



The new BFHI training package¹

The Baby Friendly Hospital Initiative (BFHI) was launched in 1991. Since then, more than 15,000 facilities in 134 countries have been awarded Baby-Friendly status. However, after the initial exponential growth in the number of designated hospitals, progress slowed down everywhere after 1996, with notable differences between and within countries. Based on the figures reported by UNICEF, since 1991 less than seven hospitals per country have been designated Baby Friendly each year. Weighed against the global number of hospitals and of births taking place in hospitals, this rate is low. Moreover, there are no figures on the proportion of Baby Friendly hospitals reassessed to verify whether they maintain their standard over time.

To revitalize the BFHI in both quantitative and qualitative terms, WHO and UNICEF have developed a new package, based on a revised 20-hour course for maternity staff. In the revised package:

- Step 4 is re-formulated as to “place babies in skin-to-skin contact with their mother immediately following birth for at least an hour and encourage mothers to recognize when their baby is ready to breastfeed, offering help if needed”.
- Step 10 is updated to emphasize the importance of early support (preferably 2-4 days after birth and again the second week) at the facility or in the community by a skilled breastfeeding support person, if possible a peer counsellor associated with a mother-to-mother support group.
- New criteria are introduced for the assessment of compliance with the International Code.
- Optional alternative criteria are given for areas with high prevalence of HIV/AIDS.
- Additional optional criteria are specified for Mother Friendly care during labour and childbirth.

To fulfil Step 2 of the BFHI, the goal is to train at least 80% of the clinical staff members that are in contact with mothers and/or infants and that have been employed 6 months or more. This is quite a challenge! A never ending activity to be planned twice a year, given the turnover of staff and the inadequate and outdated breastfeeding knowledge and skills that most health professionals acquire during their pre-service training. By the time they graduate from health schools, most doctors, nurses and midwives have been flooded with hi-tech diagnostic and treatment approaches, and are primed to address disease with a purely medical approach. Few learn to deal with pregnancy and childbirth as a physiological event, and to communicate with people and counsel them. Moreover, it is not uncommon, even during pre-service training, to be exposed to promotional material and activities provided by manufacturers of breastmilk substitutes, with the consequent bias as to the knowledge and attitude towards infant and young child feeding. It is extremely difficult to change the attitude and practice of these health professionals, and to train them in the basics of the BFHI: to protect breastfeeding as normal and natural throughout pregnancy and after birth, to promote early skin-to-skin contact, to avoid unnecessary separation of the mother from her newborn infant, to prevent the unnecessary use of bottles, teats and breastmilk substitutes, etc.

Will it be possible to revitalize the BFHI and return to the enthusiasm of the early days? Will the revised BFHI package, centred on the in-service training of professionals, increase the rate of Baby Friendly hospital certification. We believe that applying the revised package and training materials alone will not bring about the changes needed to accelerate the progress of the BFHI, currently static in many countries. In addition, we would suggest the following:

- Give priority to large teaching hospitals. These play an important role in the training of doctors, nurses and midwives. Only by learning the good practices in a Baby Friendly teaching hospital will these health professionals be able to replicate them when they are posted in other hospitals.
- Include the scientific bases of the 10 Steps and the risks of not breastfeeding in the curriculum of health schools. Include as well the International Code and knowledge of some of the commonmarketing practices of manufacturers of breastmilk substitutes.
- Promote the use of active teaching methods in BFHI courses and health schools. These methods should be based on adult learning theory that uses trainee knowledge and experience as the basis for successful acquisition and practice of new knowledge and skills.

¹ Four sections of the package are downloadable from <http://www.who.int/nutrition/topics/bfhi/en/index.html>

Breastfeeding why

Human Immunodeficiency Virus (HIV)

Becquet R, Ekouevi DK, Menan H et al. Early mixed feeding and breastfeeding beyond 6 months increase the risk of postnatal HIV transmission: ANRS 1201/1202 Ditrane Plus, Abidjan, Côte d'Ivoire. Preventive Medicine 2008;47:27-33

In 2001-2003, HIV-infected pregnant women received peri-partum antiretroviral prophylaxis and were counselled antenatally regarding infant feeding options: formula feeding or exclusive breastfeeding with early cessation from 4 months of age. Of 622 live-born infants who were HIV uninfected at or after 30 days, 15 were infected post-natally, 13/324 among breastfed, and 2/298 among formula-fed infants. The 18-month probability of remaining free from HIV infection was respectively 95% (92–97%) and 99% (97–100%) in the breastfeeding and formula-feeding groups. In adjusted analysis, breastfeeding for more than 6 months and mixed feeding during the first month of life were independently associated with a 7.5- (2.0–28.2) and a 6.3- (1.1–36.4) fold increase of postnatal transmission among breastfed children. Mixed feeding during the first month of life and breastfeeding beyond 6 months should be avoided when replacement feeding after breastfeeding cessation can be safely and sustainably provided.

