



Infant Feeding Practices



Regional Office for South Central Asia
73 Lodi Estate, New Delhi-110003

Readings in Infant Feeding Practices-4 The Obstetrician's Opportunity: Translating "breast is best" from theory to practice

BEVERLY WINIKOFF, M.D., M.P.H.

EDWARD C. BAER, B.A.

New York, New York

The superiority of breast-feeding to artificial feeding of infants has been well established for nutritional, biochemical, antiinfective, psychological, economic, and contraceptive reasons. The promotion of breast-feeding should, therefore, be a high-priority concern of health workers. Both provision of information and support to expectant mothers and changes in hospital routines in the perinatal period have been shown capable of dramatically increasing the incidence and duration of breast-feeding in populations studied. Moreover, these interventions are quite specific, effective, manageable, and affordable. Obstetricians have a special responsibility and capacity to promote breast-feeding given their contact with women throughout pregnancy and their influence on hospital birth routines. A greater commitment on the part of obstetricians to promote breast-feeding could accelerate and extend the current shift back to breast-feeding, to the benefit of mothers and their babies in all socioeconomic groups. (AM. J. OBSTET. GYNECOL. 138:105, 1980.)

EACH YEAR, scientific evidence provides increasing justification for promoting breast-feeding. While the protective effects of breast-feeding against common infections are especially important in unsanitary environments, mounting clinical and epidemiologic evidence demonstrates distinct advantages, even in modern industrialized societies.¹⁻³ However, theoretical knowledge of the superiority of breast-feeding has seldom been translated into a commitment to promote it in the community.

Re-examination of attempts to promote breast-feeding demonstrates, nevertheless, that enlightened medical practice can substantially increase the prevalence and length of successful lactation. The common perception that trends away from breast-feeding are an

inevitable part of "modernization" and are difficult to reverse does not seem to be accurate. In fact, there appears to be a series of specific, manageable steps that can increase markedly the incidence and duration of breast-feeding, and, as a bonus, they are not costly to implement. It seems that there are no special secrets to promotion of breast-feeding; what a rational person would think *might* work does, in fact, work. (See Table 1.)

Finally, analysis of the key points for intervention demonstrates that most are closely linked to obstetric practice and attitudes for several reasons. First, in the United States, obstetricians bear central responsibility for delivering prenatal care directly to patients, for setting medical standards for maternity services, and for providing public information on pregnancy and childbirth. Second, obstetricians generally are charged with supervising and monitoring the performance of labor and delivery services in hospitals. Third, obstetric attitudes and practices act on the mother throughout

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Reprint requests: Beverly Winikoff, M.D., The Population Council, One Dag Hammarskjöld Plaza, New York, New York 10017.

Table I. Summary of selected intervention program effects on incidence and duration of breast-feeding

| <i>Source</i> | <i>Place</i> | <i>Type of intervention</i> | <i>Sample size</i> | <i>Time of measurement</i> |
|--|--|--|--------------------|--|
| <i>Information and support:</i> | | | | |
| Brimblecombe and Cullen ²¹ (1977) | Exeter, England | Education of midwives and health visitors on consultant unit (L) | 562 | Hospital discharge |
| Burne ²² (1976) | Oxford, England | Continuity of care by stable, familiar health team (L) | 73 | 6 weeks post partum |
| Coles and Valman ²² (1976) | Harrow, England | Hospital-based education program (L) | ± 1,300 | Hospital discharge |
| Creery ²³ (1973) | Cheltenham, England | Education of health professionals (L) | 4,950 | Hospital discharge |
| De Chateau et al. ²⁷ (1977) | Umea, Sweden | Education of fathers (P) | 23 | Duration |
| Halpern et al. ²⁵ (1972) | Dallas, Texas | Positive attitudes of pediatricians (C) | 4,753 | * |
| Kirk ²³ (1978) | Edinburgh, Scotland | Education by doctors and nurses (L) | 278 | Initiation 1 mo post partum 4 mo post partum |
| Meyer ¹² (1968) | U.S. hospitals | Hospital programs to promote breast-feeding (unspecified (C)) | 2,951 hospitals | Hospital discharge |
| Rawlins ²⁴ (1978) | Indiana | Obstetric counseling and group support (L) | * | Hospital discharge 5 mo post partum |
| Sjölin ²⁵ (1976) | Uppsala, Sweden | Mass media education (L) | * | 1 mo post partum 2 mo post partum 4 mo post partum 6 mo post partum |
| Sloper et al. ²⁹ (1977) | Oxford, England | Education of midwives and health visitors (L) | 256 | Hospital discharge 5 mo post partum |
| Sloper et al. ³⁰ (1975) | Oxford, England | Education of midwives (L) | 435 | Hospital discharge |
| Smart and Bamford ³⁴ (1976) | Manchester, England | Education of hospital staff (L) | 1,448 | Hospital discharge |
| Waller ⁴² (1946) | Woolwich, England | Daily expression of colostrum (P) | 200 | * |
| <i>Changes in hospital routines:</i> | | | | |
| Bjerre and Ekelund ⁷³ (1970) | Malmö, Sweden | Rooming-in (P) | 3,214 | Hospital discharge |
| Clavano ⁷⁸ (1978) | Baguio, Philippines | Rooming-in, no supplementary food (L) | 10,000 | * |
| De Chateau ²⁵ (1976) | Umea, Sweden | Skin-to-skin contact and immediate suckling after birth (P) | 40 | 3 mo post partum |
| De Chateau et al. ²⁷ (1977) | Umea, Sweden | No routine weighings and no supplementary food (P) | 390 | Duration |
| | | Skin-to-skin contact and immediate suckling after birth (P) | 42 | Duration |
| Jackson et al. ⁷¹ (1956) | New Haven, Connecticut | Rooming-in (P) | 282 | Duration |
| Johnson ⁸⁸ (1976) | Seattle, Washington | Immediate suckling after birth (P) | 12 | 2 mo post partum |
| Klaus and Kennell ¹⁰ (1976) | Guatemala City, Guatemala (Social Security Hospital) | Immediate suckling after birth (P) | 40 | 6 mo post partum 12 mo post partum |

