breastfeeding when their infant reached 6 months of age, and 16% were breastfeeding when their infant reached 1 year.³ Disparity exists among ethnic and low socioeconomic groups; in 1998, 68% of whites initiated breastfeeding, compared with 45% of blacks.³ In 1995, 74% of college graduates initiated breastfeeding, compared with only 44% of grade school graduates, and 71% of nonparticipants initiated compared with 47% of participants in the Women, Infants, and Children’s Supplemental Nutrition Program.⁴

Successful long-term breastfeeding depends on a successful start. With this in mind, the Baby-Friendly Hospital Initiative (BFHI) was conceived in 1991 jointly by the World Health Organization and the United Nations Children’s Emergency Fund as a strategy to improve breastfeeding rates worldwide.⁵ A hospital or birth center can receive Baby-Friendly designation if they show compliance with the Ten Steps to Successful Breastfeeding (Table 1).^{6,7} As of July 2001 there were >16 000 baby-friendly sites worldwide; 31 are located in the United States.^{8–11}

Boston Medical Center (BMC), formerly Boston City Hospital, is an academic teaching hospital serving primarily minority, poor, and immigrant families living in inner-city Boston, Massachusetts. In December 1999 BMC became the 22nd Baby-Friendly hospital in the nation and the first in Massachusetts after almost 3 years of hospitalwide efforts to create breastfeeding supportive policies.^{12,13} The purpose of this study was to determine the impact of Baby-Friendly policies on breastfeeding initiation rates in the hospital setting. We evaluated breastfeeding rates before Baby-Friendly policies were implemented (1995), during their implementation (1998), and with Baby-Friendly policies in place (1999). We believe this is the first study published from a Baby-Friendly hospital in the United States about the effect of Baby-Friendly policies on breastfeeding initiation rates.

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TABLE 1. The 10 Steps to Successful Breastfeeding

1. Have a written breastfeeding policy that is routinely communicated to all health care staff.
2. Train all health care staff in skills necessary to implement this policy.
3. Inform all pregnant women about the benefits and management of breastfeeding.
4. Help mothers initiate breastfeeding within 1 hour of birth.
5. Show mothers how to breastfeed and how to maintain lactation, even if they should be separated from their infants.
6. Give newborn infants no food or drink other than breast milk, unless medically indicated.*
7. Practice rooming-in: Allow mothers and infants to remain together 24 hours a day.
8. Encourage breastfeeding on demand.
9. Give no artificial teats or pacifiers to breastfeeding infants.
10. Foster the establishment of breastfeeding support groups and refer mothers to them, on discharge from the hospital or clinic.

* A hospital must pay fair market price for all formula and infant feeding supplies that it uses and cannot accept free or heavily discounted formula and supplies.

METHODS

The medical records of 200 infants admitted to the newborn service at BMC for 1995, 1998, and 1999 were reviewed. The charts were randomly selected by a computer. A research assistant abstracted demographic data and infant postpartum feeding information from the medical records. Information about race and ethnicity was obtained from the hospital admission sheet or the infant's birth certificate. Hospital admission department staff completed the admission sheet through interviews with either parent when the mother was admitted to the maternity floor; information found in the birth certificate was obtained from the mother by hospital-trained clerical staff before the mother's discharge from the hospital. Payer status was determined by the insurance coverage of the mother as noted on the admission face sheet. Both documents were part of the permanent medical record. Infants were excluded for the following reasons: feeding data missing from the medical record, human immunodeficiency virus-positive parent, neonatal intensive care unit admission, maternal substance abuse, adoption, incarceration, and hepatitis C positive mother (Table 2). Mothers positive for hepatitis C were excluded, although hepatitis C is not a contraindication to breastfeeding.¹⁴ In 1995, standard hospital practice discouraged mothers with hepatitis C from breastfeeding. This practice has since been changed, but it was necessary to exclude this group in all 3 years studied.

Infant feeding information was obtained from the 24-hour flow sheet completed for every newborn by maternity nursing staff. Information on the flow sheet included documentation of each infant feeding and the type of feeding given. The research assistant totaled infant feedings during the postpartum stay, and each infant was categorized into 1 of 4 groups: exclusive breast milk (infant received no formula), mostly breast milk (if $\geq 50\%$ of feedings were breast milk), mostly formula ($>50\%$ of feedings were formula), and exclusive formula. For example, if an infant had a total of 19 feedings during 2 hospital days after birth and 5 feedings were formula and 14 were at the breast, the infant was placed into the mostly breast milk category.

