



Initiating and Supporting Breastfeeding: Guidelines for Interventions during the Perinatal Period from the French National College of Midwives

Brune Pommeret-de Villepin, Chloé Barasinski, Virginie Rigourd

► To cite this version:

Brune Pommeret-de Villepin, Chloé Barasinski, Virginie Rigourd. Initiating and Supporting Breastfeeding: Guidelines for Interventions during the Perinatal Period from the French National College of Midwives. *Journal of Midwifery and Women's Health*, 2022, 67 (S1), pp.S56-S73. 10.1111/jmwh.13420 . hal-03962217

HAL Id: hal-03962217

<https://uca.hal.science/hal-03962217>

Submitted on 30 Jan 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Copyright

Initiating and Supporting Breastfeeding: Guidelines for Interventions during the Perinatal Period from the French National College of Midwives

Brune Pommeret-de Villepin¹, RM, Chloé Barasinski², RM, PhD, Virginie Rigourd³, MD, PhD

Exclusive breastfeeding is recommended for children for the first 4 to 6 months of life, with complementary foods added thereafter. It is the most ecological way of protecting the child's and mother's health. Training of health professionals is required to avoid transmitting inconsistent information in 3 areas: 1) implementing these 3 predictors: safe skin-to-skin, first breastfeed, and rooming-in 24/7; 2) teaching and monitoring: i) early signs of waking and feeding rhythms, ii) positioning and latching, and iii) signs of effective transfer; and 3) referring women to specialized support services if difficulties arise (eg, inadequate milk production, pain, cracked nipples, engorgement). Breastfeeding should continue during mastitis or an abscess. Ultrasound-guided needle aspiration is beneficial in treating an abscess.

Précis: Information is provided to enable health professionals to better support breastfeeding and help women with the most common difficulties, thus promoting breastfeeding initiation and duration.

J Midwifery Womens Health 2022;67(Suppl. 1):S56–S73 © 2022 by the American College of Nurse-Midwives.

Keywords: breastfeeding, infant health, maternal health, skin-to-skin, first breastfeed, breastfeeding latch, breastfeeding position

INTRODUCTION

Current epidemiologic studies in France, including the national perinatal survey (*Enquête nationale périnatale 2016*)¹ and the ELFE longitudinal study (*Étude longitudinale française depuis l'enfance*, French longitudinal study from infancy, report similar data about breastfeeding (BF) rates on discharge from maternity clinics or hospitals. Initiation rates are low and declining (50% in 2016), the duration of BF is short (fewer than 7% of newborns are exclusively breastfed for 6 months), and the most vulnerable infants are less likely to be breastfed (the rate of exclusive BF of babies discharged from neonatal units is less than 50%).

A recent, unpublished survey conducted by the perinatal health network in Paris (*Réseau de Santé Périnatale Parisien*) shows that 85% of women planned to breastfeed when they were admitted (70% exclusively, 15% partially from the outset). By day 3, 25% of these women had already stopped BF due to a lack of appropriate support. By the time they were discharged, only 51.2% were still BF exclusively and 31.4% partially. These figures are identical to the findings of the 2016 French na-

tional perinatal survey. Slightly more than half of women surveyed (53.5%) thought they had received poor BF support in the facility where they gave birth. About one-third (38%) had received information about at least one of the 4 WHO (World Health Organization) recommendations for BF initiation. The failure rate was significantly higher in the group reporting inconsistent information ($P = .013$): 40% versus 23%. We have drafted these guidelines to assist health professionals who work with BF families, for they must have sufficient knowledge, competence, and skills to support BF.³

Professionals should know the factors that create barriers to BF (Figure 1) so they can identify measures in advance and implement them to optimize support. The use of formula supplements without a medical reason and inconsistent information are the most serious barriers to BF in France.⁴ These are given to 45.3% of newborns in maternity facilities, according to the perinatal health network in Paris, even though they hinder physiological production of breast milk, reduce the number and effectiveness of breastfeeds, interfere with a comfortable and effective latch, and may lead to digestive discomfort and distress in the newborn, especially when the volume of the complement is excessive for the infant's stomach capacity. This can result in a loss of confidence by the mother and the people around her about her ability to feed and care for her child. The justifications most frequently given for the use of formula are not medical reasons: fatigue, infant crying, and fear of ineffective or inadequate BF.⁵ Complementary bottles contain a quantity that is disproportionate to a newborn's stomach capacity of 22–27 mL (the size of a walnut) on day 3 and lead to reactive hypoglycemia due to the carbohydrate load.⁴ The main reason for giving a bottle is weight loss — or, more accurately, the weight gain required by professionals to allow families to be discharged. Different parameters should be considered for discharge policies. Another barrier is the pervasive display of pictures and

¹Service gynécologie-obstétrique, Centre hospitalier de Tourcoing, 155 rue du Président-René-Coty, Tourcoing, 59200, France

²Université Clermont AuvergneCHU Clermont-FerrandCNRSSIGMA Clermont, Institut Pascal, Axe TGI-DecisipH, Clermont-Ferrand, F-63000, France

³Pédiatre en néonatalogie médecin responsable du lactarium régional d'Ile de France Hopital, Necker Enfants malades, Paris, France

Correspondence

Virginie Rigourd, Pédiatre en néonatalogie médecin responsable du lactarium régional d'Ile de France Hopital Necker Enfants malades Paris.
Email: virginie.rigourd@aphp.fr



Quick Points

- This text provides professionals with
- A way to assess their ability to support breastfeeding women
- An update of recommendations for preventing or if necessary managing the main complications that breastfeeding mothers may encounter
- Tools to promote the initiation and extension of breastfeeding
- An update on the public health issues related to breastfeeding.

depictions of infant feeding and mothers, which idealize artificial feeding, while breasts are more often used to promote other merchandise (eg, lingerie and perfume). The negative pressure exerted by family and friends and the influence of some cultural beliefs and practices may also create barriers to BF.⁵ The support and feelings of the father are essential; his perspective on BF and his active involvement are factors that favor BF. On the other hand, if the father wants to feed the baby, the couple may start giving bottles immediately or soon after birth. It is important to help fathers understand that their role does not consist solely of feeding the baby. This can

be explained in childbirth and parenting classes to expectant couples or in support groups for specific populations.⁶

MATERIALS AND METHODS

The method used to formulate these clinical practice guidelines (CPGs) was divided into 4 phases:

- Systematic review and synthesis of the literature
- Preliminary draft of guidelines
- Review of guidelines
- Final draft.

PROMOTION ACTIONS

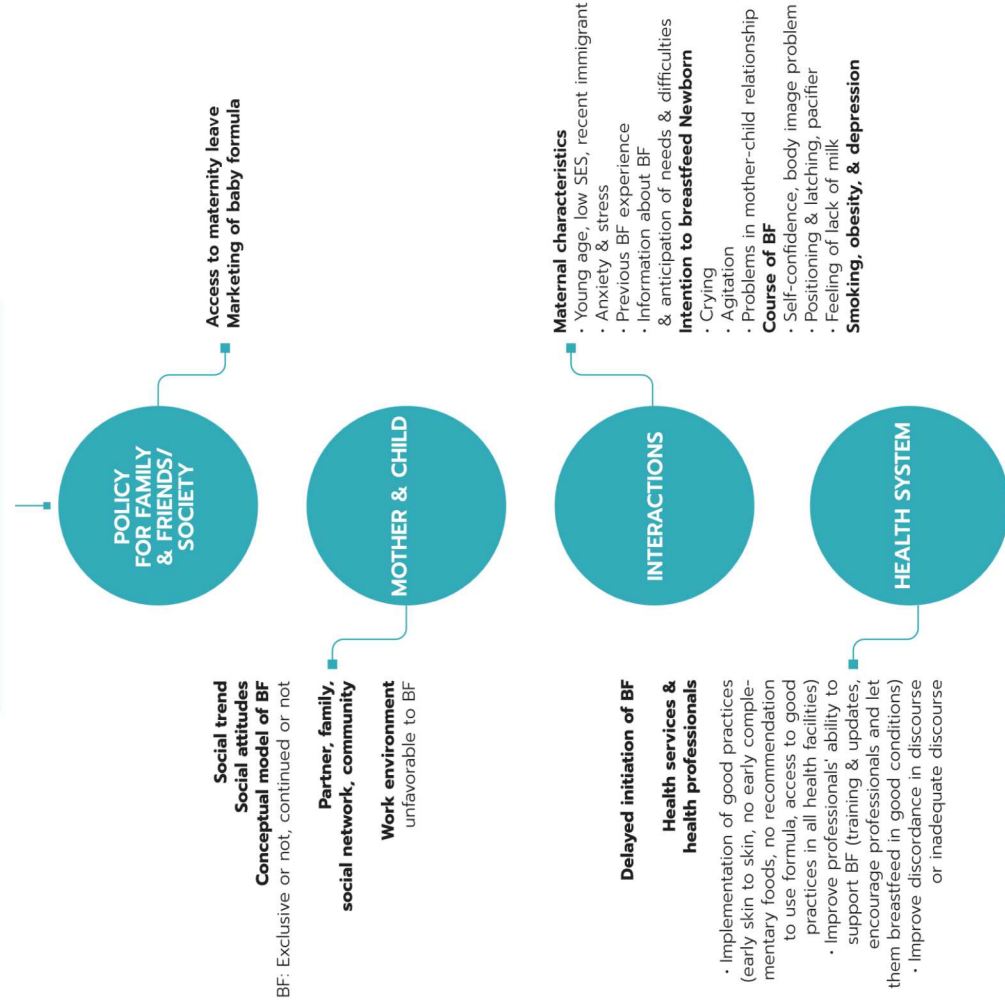


Figure 1. Barriers to Breastfeeding.