Piwoz EG, Humphrey JH, Tavengwa NV et al. The impact of safer breastfeeding practices on postnatal HIV-1 transmission in Zimbabwe. Am J Public Health 2007;97:1249-54

This study assessed the association between exposure to an educational intervention that emphasized safer breastfeeding practices and postnatal HIV transmission among 437 HIV-positive mothers in Zimbabwe, 365 of whom did not know their infection status. Mothers were tested for HIV and were encouraged, but not required, to learn their HIV status. Cumulative postnatal HIV transmission was 8.2%; each additional intervention contact was associated with a 38% reduction in postnatal HIV transmission. HIV-positive mothers who were exposed to both print and video materials were 79% less likely to transmit HIV to their infants compared with mothers who had no exposure. These findings were similar for mothers who did not know their HIV status. This article provides an important new insight in the area of HIV and infant feeding and concludes that the promotion of exclusive breastfeeding has the potential to reduce postnatal HIV transmission among women who do not know their HIV status.

Kuhn L, Sinkala M, Kankasa C et al. High uptake of exclusive breastfeeding and reduced early post-natal HIV transmission. PLoS One 2007;2:e1363

To test the hypothesis that exclusive breastfeeding is associated with a lower risk of postnatal HIV transmission than non-exclusive breastfeeding, 958 HIV-infected women and their infants were recruited in Lusaka, Zambia, as part of a randomized trial of early weaning; all were encouraged to breastfeed exclusively to 4 months. Single-dose nevirapine was provided to prevent transmission of HIV. Uptake of exclusive breastfeeding was high with 84% of women reporting only exclusive breastfeeding cumulatively to 4 months. Postnatal HIV transmission before 4 months was significantly lower among exclusively breastfed (4%; 2.4% to 5.5%) than non-exclusively breastfed infants (10.2%; 4.7% to 15.7%). There were no significant differences in the severity of disease between exclusive and non-exclusive breastfeeding mothers and the association remained significant after adjusting for maternal CD4 count, plasma viral load, syphilis screening results and low birth weight. Programmes to support exclusive breastfeeding should be expanded universally in low resource settings. Exclusive breastfeeding is an affordable, feasible, acceptable, safe and sustainable practice that reduces HIV transmission, thus providing HIV-infected women with a means to protect their children's lives.

Leroy V, Ekouevi DK, Becquet R et al, for the ANRS 1201/1202 DITRAME PLUS Study Group. 18-month effectiveness of short-course antiretroviral regimens combined with alternatives to breastfeeding to prevent HIV mother-to-child transmission. PLoS One 2008;3:e1645

The 18-month effectiveness of short-course antiretroviral peripartum regimens combined with alternatives to prolonged breastfeeding to prevent mother-to-child transmission of HIV was assessed in Abidjan, Côte d'Ivoire. HIV-infected pregnant women received from 32-36 weeks of gestation short-course zidovudine, with or without lamivudine, and with or without single-dose nevirapine at delivery; neonates received single-dose nevirapine plus 7-day zidovudine prophylaxis. Two infant-feeding interventions were systematically offered free of charge: formula-feeding or exclusive breastfeeding with early cessation at 4 months. The control group was an earlier cohort of pregnant women exposed to short-course zidovudine from 36 weeks, then to prolonged breastfeeding. Among 926 live-born children enrolled, 107 (11.6%) were HIV-infected at 18 months. Cumulative transmission risks were 22.3% (16–30%) in the 238 children of the control group, 15.9% (10–27%) in the 169 of the zidovudine + nevirapine breastfed group, 9.4% (6–14%) in the

195 of the zidovudine + nevirapine formula-fed group, 6.8% (4–11%) in the 198 of the zidovudine + lamivudine + nevirapine breastfed group, and 5.6% (2–10%) in the 126 of the zidovudine + lamivudine + nevirapine formula-fed group. Each combination had a significantly higher effectiveness than the control group except for the zidovudine + nevirapine breastfed children, ranging from 51% (20–70%) for the zidovudine + nevirapine formula fed children to 63% (40–80%) for the zidovudine + lamivudine + nevirapine breastfed children, after adjustment for various factors. It is concluded that substantial reductions of the risk of mother-to-child transmission are reachable in Africa, even in short-term breastfed children, with long-term benefits until age 18 months and without increasing mortality.

Chopra M, Rollins N. Infant feeding in the time of HIV: rapid assessment of infant feeding policy and programmes in four African countries scaling up prevention of mother to child transmission programmes. *Arch Dis Child* 2008;93:288-91

To assess the infant feeding components of prevention of mother-to-child HIV transmission programmes, an assessment was performed in all health facilities of 29 randomly selected rural and urban districts of Botswana, Kenya, Malawi and Uganda. The facility level manager and the senior nurse in charge of maternal care were interviewed; 334 randomly selected health workers completed self-administered questionnaires; 640 counselling observations were carried out; and 34 focus groups were conducted amongst men and women. Irrespective of exposure to training, most health workers (234/334, 70%) were unable to estimate correctly the transmission risks of breastfeeding. Infant feeding options were mentioned in 307 of the 640 (48%) observations of counselling sessions, and in only 35 (6%) of these were infant feeding issues discussed in any depth. Moreover, of these 35, 19 (54%) were rated as poor. Several health workers also reported receiving free samples of infant formula – in contravention with the International Code. National HIV managers stated they were unsure about infant feeding policy in the context of HIV.

Finally, almost all participants believed that an HIV-positive mother who breastfeeds will always infect her child and that a mother who intentionally avoids to breastfeed indicates that she is HIV-positive. These findings underline the need to implement and support systematic infant feeding policies and programme responses in the context of HIV programmes.