The years chosen for medical record review reflected various stages of lactation support and staff knowledge at the hospital. In 1995, lactation support was minimal, only limited breastfeeding education was available for staff or patients, and none of the Ten Steps to Successful Breastfeeding were followed consistently. By 1998, the Baby-Friendly Task Force had been formed, a lactation consultant and nurse educator had been hired, and breastfeeding education was under way. By the end of 1998, all Ten Steps were implemented with the exception of paying for all formula and

formula products (step 6) and having infants initiate breastfeeding within 1 hour of birth (step 4). Approximately 50% of infants were being put to breast within 1 hour at this time. A prime reason infants were not put to breast immediately after birth during 1998 was that the Department of Obstetrics and Gynecology did not become fully involved in the BFHI until this point. In 1999, all Ten Steps were implemented, BMC was assessed for compliance, and official Baby-Friendly designation was awarded by leadership from Baby-Friendly USA. More details about the strategies used to accomplish this achievement are included in the Discussion section.

For the 3 years investigated during this study, births at BMC fluctuated between 1600 and 1800 per year. The study received institutional review board approval. Bivariate χ^2 statistics were used to test the null hypotheses of no statistically significant difference between relevant proportions. A significance level of $\alpha \leq 0.05$ was used throughout.

RESULTS

Infant and maternal demographics were similar for all 3 years (Table 3). Only maternal ethnicity changed; in 1999 there was an increase in white patients (some resulting from an influx of European immigrants into the Boston area) and a smaller percentage in the "other" category.

Breastfeeding initiation rates, defined as an infant receiving any amount of breast milk while in the hospital after birth, increased significantly from 58% in 1995, to 77.5% in 1998, to 86.5% in 1999, $P < .001$ (Table 4). Exclusive breastfeeding rates increased from 5.5% to 28.5% to 33.5% ($P < .001$). Breastfeeding initiation rates among US-born blacks in this population increased from 34% in 1995, to 64% in 1998, to 74% in 1999 ($P = .001$; Table 5).

DISCUSSION

The findings of this study indicate that the successful implementation of Baby-Friendly policies is associated with a significant increase in breastfeeding initiation rates. The data support the results of pre-

TABLE 2. Medical Records Excluded

Year	1995	1998	1999
Total medical records retrieved	236	225	234
(Medical records excluded)	36	25	34
Missing feeding data	16	17	20
Human immunodeficiency virus-positive parent	1	2	1
NICU admission	7	4	2
Maternal substance abuse	8	1	5
Adoption	3	1	2
Incarceration	1	0	1
Hepatitis C-positive mother	0	0	3

TABLE 3. Demographic Data

Year	1995 (n = 200)	1998 (n = 200)	1999 (n = 200)	P Value
Infant				
Female (%)	52	47	50	.66
Gestational age \geq 37 wk (%)	97	94	94	.36
Mean birth weight (g)	3318	3389	3323	.29
Maternal				
Vaginal birth (%)	83	79	81	.52
Age (%)				
<20 y	10	14	13	
20–30 y	58	57	56	
>30 y	32	30	32	.80
Ethnicity (%)				
Black	56	61	54	
Hispanic	23	24	23	
White	11	9	21*	
Other	9	6	3	.013
	n = 196	n = 191	n = 195	
Payer status (%)				
Medicaid	54	55	56	
Uninsured	36	31	37	
Other	11	15	8	.26

* 4/40 (10%) Albanian, 5/40 (12.5%) other European immigrants (2 Irish, 1 German, 1 Bosnian, 1 Russian), 24/40 (60%) US-born, 7/40 (17.5%) various other.

TABLE 4. Infants Categorized by Feeding

	1995		1998		1999		P Value
	n	(%)	n	(%)	n	(%)	
Exclusive breast milk	11	(5.5)	57	(28.5)	67	(33.5)	<.001
Mostly breast milk	49	(24.5)	61	(30.5)	79	(39.5)	.005
Mostly formula	56	(28.0)	37	(18.5)	27	(13.5)	.001
Any breast milk	116	(58.0)	155	(77.5)	173	(86.5)	<.001
Exclusive formula	84	(42.0)	45	(22.5)	27	(13.5)	<.001