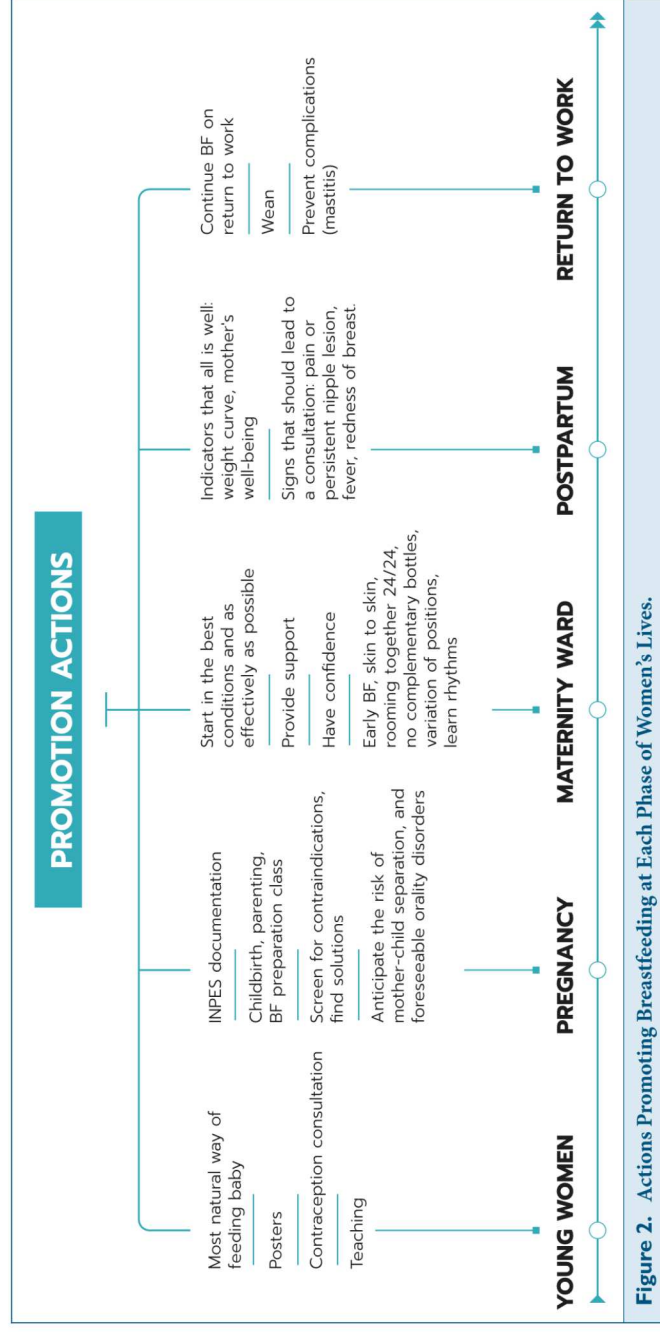


Figure 2. Actions Promoting Breastfeeding at Each Phase of Women's Lives.

The development of these CPGs was based on the analysis and synthesis of the scientific literature. The literature search was conducted between September 2019 and September 2020. The search included studies in English and in French.

We used the PubMed platform to review various meta-analyses, French and international guidelines, and evidence-based medicine reports less than 5 years old. The guidelines were complemented by references suggested by experts in working groups and review committees; other articles and documents are listed in the bibliography. The levels of evidence (LE) supporting these guidelines and their grades are reported here according to the HAS (*Haute Autorité de Santé*, French national authority for health) criteria.

The overall methodology used in these CPGs is described in detail in the short text summarizing these recommendations.⁷

ROLE OF MIDWIVES IN THE PROMOTION AND CONTINUATION OF BF

Midwives play a key role in the promotion, initiation, and continuation of BF, because of the amount of time women, couples, and newborns spend at appointments and in discussion with midwives before, during, and after pregnancy.⁷

At the national level, every professional (teachers and health professionals) should be able to provide early guidance on BF from as early an age as possible.⁸ If adolescents could shift their perspective to see that the role of the breast is to feed their future babies, pregnant women might consider BF to be the obvious choice.

Through classroom teaching, publicity campaigns (posters promoting BF rather than bottle-feeding), and/or children's literature, attitudes can begin to change. Perinatal health workers have a role to play in supporting BF through each stage of the lives of each woman and of the people supporting her (Figure 2).

Information on breastfeeding from as early an age as possible is recommended at the national level to change the public's view of breastfeeding (expert consensus).

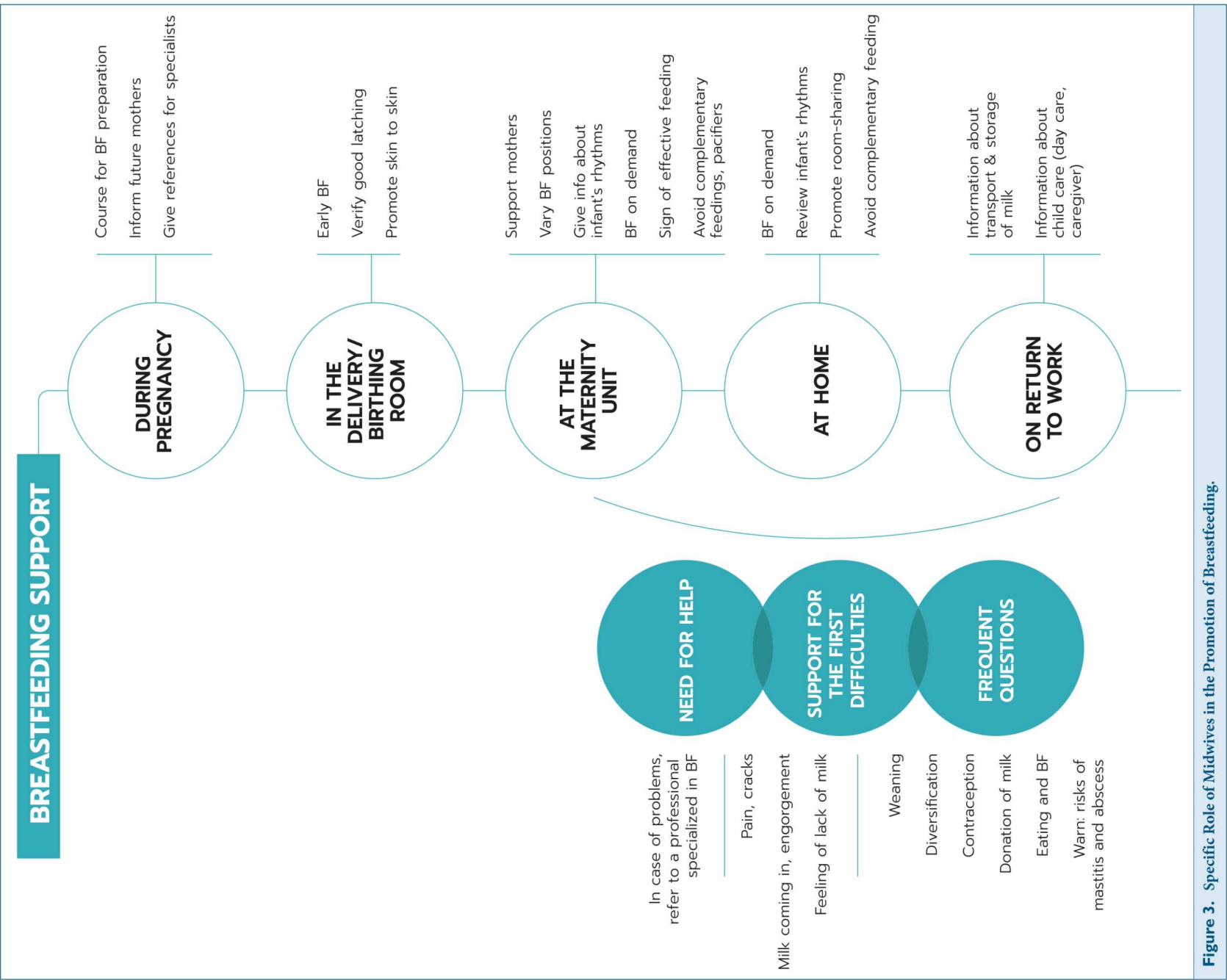
A meta-analysis of randomized trials published in 2016 found that attending BF information sessions led by health professionals during pregnancy had a positive impact on the initiation of BF (relative risk [RR], 1.43; 95% confidence interval [95% CI], 1.07-1.92) (LE2).⁹ More recently, a meta-analysis of observational studies published in 2018 found the same positive impact on initiation (19 studies, RR 1.41; 95% CI 1.29-1.54) and duration (14 studies; RR, 1.37; 95% CI, 1.14-1.65) (LE2).¹⁰ A meta-analysis of randomized trials by Lumbignon et al. in 2016 did not find that prenatal information improved the duration of BF¹¹; however, studies have found that structured prenatal educational programs do improve this duration among disadvantaged women.⁹

Women of reproductive age and/or who are pregnant need to be informed of the benefits of BF for themselves and their children. A midwife can give them this information at childbirth preparation and parenting sessions and at the interview during the fourth month of pregnancy. Midwives can also organize support and discussion groups on BF and newborn behavior and rhythms (Figure 3). These BF preparation sessions may take the form of appointments with the expectant parents, group discussions, or question-and-answer sessions. Written materials, videos, and practice with dolls and other props can be integrated into the session; they are available, for example, from the INPES (*Institut national de prévention et d'éducation pour la santé*, French institute for prevention and health education) and the WHO.¹²

It is recommended that information on breastfeeding be included in childbirth and parenting education sessions (Grade B). In addition, information on milk banks and donation is recommended for all breastfeeding women (expert consensus).

Midwives encourage women to make their own choices, help them initiate BF, and educate them to prevent and





identify any problems that may occur and thus to increase its duration.

In the immediate postpartum period, skin-to-skin contact between mother and baby is a major determinant of BF initiation and duration. A meta-analysis of randomized trials

published in 2016 found a higher rate of BF at one month and at 4 months postpartum, longer durations of BF, and more effective BF (LEI)^{13,14}. For optimal establishment of breastfeeding, initiation of breastfeeding and safe skin-to-skin is recommended in the first 2 hours after childbirth, as soon as



the mother and infant are medically stable, including after cesarean birth (Grade A).

During her recovery in the maternity clinic or unit, the mother should feel confident and supported in her plan to breastfeed. Solutions to common problems (tender or sore nipples, milk coming in, cracked nipples, difficulties latching the baby) should be suggested promptly.

After discharge, midwives should continue to provide regular support to new mothers, especially if they have difficulties (cracked nipples, engorgement, mastitis, etc.).

