

# Sustained Breastfeeding Rates at a US Baby-Friendly Hospital

Barbara L. Philipp, MD\*‡; Kirsten L. Malone, BA‡; Sabrina Cimo, BA§; and Anne Merewood, MA||

**ABSTRACT.** *Objective.* Boston Medical Center (BMC) became the 22nd US Baby-Friendly hospital in 1999. Previous research found that breastfeeding initiation rates increased significantly from 58% in 1995 to 86.5% in 1999. The objective of this study was to establish whether Baby-Friendly status would sustain elevated breastfeeding initiation rates at this US hospital beyond the year of designation. Breastfeeding rates in 1999 were compared with rates in 2000 and 2001.

*Methods.* A total of 200 medical records of full-term, healthy infants who were born at BMC in 2000 and 2001 were reviewed using the same criteria as the study conducted for 1999. Records were selected randomly by a computer-generated list. All infant feedings during the hospital postpartum stay were tallied, and each infant was categorized into 1 of 4 groups: 1) exclusive breast milk, 2) mostly breast milk, 3) mostly formula, and 4) exclusive formula.

*Results.* Maternal and infant demographics for all 3 years were comparable. The breastfeeding initiation rates, defined as an infant's receiving any amount of breast milk, remained at high levels: 87% (1999), 82% (2000), and 87% (2001). Infants who received more breast milk than formula also was sustained: 73% (1999), 67% (2000), and 67% (2001). Infants who were breastfed exclusively across the 4 years did not differ significantly: 34% (1999), 26% (2000), and 25% (2001).

*Conclusions.* Full implementation and continued application of the "Ten Steps to Successful Breastfeeding," the framework of the Baby-Friendly Hospital Initiative, has an extended positive impact on breastfeeding rates in a US hospital setting. *Pediatrics* 2003;112:e234–e236. URL: <http://www.pediatrics.org/cgi/content/full/112/3/e234>; breastfeeding, breastfeeding rates, Baby-Friendly Hospital Initiative.

ABBREVIATIONS. BFHI, Baby-Friendly Hospital Initiative; BMC, Boston Medical Center.

Prominent national and international physician organizations strongly recommend breastfeeding.<sup>1–4</sup> The American Academy of Pediatrics, describing breastfeeding as "the optimal form of nutrition for infants," recommends exclusive breast-

feeding for approximately the first 6 months of life, continuing to at least 1 year or beyond with the addition of complementary foods at approximately 6 months of age.<sup>1</sup>

The Baby-Friendly Hospital Initiative (BFHI), created in 1991 by UNICEF and the World Health Organization, strives to increase breastfeeding rates worldwide.<sup>5–9</sup> Previously, we reported breastfeeding rates at Boston Medical Center (BMC) before (1995) and with (1999) Baby-Friendly policies in place. Breastfeeding initiation rates increased from 58% to 86.5%, rates among women offering more breast milk than formula rose from 30% to 73%, and exclusive breastfeeding rates improved from 5.5% to 33.5%.<sup>10,11</sup> The purpose of this study was to establish whether Baby-Friendly (in the United States, the terminology Baby-Friendly is a trademark of the US Fund for UNICEF) status would sustain elevated breastfeeding rates at this US hospital beyond the year of designation. Breastfeeding rates in 1999 were compared with rates in 2000 and 2001.

## METHODS

Using the same methods as previously reported, the medical records of 200 infants who were admitted to the BMC newborn service for 2000 and 2001 were reviewed. Medical records were selected randomly by a computer-generated list. 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 of mother, maternal medication contraindicated for breastfeeding, and hepatitis C-positive mother. Mothers who were positive for hepatitis C were excluded, although hepatitis C is not a contraindication to breastfeeding,<sup>12</sup> because, 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 from all years studied.

Infant feeding information was obtained from the 24-hour flow sheet completed for every newborn by maternity nursing staff. The same flow sheet was used for all study periods. Information found in the flow sheet included documentation of each infant feeding and type of feeding given. The research assistant totaled infant feedings during the postpartum stay, and each infant was categorized into 1 of 4 feeding groups: exclusive breast milk (infant received no formula), mostly breast milk ( $\geq 50\%$  of feedings were breast milk), mostly formula ( $>50\%$  of feedings were formula), and exclusive formula. For example, if a vaginally born infant had a total of 19 feedings during the 2-day hospital stay

From the \*Department of Pediatrics, Boston University School of Medicine, Boston, Massachusetts; ‡Breastfeeding Center, Boston Medical Center, Boston, Massachusetts; §Department of Pediatrics, Division of Neonatology, Boston Medical Center, Boston, Massachusetts; and ||Department of Pediatrics, Boston University School of Medicine, and Breastfeeding Center, Boston Medical Center, Boston, Massachusetts.