TABLE 5. Infants Categorized by Feeding and Ethnicity

	1995		1998		1999		P Value
	n	(%)	n	(%)	n	(%)	
US-born black							
Breastfeeding initiated	16	(34)	29	(64)	39	(74)	
No breastfeeding	31	(66)	16	(36)	14	(26)	.001
Non-US-born black							
Breastfeeding initiated	43	(78)	45	(76)	48	(96)	
No breastfeeding	12	(22)	14	(24)	2	(4)	.013

vious publications that demonstrated that traditional hospital policies and practices seem to interfere with breastfeeding success.^{15–21}

More importantly, our results demonstrate that successful implementation of Baby-Friendly policies is associated with an increase in breastfeeding rates across all ethnic and socioeconomic groups. US-born blacks traditionally have the lowest breastfeeding rates in the United States,⁴ but in our study, significantly more US-born blacks initiated breastfeeding once the Ten Steps to Successful Breastfeeding were in place. Similarly, women of low socioeconomic status have the lowest breastfeeding rates in the nation.⁴ Our data found a significant increase in breastfeeding initiation and success among women with Medicaid health insurance and no health insurance when Baby-Friendly policies were in place.

Much time, effort, and money have been invested in determining why minority and impoverished women do not breastfeed. Knowledge of determi-

nants is now extensive,^{22–25} yet efforts to promote breastfeeding success in these groups have been largely ineffective. In the *HHS Blueprint for Action on Breastfeeding*, the Surgeon General describes breastfeeding rates among blacks as “alarmingly low” and calls for the nation “to address these low breastfeeding rates as a public challenge and put in place national . . . strategies to promote breastfeeding. . . . The Blueprint for Action introduces an action plan for breastfeeding based on education, training, awareness, support and research.”³

Becoming Baby-Friendly entails strategic planning, implementing and maintaining change throughout an entire institution, staff education at all levels, cooperation between many departments, the support of senior staff members, and expense. Persuading a large institution to pay for infant formula, which most US hospitals receive for free from infant formula manufacturers, is a particularly difficult barrier to overcome.¹² However, as the BMC example

demonstrates, Baby-Friendly status is attainable, even in a large inner-city hospital. The data suggest that changing hospital policy nationwide to concur with Baby-Friendly standards would work, where other strategies have failed, to increase breastfeeding rates significantly in challenging population groups.

How did BMC overcome obstacles and challenges that are so common to other hospitals and achieve Baby-Friendly status? The process began with the creation of a Baby-Friendly task force in 1997 co-chaired by 2 pediatricians and a pediatric nurse administrator. Eventually, the task force included >40 members from a wide array of departments within the hospital. An early goal of the Task Force was to create a breastfeeding-friendly environment, which began with the opening of a breastfeeding and expressing room in a highly visible location in the pediatric primary care practice. Subsequently, to support patients and staff in their decision to breastfeed, 3 more breastfeeding rooms opened on the 2 hospital campuses, at a cost of approximately \$2000 each. The Ten Steps to Successful Breastfeeding, printed in English, Spanish, and French Creole, and artwork depicting breastfeeding women were posted throughout the hospital. At the same time, formula company breastfeeding videotapes and literature were removed, and formula company diaper discharge bags and bassinet cards were replaced by a BMC diaper discharge bag and BMC bassinet cards listing breastfeeding tips.

Staff education was also crucial for achieving Baby-Friendly status. Physician education, which is reported in the literature as being suboptimal in the breastfeeding area,²⁶⁻²⁸ was undertaken primarily by one of the task force co-chairs via pediatric and obstetrics grand rounds presentations. She began monthly training sessions with the residents, interns, and medical students on the postpartum unit and in the neonatal intensive care unit (NICU). Two pediatric nurse educators worked closely with the lactation consultant to provide comprehensive nurse education, which included a breastfeeding competency requirement for all pediatric and obstetric nurses. More than 60 staff members attended a 5-day breastfeeding course, and advanced sessions were held to teach alternative feeding methods and to train nurses to teach the breastfeeding classes. An annual breastfeeding conference was also initiated.

For staff beyond the front-line caregivers, task force members created Reach and Teach, an educational program including slides and a short videotape covering the health benefits of breastfeeding and information on the BFHI. Reach and Teach sessions were performed for senior administrators, cleaning staff, interpreters, telephone operators, unit secretaries, and other employees.

Patient education and support for breastfeeding mothers were also initiated. The lactation consultant began teaching weekly breastfeeding classes for mothers in 1998; within a few months, 3 weekly classes were instituted. A telephone support line began operating in 1998, and the Breastfeeding Center hired a peer counselor, funded by external grants, to

work with mothers before and after hospital discharge.