Returning to work is another important stage at which specialized help, whether with weaning or continuing to breastfeed while working, should be offered to the mother. Midwives can provide information about pumping, storing, and transporting breast milk, as well as about childcare settings (nurseries, childminders, and carers) and safe handling and use of breast milk.¹⁵

TRAINING HEALTH PROFESSIONALS TO HELP WITH COMMON DIFFICULTIES ASSOCIATED WITH BF

Breastfeeding training for professionals should include knowledge of its physiology and understanding of barriers to it to avoid inconsistent information (expert consensus).

Importance of Improved Training for Perinatal Professionals in BF Support

Listed as essential by most organizations — including the WHO, the United Nations Children's Fund (UNICEF), the Baby-Friendly Hospital Initiative (BFHI), the Turk Report,⁸ and more recently the report of the World Breastfeeding Trends Initiative (WBTI)¹⁶ — the training of professionals is a prerequisite for providing effective BF help. Training based on physiology enables professionals to adopt a consistent discourse. The initial education of all categories of professionals on this topic is inadequate.

Several studies have proven that training health care professionals^{6,17,18} in BF increases the rate of exclusive BF at one week and at 6 weeks postpartum (1E2). The number of trained professionals required per BF woman for a specific population remains to be determined. In Australia, where BF rates are excellent, the ratio of lactation consultants to births is 1:148 (compared to 1:1500 in France). An estimate of the number of professionals trained in BF should include sufficient resources for one prenatal consultation specifically on BF and 2 systematic postpartum consultations to monitor BF initiation, or 3 perinatal appointments related to preventive health and education. In addition, 2 consultations for *pathological BF situations* should be available if problems arise. In France, there are 800,000 births per year, 75% of women plan to breastfeed, and 70% will encounter challenges; this necessitates 3 million consultations with someone who should be a competent trained professional.¹⁹ If the average annual number of consultations of a full-time professional is 5,170, the number of professionals specialized in BF support required is 1 for every 700 births.

The number of professionals specialized in breastfeeding to ensure that women can initiate and sustain breastfeeding in optimal conditions is 1 per 700 births (expert consensus).

Although the minimum number of health professionals required to care for vulnerable newborns is clearly stipulated

in the regulations (perinatal decree) that set the requirements authorized obstetrics facilities must meet), no official number or proportion exists in France for the number of trained professionals required for women have the best possible opportunity to initiate and maintain BF. A full assessment must take multiple individual and institutional factors into account; our calculation is one approach.²⁰

Access to Training and Continuing Education

To complement a professional's initial education, which may have taken place many years before, upgrading knowledge through additional training can prevent the perpetuation of certain practices that may have been suggested in earlier educational programs and materials but are currently outdated and inappropriate, and can enable new practices to be introduced.²¹

Midwives are in contact with BF women at different stages of their BF experience (Figure 2), from the time they first decide to breastfeed until their child is weaned. Each stage requires current specific knowledge (Table 1).

Preparing to Help BF Women

Adequate preparation to answer the questions BF families ask is an essential part of professional practice and requires that professionals be able to provide evidence-based information and accurate, reliable data. They must also be able to adapt support to each situation in both a holistic and individually appropriate manner.

As 70% of women report difficulties during BF,¹⁹ learning how to respond to the list of common challenges is an important part of a professional's training.

The Paris perinatal health network set up a BF telephone help line (*SOS Allaitement 75*), a toll-free number that parents can call evenings between 7 PM and 10 PM and weekends and holidays from 10 AM to 8 PM. Respondents fully up to date on BF topics answer mothers' questions. More than 2000 calls are received each year. This initiative was described in the national nutritional health plan (*Plan national nutrition santé 2019–2023*, PNSS) (<https://www.sraenutrition.fr/blog/lancement-du-4eme-programme-national-nutrition-sante-2019-2023/>). It is hoped that this service will be made available in other regions and districts as well. *SOS Allaitement 75* has listed the most frequent reasons for calls from BF women (Figure 4). Their data are very close to those found in other populations in the literature.¹⁹

When any of these difficulties occur, the mother needs to receive an appropriate answer to ensure that she can continue BF.

BASIC INFORMATION ABOUT BREASTFEEDING Benefits of BF

The WHO explains that receiving breast milk and no other solid or liquid ingesta ensures the optimal development of newborns and then infants. The multiple nutritional and biological properties of human milk, which are both unique and specific (oligosaccharides, fatty acids, nucleotides,



Table 1. Continuing Education Programs

Program	Prerequisite	Duration	Contact information for registration and cost
DIU Lactation humaine (Lille)	Variable	2 24-hour seminars and 96 hours of E-learning	Faculté de médecine de Pôle Recherche LILLE
DU allaitement maternel (Marseille)			Marseille
IBLC (International Board of Lactation Consultant)	1000 hours of clinical practice in BF in the 5 previous years, and 90 hours of specialized education	1 year, 140 hours of instruction, 40 hours of internship, 1 thesis 1 year, 194 hours, 5 modules of 5 days each, 40 hours of internship	ACLIP (Association des consultantes en lactation, professionnels de santé) Bordeaux and Paris GREFAM (centres de recherche, d'évaluation et de formation à l'allaitement maternel) Paris and Montpellier
MOOC (Massive online open course)	None	Thesis and/or article 5 modules	https://www.pns-mooc.com/fr/mooc/3/presentation
Online learning (e-learning)	Registration at the university of Bordeaux	1 to 2 hours each 5 modules 5 hours minimum	http://www.umfcs.u-bordeaux2.fr/elearning/les-grandes-questions-sur-l-allaitement-maternel

anti-infective factors, etc.), protect the health of infants and mothers (LE1).²²

The most recent national nutritional health plan sets out specific actions to promote BF. One step is to enhance the knowledge of team members in newborn nutrition.²³ The WHO recommends that healthcare professionals in direct contact with BF families have sufficient knowledge, competence, and skills to support BF women.³ It is recommended that professionals keep themselves well-informed of current data on the benefits of breastfeeding. This is essential for them to be able to answer the questions of families and professionals and to evaluate the impact of each action (expert consensus).

The benefits of BF for the health of mothers, infants, and future adults are multiple, and some of them are intergenerational.²⁴ They involve an intricate network of biological, genetic, and epigenetic factors. All major areas of health are affected, including but not limited to infections, allergies, inflammation and immunity, cardiovascular diseases, obesity, cancer, and cognitive development. BF reduces the risks of gastroenteritis, ear-nose-and-throat and respiratory infections, bacterial and viral meningitis, and urinary infections. It reduces hospital admissions for respiratory illnesses by 70% and decreases the occurrence of problems related to intestinal inflammation (31%) and celiac disease (52%) in at-risk populations. There is an inverse relation between asthma and BF at one and 3 years of age, with a dose-dependent response. Breastfed newborns have a lower risk of developing cavities.²⁵ The first cognitive advantages appear after 3 months of exclusive BF and increase after 6 months. Child-

hood BF is correlated with cognitive and psychological results in adults. For the most vulnerable (premature) infants, BF is associated with a 6- to 10-fold decrease in the incidence and seriousness of necrotizing enterocolitis, hospital-acquired infections (with a dose-dependent response), neurodevelopmental benefits, and a reduction in the occurrence of all stages of retinopathy of prematurity (ROP).²⁶ Maternal health also benefits: BF reduces postpartum metrorrhagia by promoting the involution of the uterus, decreases the incidence of breast cancers (there would be 20,000 fewer cases per year around the world if all babies were breastfed for 6 months) and of ovarian cancer. BF has a preventive role in osteoporosis as well as cardiovascular diseases.²⁷ Although its ability to facilitate maternal weight loss has not been clearly demonstrated, BF was recently shown to play a role in preventing early menopause.²⁷ One of the most remarkable developments in recent years has been a better understanding of the mechanism underlying BF's preventive role in the *programming* of pathologies such as obesity, blood pressure, and diabetes, for both the breastfed newborn and the BF mother.

Exclusive breastfeeding is recommended for 4 to 6 months (Grade B). After that time, continued breastfeeding is recommended, along with appropriate complementary foods.

BF is the most ecological and economical infant and child feeding method (LE2). The carbon footprint of BF is almost zero, compared to the much higher rate for artificial feeding.²⁸ BF is also an effective way of reducing costs, for both households and societies.²⁹