C = Cross-sectional. L = Longitudinal. P = Prospective controlled.

*Not given.

| % Breast-feeding or duration of breast-feeding before inter- vention (or in control group) | % Breast-feeding or duration of breast-feeding after inter- vention (or in control group) | Net increase in % breast-feeding or duration of breast-feeding |
|---|--|---|
| 42.5% | 51.0% | 8.5% |
| 32.0% | 69.0% | 37.0% |
| 54.7% | 69.4% | 14.7% |
| 45.0% | 64.0% | 19.0% |
| 75 days (fathers not informed) | 135 days (fathers informed) | 60 days |
| 14.5% (pediatricians indifferent about breast-feeding) | 29.1% (pediatricians not indiffer- ent) | 14.6% |
| 43.6% | 68.5% | 24.9% |
| 26.9% | 43.5% | 37.0% |
| 10.3% | 37.0% | 26.7% |
| 18.0% (overall rate) | 34.8% (for hos- pital with breast-feeding program) | 16.8% |
| 33.0% | 65.0% | 32.0% |
| 15.0% | 52.0% | 37.0% |
| 39.5% | 78.8% | 49.3% |
| 22.1% | 69.0% | 45.9% |
| 6.0% | 39.4% | 33.4% |
| 1.0% | 15.4% | 14.4% |
| 37.0% | 52.0% | 15.0% |
| 23.0% | 43.0% | 20.0% |
| 14.0% | 37.0% | 23.0% |
| 37.0% | 44.0% | 7.0% |
| 56.0% | 83.0% | 27.0% |
| 76.0% | 93.0% | 17.0% |
| 26.4% | 87.3% | 60.9% |
| 26.0% | 58.0% | 32.0% |
| 42 days | 95 days | 53 days |
| 108 days | 175 days | 67 days |
| 1.77 mo | 3.14 mo | 1.37 mo |
| 16.6% | 100.0% | 83.4% |
| 16.7% | 52.9% | |
| 0.0% | 29.4% | |

pregnancy, labor, and delivery and have a marked influence on initial infant feeding choices. Despite the appealing logic of assuming that the neonate is the pediatrician's patient, obstetricians simply cannot divest themselves of the responsibility for promoting appropriate patterns of infant feeding. The evidence suggests that obstetric specialists have, along with unique responsibilities, unmatched opportunities and abilities to perform this service well.

Why promote breast-feeding?

Significant nutritional, immunologic, biochemical, antiallergenic, psychological, contraceptive, and economic advantages of breast-feeding have been well documented in the scientific literature.¹⁻⁹ A wide range of clinical experiments has established the value of breast-feeding in preventing gastroenteritis, respiratory tract infections, necrotizing enterocolitis, otitis media, shigella infections, hypocalcemia, hypernatremia, obesity, cow's milk allergy, asthma, and a variety of other diseases. The psychological implications of successful mother-child bonding, a process enhanced by breast-feeding, are only now beginning to be understood and appear crucial to harmonious early development.^{10, 11} Because of this extensive documentation, endorsements of the crucial importance of breast-feeding have come from the World Health Organization, the International Pediatrics Association, the British Department of Health and Social Security, and the American Academy of Pediatrics, which recently stated: "Ideally, breast milk should be practically the only source of nutrients for the first four to six months for most infants."