Coutsoudis A, Coovadia HM, Wilfert CM. HIV, infant feeding and more perils for poor people: new WHO guidelines encourage review of formula milk policies. *Bull World Health Organization* 2008;86:210–14

This paper explores infant feeding policies in relation to broader socioeconomic issues in the light of the new WHO guidelines on HIV and infant feeding (2006). In order to accumulate evidence on the increase in rates of malnutrition, morbidity and mortality associated with the avoidance or early cessation of breastfeeding by HIV-infected mothers, and the unanticipated hazards of formula feeding, it is necessary to better assess the measures leading to optimum policies on infant and child nutrition and the reduction of poverty. Piecemeal interventions that increase resources directed at only a fraction of a family's impoverishment, such as basic materials for preparation of hygienic formula feeds and making flawed decisions on choice of infant feeding, are bound to fail. Providing formula to poor populations with high HIV prevalence is justified neither by evidence, humanitarian considerations, respect for local traditions or economic outcomes. Exclusive breastfeeding – even threatened by the HIV epidemic – remains an unfailing anchor of child survival.

Child mortality

Jakobsen MS, Sodemann M, Biai S et al. Promotion of exclusive breastfeeding is not likely to be cost effective in West Africa. A randomized intervention study from Guinea-Bissau. *Acta Paediatr* 2008;97:68-75

In order to evaluate the impact of health education on infant health in a region characterised by high mortality rates, widely practised breastfeeding and low exclusive breastfeeding rates, the 1,721 infants of a birth cohort were randomized and their mothers were informed about the benefits of exclusive breastfeeding for the first 4-6 months. All children were followed from birth to 6 months. Introduction of both water and weaning food was significantly delayed in the intervention group (IG). There was no reduction in mortality in the IG compared with the control group (CG). Weight at 4-6 months was significantly lower in the IG (7.10 vs 7.25 kg). There was no difference in diarrhoea morbidity and hospitalization rates. Although mothers wanted to follow the new breastfeeding recommendations, these had no beneficial impact on infant health in this society with traditional, intensive breastfeeding.

Edmond KM, Kirkwood BR, Amenga-Etego S et al. Effect of early infant feeding practices on infection-specific neonatal mortality: an investigation of the causal links with observational data from rural Ghana. Am J Clin Nutr 2007;86:1126-31

This study assessed the effect of different early infant feeding practices (delayed breastfeeding initiation, prelacteal feeding, established neonatal breastfeeding) on infection-specific neonatal mortality. A cohort of 10,942 breastfed singleton neonates born in Ghana between 1 July 2003 and 30 June 2004 and who survived to day 2, was examined. Verbal autopsies ascertained the cause of death. Of the 140 neonates that died from days 2-28, 93 died of infection and 47 of non-infectious causes. The risk of death as a result of infection increased in parallel to the delay in initiation of breastfeeding from hour 1 to day 7. Overall late initiation (after day 1) was associated with a 2.6-fold risk of death (1.68-4.04). Partial breastfeeding was associated with a 5.7-fold risk of death (2.75-11.91) as a result of infectious disease. No obvious associations were noted between these feeding practices and non-infection-specific mortality. This study provides the first epidemiologic evidence of a causal association between early breastfeeding and reduced infection-specific neonatal mortality.

Allergy

Kramer MS, Matush L, Vanilovich I et al. Effect of prolonged and exclusive breastfeeding on risk of allergy and asthma: cluster randomised trial. BMJ 2007;335:815-20

In this cluster randomised trial, a total of 17,046 mother-infant pairs, of whom 13,889 (81.5%) were examined again at age 6.5 years, were enrolled in 31 Belarusian maternity hospitals and their affiliated polyclinics to assess whether exclusive and prolonged breastfeeding reduce the risk of childhood asthma and allergy. A breastfeeding promotion programme modelled on the Baby Friendly Hospital Initiative (BFHI) had previously been implemented in the intervention group of hospitals and polyclinics. The intervention led to a large increase in exclusive breastfeeding at 3 months (44.3% vs 6.4%) and a significantly higher prevalence of any breastfeeding at all ages up to and including 12 months. The experimental group of infants had no reduction in risks of allergic symptoms and diagnoses or positive skin prick tests. These results do not support conclusions of some other studies regarding a protective effect of prolonged and exclusive breastfeeding on asthma or allergy.

Greer FR, Sicherer SH, Wesley Burks A and the Committee on Nutrition and Section on Allergy and Immunology. Effects of early nutritional interventions pediatric care on the development of atopic disease in infants and children: the role of maternal dietary restriction, breastfeeding, timing of introduction of complementary foods, and hydrolyzed formulas. Pediatrics 2008;121:183-91

This report of the American Academy of Pediatrics reviews the nutritional options during pregnancy, lactation, and the first year of life that may affect the development of atopic disease (atopic dermatitis, asthma, food allergy) in early life. The documented benefits of nutritional intervention that may prevent or delay the onset of atopic disease are largely limited to infants at high risk of developing allergy (i.e., infants with at least one first-degree relative with allergic disease). Current evidence does not support a major role for maternal dietary restrictions during pregnancy or lactation. There is evidence that breastfeeding for at least 4 months – compared with feeding formula made with intact cow milk protein – prevents or delays the occurrence of atopic dermatitis, cow milk allergy, and wheezing in early childhood. In studies of infants at high risk of atopy and who are not exclusively breastfed for 4 to 6 months, there is some evidence that the onset of atopic disease may be delayed or prevented by hydrolyzed formula rather than formula made of intact cow milk protein. There is also some slight evidence that delaying the introduction of complementary foods beyond 4 to 6 months prevents the occurrence of atopic disease. At present, there is insufficient data to document the protective effect of any dietary intervention beyond 4 to 6 months of age for the development of atopic disease.