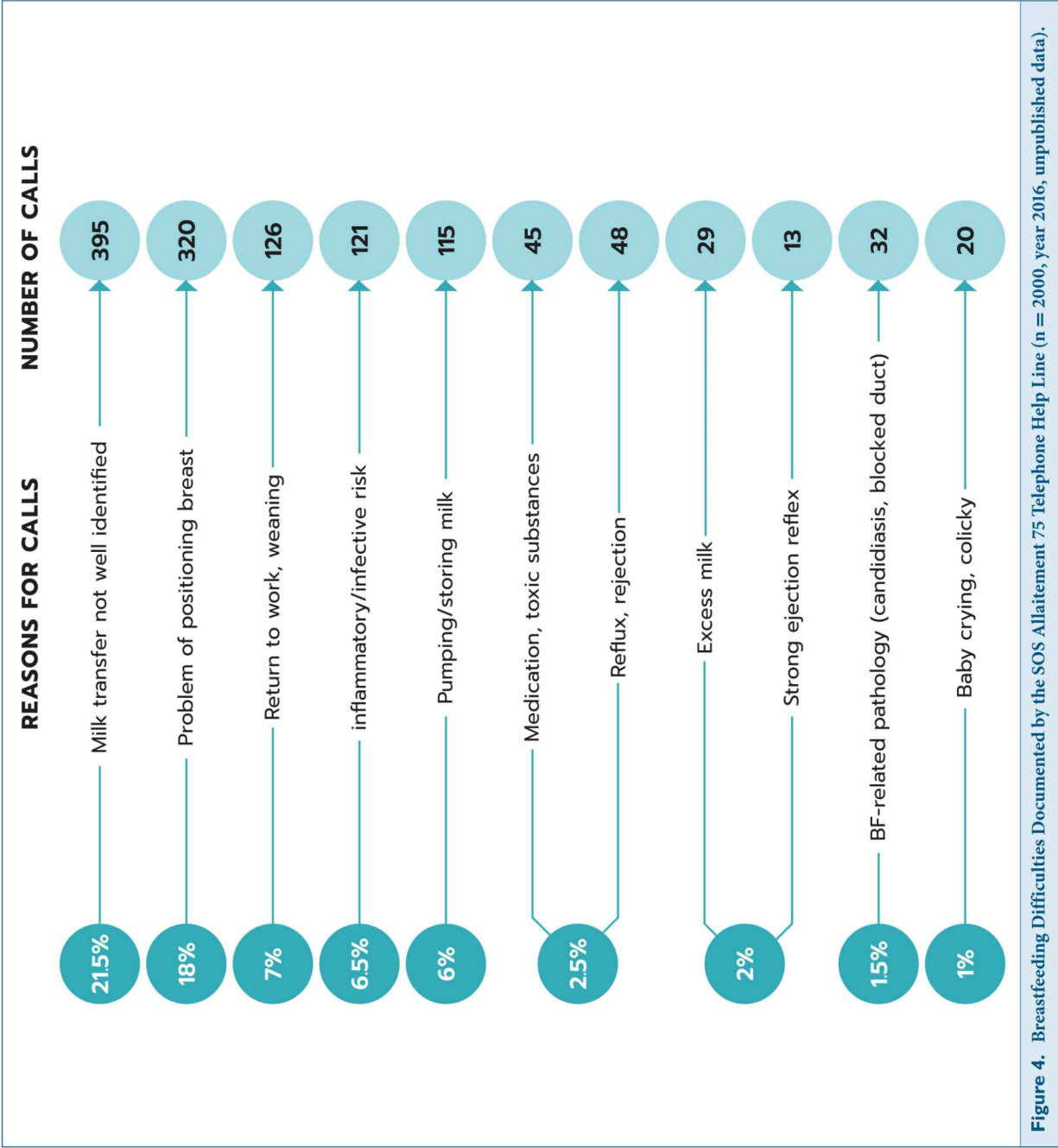


Figure 4. Breastfeeding Difficulties Documented by the SOS Allaitement 75 Telephone Help Line (n = 2000, year 2016, unpublished data).

Knowing BF Physiology to Better Understand and Support It

A knowledge of BF physiology includes, first and foremost, an understanding of the mechanisms that are responsible for effective milk production and that facilitate the establishment of BF, as well as knowledge of the practices that lead to difficulties and of the solutions that can be offered.³⁰

It is helpful to understand:

- how to increase milk production and what can decrease it (pacifier, bottles of formula, strict schedules, limited frequency or duration of BF sessions)
- the importance of a comfortable and effective latch and suckling
- BF patterns and rhythms; the triad of storage capacity, effective milk transfer, and the baby's needs (Figure 5).

These elements are the pillars of initiating and continuing BF.

Lactation is linked to neuroendocrine factors involving prolactin. Frequent BF on cue and skin-to-skin positioning as soon as possible after birth, as well as at home, optimize the capacity of the mammary gland to produce milk. Later, the volume of milk produced is regulated by the emptying of the alveolar cells, as determined by the frequency, duration, and effectiveness of feedings, under autocrine control, through a milk protein (Feedback inhibitor of lactation protein). This period of calibration enables the production (supply) of milk to adapt to the infant's cues (demand). The rhythm and duration of BF sessions will then be influenced by the storage capacity, which varies among women and even between breasts, as well as with the effective transfer of milk, and the infant's needs, maturity, and sleep-wake patterns. Understanding this phenomenon makes it possible to answer the classic questions asked every summer during a hot spell: "Should I give the baby water?" "Is the baby nursing more often because he's thirsty?" Yes, an infant breastfeeds more often when it is hot. Breasts that are emptied more often will produce more milk, and it is



not useful to give a baby water and interfere with the mechanism that allows the body to adapt by replacing BF this way.

The 3 Predictors of Effective BF Initiation:

The literature describes 3 predictors of effective BF initiation:

- Skin-to-skin: this is the major determinant of BF initiation and continuation (LE1).¹³ For healthy newborns, the need for continuous monitoring in the first 2 hours of life (*Décret de périnatalité* no. 98–900, October 9, 1998) is not incompatible with safe placement of the infant in a skin-to-skin position right after birth. Certain circumstances related to the infant, the mother, or the health team may require skin-to-skin with a monitor or contraindicate it. This should be explained to the family and may simply cause a slight delay in starting skin-to-skin.
- First breastfeeding: By taking advantage of the newborn's rooting reflex and state of alertness during the first few hours of life, early BF helps the baby to acquire correct suckling techniques and stimulates adequate milk production, associated with a longer duration of BF (LE1).¹⁴ Sometimes it is this first breastfeeding that determines whether the mother will continue BF. Some women do not wish to continue; they should be told of the risks of engorgement and of options for dealing with it.
- Rooming-in: When the infant and mother share a room 24 hours a day, their proximity makes it easier to breastfeed during the night as well as the day and makes it easier to recognize the baby's cues. Being together also stimulates milk production and reduces the risk of engorgement. Rooming-in does not necessarily involve *bed sharing*, which may increase the risk of sudden unexpected infant death (SUID) (LE2).³¹ Sharing a room, as opposed to sharing a bed, can facilitate the mother-child proximity necessary for effective BF while keeping the infant safe.³²

Other factors such as not introducing complements or pacifiers and providing information on normal newborn patterns are also associated with successful and continued BF.³³

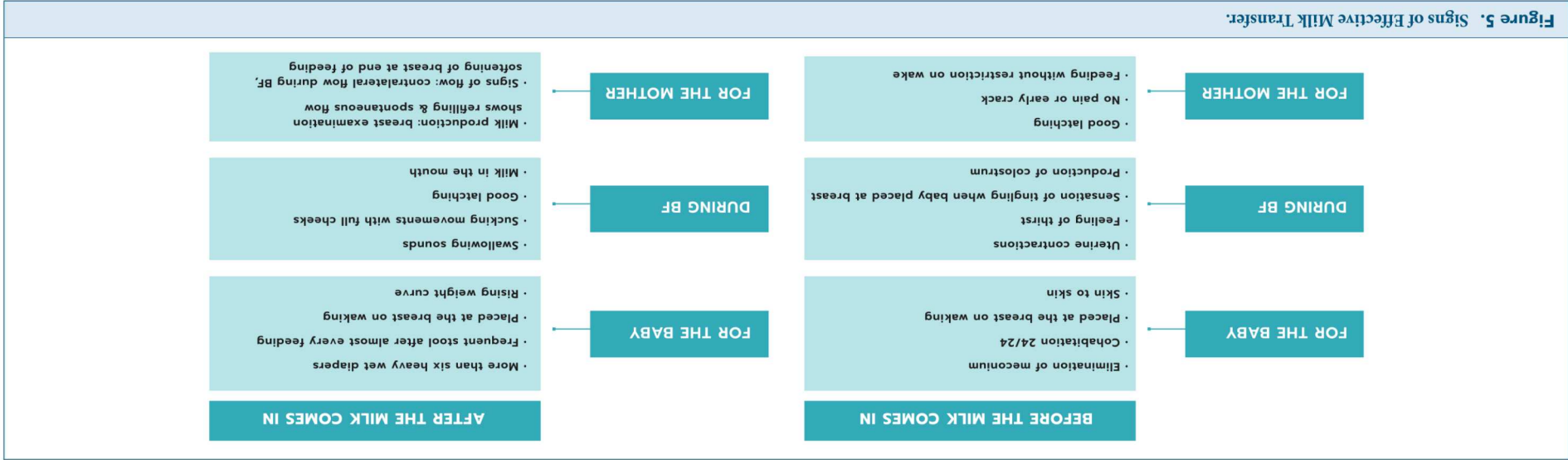
Implementing the following 3 predictors of effective BF initiation is recommended: skin-to-skin contact, first breastfeeding, and rooming-in (sharing a room) of newborn and mother (Grade A).

Assessment of BF Effectiveness

The HAS recommendations³⁴ for discharge from maternity facilities suggest observing at least 2 BF sessions to ensure that the mother can recognize effective milk transfer before her (early or regular) discharge from the maternity facility (expert consensus).

The midwife should assess at least 2 BF sessions before discharge. This assessment should include 2 parameters: the latch, or position of the breast in the infant's mouth, and an evaluation of BF effectiveness (expert consensus).

It is recommended that the signs of a good latch, or position of the breast in the infant's mouth, and of effective breastfeeding, be taught and monitored (expert consensus). Figures 5 and 6 illustrate these points.



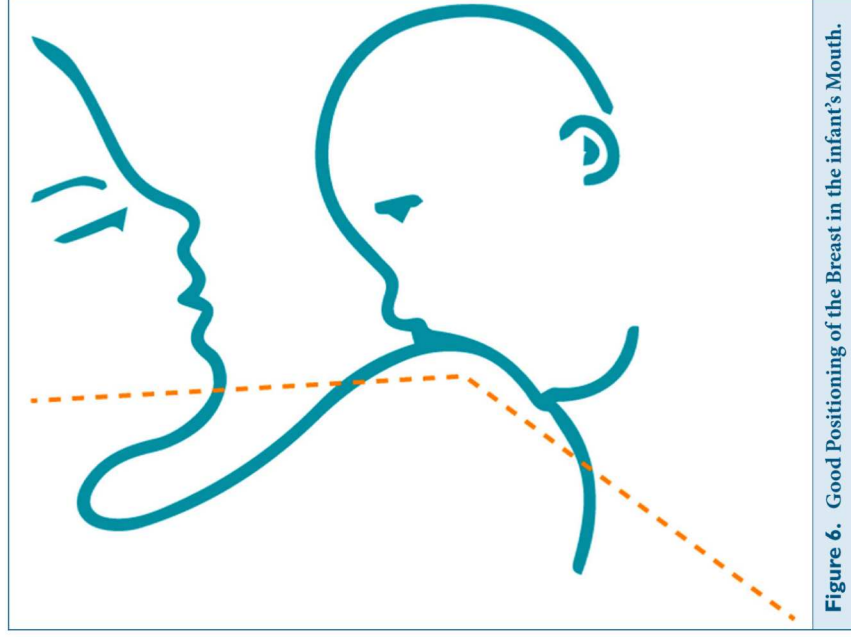


Figure 6. Good Positioning of the Breast in the infant's Mouth.