The history of breast-feeding patterns in industrialized countries has shown two major trends since the early twentieth century. Breast-feeding in the United States and Western Europe began to decline dramatically in the 1930s and 1940s, this trend lasting through the 1960s.¹² In 1966, only 18% of mothers in the United States were exclusively breast-feeding their babies upon hospital discharge.¹³ In the last several years, however, breast-feeding in the industrialized countries has enjoyed a new surge of popularity.¹⁴ Unlike the situation in most developing countries, where the rich breast-feed the least, in industrialized nations middle- and upper-class mothers breast-feed more and longer than the poor. It may be that, as with the adoption of artificial feeding earlier in this century, the poor will follow the rich classes back to breast-feeding in the future. However, the possibility that the shift back to breast-feeding may eventually include the poor is no justification for failing to hasten the process, especially since breast-feeding among low-income groups in the United States continues to be extremely rare.¹⁵

Table I—Cont'd

| Source | Place | Type of intervention | Sample size | Time of measurement |
|---|--|--|-------------|--|
| <i>Changes in hospital routines—Cont'd:</i> | | | | |
| McBryde ⁷⁴ (1951) | Durham, North Carolina | Rooming-in (L) | 2,067 | Hospital discharge |
| Salaria et al. ⁶⁸ (1978) | Dundee, England | Early initiation and increased frequency of breast-feeding (P) | 111 | Duration |
| Sosa et al. ⁶¹ (1976) | Guatemala City, Guatemala (Roosevelt Hospital) | Immediate suckling after birth (P) | 68 | Duration |
| | Guatemala City, Guatemala (Social Security Hospital) | Immediate suckling after birth (P) | 40 | Duration |
| Sousa et al. ⁷⁵ (1974) | Pelotas, Brazil | Immediate suckling and rooming-in (P) | 200 | 2 mo post partum |
| <i>Combined programs:</i> | | | | |
| Jepson et al. ⁹⁰ (1976) | Sheffield, England | Education and changes in hospital routines (L) | 11,658 | Intention to breast-feed 1 mo post partum |
| Švejcár ⁹⁶ (1977) | Prague, Czechoslovakia | Education of nursing staff and demand feeding and rooming-in (L) | * | Hospital discharge |
| Wong ⁹¹ (1975) | Singapore | Support of breast-feeding by hospital staff and no supplementary feeding (P) | * | Initiation |

Traditional versus modern societies: The need for planned interventions

Lactation is almost always successful in traditional societies in contrast with the high rates of lactation failure often reported in industrialized societies.⁴⁻¹⁶ In traditional societies, no alternative to breast-feeding is perceived or practiced. Pressures to bottle-feed (e.g., commercial advertising of milk substitutes, misguided advice of medical practitioners, supplantation of the breast's nurturing functions by its erotic role) are conspicuously absent. In short, breast-feeding is viewed as a routine, socially acceptable, necessary activity expected of every mother of every new baby. In Western industrial societies, the development of nutritionally acceptable artificial substitutes has meant that breast-feeding is no longer essential for infant survival. The high value placed on "scientific feeding," the indifference or ignorance of the health professions, the desire of some women for time away from infant care, and the aggressive promotion of infant formula combine to demote the importance of breast-feeding. In fact, breast-feeding has been explicitly rejected as embarrassing, crude, and primitive.¹⁷⁻¹⁸

The lack of emotional and social support for breast-feeding in industrialized culture is held by many to be a key determinant of breast-feeding failure.^{19, 20} Marked

declines in breast-feeding have been observed among immigrants to Western cultures,^{1b} reflecting the accessibility of substitutes and the generally low esteem for breast-feeding in modern society. In modern, Westernized culture, with reinforcement for breast-feeding generally lacking in the social system, it falls to health care institutions to provide information as well as surrogates for the supportive atmosphere of traditional societies. Breast-feeding promotion programs in industrialized countries operate within a context in which bottle-feeding is treated as an appropriate infant feeding method and where infant formula is made available to all mothers on the shelf of the local store as well as distributed free to the hospital nursery. Nevertheless, even under conditions typical of advanced societies, focused institutional programs show significant measures of success in the promotion of breast-feeding.

Factors affecting breast-feeding

Personal and social correlates of breast-feeding. The most significant correlate of successful breast-feeding is social class. Virtually every study of breast-feeding patterns in Western nations in the last 20 years reveals a clear positive correlation between successful breast-feeding and higher social class.^{14, 21-30} Factors such as education, which are linked with social class, are

| % Breast-feeding or duration of breast-feeding before inter- vention (or in control group) | % Breast-feeding or duration of breast-feeding after inter- vention (or in control group) | Net increase in % breast-feeding or duration of breast-feeding |
|---|--|---|
| 35.0% | 58.5% | 23.5% |
| 77 days | 182 days | 105 days |
| 109 days | 159 days | 50 days |
| 104 days | 196 days | 92 days |
| 27.0% | 77.0% | 50.0% |
| 36.0% | 59.0% | 23.0% |
| 21.8% | 27.7% | 5.9% |
| 67.0% | 81.0% | 14.0% |
| 47.0% | 72.0% | 25.0% |

similarly correlated.^{14, 22} For other factors, such as parity, maternal age, marital status, how the mother herself was fed as an infant, place of residence, place of delivery, difficulty of delivery, sex of infant, ethnic group, etc., the evidence is at best suggestive and at worst contradictory.