Cancer

MacArthur AC, McBride ML, Spinelli JJ et al. Risk of childhood leukemia associated with vaccination, infection, and medication use in childhood: the Cross-Canada Childhood Leukemia Study. Am J Epidemiol 2008;167:598-606

This study examined the effect of postnatal exposures known to affect early immune functioning - childhood vaccinations, illness, medication and breastfeeding patterns - on the risk of childhood leukemia. Children 0-15 years of age diagnosed from 1990 to 1994 with leukemia, and residing in the principal cities across Canada were eligible for inclusion. 399 cases were ascertained at the time of diagnosis through paediatric oncology centres and population-based cancer registries. For each case, an age-, gender-, and area-matched control was randomly selected

from government health insurance rolls. Risk factor information was obtained through personal interviews with each child's parents or guardians. Use of immunosuppressant medication decreased the risk of leukemia by 63% (16-84%), while vitamin intake increased it by 66% (18-133%). Breastfeeding for more than 6 months was also protective: milk supplements given more than 50% of the time to infants 7-12 months of age increased the risk of leukemia by 79% (11-189%).

Ortega Garcia JA, Ferris Tortajada J, Torres Cantero AM et al. Full breastfeeding and paediatric cancer. *J Paediatr Child Health* 2008;44:10-3

This study investigated the association between full breastfeeding and paediatric cancer in a case control study in Spain. Maternal reports of full breastfeeding, collected through personal interviews, compared 187 children of 6 months and more who had paediatric cancer and 187 age-matched control siblings. The mean duration of full breastfeeding was 8.43 weeks for the first group (cases) and 11.25 for the control group. Cases had 80% (10-180%) more probability of bottle-feeding than controls. Cases were also 50% (20-70%) less likely to have been breastfed for at least 2 and 4 months, and for 24 weeks or more. To conclude, breastfeeding was inversely associated with paediatric cancer, the protection increasing with the duration of full breastfeeding.

Child behaviour and cognitive development

Kramer MS, Fombonne E, Igumnov S et al. for the Promotion of Breastfeeding Intervention Trial (PROBIT) Study Group. Effects of prolonged and exclusive breastfeeding on child behavior and maternal adjustment: evidence from a large, randomized trial. *Pediatrics* 2008;121:e435-40

Kramer MS, Aboud F, Mironova E et al. for the Promotion of Breastfeeding Intervention Trial (PROBIT) Study Group. Breastfeeding and child cognitive development: new evidence from a large randomized trial. *Arch Gen Psychiatry* 2008;65:578-84

These two papers come from the PROBIT cluster randomised trial carried out in Belarus, where 17,046 healthy breastfeeding mother-infant pairs – enrolled in 31 maternity hospitals and affiliated polyclinics, half of which had a BFHI intervention – were followed for several years with the aim to assess various outcomes. Approximately 82% of the mothers and children were assessed at age 6.5 years to examine child behaviour and cognitive development as well as maternal adjustment. Mothers and teachers completed the questionnaire on

behaviour. Scales to measure the intelligence quotient (IQ) were applied to the same children. Mothers also responded to questions concerning their relationships to their partner, their child and breastfeeding of children born subsequently. The BFHI intervention led to a large increase in exclusive breastfeeding at 3 months (43.3% vs 6.4%) and a significantly higher prevalence of any breastfeeding at all ages up to and including 12 months. No significant effects of the intervention were observed on the mother or the teacher ratings of total difficulties, emotional symptoms, problems of conduct, hyperactivity, peer problems, or social behaviour. Nor was there evidence of effects on the parents' marriage or on the mother's satisfaction regarding her relationship with her partner or child. The intervention group had higher averages on all the scales of intelligence measures, with mean differences of +7.5 (+0.8 to +14.3) for verbal IQ, +2.9 (-3.3 to +9.1) for performance IQ, and +5.9 (-1.0 to +12.8) for full-scale IQ. Teachers' academic ratings were significantly higher in the intervention group for both reading and writing. These results, based on the largest randomized trial ever conducted in the area of human lactation, provide strong evidence that prolonged and exclusive breastfeeding improves children's cognitive development.

Breastfeeding how?

Baby Friendly Hospital Initiative (BFHI)

Moura de Araújo MF, Soares Schmitz BA. Reassessment of Baby Friendly Hospitals in Brazil. *J Hum Lact* 2007;23:246-52

This cross-sectional study was conducted in 2002 to assess adherence to the Baby Friendly Hospital Initiative (BFHI) in the 172 hospitals that have been certified in Brazil in the period from 1992 to 2000. Of the 167 hospitals assessed, 137 (82%) of hospitals met all ten steps of the Baby Friendly Hospital Initiative. Steps 2 and 3 presented the lowest adherence rates (91% and 92%, respectively), followed by Steps 4, 5 and 10, with 95% each. Steps 7 and 9 reflected the highest adherence rate, at 99%. These findings suggest the need to intensify regular training programmes for professionals working in Baby Friendly Hospitals and to implement strategies that favour implementation of Steps 3 (inform all pregnant women) and 10 (provide support in the community), to further promote and support breastfeeding before and after delivery.