Received for publication Sep 11, 2002; accepted May 2, 2003.

Reprint requests to (B.L.P.) Division of General Pediatrics, Boston Medical Center, Maternity Building, 4th Floor, 91 E Concord St, Boston, MA 02118. E-mail: bobbi.philipp@bmc.org

PEDIATRICS (ISSN 0031 4005). Copyright © 2003 by the American Academy of Pediatrics.

**TABLE 1.** Demographic Data

Year	1999 (n = 200)*	2000 (n = 200)*	2001 (n = 200)*	P Value
Infant				
Female (%)	50	60	49	.06
Gestational age ≥37 wk (%)	94	93	94	.92
Mean birth weight (g)	3333	3360	3351	.86
Mother				
Vaginal birth (%)	81	80	79	.93
Age (%)				
<20 y	13	14	11	
20–30 y	56	52	49	
>30 y	32	34	40	.41
Race/ethnicity (%)				
Black	54	46	54	
Hispanic	23	27	23	
White	21	12	9	
Other	3	15†	14‡	<.001
Payer status				
Medicaid	56	51	48	
Uninsured	37	33	40	
Other	8	16	13	.13

\* Some cells have n < 200 because of missing data (range: 195–200).

† 33% (n = 10) Asian/Pacific Islander.

‡ 57% (n = 16) Asian/Pacific Islander.

after birth and 13 feedings were breast milk and 6 feedings were formula, then the infant was placed in the “mostly breast milk” category.

For the 3 years investigated during this study, births at BMC fluctuated between 1800 and 2000 per year. This study received institutional review board approval. SAS v8.2 software (Carey, NC) was used to analyze all data. Analysis of variance was used to test the equality of mean birth weights. Calculating  $\chi^2$  statistics and using Fisher exact test when appropriate evaluated all other comparisons. Significance level of  $\alpha \leq 0.05$  was used throughout.

**RESULTS**

Infant and maternal demographics were similar for all 3 years (Table 1). Only maternal ethnicity changed; in both 2000 and 2001, there was a decrease in white patients and an increase in “other.” Medical records excluded were similar for all 3 years: 34 (1999), 46 (2000), and 35 (2001).

Breastfeeding initiation rates, defined as an infant’s receiving any amount of breast milk during the hospital stay, were similar for all 3 years: 86.5% (1999), 81.5% (2000), and 87% (2001;  $P = .23$ ). Mothers who fed more breast milk than formula remained high: 73% (1999), 67% (2000), and 67.5% (2001;  $P = .35$ ). Exclusive breastfeeding rates decreased from 33.5% in 1999 to 26% in 2000 to 24.5% in 2001, but the difference was not statistically significant ( $P = .10$ ; Tables 2 and 3)

Only 34% of US-born black mothers at BMC initiated breastfeeding in 1995; with Baby-Friendly policies in place, these rates rose and were sustained: 74% (1999), 77% (2000), and 69% (2001;  $P = .83$ ).

**TABLE 2.** Infants Categorized by Feeding

	1999		2000		2001		P Value
	n	%	n	%	n	%	
Exclusive breast milk	67	33.5	52	26.0	49	24.5	.19
Mostly breast milk	79	39.5	82	41.0	86	43.0	
Mostly formula	27	13.5	29	14.5	39	19.5	
Any breast milk	173	86.5	163	81.5	174	87.0	
Exclusive formula	27	13.5	37	18.5	26	13.0	

Breastfeeding exclusivity varied according to method of birth: 30% of infants who were born vaginally and breastfed exclusively in both 2000 and 2001 compared with 10% of infants in 2000 and 7% in 2001 born by cesarean birth.

**DISCUSSION**

These are the first findings to demonstrate that the BFHI is a successful strategy to sustain breastfeeding initiation rates in a US hospital setting. Breastfeeding initiation rates, mothers’ feeding more breast milk than formula, and exclusive breastfeeding rates all were sustained.