A composite profile of women most likely to breast-feed identifies those who are from middle and upper classes, well educated, older than 25 years, married, and were themselves breast-fed. Parity is a confusing factor: Some studies show no independent influence,^{30, 31} while others suggest that primiparous women are more likely to initiate breast-feeding²³ but also are more likely to give it up.²⁶ For multiparous women, a strong correlation exists between how previous children were fed and how the subsequent child is fed.²⁶ This correlation suggests the crucial importance of supporting a primiparous patient for successful breast-feeding as it will influence feeding patterns for later children as well.^{26, 32}

The mother's decision. Many women have already decided on the method of infant feeding before pregnancy^{24, 26} and almost all have decided by the last trimester of pregnancy. Thus, information given during obstetric care is much more important than any pediatric pleadings after birth. Mothers report re-

ceiving information and advice from a variety of sources.^{17, 21, 24, 30} The reasons women choose to start breast-feeding center around the recognition of health benefits for the baby, the closeness possible between mother and child, and the belief that it is "the natural thing" to do. The reasons for which mothers bottle-feed also are complex, but the proportion of these mothers expressing fear and embarrassment about breast-feeding is high (in some cases over 50%).^{17, 18, 24, 28} Also of concern is the proportion of women who are unaware of any differences between breast- and bottle-feeding or who have simply never thought about breast-feeding.³³

Although many writers glibly state that salaried work causes women to reject breast-feeding, the contention that work is a major impediment is not sustained by empirical evidence.^{17, 24, 34-36} No study of the impact of work on breast-feeding suggests this as an important consideration for more than 10% of the population surveyed, and it is frequently far less.^{17, 18, 21, 24, 26, 37} There is some evidence that working women breast-feed more than nonworking women.^{35, 38}

The most commonly cited reason for mothers who are nursing to stop is that the milk "dries up" or is insufficient.^{17, 21, 24, 30} Helsing³⁹ emphasizes that this answer is commonly cited because it is socially acceptable. Applebaum⁴⁰ and Gurney⁴¹ stress that where milk is, in fact, insufficient this is frequently caused by inappropriate advice and faulty technique—usually the introduction of supplementary feeds that reduce sucking on the breast and thus reduce milk secretion. Other factors which have been noted as contributing to discontinuation are fatigue, sore nipples, and medical advice to discontinue breast-feeding.

Interventions

A recent resurgence of breast-feeding in Western countries has come about, in part, as a result of three forces: the activities of breast-feeding support groups^{19, 42}; a "back-to-nature movement," in which consumers spurn artificial or processed foods; and growing appreciation of and advocacy for breast-feeding by some health professionals. In the 1970s, there was a virtual explosion of interest in breast-feeding: More than 150 papers on human milk and the process of breast-feeding appeared in the last 9 months of 1976 alone.⁴³ Beyond these general phenomena are specific program efforts undertaken in an attempt to increase the incidence and duration of breast-feeding. Some of these have taken place at the national level (e.g., in England and Sweden) while most were implemented at the hospital level. Overall, there is impressive evidence demonstrating that rates of breast-feeding can be increased.

Medical interventions which have proved effective in promoting breast-feeding can be divided into two categories: those that supply information and support and those that change hospital routines so as to facilitate the successful establishment of lactation. In many cases, successful programs to increase breast-feeding have involved both types of actions, which seem to have the potential for interacting synergistically. Indeed, increased information on the importance of breast-feeding may influence hospital staff to change hospital routines because the staff itself has become more supportive of breast-feeding. Such positive staff attitudes also may be translated into direct support of patient decisions to breast-feed even without a formal patient-education program. To the extent that the data permit, however, information/support programs and hospital routine changes will be considered separately since they have different practical implications: The first set of activities involves changes in the behavior of personnel toward patients while the second involves changes in the management of hospital services.

Information and support. Theoretically, activities providing information and those providing support are different from each other and separable in their effects. In fact, the two types of activities are almost impossible to separate. In the first place, *all* educational exchanges involve nonformal, unspoken messages of support from health personnel to patients, and these messages seem valuable in promoting breast-feeding. Second, imparting information to patients requires increased staff time in direct patient contact, and this too has emotionally supportive effects. Finally, training of staff so that they can teach patients has the effect of increasing staff knowledge—and often enthusiasm—about the benefits of breast-feeding. The impact of any educational program may thus derive as much from the support offered as from the technical information given. The close interaction of information and support is demonstrated in studies where the efficacy of technical advice in solving common problems can be evaluated separately from the effect of the intervention *in toto* in promoting lactation. For example, while breast-feeding classes do favor a longer duration of nursing, the breast preparation taught in those very classes, contrary to expectations, is *not* effective in preventing sore nipples or breast engorgement.⁴¹ Similarly, it was found that it was not nipple preparation *per se* but the extra support and encouragement provided to an experimental group that accounted for their better nursing experiences.^{45, 46}

Some of the earliest programs to increase breast-feeding consisted of combined information and support. Because artificial feeding resulted in catastrophic

episodes of infectious diseases,⁴⁷⁻⁵⁰ physicians in the first decades of the twentieth century were concerned with promoting breast-feeding in order to reduce infant morbidity and mortality. One of the first programs to promote breast-feeding took place in Minneapolis, Minnesota.⁵² There, two doctors established a Breast-feeding Investigation Bureau, which enlisted the cooperation of every physician in the city, assigned a nurse to visit the home of every mother within 3 weeks of a birth, and solicited information by mail on each nursing mother and her child. While no comparisons can be made with breast-feeding rates before the Bureau's work began, the doctors cite a fall in the city's infant mortality rate from 81 to 65 per thousand as evidence of their success in promoting breast-feeding. Among babies born in the first 5 months of 1919, 96% were breast-fed after 2 months, and 72% were still receiving breast milk after 9 months. A similar system was adopted in Nassau County, New York, in 1923.⁵² Nine tenths of the mothers breast-fed their infants for 1 month and two thirds continued for at least 7 months. Again, while no comparative data from earlier years are available, the authors note that the infant mortality rate in this group was 49 per thousand, as compared with 70, 67, and 78 per thousand in the immediately preceding years of 1920, 1921, and 1922.