Assessing the Latch

BF is a dynamic process and requires the coordination of successive movements of the infant's jaws, the wave-like motion of the tongue, and the mother's milk ejection reflex.³⁵ The primary cause of nipple pain is incorrect latching on and positioning of the breast in the infant's mouth. It is believed that all dyads can achieve a correct latch and positioning.³⁶

Professionals should assess the latch and BF in different positions for the purpose of ensuring adequate stimulation of milk production and subsequently effective milk transfer (Figure 6) at every stage of follow-up.

What are the signs of a good latch?

- The infant's head is positioned along the same axis as his or her back, with ear, shoulder, and hip in a straight line; the baby is stomach-to-stomach with the mother.
- The newborn's head is tilted back slightly, the chin is buried in the mother's breast, and the nose is clear of any obstruction.
- The child's mouth is wide open and takes in a large part of the areola. The baby should be latched on the breast and not the end of the nipple, as the latter may cause cracked or sore nipples or stimulate the breast without emptying it, thereby causing engorgement or mastitis.
- The latch is asymmetric, and both lips are flanged. Part of the areola can be seen under the upper lip but not the lower lip. After a BF session, the nipple is elastic and round rather than pinched, showing that the baby can create a seal and draw milk.

Signs of Effective BF

Once the baby is well positioned at the breast, it is important to ensure that BF is effective (Figure 5).

- Before milk volume increases (before "the milk comes in"). To be effective, BF must stimulate the breast. The signs of good positioning, a good latch, and oxytocin release should be identified. When oxytocin is released, the mother may experience uterine contractions and bleeding, feel a pins and needles sensation, tingling, tightening of the breast, or become thirsty. During the first few days after birth, mothers secrete colostrum, which the baby will be able to extract, and which accelerates the passage of meconium.
- After milk volume increases, the transfer of milk into the infant's mouth should be assessed to ensure that the breast is being emptied and that the infant will gain an adequate amount of weight. Signs of adequate transfer include: (1) milk dripping or leaking from the other breast, (2) breasts that are softer after BF, (3) the baby's suck-swallow pattern becoming slower, indicating a shift from stimulating "flutter sucks" (30 seconds to 1–2 minutes of rapid, shallow suckling) to the phase of swallowing (deeper, slower sucks), (4) sounds of swallowing, (5) frequent, soft or loose, mustard-colored, seedy stools replacing meconium and occurring after each feeding; frequent and spontaneous urination approximately 6 times a day, and (6) one of the best indications of effective BF, despite requiring monitoring of the infant's weight curve: adequate weight gain.³⁷

The infant is calm, peaceful, and tends to fall asleep after BF. It is important to understand that, after milk production is regulated (after the first 3–4 weeks), if the milk storage capacity is small, BF will continue to be frequent, day and night, and the mother may not feel her breasts becoming full and then softer.

Showing mothers different breastfeeding positions and effective methods of draining all quadrants of the breast is recommended (Expert consensus). BF positions are described in Appendix 1. Milk production is regulated separately in each quadrant of the breast. The more quadrants are drained, the more abundant milk production will be. By stimulating production in all areas of the breast, regular emptying in all 4 quadrants will also facilitate the adaptation of the mammary gland to variations in the infant's patterns.

Formula Supplements

The main reason for giving a bottle to supplement BF is weight loss—or, more accurately, the weight gain required in a newborn for professionals to allow families to be discharged. Different parameters for discharge should be considered. In a study of a Portuguese cohort of 1288 mother-baby dyads (singletons born at term), the authors found that the lowest weight of newborns was recorded at an average of 52 hours of life (LE3).³⁸ A recent systematic review of the literature including 11 studies (6 retrospective and 5 cohort studies) found that weight was lowest at 2, 3, or 4 days after birth.³⁹ In the clinical protocol published by the Academy of Breastfeeding Medicine in 2017, the authors specified that breastfed infants regain their birth weight at an average of 8.3 days (95% CI,



7.7–8.9 days), and 97.5% by 21 days.⁴⁰ A study of 161,471 singletons born at ≥ 36 weeks of gestation (dated from the first day of the last menstrual period) and exclusively breastfed found a 10% loss of birth weight in 5% of infants born vaginally and 10% of those born by cesarean at 48 hours after birth. At 72 hours, more than 25% of those born by cesarean had lost 10% of their birth weight.⁴¹

Thus, it appears that having completely regained birth weight at 72 hours of life is not physiologically normal (LE2). The weight loss of infants born at term and breastfed seems higher among those born by cesarean compared to those experiencing vaginal birth (LE2).

A longitudinal study of 372 women identified the main reasons that they stopped exclusive BF: young parent, fatigue, pain, perception of low milk supply, lack of confidence in BF, maternal choice, and finally infant-related factors (such as weak suck or prematurity).⁴² These reasons are the same as those given for introducing formula supplements and for the vicious circle that results from these bottles: the newborn is satiated by the higher concentrations of components in artificial formula and does not stimulate milk production, the mother perceives a drop in her production, the newborn is uncomfortable because the volume of formula is inappropriate for his stomach size and cries, the mother loses confidence in her ability to breastfeed, the mother gives the baby a bottle... (LE4).

It is recommended that formula supplements not be given unless it is medically necessary (expert consensus). It is recommended that formula supplements not be given for any of the following reasons: fatigue, infant crying, fear of inadequate breastfeeding (expert consensus), a weight on day 3 lower than birth weight (Grade B), a weight on day 15 lower than birth weight if the weight is increasing and the dyad is receiving specialized help (expert agreement).

The use of different techniques such as stimulating the baby, consistently offering both breasts, reverse pressure softening and breast compressions to increase passive transfer, hand expression (Appendix 2) and/or pumping can increase the mother's milk production.⁴³

If formula supplements are necessary, they should be used in conjunction with other methods of stimulating milk production, such as: stimulating the baby, consistently offering both breasts, reverse pressure softening, and breast compressions to increase passive transfer, hand expression and/or pumping (expert consensus), as well as with a reassessment of breastfeeding effectiveness. It would be preferable for each milliliter of expressed milk to be given with appropriate BF tools, and gradually replaced by feeds directly and exclusively at the breast (expert consensus).

A cohort study in the USA ($n = 1116$) found shorter durations of BF when mothers pumped for nonmedical reasons (LE2).⁴⁴ Nonetheless, the methods it used did not establish a causal link between the use of a pump and the decision to discontinue BF. A pump should not be used to measure the quantity of milk a mother is producing. Instead, professionals should rely on signs of effective transfer (Figure 5) to assess production.

Prescriptions for pumps should not be systematically offered to mothers on discharge from maternity facilities (expert consensus). If a pump is pre-

scribed, the size of the flange must fit the mother well (Appendix 3).

OVERCOMING CHALLENGES

In its recommendations for promoting, protecting, and supporting BF, published in 2017, the WHO emphasized the importance of providing parents at discharge with a well-planned and coordinated follow-up, to ensure they receive ongoing support and appropriate care.³ Women who encounter difficulties (cracks, engorgement, mastitis, perception of lack of milk, difficulties latching or positioning, etc.) should be referred to professional breastfeeding support services (expert consensus). Continuing follow-up until breastfeeding is well established and comfortable for the mother-infant pair is recommended (expert consensus).

The Perception of Inadequate Milk

This is a common impression, and it is the health professional's role to determine whether or not it is an actual problem.⁴⁵ Insufficient lactation is usually identified when the infant's weight gain is inadequate. In the case of low weight gain, a physician, or a person knowledgeable about BF should be consulted to rule out other possible causes. Techniques to improve BF include increasing the frequency of BF sessions, being aware of and responding quickly to the baby's waking or hunger cues, offering both breasts at every feeding, and optimizing the emptying of the breasts (breast compressions at the end of the feeding), adjusting the position, stimulating the baby when sucking slows down or stops (rubbing feet, massaging neck muscles, using breast compressions). Mothers should drink to thirst, eat a balanced diet, and, if possible, reduce stress and get help. Babywearing and skin-to-skin are suggested.⁴⁶ There is no conclusive evidence of the efficacy of medications to increase supply.⁴⁷ One cause associated with inadequate production is the early introduction of formula supplements. These are often not necessary and, if they are used, milk should be expressed regularly to maintain or increase milk production. Ineffective BF may also be a reason for low production. An experienced professional may identify the cause of inadequate milk transfer by observing a BF session and recognizing, for example, symptomatic tongue-tie (ankyloglossia) or hypotonia. Sometimes supplementary bottles are indicated in the case of insufficient weight gain. Taking pre- and post-feed weights does not increase the mother's confidence on the third day, at discharge, or a week after returning home.⁴⁸

A Baby Who Is Constantly on the Breast

The following comments are common: "he breastfeeds nonstop, I must not have enough milk," or "she gets mad when she goes on the breast, she must not like my milk." When professionals do not respond to these questions in an appropriate and empowering manner, the situation can result in unfounded concerns, the introduction of supplements, or weaning.



- The approach should be based on the growth curve:
- If the weight gain is appropriate, explain that the breast storage capacity and intake at each feeding session are probably small, and that the baby compensates by BF frequently.⁴⁹ It can be useful to review the baby's positioning and latch, remind the parents of infant signs of satiety (baby is calm, content, falls asleep; milk dribbles from the baby's mouth; sleep-mark signs of rooting), explain the difference between nutritive sucking with signs of transfer (Figure 5) and non-nutritive or comfort sucking (without milk transfer) that may be satisfied by soothing techniques such as baby-wearing and rocking, often by the co-parent.
 - If the weight gain is insufficient, professional support is necessary; the appropriate course of action depends on the infant's age, kinetic energy, and situation.