Rosenberg KD, Stull JD, Adler MR, Kasehagen LJ, Crivelli-Kovach A. Impact of hospital policies on breastfeeding outcomes. *Breastfeed Med* 2008;3:110-6

This study explored the association between the Ten Steps of the BFHI and breastfeeding at 2 days and 2 weeks in each of the 57 birthing hospitals in Oregon through a 65-question institutional survey. Breastfeeding outcomes were obtained from the newborn metabolic screening forms. Overall hospital breastfeeding support scores ranged from 49.4 to 98.2 (possible total score of 100). Hospital compliance with individual steps ranged from 5.3% for Step 2 (staff training) to 93% for Step 4 (helping with breastfeeding initiation) and Step 8 (encouraging feeding on demand). After controlling for institutional differences, increases in overall hospital breastfeeding support scores were associated with increases in breastfeeding rates at 2 days and at 2 weeks. In analyzing each step individually however, only the presence of a written hospital policy was independently associated with increases in breastfeeding rates. This evaluation suggests that hospitals with comprehensive breastfeeding policies are likely to have better breastfeeding support services and better breastfeeding outcomes.

Training

Bassichetto KC, Rea MF. Infant and young child feeding counseling: an intervention study. *J Pediatr* (Rio J) 2008;84:75-82

This randomized study, carried out in São Paulo, Brazil, aimed to evaluate the effectiveness of an integrated infant and young child feeding counselling training course. The study included 29 health professionals in the intervention group (IG), and 27 others in the control group (CG). Interviewers collected data from the professionals before and 2 months after the intervention. Regarding the specific level of knowledge, the results showed significantly improved outcomes in the intervention group for the overall questionnaire, as well as regarding specific questions on breastfeeding, HIV and infant and young child feeding, complementary feeding and counselling in infant and young child feeding. Also, in terms of performance, the professionals in the intervention group significantly improved the way they took feeding histories. On the other hand there was no improvement in their counselling skills.

Kronborg H, Vaeth M, Olsen J et al. Effect of early postnatal breastfeeding support: a cluster-randomized community based trial. *Acta Paediatr* 2007;96:1064-70

Kronborg H, Vaeth M, Olsen J et al. Health visitors and breastfeeding support: influence of knowledge and self-efficacy. *Eur J Public Health* 2008;18:283-88

This community-based cluster randomized trial was conducted in Western Denmark to assess the impact of a supportive intervention on the duration of exclusive breastfeeding to 6 months. Fifty-two health visitors and 781 mothers were allocated to the intervention group (IG), 57 health visitors and 816 mothers to the comparison group (CG). In the former, health visitors received an 18-hour course that addressed maternal psychosocial factors and focused on knowledge about lactation and how to guide the mother to learn the mechanisms of breastfeeding. Mothers in the IG had a 14% (1-25%) lower cessation rate; they received their first home visit earlier, and received more visits and practical breastfeeding training within the first 5 weeks; they also reported having received more support than mothers in the CG. Babies in the IG were breastfed more frequently; fewer used pacifiers; and their mothers reported being more confident about not knowing the exact amount of milk their babies had received when being breastfed. Health visitors in the IG demonstrated significantly higher scores regarding knowledge questions and reported significantly higher guidance self-efficacy in three out of five breastfeeding problems. It was concluded that home visits in the first 5 weeks following birth prolong the duration of exclusive breastfeeding. Postnatal support should focus on both the psychosocial and the practical aspects of breastfeeding. An interactive course increased the health visitors' knowledge of breastfeeding practice and increased their self-efficacy in helping mothers with common breastfeeding problems.

Creedy DK, Cantrill RM, Cooke M. Assessing midwives' breastfeeding knowledge: properties of the Newborn Feeding Ability questionnaire and Breastfeeding Initiation Practices scale. *Int Breastfeed J* 2008;3:7

There are few reliable and valid tools to assess lactation and infant feeding knowledge and practices. This study tested the properties of two new scales, the Newborn Feeding Ability (NFA) questionnaire and the Breastfeeding Initiation Practices (BIP) scale, to assess midwives' breastfeeding knowledge and practices specific to breastfeeding initiation. The postal survey was conducted with 3,500 Australian midwives in October 2001. The response rate was about 32%.

Five factors on the NFA questionnaire were congruent with knowledge about effects of skin-to-skin contact, physiological stability, newborn innate abilities, work practices and effective breastfeeding. The BIP revealed three factors related to observing pre-feeding behaviour, mother/baby care and attachment and positioning practices. Midwives with high knowledge scores were more likely to report best practice when assisting mothers to initiate breastfeeding. Midwives with more personal breastfeeding experience scored higher on all scales. The questionnaires could be used to identify individual learning needs and to evaluate the effectiveness of education interventions.