A wide variety of recent studies confirms the principle that mothers afforded reliable information from health workers are more likely to initiate and continue breast-feeding. Wood³⁹ notes that women choosing breast-feeding have the largest number of sources of information. In one sample, only a third of new mothers felt that hospital nurses provided useful information, yet among those women who felt that the information they had received was useful, 79% were still breast-feeding at 3 months post partum, more than twice the average for the whole group. The main difference between those who were successful at breast-feeding and those who were not seemed to be the women's access to support and information.²²

Another striking finding is that information and education programs aimed at *hospital staff* are often as effective in increasing breast-feeding rates as direct education of new parents. Promoting breast-feeding among relevant health personnel seems to be the first step in creating a service atmosphere that is truly conducive to successful lactation. This argues for better training of all staff and reinforcement of breast-feeding messages from obstetricians, in particular, to other personnel with whom they work. A single ward seminar designed to increase the interest in and knowledge of the nursing staff succeeded in increasing the proportion of mothers breast-feeding on hospital dis-

charge from 14% to 37%.³⁰ When this study was repeated 2 years later,²⁹ the proportion of women breast-feeding on discharge had risen to 52%, with a longer duration of breast-feeding and a noticeable delay in the introduction of solid foods. Smart and Bamford²⁴ noted an increase in breast-feeding upon hospital discharge from 37% to 44% over a few months without any specific patient-oriented program. They attributed this rise in part to the fact that their own research had stimulated great interest in breast-feeding among the health staff.

Continuity of medical care also seems to be an important factor in providing the background of information and support necessary for successful lactation. Two groups, both seen in the same antenatal clinic, were noted to have markedly different breast-feeding rates. Among those seeing general practitioners who personally provided all the prenatal, labor and delivery, and postnatal care for each of their patients, breast-feeding was practiced by 69% at 6 weeks post partum. Those seen by specialist obstetricians, on the other hand, were given prenatal care by a shared, group practice arrangement and were seen in the hospital by a number of different house physicians. This second group had a breast-feeding rate of only 32% at 6 weeks post partum.³⁵

Physicians as individuals can exercise a great deal of influence on breast-feeding, both positively³⁶ and negatively.²² An American obstetrician in Indiana promotes breast-feeding by convening her patients in an informal group discussion. Each expectant mother is assigned a "counselor" who herself is an experienced breast-feeding mother. In 2 years, the hospital breast-feeding rate of these patients increased from 33% to 65%, and the proportion breast-feeding at 5 months increased from 15% to 52%.³⁷ Haider³⁸ shows that with a minimal investment of time in a group discussion conducted by a physician for 20 to 30 parents, 80% of those attending breast-feed as compared with only 20% of those who do not attend. When talks are given in smaller groups, 90% of women breast-feed in the hospital and 80% continue for at least 3 months.

Although it is clear that good information and support networks can increase the prevalence of successful breast-feeding, the proportion of women receiving little or no advice from professional sources is surprisingly high. Many women are acutely aware of the failure of professional sources to provide information.^{24,44, 59} In one group of mothers, only 8% had been given specific information on breast-feeding at their antenatal clinic²⁸; of these, 91% attempted to breast-feed, far more than those given little or no advice. Seventy-eight percent of bottle-feeders reported they had been given

no encouragement to breast-feed; even among breast-feeders, only 42% said they had been encouraged to do so. Even when women acknowledge professional support, most rank the help of the doctor below that of the nurse or midwife.³⁹ Women apparently feel that doctors are frequently unsupportive,⁴² and if doctors are discouraging about breast-feeding, mothers will be discouraged from attempting it.²³ Taken together, all these studies provide evidence for the general hypothesis that information and support can significantly enhance the chances for successful breast-feeding. While the types, timing, and duration of programs will need to be tailored to suit each locale, it is clear that health personnel play an important role in fostering the conditions in which breast-feeding can flourish.

Changes in hospital routines. Technological progress has permitted enormous advances in the care of sick and abnormal infants, but routine hospital procedures for healthy infants, in many cases, appear to interfere with normal physical and psychological processes.¹¹ In particular, many hospital routines have been shown to decrease the likelihood of successful initiation and maintenance of lactation. Revision of these routines can increase the incidence of positive breast-feeding experiences. Anything that restricts feeding contact during the first 10 days of life is associated with less successful breast-feeding.^{60, 61} Included are separation of mother and baby after birth, introduction of prelacteal feeds and/or supplementary feeds, feeding on a rigid schedule, and drugs administered in labor.