Inadequate Weight Gain

Infant growth that falls below or does not stay within the centile lines for weight are often a concern for health professionals as well as parents. A common misconception about weight gain is that "the baby isn't gaining because my milk isn't rich enough." Many beliefs need to be corrected. The micronutrient quality of milk is not influenced by the mother's diet.⁵⁰ Even women who are severely deficient in nutrients make milk that enables their babies to grow appropriately until they wean. Having anorexia does not affect the quality of milk. To avoid the risk of maternal nutritional deficiencies, women who are following an elimination diet should be monitored carefully, ideally by a dietitian or a nutritional specialist, in a multidisciplinary care team during pregnancy (expert consensus).⁵¹ Iron and vitamin supplements taken by a BF woman do not increase the quantity of iron or vitamins in her milk. During BF, foods rich in vitamins A and C are recommended (expert consensus). The only effective and helpful interventions are those that consist of increasing the amount of omega 3 and 6 in the diet to increase their proportions in the milk.⁵² Foods rich in omega 3 and 6 include canola oil, enriched margarine, and fatty fish. This subject is discussed in detail in chapter 3.⁵¹

In most situations, inadequate weight gain is related to inadequate milk production, which in turn is related to inadequate stimulation of the breast (mother-baby separation or lack of rooming-in, reduced skin-to-skin contact, restriction of frequency or duration of BF sessions, strict schedules, baby conceived through fertility therapy, or difficulties in the transition to extrauterine life), and/or inadequate milk transfer (due, for example, to incorrect latch or positioning, feeding on the end of the nipple, or lack of pressure on the breast). Each of the relevant causes should be identified and addressed appropriately before resorting to supplements.

Inadequate Weight Gain between Day 1 and Day 10 of Life

The WHO has created growth charts for breastfed newborns. Professionals can find them here: <https://www.who.int/toolkits/child-growth-standards/standards>.

Conditions required for discharge from maternity facilities involve detecting maternal or infant risks, ensuring a re-

Table 2. Care Plan for Infants Who Have Not Regained Birth Weight by Day 15

Birth Weight Not Regained by Day 15 Requires a review of lactation with a specialist to stimulate lactation. Supplementary bottles are not systematically indicated if the clinical exam is normal. Give clear instructions regarding tools (pumps, nipple shields, etc.)
Increase milk transfer: Increase number of breastfeeding sessions, offer both breasts at every feeding, review the position of the baby at the breast (see appendices), latch (position of breast in baby's mouth) (see appendices), breast compressions, and stimulation of infant Monitor the baby's growth twice a week to ensure increase (> 20 g/d)

alistic weight gain, and planning for appropriate follow-up, as recommended by the HAS.³⁴ The idea of changing the practice of weighing babies every day in the maternity facility would be interesting except for the concern that it would result in introducing supplementary bottles, due to a lack of a broader view of the infant's growth and energy needs.

Inadequate Weight Gain between Day 10 and Day 21

After ruling out medical reasons for formula supplements, it is recommended that they not be introduced until proactive measures have been implemented to stimulate lactation and increase milk transfer, while closely monitoring their effect on the growth curve (Expert consensus). In the case of inadequate weight gain on day 15, professionals can use the care plan in Table 2.

Beyond these suggestions, professionals should rule out the existence of medical or surgical problems or major anomalies affecting the suck (short frenulum, hypotonia, etc.),⁵³ a rare condition that prevents a sufficient milk supply from developing, such as a congenital anatomical anomaly (insufficient glandular tissue), or previous breast surgery.⁵⁴

Potential hormonal causes to be ruled out include prolactin deficiency, retained placenta, severe stress, contraception during a period of glandular development (eg, birth control containing both estrogen and progesterone or injections of progesterone before 6 weeks postpartum), or a thyroid dysfunction affecting milk ejection.

It is important to reassess the suggestions used to increase weight:

- If the baby is gaining weight and the mother is pumping, formula supplements can gradually be replaced by direct BF.
- If the baby's weight remains at the same level, formula supplements can be added while working towards effective lactation and until it is achieved.
- If the baby is losing weight or the situation is serious (ie, there are signs of dehydration, lethargy, jaundice, or other major concerns), hospitalization is required.



Inadequate Weight Gain after Day 21

It is essential to measure and plot the weight, height/length, and head circumference (HC) of infants, because this will determine the best course of action. A newborn whose growth in length and HC are healthy but whose weight gain is slow or drops to a lower standard deviation (SD) will require a different care plan than one who is affected in all 3 areas. In the first case, the newborn is following a physiological curve; measures designed to boost milk production can be introduced. In the case of all 3 curves more than 2 SD below the mean or dropping dramatically, pediatric causes should be explored. One possibility is an allergy to cow's milk protein; an elimination diet can be suggested to the mother. If weight loss occurs in an older baby, introducing a variety of complementary foods, while avoiding foods to which the baby is allergic or intolerant (such as gluten or dairy products) can compensate for milk intake; this feeding plan should be discussed with a pediatrician.

Babies Who Cannot or Will Not Breastfeed

If a baby refuses the breast, medical or surgical causes should be ruled out: fever, lethargy, intestinal occlusion (frequent or abundant or bilious vomiting, lack of bowel movements), or respiratory ailment. Signs of serious problems should be monitored: paleness, jaundice, dehydration, mottling or skin discoloration, or cold extremities. Parents and professionals should watch for behavioral changes in the child (weakened muscle tone or reactivity) or persistent changes in behavior at the breast (refusing the breast, agitation, or crying at the breast).

In the absence of red flags, professionals can reassure the parents and make the following suggestions to prevent engorgement:

- Never force the child to take the breast.
- Do lots of safe skin-to-skin; encourage the mother to relax with the baby in a calm atmosphere, limiting visitors.
- Begin by expressing a few drops of milk by hand and placing them on the baby's lips to stimulate rooting, then gently offer the breast.
- Avoid delaying feeds or waiting until the last minute to place the baby on the breast; it is easier to breastfeed a baby who is half-awake than one who is hungry, agitated, or frustrated.
- Explore the possibility of a forceful milk ejection reflex and try a biological nurturing (BN) or laid-back position (Appendix 1).
- If none of these methods works, a nipple shield can be used as a last resort.⁵⁵

If a shield is necessary, the mother should have a follow-up during the stay at the maternity facility and throughout the time it is used. Mothers can hand express each time they breastfeed to stimulate the milk flow, and then use breast compressions before the feeding ends to empty the breast and increase the transfer of milk (expert consensus). The use of a shield may be (1) temporary, until cracked or bleeding nipples have healed, while at the same time using specific preventive and healing measures, or (2) long term, if nipples are very flat or inverted or the baby's mouth does not open wide (prema-

turity, retrognathia), but only after other attempts to correct the latch or positioning have failed and while using the other proactive measures to stimulate milk production and transfer listed above.

The mother can be reminded that BF should take place whenever the baby shows signs of waking or early signs of hunger in the first month, whenever the baby cues (or cries) to feed in the second month, and whenever the baby and mother agree from the third month on.⁴⁶

Educating parents about the phases of active sleep, which do not require parental intervention (expert consensus), and suggesting they interact with their babies during awake and alert phases (expert consensus) are recommended.

Basic ideas about the BF and sleeping patterns of newborns are explored in chapter 7.⁴⁶

Breastfeeding Challenges: Pain, Cracked Nipples, and Other BF-Related Disorders

It is time to stop telling mothers that the early days of BF are synonymous with pain. The opposite is true: any pain experienced while BF the first few times mean there is a problem with the latch and/or positioning. Rather than waiting or tolerating the pain, mothers should immediately seek help to correct the problem before the nipples are cracked or damaged, leading to reduced frequency or duration of BF sessions and inadequate production. Inversely, signs of oxytocin release indicate effective BF.

In a cohort study of 792 women in Italy, the 70% who reported BF challenges ranked the pain associated with cracked nipples as the most frequent cause (41% of causes of difficulties) (LE2).¹⁹ A recent review of the literature found that pain was one of the top 2 reasons for discontinuing BF earlier than planned.⁵⁶

Any pain or damage in the nipple should be treated immediately (expert consensus)

Sometimes, a specific diagnosis is found to explain the pain.

Cracks

Cracks are deep or shallow lesions in the skin of the nipple-areolar complex. They may bleed and are often extremely painful. They occur more frequently when the initiation of BF is delayed. BF soon after birth takes place during a phase in which the baby is alert, and the sensory context stimulates the rooting reflex of the newborn and a correct and reproducible latch.

To promote healing and scabbing of cracked nipples, professionals should⁵⁷:

- examine the mobility of the infant's tongue
- help the mother choose the most appropriate positions for herself and her baby, and vary them
- assess and correct the latch and the position of the breast in the baby's mouth (LE3)^{58–60}
- suggest limiting the use of nursing pads and/or changing them frequently, keeping all BF accessories clean (shells, nursing cups) to avoid any secondary infection (LE3)⁶¹



- prescribe an analgesic such as acetaminophen to relieve the pain
- consider referring the dyad to an osteopath knowledgeable about BF, although research on these treatments has given variable results.⁶⁵

Another useful step is to recommend placing a few drops of colostrum on the nipple and areola after each BF session, starting immediately after birth. If a nipple starts to crack, a moist “colostrum compress” or “breast milk compress” will promote the formation of scabs because of the anti-infective and healing effects of human milk. Breast milk is more effective for pain than lanolin (LE2).⁶² Pure lanoline has only a moisturizing effect and may cause allergic reactions. The use of medical grade honey may also be appropriate; its use has been studied in other situations (surgical wound healing, ulcers, and burns), although no reliable clinical studies on cracked nipples have been completed to date.^{63,64}

Suggesting that the mother wean the baby, on the other hand, should be avoided. However, in the case of serious pain, when correcting the latch or position does not suffice, professionals can suggest using nipple shields and pumping for 24 to 48 hours if necessary.

When a nipple is cracked, the first treatment methods are improving the latch and positioning (Grade C) and applying breast milk (Grade B).

Engorgement

Engorgement results from edema of interstitial tissues secondary to capillary and lymphatic hyperemia, aggravated by milk stasis. It is considered physiological when the lactogenesis II stage begins and is, at that time, associated with an increase in the volume of milk produced when milk “comes in.” If not managed correctly, engorgement can quickly lead to an inhibition of milk production and cause growing difficulties latching and BF due to edema of the areola. Engorgement may also evolve into mastitis.⁶⁶

A Cochrane meta-analysis updated in 2020 examined methods used to deal with engorgement.⁶⁷ The authors found that certain interventions can be effective in treating primary engorgement, including cabbage leaves, cold compresses, plant-based compresses, and massages. However, the level of evidence for their use is low.