A survey in the NICU revealed that 40% of women did not have health insurance that would pay for a hospital-grade breast pump. Therefore, task force members created Pumps for Peanuts, a grant-funded program that provides a top-quality electric breast pump to all mothers with infants in the NICU, regardless of their insurance status or ability to pay.²⁹

Although all these measures required patience and perseverance, the most significant obstacle was the Baby-Friendly requirement that hospitals must pay fair market value for all their infant formula and related products. In 1997, when the task force was formed, the hospital was paying for formula. However, in 1998, Ross Laboratories (Columbus, OH), an infant formula manufacturer, entered into a 3-year agreement to provide the hospital with free products, and a detailed list of >30 items suggested that Ross Laboratories was supplying BMC with free formula and related products worth approximately \$72 000 per year. This initially unanticipated expense created a major hurdle for the task force. However, a careful tally of the amount of formula (and other free Ross products) being used on all relevant units revealed that the quantity of formula on the manufacturer's list appeared to be far more than the amount being used by the hospital. Working with an estimated cost of 20 to 25 cents per bottle for formula and figuring in the 1800 births per year and the breastfeeding rates, BMC's estimated annual total cost for formula and formula products came to approximately \$20 000 per year, far less than the original \$72 000 figure. After several months of discussion, senior management agreed that paying for infant formula was the right thing to do and that the annual cost of formula should not stand in the way of gaining the esteemed Baby-Friendly status. Ross Laboratories designed a new agreement with BMC to replace the previous 3-year agreement.¹²

Two months before the Baby-Friendly inspection of September 1999, BMC began paying for formula. This accomplishment brought BMC into full compliance with Baby-Friendly requirements, and with all Ten Steps in place, BMC was assessed for compliance in September 1999 and officially awarded Baby-Friendly status in December 1999.

Although expense is certainly a factor in bringing about change and pursuing Baby-Friendly status, over the long term, investment in breastfeeding can create significant savings to society, the hospital, and the breastfeeding family. Several studies have linked breastfeeding with savings in health care dollars.^{30,31} One study concluded that treating otitis media, gastroenteritis, and respiratory tract infections costs the health care system \$331 to \$475 during the first year of life for each formula-fed infant.³² In addition, the annual cost of treating US children <5 years of age for otitis media is estimated at \$5 billion per year.³³ Breastfeeding reduces the incidence of otitis media: infants who breastfed exclusively for at least 4 months have been shown to have half as many episodes of acute otitis media as formula-fed infants in the first year of life.³⁴ Kramer published the first

report of long-term benefits associated with the BFHI from the Republic of Belarus: a longer duration of breastfeeding at 3 months and throughout the first year and a lower prevalence of gastrointestinal infection and atopic eczema among infants born at Baby-Friendly sites compared with control sites.³⁵

Other possible cost savings associated with breastfeeding may be more difficult to quantify but are no less important. Studies have uncovered an emotional benefit specific to Baby-Friendly policies. Looking at infant abandonment rates in a Russian hospital before and after implementation of Baby-Friendly policies, one study found that the mean infant abandonment rate decreased from 50.3 to 27.8 (per 10 000 births).³⁶

Some issues in this study merit clarification. First, the medical record review was not blinded, but guidelines were delineated and discussed with the research assistants for demographic data and feeding categories. Second, it is possible that the quality of nurse recording of breastfeeding may have changed over the 3 years studied, and this was the reason for the increase in breastfeeding rates. There is no measurement of the accuracy of nursing recordings over this period of time, a limitation of the study. In addition, the study recorded similar percentages of white women among the groups studied in 1995 and 1998 but an increase of white mothers in 1999. The patients seen at BMC reflect immigration patterns and economic shifts in the area because of the institution's important ability to care for those without insurance. Payer status did not differ across the 3 years studied, suggesting that the greater number of white mothers in 1999 were from the same socioeconomic groups as in 1995 and 1998.

The scientific evidence is well-established: breastfeeding offers overwhelming benefit for infants, mothers, families, and society.¹ We have moved beyond asking whether women should breastfeed. The current question is how to ensure successful breastfeeding initiation and successful breastfeeding duration. According to this study, one way to improve breastfeeding initiation rates is to promote the success of the BFHI in every hospital and birth center in the nation.

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