Lasarte Velillas JJ, Hernández-Aguilar MT, Pallás Alonso CR et al. A breastfeeding e-learning project based on a web forum. *Breastfeed Med* 2007;2:219-28

Internet has introduced new ways of learning that may complement medical training during the residency period. This paper describes the experience with a new method of e-learning for training in human lactation and breastfeeding counselling. Paediatric residents participated in the Human Lactation Forum maintained by the Spanish Paediatric Association Breastfeeding Committee, a site on the Internet where parents may write in for paediatric advice on breastfeeding. From April 2005 to May 2006, 42 paediatric residents from four hospitals received a month of intensive theoretical training on breastfeeding. Afterward, they took weekly turns answering parents' questions in the forum. Before and after the experience, they completed a pre-post knowledge test and an opinion post-experience questionnaire with open questions. The mean age of participants was 28.3 years; 88% were women, and 80% were in their third or fourth year of residency. The percentage of correct answers was higher after participation in the programme. The residents estimated that nearly half of their patients needed breastfeeding advice, and they thought that the programme improved their knowledge of breastfeeding and their communication skills with mothers. On average, they spent 2.9 hours daily answering the questions. The learning experience was positively evaluated by the participants and contributed to increase their knowledge and skills in breastfeeding issues.

Peer counsellors

Curtis P, Woodhill R, Stapleton H. The peer-professional interface in a community-based, breastfeeding peer-support project. *Midwifery* 2007;23:146-56

This study explored key elements of the peer/professional interface in a breastfeeding peer-support community project based in Doncaster, England. Data was generated from focus-group discussions with seven volunteer peer supporters and nine health professionals (community midwives and health visitors). Both volunteers and health professionals highlighted the benefits associated with participating in the breastfeeding peer-support scheme. Volunteers experienced enhanced social support and increased self-esteem and personal development. Health professionals benefited from being able to "spread the load" of breastfeeding support; some also learned from the volunteers' specialist experiential and cultural knowledge. On the other hand, health professionals were concerned about volunteers "transgressing" boundaries; and both volunteers and health professionals described "gate-keeping" activities and surveillance behaviours practised by health professionals as efforts to control the volunteers' access to, and work with, breastfeeding women. It became clear that in order to reduce tension at the peer-professional interface, and optimise relationships between volunteers and health professionals, an ongoing process of development involving both groups was essential. Such a process would need to proactively identify and diffuse the concerns of professionals while addressing both the vulnerabilities of the volunteers and their potential for semi-autonomous development within and beyond the context of the peer-support scheme.

Neonatal weight loss

Van Dommelen P, van Wouwe JP, Breuning-Boers JM et al. Reference chart for relative weight change to detect hypernatraemic dehydration. *Arch Dis Child* 2007;92:490-4

Neonatal hypernatraemic dehydration (NHD) in the first days of life is a rare but potentially serious condition. In otherwise healthy full-term breastfed babies the cause is poor milk intake with consequent weight loss that must be detected early. The validity of the rule that infants may lose 10% of their weight in the first days after birth goes unproven. This study assessed the validity of this rule to detect breastfed infants with NHD. A reference chart for relative weight change obtained

by a retrospective cohort study was constructed and used to analyse 1,544 healthy, exclusively breastfed infants born in the Netherlands. In all, there were 3,075 weight measurements and 83 cases of breastfed infants with NHD. The sensitivity of the rule that infants may lose 10% of their weight in the first days was 90.4%, its specificity was 98.3% and its positive predictive value was 3.7%, because of too many false positive results. A chart for relative weight change can be helpful to detect infants with NHD.

Iyer NP, Srinivasan R, Evans K et al. Impact of an early weighing policy on neonatal hypematraemic dehydration and breastfeeding. *Arch Dis Child* 2008;93:297-9

In Swansea, Wales, a policy of weighing infants at 72–96 hours was introduced from 1 July 2004. Two time periods – pre- and post-policy – of 18 months each, were studied to ascertain the effect of early weighing on the detection and severity of NHD and on breastfeeding rates in the short and medium term. Babies of 28 days of age referred to hospital because of plasma sodium concentrations 145 mmol/l or higher, were identified. Age, plasma sodium concentration, percentage loss of body weight at presentation, breastfeeding rates at discharge and at 8 weeks, and complications due to hypernatraemia or its management were compared between the two periods. Sixty cases of NHD were identified: 23 before and 37 after introduction of the policy. After the policy, there was earlier recognition of NHD (median 3 vs 6 days), lower percentage weight loss (11% vs 15%), lower increase in sodium (147 vs 150 mmol/l), and higher breastfeeding rates both at discharge (73% vs 22%) and at 8 weeks (57% vs 22%). There was one death in the pre-policy group, and none in the post-policy group. Weighing babies early, coupled with appropriate lactation support, results in the early recognition of NHD, with less dehydration, less severe hypernatraemia, and higher breastfeeding rates in the short and medium term.

Low birth weight infants

Amaizu N, Shulman RJ, Schanler RJ et al. Maturation of oral feeding skills in preterm infants. *Acta Paediatr* 2008;97:61-7

Safe and successful oral feeding requires proper maturation of sucking, swallowing and respiration. To test the hypothesis that oral feeding difficulties may result from different temporal development of the muscles implicated in these functions, 16 stable preterm infants of 26 to 29 weeks' gestational age were recruited. Specific feeding skills were monitored

as markers for the maturation of oral feeding muscles. Infants born at 26/27 and 28/29 weeks of gestational age were at similar postmenstrual ages when taking 1-2 and 6-8 oral feedings per day. Over time, feeding efficiency and several skills improved, while some others decreased and still others remained unchanged. This study demonstrates that, despite similar oral feeding outcomes, differences in functional stability of particular feeding skills depend on gestational age rather than on postmenstrual ages.