The best course of treatment is to:

- Drain the milk by increasing the frequency of BF sessions, using several different positions, and applying heat (hot shower, glove) before BF, using hand expression and reverse pressure softening massages to soften the areola and make latching the baby easier (LE3).^{67,68}
- Empty the breast as well as possible at each BF, without overstimulating it, by using reverse pressure or hand expression, or using a manual or electric pump.
- Prescribe an analgesic (acetaminophen) or a nonsteroidal anti-inflammatory drug (NSAID) to reduce the pain and improve the drainage. Do not hesitate to apply cold (ice pack, cold compresses), which also has an analgesic effect.

Mastitis

Mastitis is a breast inflammation resulting from milk stasis, which may or may not be accompanied by an infection. The risk of mastitis evolving into an abscess increases if management or treatment of the situation is delayed or inadequate. Mastitis is an inflammation and produces localized redness, pain, and heat. General symptoms often associated with mastitis include fever or flu-like symptoms.

An abrupt discontinuation of BF can lead to an abscess (LE3).⁶⁸ Furthermore, in its recommendations on the treatment of mastitis, WHO states that there is no evidence of risk to the healthy term infant of continuing BF from a mother with mastitis (LE4).⁶⁹

In the case of mastitis and/or abscess, continuing breastfeeding is recommended (grade C)

In fact, a positive Budin’s sign reflects milk that is richer in anti-infective factors and sodium due to a reactionary modification of the intercellular spaces of the epithelial barrier. Therefore, it should not be falsely interpreted as pus, for this milk does not contain pathogens. Nor does it contraindicate BF. In mastitis, the junctions between lactocytes re-open, giving human milk a saltier taste. This can make the breastfed infant react or hesitate to drink the milk and may be interpreted erroneously as a sign that the milk is not suitable.⁶⁶

Thus, mastitis should be managed immediately by (1) draining the milk by increasing the frequency of BF or expressing milk (hand expression, pumping, or “juice jar” technique) or (2) prescribing an NSAID and an analgesic (acetaminophen). Cabbage leaves are no more effective than cold compresses to relieve pain and there is no evidence that they reduce the duration of the inflammation (LE2).⁷⁰

NSAIDs can be prescribed with medical supervision for mastitis (expert consensus)

A code of good practices regarding NSAIDs was published in 2013 by the National drug safety and medical device agency (*Agence nationale de sécurité du médicament et des produits de santé*).⁷¹

A case-control study (192 women with mastitis vs. 466 samples of donor milk) found the same bacteria in the milk of women with mastitis and in donor milk samples. Researchers did not find differences in the bacteria count in women with mastitis who had taken antibiotics and those who had not taken antibiotics.⁷² The most recent recommendations of the Academy of Breastfeeding Medicine and the WHO concur that laboratory investigations and other diagnostic procedures are not routinely needed for mastitis. They specify that breast milk culture and sensitivity testing should be undertaken if: there is no response to antibiotics within 2 days, the mastitis recurs, it is a hospital-acquired (nosocomial) infection, the patient is allergic to the usual therapeutic antibiotics, or there is a clinical symptom that indicates a secondary bacterial infection (LE3).^{69,73}



Generally, in cases of mastitis, breast milk culture and laboratory investigations are not recommended as a first course of action (Grade C)

The status of the case should be reassessed daily. Antibiotic treatment with pristinamycin 1 g 3 times a day may be indicated if more serious symptoms occur, such as: crack(s) with a secondary infection, severity shown by an elevated, persistent fever, or lack of resolution in 24 to 48 hours despite effective removal of milk. However, antibiotic treatment should not be automatic and should be reassessed to avoid delaying the diagnosis of an abscess requiring specialized treatment.⁷⁴

Several risk factors have been identified: poor positioning, local pressure (bras, hands), cracks, changes in frequency, overproduction, and inadequate drainage or removal of milk.

Abscess

Abscesses are a complication of mastitis that has been poorly managed. An abscess presents with radiating pain and is often associated with fatigue and fever, but it can also be insidious, without noticeable general or local symptoms. Examination reveals a well-defined, fluctuant breast mass that may be difficult to feel because it is located deep in the breast or in a subareolar or retroareolar area. Ultrasound by an experienced professional can be useful in these cases to confirm the diagnosis. The most appropriate antibiotic to use is pristinamycin (1 g 3 times/day), as needle aspiration reveals *Staphylococcus aureus* in the fluid in 99% of cases. An abscess is compatible with continued BF, which contributes to emptying the breast, reducing the inflammation, and improving healing. If symptoms persist, a specialized ultrasound examination of the breast is indispensable. The recommended treatment of a confirmed abscess is one or more ultrasound-guided needle aspirations, alongside medical treatment.⁷⁵ The size of the abscess does not limit the use of needle aspiration. Close clinical follow-ups every 48 hours allow the duration of antibiotic and anti-inflammatory use to be adjusted, if necessary, as well as the need for further needle aspirations to be determined.^{74,76} Several needle aspirations may be necessary, but the longer treatment is delayed the higher the risk of surgery.

In case of an abscess, immediate management by ultrasound-guided needle aspiration is recommended as first-line treatment (Grade C) to protect continued breastfeeding (LE4).

Fungal Infections and Differential Diagnosis

Burning, intense tingling in the nipples that continues throughout the feeding and may also occur between BF sessions,^{59,62} pain aggravated by heat and slightly alleviated by cold, not attenuated by pumping or hand expression, a localized stabbing pain or pins and needles feeling — all can lead in the end to the diagnosis of a fungal infection.^{77,78} A shiny red nipple and areola or scaly patches may also be present, but at other times the presence of a fungal infection is not indicated by the appearance of the nipple, areola, or breast. The newborn's mouth should be examined for signs of candidiasis (thrush). Laboratory tests for bacteria are completely useless. Conventional cultures underestimate the prevalence of yeast, because lactoferrin inhibits its growth *in vitro*. The

CASTLE (Candida and Staphylococcus Transmission: Longitudinal Evaluation) study of 360 women found 33% of PCR (polymerase chain reaction) tests were positive for *Candida albicans* vs. 3% of standard cultures.⁷⁹ The existence of risk factors associated with pain, described previously, and a lack of response to the usual management of nipple pain suggest a diagnosis of nipple candidiasis. Some of its risk factors include its presence in other locations, damage to the skin, antifibiotic treatment in the perinatal period, treatment with corticosteroids or immunosuppressors, hormonal contraception, diabetes, obesity, use and inadequate cleaning of accessories (pacifiers, bottle nipples, nipple shields, breast shells, breast pads, etc).

Once the diagnosis is made and differential diagnosis has eliminated other possibilities, an appropriate specific local or general treatment must begin.^{77,78}

Pain can be relieved by administering effective treatments such as acetaminophen 1 g 4 times/day. Vaginal candidiasis can be treated, and flora can be restored to its proper balance, by using probiotics with acidophilus.

Two differential diagnoses can be considered:

- Eczema of the areola or nipple can require local corticosteroid therapy; a referral to a dermatologist is recommended.
- Local discoloration may suggest nipple vasospasm, sometimes associated with Raynaud's syndrome.^{80,81}

When to Seek Urgent Treatment

In certain situations, it is necessary to direct the mother and/or child to seek urgent care (Figure 7).

A specialized team approach is recommended for some breastfeeding situations (hospitalization of the newborn, prematurity, extended breastfeeding or tandem nursing, maternal vulnerability or disability, adoption, breast surgery, and addictions) (**expert consensus**).^{82–84}

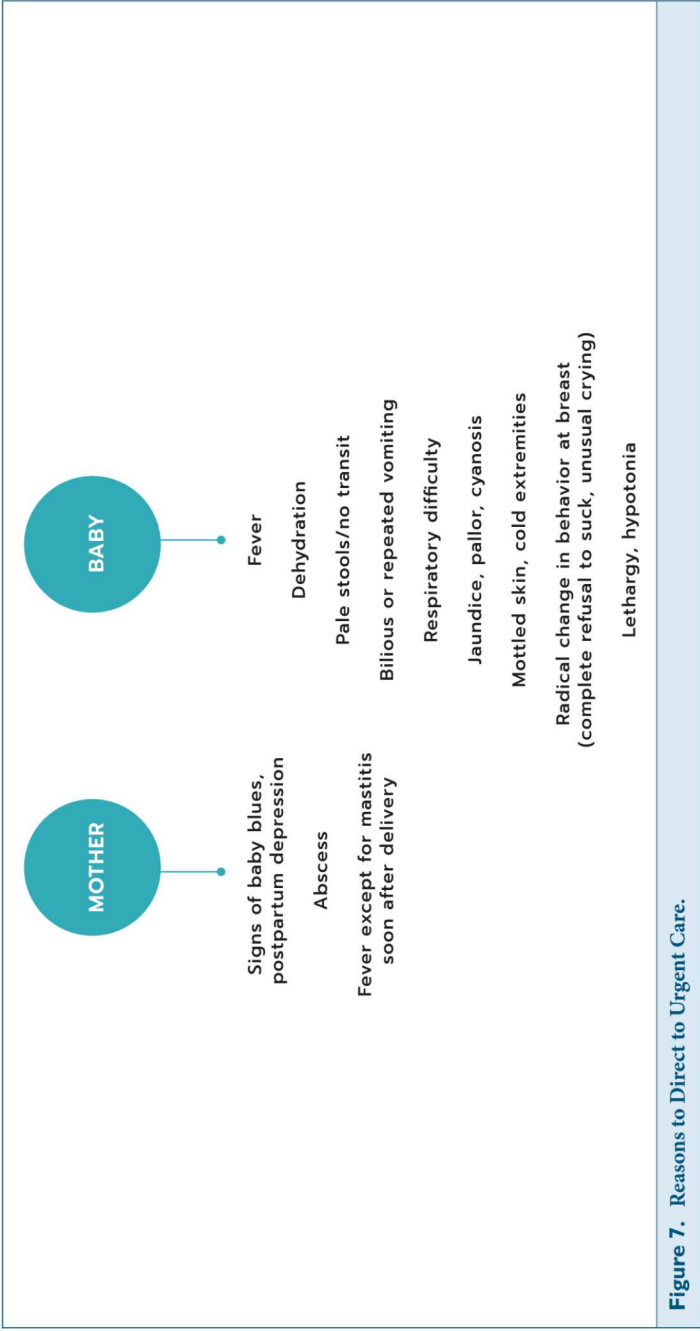
Some situations (medications, vaccines, contrast products, tandem nursing) are discussed in the clinical case studies in Appendix 4. Information sheets on topics including BF follow-up in maternity facilities, the treatment of fungal infections, and collecting and storing milk are available on the French National College of Midwives website.