Immediate breast-feeding and skin-to-skin contact. A number of studies point toward the primary importance of sustained intimate contact between mother and infant in the first postpartum days.^{10, 11, 62, 63} Mothers permitted such contact show greater affectionate behavior, adaptability, and independence when compared to mothers deprived of this experience. There is a significant and growing body of evidence suggesting that skin-to-skin contact between mother and child immediately after delivery strengthens the mother-child bond, one consequence of which is greater likelihood of prolonged breast-feeding. Studies from distinctively different population groups support this hypothesis. In Guatemala, the pioneering work of Klaus and Kennell¹⁰ demonstrated that 45 minutes of contact after birth was significantly associated with a greater duration of breast-feeding, up to 100% longer than in the control group. Infants in the experimental group suffered fewer episodes of infectious disease, and in one trial infants in the experimental group gained more weight at 6 months and 1 year than the control group infants.⁶⁴

De Chateau⁶⁵ found that providing 30 minutes of skin-to-skin contact immediately after birth resulted in a breast-feeding rate of 58% at 3 months, as compared with 26% in the control group. The effect of early mother-child contact was also demonstrated by a small controlled trial in the United States.⁶⁶ Of 12 mothers intending to breast-feed, six were given their babies shortly after birth while the other six were given their babies 16 hours later. At 2 months post partum, all six of the early contact mothers were still breast-feeding, while only one of six in the delayed contact group was doing so. Similar results were found in a Swedish study of the effect of early skin-to-skin contact and suckling on breast-feeding patterns.⁶⁷ The median duration of breast-feeding in the early contact group was 175 days, over 2 months more than the median duration of 108 days in the control group mothers. Significant benefits of early initiation of breast-feeding combined with increased frequency of nursing also has been demonstrated.⁶⁸ A group of mothers who nursed early and breast-fed every 2 hours continued feeding for a median of 182 days, as compared to 77 days for a group who initiated breast-feeding later and fed only every 4 hours. The early initiation of sucking was found more important in prolonging breast-feeding than the increased frequency of feeding.

While immediate skin-to-skin contact and early sucking are powerful promoters of successful breast-feeding, cross-cultural studies show that in very traditional societies, where breast-feeding is the norm, successful lactation may occur without immediate sucking.^{20, 69} In such situations, however, many other extremely powerful stimuli to successful breast-feeding also are at work. This lends weight to the conclusion that "early contact may be a simple way of promoting breast-feeding for some mother-infant pairs cared for in the highly technical and 'unnatural' environment of today's delivery units."⁷⁰ The diversity of possible pathways to successful breast-feeding—and mothering—speaks to the flexibility and adaptability of the human species. Still, there need to be mechanisms by which mother-infant attachment is facilitated, whether these are built into the general social structure or specifically provided by a technologically oriented birth-care system.

Rooming-in. Rooming-in (keeping the newborn infant within easy reach of the mother 24 hours a day) also has been shown to increase the likelihood of successful breast-feeding. A detailed analysis of the effects of rooming-in on the incidence and duration of breast-feeding showed that as late as 3 to 4 months after delivery about 1½ times as many "rooming-in" mothers as "nursery" mothers were still breast-feeding.⁷¹ Similar

results were reported by Lind and Jaderling⁷² in 1964 in a trial with 172 rooming-in mothers and 172 control mothers. In a Swedish study of 3,214 mothers, 93% of mothers who had had rooming-in were breast-feeding upon hospital discharge as compared with 76% of mothers from the regular maternity ward.⁷³ Mothers who had rooming-in also showed more self-confidence in the management of their children and sought advice less often in the first month post partum. The institution of compulsory rooming-in in Durham, North Carolina, boosted the breast-feeding rate there from 35% to 58.5% upon hospital discharge.⁷⁴ While no significant correlation was found between room arrangements and *intention* to breast-feed, two thirds of those mothers who were still breast-feeding at 3 months post partum had had rooming-in arrangements while more than half of the mothers who had stopped breast-feeding at this time had not.²²

Programmatically, the advantages of early contact between mother and child and 24-hour rooming-in are often combined. Sousa and associates⁷⁵ showed that among mother-infant pairs who enjoyed these arrangements, 77% were still breast-feeding at 2 months post partum, as compared to 27% of the control group in which mothers and babies were separated according to hospital routine. In the Philippines, Clavano⁷⁶ reorganized the postpartum ward of one hospital to provide rooming-in for all mothers and newborn infants. Mothers were given their infants within 2 hours after birth and were not separated from their infants while in the hospital. In addition to an increase in the percentage of women breast-feeding from 26.4% to 87.3%, in the infant population there was a reduction in the morbidity rate of 56.8% and in the mortality rate of 44.9%, mostly because of decreases in septicemia and diarrhea.