Akerstrom S, Asplund I, Norman M. Successful breastfeeding after discharge of preterm and sick newborn infants. *Acta Paediatr* 2007;96:1450-4

This hospital-based follow-up of 1,730 infants born in 1996, 2001 and 2004 in Sweden, and studied from discharge to 6 months of post-natal age, was carried out to determine the extent and duration of breastfeeding in preterm and sick newborn infants. At discharge, 98% of term (n = 945) and 92% of preterm (n = 785) infants were exclusively or partly breastfed. Exclusive breastfeeding increased at 2 months of corrected post-natal age and 78% of term infants were still exclusively or partly breastfed at 6 months of corrected post-natal age. Duration of breastfeeding among preterm infants was significantly shorter than in term-born infants. However, even among extremely preterm infants with a gestational age <28 weeks, 41% were still breastfeeding, exclusively or in part, at 6 months of post-natal age. There was no difference between 1996 and 2004 in breastfeeding after intensive neonatal care. Moreover, the study showed that breastfeeding after intensive neonatal care differed only slightly from data concerning all infants in Sweden.

Flacking R, Wallin L, Ewald U. Perinatal and socioeconomic determinants of breastfeeding duration in very preterm infants. *Acta Paediatr* 2007;96:1126-30

This article describes the impact of prematurity, size at birth, neonatal disorders and the families' socioeconomic status (SES) on breastfeeding duration in mothers of very preterm infants in Sweden. Data on breastfeeding, registered in two Swedish counties in 1993-2001, were matched with data from two national registries. Mothers of 225 very preterm singleton infants were identified and included. Seventy-nine percent of the mothers breastfed at 2 months, 62% at 4 months, 45% at 6 months, 22% at 9 months and 12% at 12 months. Prematurity, size at birth and neonatal disorders did not show an effect on breastfeeding duration. Being adversely exposed to any of the SES factors (maternal education, unemployment benefits, so-

cial welfare and equivalent disposable income in the household) was significantly associated with earlier weaning up to 6 months of the infant's postnatal age. This study shows that the duration of breastfeeding in mothers of very preterm infants was affected by SES, and highlights the need for improved support of socioeconomically disadvantaged mothers, during and after their hospital stay.

Maternal smoking

Mennella JA, Yourshaw LM, Morgan LK. Breastfeeding and smoking: short-term effects on infant feeding and sleep. *Pediatrics* 2007;120:497-502

This study sought to determine what effects mother's smoking had on the breastfed infant. Fifteen mother-infant dyads were tested on two different days, each separated by a one-week interval. Mothers smoked (in the absence of their infant) on one test day and refrained from smoking on the other. During the 3.5 hours that followed the smoking episode, they breastfed their infant on demand. Despite the taste change in the mothers' breastmilk, there was no significant difference in breastmilk intake. On the other hand, the infants slept significantly less during the hours immediately following their mother's smoking episode (53.4 minutes), than they did following the non-smoking day (84.5 minutes). The reduction was attributed to a shorter period of the longest sleep bout, and to a reduction of time spent in both active and quiet sleep. In other words, less time was spent in active sleep when greater doses of nicotine were delivered to the infant. It was concluded that acute episodes of smoking by lactating mothers alter infants' sleep/wake patterns. Concerns that their milk may taste like cigarettes and their infant's sleep patterns may be disrupted may motivate lactating mothers to abstain from smoking.

International Code

Rosenberg KD, Eastham CA, Kasehagen LJ et al. Marketing infant formula through hospitals: the impact of commercial hospital discharge packs on breastfeeding. *Am J Public Health* 2008;98:290-5

In the USA, commercial hospital discharge packs are commonly given to new mothers. This study, carried out in Oregon between 2000 and 2001, analyzed data from a survey of 3,895 postpartum women (response rate = 72%). Among women who had initiated breastfeeding, 67% reported having received commercial hospital discharge packs. Women who received these packs were about 40% more likely to exclusively breastfeed

for fewer than 10 weeks than women who had not received the packs. The distribution of commercial discharge packs to mothers is not allowed under the International Code and should be banned everywhere in light of its negative impact on exclusive breastfeeding.

McInnes RJ, Wright C, Haq S et al. Who's keeping the code? Compliance with the International Code for the marketing of breastmilk substitutes in Greater Glasgow. *Public Health Nutrition* 2007;10:719-25

To evaluate compliance with the International Code in primary health care in Glasgow, an audit form was sent to all community-based health professionals with an infant feeding remit. Walking tours were conducted in a random sample of community care facilities. The results showed that contact with company personnel was minimal, usually unsolicited and mainly to provide product information. Free samples of breastmilk substitutes or feeding equipment were rare, but child care or parenting literature was more prevalent. One-third of facilities were still displaying materials non-compliant with the Code, such as weight conversion charts and posters. Due to the high level of bottle-feeding in Glasgow, primary-care staff stated a need for information about breastmilk substitutes.