Although the decline in exclusive breastfeeding rates did not reach statistical significance, the decrease of approximately 30% bears close observation. As noted, breastfeeding exclusivity varied according to method of birth: 30% of infants who were born vaginally and breastfed exclusively in both 2000 and 2001 compared with 10% of infants in 2000 and 7% in 2001 born by cesarean birth. This highlights the importance of monitoring initiation rates at Baby-Friendly sites to detect areas that need improvement. Indeed, the BMC hospital-wide Baby-Friendly Task Force is currently reviewing hospital policies and systems for infants who are born by cesarean birth

With breastfeeding initiation rates sustained and meeting Healthy People 2010 goals of a 75% initiation rate, an important focus at BMC will be to monitor duration rates to determine whether they meet Healthy People 2010 goals of 50% of women breastfeeding at 6 months and 25% breastfeeding at 1 year. We also suggest that the BFHI is 1 strategy to answer the Surgeon General’s call to address low breastfeeding rates among black women.<sup>13</sup> Only 34% of US-born black mothers at BMC initiated breastfeeding in 1995. As noted in this study, with Baby-Friendly policies in place, these rates increased to 74% in 1999 and were sustained in 2000 (77%) and 2001 (69%).

These data add to the international evidence on the

**TABLE 3.** Breastfeeding Rates (%)

	1999	2000	2001	P Value
Breastfeeding initiation	86.5	81.5	87.0	.23
More breast milk than formula	73.0	67.0	67.5	.35
Exclusive breastfeeding	33.5	26.0	24.5	.10

effectiveness of the BFHI. Kramer et al<sup>14,15</sup> evaluated 16 sites in Belarus that were randomly assigned to receive “an experimental intervention modeled on the Baby-Friendly Hospital Initiative” and compared outcome data with 15 control sites that continued with “traditional” maternity practices. He showed that Baby-Friendly practices increased the likelihood of and amount of breastfeeding at 12 months, increased breastfeeding rates and exclusive breastfeeding rates at 3 and 6 months of life, and significantly reduced the incidence of gastrointestinal tract infections and atopic eczema during the first year of life. In another study to determine whether early mother-infant contact reduced rates of infant abandonment, a Russian hospital that “implemented portions of the” BFHI found that infant abandonment decreased from approximately 50 per 10 000 births to approximately 28 per 10 000 births during a 6-year period after implementation of early infant contact and rooming in.<sup>16</sup> In China, after 2 years of BFHI implementation, breastfeeding rates doubled in rural areas and increased from 10% to 47% in urban areas. Exclusive breastfeeding in Cuba rose from 25% to 72% during a 6-year period after the introduction of the BFHI.<sup>17</sup>

Limitations of the study deserve mention. First, the research assistant who conducted the medical record review was not blind to the study hypothesis, but the research team met numerous times and clearly delineated medical record review guidelines and study parameters. Second, there is no measure of the accuracy of nurse recordings of feedings.

**CONCLUSIONS**

Health professionals are expected to practice evidence-based medicine in all areas, including lactation. Scientific evidence overwhelmingly supports breastfeeding as the optimal form of nutrition for infants. The issue then becomes how best to support breastfeeding in the critical early days of life so that mothers and infants can be breastfeeding successfully later on. This study adds to the scientific evidence that the BFHI, framed around the “Ten Steps to Successful Breastfeeding,” is a successful strategy to increase and sustain breastfeeding initiation rates in the hospital setting.<sup>18–21</sup> With the evidence mounting, the onus is now on all US maternity hospitals to become Baby-Friendly compliant.

**ACKNOWLEDGMENT**

This study was funded by the Centers for Disease Control and Prevention/Association of Teachers of Preventive Medicine (TS-0606).