As demonstrated by the decline in morbidity and mortality in Clavano's⁷⁶ study, rooming-in appears to offer substantial benefits in reduction in the risk of infection. It also may reduce the amount of staff time needed for infant care since the mothers provide most of the care for their own babies. It seems to increase the confidence and independence of mothers^{10, 62} and, above all, to foster a healthy relationship between mother and newborn infant in the sensitive period following birth. Furthermore, the rooming-in model has been demonstrated to be overwhelmingly preferred by mothers.⁶²

Demand feeding with no supplementary bottles. A close concomitant of early initiation of breast-feeding and rooming-in is demand feeding, in which the baby is allowed to nurse whenever it desires rather than according to a rigid schedule. Apparently, demand feed-

ing can be instituted as part of the normal hospital routine with little difficulty.⁷⁷ Consistently, breast-feeding has been found more likely to be successful among infants on demand feeding.^{78, 79} A sensitive, dynamic interaction between mother and child governs the normal hormonal control of milk secretion (prolactin) and milk ejection (oxytocin). Feeding according to a rigid schedule inhibits natural interactions and the early successful establishment of lactation⁸⁰ at least three separate ways. Interference with normal hunger/satiety cycles in the infant may disrupt the mechanisms for regulation of food intake; decreased frequency and effectiveness of infant sucking will interfere with prolactin production and, therefore, the milk supply of the mother; finally, rigid routines increase anxiety in the mother and interfere with milk ejection.

Evidence is mounting that the mechanisms for self-regulation of food intake in the infant are sensitive and effective.⁸¹ Both small-for-date and large-for-date breast-fed infants tend to "grow back into the charts" more quickly than their bottle-fed counterparts.⁸² These same mechanisms of intake regulation, when undisturbed, also have been reported to decrease the likelihood of infantile obesity.⁸³

The routine administration of prelacteal feeds and subsequent complementary feeds to the breast-fed infant reduce the infant's sucking on the breast and hence the secretion of milk.⁵⁹ Furthermore, since sucking a bottle is a fundamentally different process from sucking a breast, complementary feeds also may undermine lactation by making the infant's sucking motions inappropriate for breast-feeding. This hypothesis is supported by a study of 884 infants in which the duration of breast-feeding was doubled if supplementary feedings were introduced by spoon rather than bottle.⁸⁴

The undesirable effects of complementary feeding include not only the physiologic inhibition of milk secretion due to decreased sucking but also the implicit undermining message to the mother: The staff feels she cannot meet the baby's needs by herself. This message also may be conveyed by other rigid procedures with equally deleterious effects. This may be the mechanism whereby routine weighing of babies before and after each breast-feeding inhibits successful lactation.⁶⁷ Abandonment of this routine was found to reduce early lactation failure, probably by decreasing anxiety that blocks the milk "let-down reflex." In fact, prelacteal feeds have been found useless to prevent weight loss in the newborn infant; what they more commonly prevent is successful breast-feeding.⁷⁰ Supplementary feeds may have the same effect. When women com-

plain of insufficient milk, a problem with many possible causes, they are often counseled to add artificial feeds. The offer by physicians of a "prescription" of bottle supplements without investigation of the cause of the mother's complaint is an unusual deviation from normal standards of medical care. In a study of patient-physician interactions, it was found that women who complained of "insufficient milk" were counseled to add complementary feeds, with the result that breast-feeding stopped within 2 weeks in every case.⁵⁵

Drugs. Certain drugs given to mothers may inhibit the establishment of successful lactation.⁴⁰ Brazelton^{85, 85a} demonstrated that the ability to breast-feed successfully was impaired by the administration of barbiturates to the mother during labor. On the first postpartum day, 30% of heavily medicated mothers were considered "effective" breast-feeders, as compared to 65% of lightly medicated mothers. It took 5 to 6 days before this difference disappeared. Using more precise measurements of sucking, Kron and co-workers⁸⁶ demonstrated that central nervous system depressants given during labor reduce the amount of nutritive sucking by the infant. Decreased sucking leads to decreased consumption of milk by the infant and decreased stimulus for milk production in the mother. Medication given in labor can inhibit sucking and render feeding interactions more difficult for up to 10 days post partum.⁸⁷ It has also been shown that ergonovine maleate interferes with prolactin secretion and thus may decrease milk production.⁸⁸

Preliminary evidence from Thailand indicates that the timing of postpartum sterilization may have significant effects on lactation, either because of the anxiety and stress caused by the procedure or because of the use of sedation and anesthesia.⁸⁹ Milk production was apparently not affected in women undergoing operation within 24 hours of delivery, but there was a significant lowering of milk volume at both 7 and 14 days post partum in mothers whose tubal ligations were done 4 to 6 days after delivery. The investigators hypothesize that the lactation-suppressing effects of drugs and anxiety are most critically significant if imposed on mothers during the time when milk production begins and lactation is being established.

The evidence demonstrates that certain routine medical practices and procedures can have deleterious effects on lactation. The effects of many other practices on breast-feeding, even those thought to be totally unrelated to lactation, remain completely unknown. Certainly, it cannot be assumed that routine patient care practices are entirely benign in their effects on mother-infant interactions. Until questions are asked about the effects of routine practices, however, their

exact impacts on nursing performance will never become evident.