Systematic reviews

Boyd CA, Quigley MA, Brocklehurst P. Donor breast milk versus infant formula for preterm infants: systematic review and meta-analysis. *Arch Dis Child Fetal Neonatal Ed* 2007;92:169-75

This systematic review of trials and observational studies compared the effect in pre-term infants of donor breastmilk with infant formula. The main outcomes were death, necrotising enterocolitis (NEC), infection, growth and development. Seven studies (including five randomised controlled trials), all from the 1970s and 1980s, fulfilled the inclusion criteria. All studies compared the effect of sole donor breastmilk with formula (combined n = 471). One of these also compared the effect of donor breastmilk with formula given as a supplement to the mother's own milk (n = 343). No studies examined fortified donor breast milk. A meta-analysis based on three studies found a 79% (24-94%) lower risk of NEC in infants receiving donor breastmilk compared with formula. Donor breastmilk was associated with slower growth in the early postnatal period, but its long-term effect was unclear. Further research is needed also to measure the effect of fortified or supplemented donor breastmilk.

Flint A, New K, Davies MW. Cup feeding versus other forms of supplemental enteral feeding for newborn infants unable to fully breastfeed. Cochrane Database of Systematic Reviews 2007, Issue 2. Art. No.: CD005092

Some newborn infants may not be able to fully breastfeed and may therefore require supplemental feeding. Traditionally, bottles and nasogastric tubes have been used for this purpose. This review was carried out to determine the effects of cup feeding versus other forms of supplemental feeding on weight gain and achievement of successful breastfeeding. After searching several databases for randomised or quasi-randomised controlled trials, and after quality assessment, four studies were eligible for inclusion. There was no significant difference in the incidence of not breastfeeding at hospital discharge and at 3 or 6 months. There was a significant difference in not fully breastfeeding at hospital discharge, but not at 3 and 6 months, in favour of cup feeding. There was no significant difference in weight gain from one study that reported this outcome. In the one study that assessed it, there was a significantly increased length of hospital stay in the cup fed infants. Time to full breastfeeding was not assessed in any study. It is concluded that cup feeding cannot be recommended over bottle feeding as a supplement to breastfeeding because it confers no significant benefit in maintaining breastfeeding beyond hospital discharge and carries the unacceptable consequence of a longer stay in hospital.

Shah PS, Aliwalas L, Shah V. Breastfeeding or breastmilk to alleviate procedural pain in neonates: a systematic review. Breastfeed Med 2007;2:74-82

This systematic review and meta-analysis compares breastfeeding and breastmilk with various controls (placebo, no treatment, sucrose, glucose, pacifiers, and positioning) to measure their effectiveness in reducing pain in neonates. Eleven eligible randomized and quasi-randomized trials were identified from electronic databases and hand searches. There were marked differences in control intervention and pain assessment measures. The breastfeeding group had a significantly lower increase in heart rate, a reduced proportion of crying time, and a reduced duration of crying compared to the swaddled and pacifier groups. Infant pain scores were lower in the breastfeeding group when compared to the placebo group and the group placed in the mother's arms, but were similar to the no-treatment and the glucose groups. Compared to the placebo group, neonates in the supplemental breastmilk group had a significantly lower increase in heart rate and facial coding

scores, but no significant difference in the duration of crying time and oxygen saturation change. To conclude, in order to alleviate pain in neonates undergoing painful procedures, breastfeeding or breastmilk, if available, should be preferred to placebo, positioning or no intervention. It should also be noted that in this study, the administration of glucose/sucrose had similar pain reduction effectiveness to breastfeeding.

Hannula L, Kaunonen M, Tarkka MT. A systematic review of professional support interventions for breastfeeding. J Clin Nurs 2008;17:1132-43

The objectives of this systematic review were to describe how breastfeeding is professionally supported during pregnancy, at maternity hospitals and during the postnatal period, and to find out how effective interventions are in supporting breastfeeding. Several databases were searched and two reviewers independently analysed 36 articles. Interventions expanding from pregnancy to the intrapartum period and throughout the postnatal period were more effective than interventions concentrating on a shorter period. In addition, period were more effective than interventions concentrating on a shorter period. In addition, intervention packages using various methods of education and support from well-trained professionals were more effective than interventions concentrating on a single method. During pregnancy, the effective interventions were interactive, involving mothers in conversation. Postnatally effective were home visits, telephone support and breastfeeding centres combined with peer support. The BFHI programme is effective and it would be wise to include the core components of the programme in breastfeeding promotion interventions.

Spiby H, McCormick F, Wallace L, Renfrew MJ, D'Souza L, Dyson L. A systematic review of education and evidence-based practice interventions with health professionals and breastfeeding counsellors on duration of breastfeeding. Midwifery 2007 Epub ahead of print

To examine the effects of interventions (training, education, practice change) with health professionals and lay breastfeeding educators and counsellors on duration of breastfeeding, this review selected from appropriate databases nine studies undertaken in high income countries and published between 1980 and 2003. All were before-and-after studies that included the education of health professionals; no studies related to breastfeeding counsellors. In six of the studies, the participants were working with mothers and babies in hospitals (three in the UK, two in Italy and one in France); in three

studies, the participants were working in community settings (Canada, Spain and the USA). Two UK studies and two non-UK studies (Spain and USA) involved mothers living in disadvantaged areas. Most interventions aimed to increase knowledge and change professional practice in support of breastfeeding. Many of the studies reviewed had methodological limitations. Study settings and contexts varied and lacked comparability.

Evidence from these studies was insufficient to draw conclusions about the overall benefit or harm associated with the interventions. From the studies identified, there seems to be no single way that consistently achieves changes in breastfeeding duration. From one of the more methodologically robust studies, it seems that the UNICEF/WHO BFHI training might have the potential to influence breastfeeding duration.

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