**REFERENCES**

- American Academy of Pediatrics, Work Group on Breastfeeding. Breastfeeding and the use of human milk. *Pediatrics*. 1997;100:1035–1039
- American College of Obstetrics and Gynecology. Breastfeeding: maternal and infant aspects. *Educ Bull*. 2000;258:1–16
- American Academy of Family Physicians. Breastfeeding Position Paper; 2002. Available at: [www.aafp.org/policy/x1641.xml](http://www.aafp.org/policy/x1641.xml)
- Academy of Breastfeeding Medicine. *ABM Mission Statement*. Princeton Junction, NJ: Academy of Breastfeeding Medicine; 1995
- World Health Organization, United Nations Children’s Fund. Protecting, promoting and supporting breastfeeding: the special role of maternity services (A joint WHO/UNICEF statement). *Int J Gynecol Obstet*. 1990;31(suppl 1):171–183
- World Health Organization. *Evidence for the Ten Steps to Successful Breastfeeding*. WHO/CHD/98.9. Revised ed. Geneva, Switzerland: World Health Organization; 1998
- Saadeh R, Akre J. Ten steps to successful breastfeeding: a summary of the rationale and scientific evidence. *Birth*. 1996;23:154–160
- Naylor AJ. Baby-Friendly Hospital Initiative: protecting, promoting, and supporting breastfeeding in the twenty-first century. In: Schanler RJ, ed. *Pediatric Clinics of North America: Breastfeeding 2001, Part II: The Management of Breastfeeding*. Philadelphia, PA: WB Saunders Company; 2001:475–483
- Turner-Maffei C. Using the Baby-Friendly Hospital Initiative to drive positive change. In: Cadwell K, ed. *Reclaiming Breastfeeding for the United States: Protection, Promotion, and Support*. Sudbury, MA: Jones and Bartlett; 2002:23–33
- 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
- Radford A, Southall DP. Successful application of the Baby-Friendly Hospital Initiative contains certain lessons that might be applied to the control of formula feeding in hospitals in industrialized countries. *Pediatrics*. 2001;108:766–768
- Centers for Disease Control and Prevention. Recommendations for prevention and control of hepatitis C virus (HCV) infection and HCV-related chronic disease. *MMWR Morb Mortal Wkly Rep*. 1998;47(RR-19): 1–39
- US Department of Health and Human Services, Office on Women’s Health. *HHS Blueprint for Action on Breastfeeding*. Washington, DC: Department of Health and Human Services, Office on Women’s Health; 2000
- Kramer MS, Chalmers B, Hodnett ED, et al. Promotion of Breastfeeding Intervention Trial (PROBIT): a randomized trial in the Republic of Belarus. *JAMA*. 2001;285:413–420
- Kramer M, Guo T, Platt R, et al. Breastfeeding and infant growth: biology or bias? *Pediatrics*. 2002;110:343–347
- Lvoff NM, Lvoff V, Klaus MH. Effect of the Baby-Friendly Initiative on infant abandonment in a Russian hospital. *Arch Pediatr Adolesc Med*. 2000;154:474–477
- Programme Division UNICEF. *The Baby-Friendly Hospital Initiative: Case Studies and Progress Report*. New York, NY: UNICEF; 1999
- Innocenti Declaration on the Protection, Promotion, and Support of Breastfeeding. New York, NY: UNICEF; 1990
- Merewood A, Philipp BL. Becoming Baby-Friendly: overcoming the issue of accepting free formula. *J Hum Lact*. 2000;16:279–282
- Merewood A, Philipp BL. Implementing change: becoming Baby-Friendly in an inner city hospital. *Birth*. 2001;28:36–40
- Philipp BL, Merewood A, O’Brien S. Physicians and breastfeeding promotion in the United States: a call for action. *Pediatrics*. 2001;107: 584–588

**Sustained Breastfeeding Rates at a US Baby-Friendly Hospital**  
Barbara L. Philipp, Kirsten L. Malone, Sabrina Cimo and Anne Merewood  
*Pediatrics* 2003;112:e234  
DOI: 10.1542/peds.112.3.e234

<b>Updated Information &amp; Services</b>	including high resolution figures, can be found at: <a href="/content/112/3/e234.full.html">/content/112/3/e234.full.html</a>
<b>References</b>	This article cites 13 articles, 5 of which can be accessed free at: <a href="/content/112/3/e234.full.html#ref-list-1">/content/112/3/e234.full.html#ref-list-1</a>
<b>Citations</b>	This article has been cited by 6 HighWire-hosted articles: <a href="/content/112/3/e234.full.html#related-urls">/content/112/3/e234.full.html#related-urls</a>
<b>Subspecialty Collections</b>	This article, along with others on similar topics, appears in the following collection(s): <b>Nutrition</b> <a href="/cgi/collection/nutrition_sub">/cgi/collection/nutrition_sub</a> <b>Breastfeeding</b> <a href="/cgi/collection/breastfeeding_sub">/cgi/collection/breastfeeding_sub</a>
<b>Permissions &amp; Licensing</b>	Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at: <a href="/site/misc/Permissions.xhtml">/site/misc/Permissions.xhtml</a>
<b>Reprints</b>	Information about ordering reprints can be found online: <a href="/site/misc/reprints.xhtml">/site/misc/reprints.xhtml</a>

PEDIATRICS is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. PEDIATRICS is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2003 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 0031-4005. Online ISSN: 1098-4275.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™



# PEDIATRICS®

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

## **Sustained Breastfeeding Rates at a US Baby-Friendly Hospital**

Barbara L. Philipp, Kirsten L. Malone, Sabrina Cimo and Anne Merewood

*Pediatrics* 2003;112:e234

DOI: 10.1542/peds.112.3.e234

The online version of this article, along with updated information and services, is located on the World Wide Web at:

[/content/112/3/e234.full.html](#)

PEDIATRICS is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. PEDIATRICS is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2003 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 0031-4005. Online ISSN: 1098-4275.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™