Information combined with changed hospital practices. Just as combining information and support enhances breast-feeding more than either one alone, combining both with sensible hospital routines should act as an even more powerful promoter of breast-feeding success. In Sheffield, England, a package of changes, including better education of doctors and nurses, public education, antenatal classes, modification of hospital routines, and better home help to mothers from midwives and nurses, was instituted. The result was an increase in the proportion of women intending to breast-feed from 36% in 1973 to 59% in 1976.⁹⁰ In a prospective study in Singapore, Wong⁹¹ showed that 72% of mothers initiated breast-feeding in a ward where nurses and midwives enthusiastically promoted it and where supplementary feeding was halted. In a comparable ward, where staff had no more than routine interest and powdered infant formula was supplied on demand, only 47% of mothers initiated breast-feeding.

Implications for actions to promote breast-feeding

Breast-feeding is a complex interaction between mother and infant that can be enhanced or inhibited by a wide range of social, psychological, and physiologic factors. While the overall social context and the value that each culture places on breast-feeding may ultimately determine infant feeding patterns, medical personnel have both the responsibility and the opportunity to increase the status of breast-feeding within the professions as well as in the community. The evidence cited above demonstrates that breast-feeding promotion activities work in all social environments and systematically raise the prevalence and duration of breast-feeding, whether these were initially low or high. For example, in Sweden, a high breast-feeding rate was made almost universal (76% to 93%), whereas in Brazil interventions converted a low rate into a high rate (27% to 77%).^{73, 75}

In this paper, interventions that have been shown to be successful are classified into two broad categories: information and support and hospital routines. In general, the first type of change is most likely to meet with the greatest acceptance from health workers. Few members of the health team have vested interests in "no education," and none would oppose actively the provision of information. The absence of education in most hospitals is usually ascribed to heavy patient loads, but this is merely a reflection of its low priority in most service delivery systems: With a medical orientation

toward unusual pathology, normal lactation is seldom found "interesting."

In the case of hospital routines, however, the situation is different: "Hospital routines are often much more geared to the requirements of the institution than to the needs of mother and infant."⁷⁷ Changing routines, even when the overwhelming weight of evidence shows clear benefits to patients, encounters initial resistance from those accustomed to standard procedures. Ironically, although it is easier to gain administrative and staff support for educational activities than for institutional changes, the latter may be easier and cheaper to accomplish. Education programs require ongoing staff commitment, repeated effort every year, and recurrent funds. Changes in hospital practices, on the other hand, generally can be accomplished in a short period of time, need be done only once, do not require continued efforts, and often end up saving money.⁷⁶

Given the current pressures on medical care to (1) encourage self-reliance, (2) promote physical and psychological health through preventive rather than curative medicine, and (3) contain costs, the promotion of breast-feeding offers exciting possibilities. In the immediate future there are a number of steps that can contribute to the promotion of breast-feeding, and these do not require unreasonable amounts of staff time, expensive pedagogic materials, or elaborate architectural renovations. The data suggest that even minimal expressions of interest by physicians in breast-feeding (e.g., ward seminars, research projects, simply inquiring how many women are breast-feeding) can make a difference. Similarly, reorganization of hospital routines in the perinatal period, with an eye to minimizing interventions and practices of questionable value, could enhance the well-being of mother and infant.

The burden of responsibility for promoting breast-feeding has fallen on pediatricians because they treat illnesses arising out of improper feeding. Good pediatric guidance is, of course, essential if breast-feeding is to be sustained through minor physical and psychological problems. However, if a mother is not convinced of the superiority of breast-feeding, she may not even try it in the first instance: Positive attitudes toward breast-feeding are correlated with significantly higher success rates than ambivalent or negative attitudes. By the time a pediatrician sees the mother, it is too late to provide the information and encouragement that enhance the chances for successful nursing. It is the obstetrician who, in fact, has the greatest potential for increasing the prevalence and duration of breast-feeding.

Because of the state of the art of breast-feeding re-

search, there are certain important things which we do not yet understand. Although it is clear that both information/support and appropriate medical practices will increase breast-feeding rates, we do not yet know anything about optimum mixes of these two sorts of interventions. It is not known how much of each must be provided for maximum efficacy and efficiency of program operation, although it is clear that there is some substitutability of effect. For example, while late initiation of breast-feeding is not detrimental to successful lactation in certain traditional societies, it obviously has adverse effects in Western-oriented medical systems. How much support and education would be necessary to overcome this barrier to nursing? Would it be easier and/or cheaper to make universal changes in postdelivery practices than to provide information and

support networks? The answers to such questions are not immediately available.

Neither is it known how to compute the exact costs and/or savings involved in revision of hospital routines. Although it is clearly not an expensive proposition, and may be money saving, to make such changes, figures applicable to United States institutions with different service provision patterns are not available at present. Both the financial and service mix questions have important implications for rational program development, and, although the answers are not yet known, there is no reason to suppose that they are unknowable. What is apparent is that staff attitudes and hospital routines can be structured rather easily and effectively so that they make important contributions to successful lactation.

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