CONCLUSION

Every health professional who is in contact with BF mothers and babies and, more broadly, families, should acquire basic education in BF to address the 4 most frequent causes of premature cessation of BF: engorgement, sore nipples, low weight gain, and the perception of inadequate milk production. The support offered currently to women who plan to breastfeed (70%) is not optimal, due to the lack of training and competence on the part of many health professionals. Many BF experiences are shorter than women plan or want them to be.

BF is the most appropriate, ecological, and economical way to protect the health of the mother, child, and planet. We need to promote and protect it by improving and updating our skills. We must commit to the 3 areas set out in the





2019–2023 nutritional plan: designing and developing communications on media platforms, helping to establish support methods such as help lines, and promoting a breastfeeding-friendly environment.

ACKNOWLEDGMENTS

The authors thank: the coordinators (Chloé Barasinski, Clermont-Ferrand; Rémi Béranger, Rennes; Catherine Salinier, Gradignan; Cécile Zaros, Paris) and the experts in the working group (Julie Bercherie, Paris; Jonathan Bernard, Paris; Nathalie Boisseau, Clermont-Ferrand; Aurore Camier, Paris; Corinne Chanal, Montpellier; Bérénice Doray, la Réunion; Romain Dugravier, Paris; Anne Evrard, Lyon; Anne-Sophie Ficheux, Brest; Ronan Garlantézec, Rennes; Manik Kadawathagedara, Rennes; Anne Laurent-Vannier, Saint-Maurice; Marion Lecorguillé, Paris; Cécile Marie, Clermont-Ferrand; Françoise Molénat, Montpellier; Fabienne Pelé, Rennes; Brune Pommeret de Villepin, Lille; Mélie Rousseau, Loos; Virginie Rigourd, Paris; Laurent Storme, Lille; Stéphanie Weiss, Chambéry), who contributed the discussions, as well as to the production and validation of this text. The authors also thank the members of the reading group who read all of the texts (complete list presented in the synthesis⁸⁵).

CONFLICT OF INTEREST

This article was originally published online in French and has been translated for publication in the *Journal of Midwifery & Women's Health*. The publication of this article has been funded by the Collège National des Sages-Femmes de France (French National College of Midwives).

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

- Figure S1: BN or Laid-Back Position.
- Figure S2: Cradle Position.
- Figure S3: Clutch or Rugby Ball Position.
- Figure S4: Side-Lying Position.
- Figure S5: Straddle Position.
- Figure S6: Positions for Breastfeeding Twins (1).
- Figure S7: Positions for Breastfeeding Twins (2).
- Figure S8: Hand expression of milk.
- Figure S9: Choosing a Nipple Shield.
- Table S1: Contrast products and migraine medication.

Appendix

REFERENCES

1. INSERM, DRESS. Enquête Nationale Périnatale: RAPPORT 2016. EPOpé. Published October 11, 2017. Accessed August 28, 2019. <http://www.xn--epop--inserm--ebb.fr/enquete-nationale-perinatale-2016-premiers-resultats-952>
2. Wagner S, Kersuzan C, Gojard S, et al. Breastfeeding initiation and duration in France: The importance of intergenerational and previous maternal breastfeeding experiences - results from the nationwide ELFE study. *Midwifery*. 2019;69:67-75. <https://doi.org/10.1016/j.midw.2018.10.020>.
3. World Health Organization. Guideline: Protecting, Promoting and Supporting Breastfeeding in Facilities Providing Maternity and Newborn Services. 2017. Accessed March 30, 2021. <https://apps.who.int/iris/bitstream/handle/10665/259386/9789241550086-eng.pdf;jsessionid=16F15C85C782431F8507914C97417B3?sequence=1>
4. Bruel H, Villepin B de, Beziz D, et al. Prise en charge en maternité des nouveau-nés à risque d'hypoglycémie — Co-FAM. *Rev Médecine Périnatale*. 2013;5(4):230-235. <https://doi.org/10.1007/s12611-013-0256-2>
5. Batista CLC, Ribeiro VS, Desterro SB, Nascimento M, Rodrigues VP. Association between pacifier use and bottle-feeding and unfavorable behaviors during breastfeeding. *J Pediatr*. 2018;94(6):596-601.
6. Martín-Iglesias S, Santamaría-Martin MJ, Alonso-Álvarez A, et al. Effectiveness of an educational group intervention in primary healthcare for continued exclusive breast-feeding: PROLACT



- study. *BMC Pregnancy Childbirth*. 2018;18(1):59. <https://doi.org/10.1186/s12884-018-1679-3>
7. Barasinski C, Béraner R, Salinier C, et al. Recommandations pour la pratique clinique: "Interventions pendant la période périnatale". *Synthèse*. Published online July 2021. Accessed July 27, 2021. <https://hal.uca.fr/hal-03283227>
8. Turck D, Razanamahela L, Dazelle C, et al. Plan d'action : allaitement maternel. *Médecine Nutr*. 2011;46:25-47. <https://doi.org/10.1051/nnut/201030002>
9. Balogun OO, O'Sullivan EJ, McFadden A, et al. Interventions for promoting the initiation of breastfeeding. *Cochrane Database Syst Rev*. Published online 2016.
10. Cohen SS, Alexander DD, Krebs NF, et al. Factors Associated with Breastfeeding Initiation and Continuation: A Meta-Analysis. *J Pediatr*. 2018;203:190-196.e21. <https://doi.org/10.1016/j.jpeds.2018.08.008>
11. Lumbiganon P, Martis R, Laopaiboon M, Festin MR, Ho JJ, Ti HM. Antenatal breastfeeding education for increasing breastfeeding duration SO. *Cochrane Database Syst Rev*. Published online 2016.
12. ANAES. Allaitement maternel – Mise en œuvre et poursuite dans les 6 premiers mois de vie de l'enfant". 2002. https://www.has-sante.fr/upload/docs/application/pdf/allaitement_rap.pdf.
13. Moore ER, Bergman N, Anderson GC, Medley N. Early Skin-to-Skin Contact for Mothers and Their Healthy Newborn Infants *Cochrane Database Syst Rev*; 2016.
14. Smith ER, Hurt L, Chowdhury R, et al. Delayed breastfeeding initiation and infant survival: A systematic review and meta-analysis. *PLoS One*. 2017;12(7):e0180722. <https://doi.org/10.1371/journal.pone.0180722>
15. Becker GE, Smith HA, Cooney F. Methods of milk expression for lactating women. *Cochrane Database Syst Rev*. Published online September 29, 2016. <https://doi.org/10.1002/14651858.CD006170.pub5>.
16. World Breastfeeding Trends Initiative (WBTi). Galvanising Action and Making a Global Data Repository (Breastfeeding & Infant and Young Childfeeding- Policies and Programmes). 2019. Accessed November 24, 2021. <https://www.worldbreastfeedingtrends.org/uploads/resources/document/wbti-guide-book-may-2019.pdf>
17. Rollins NC, Bhandari N, Hajeerhoy N. Why invest, and what it will take to improve breastfeeding practices? *Lancet*. 2016;387:491-504.
18. Wallwiener S, Müller M, Doster A, et al. Predictors of impaired breastfeeding initiation and maintenance in a diverse sample: what is important? *Arch Gynecol Obstet*. 2016;294:455-466.
19. Gianni ML, Bettinelli ME, Manfra P, et al. Breastfeeding Difficulties and Risk for Early Breastfeeding Cessation. *Nutrients*. 2019;11(10). <https://doi.org/10.3390/nu1102266>
20. Patel S, Patel S. The Effectiveness of Lactation Consultants and Lactation Counselors on Breastfeeding Outcomes. *J Hum Lact Off J Int Lact Consult Assoc*. 2016;32(3):530-541. <https://doi.org/10.1177/0890334415618668>
21. Gavine A, MacGillivray S, Renfrew MJ, Siebelt L, Haggi H, McFadden A. Education and training of healthcare staff in the knowledge, attitudes and skills needed to work effectively with breastfeeding women: a systematic review. *Int Breastfeed J*. Published online 2016.
22. Victora CG, Bahl R, Barros AJD, et al. Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect. *The Lancet*. 2016;387(10017):475-490. [https://doi.org/10.1016/S0140-6736\(15\)01024-7](https://doi.org/10.1016/S0140-6736(15)01024-7)
23. Ministère de la santé et des solidarités. Programme National Nutrition Santé 2019-2023. https://www.mangerbouger.fr/content/download/45992/880015/version/2/file/pnns_2019_2023.pdf
24. Turck D, Vidailhet M, Bocquet A, et al. Allaitement maternel : les bénéfices pour la santé de l'enfant et de sa mère. *Arch Pédiatrie*. 2013;20:S29-S48. [https://doi.org/10.1016/S0929-693X\(13\)72251-6](https://doi.org/10.1016/S0929-693X(13)72251-6)
25. Branger B, Camelot F, Droz D, et al. Breastfeeding and early childhood caries. Review of the literature, recommendations, and prevention. *Arch Pediatr Organe Off Soc Française Pediatr*. 2019;26(8):497-503. <https://doi.org/10.1016/j.arcped.2019.10.004>
26. Quigley M, Embleton ND, McGuire W. Formula versus donor breast milk for feeding preterm or low birth weight infants. *Cochrane Database Syst Rev*. 2019;7:CD002971. <https://doi.org/10.1002/14651858.CD002971.pub5>
27. Chowdhury R, Sinha B, Sankar MJ, et al. Breastfeeding and maternal health outcomes: a systematic review and meta-analysis. *Acta Paediatr*. 2015;104:96-113.
28. Breastfeeding Promotion Network of India, Réseau international des groupes d'action pour l'alimentation infantile. *Formula for Disaster: Weighing the Impact of Formula Feeding vs Breastfeeding on Environment*; 2014.
29. Bartick MC, Schwarz EB, Green BD, et al. Suboptimal breastfeeding in the United States: Maternal and pediatric health outcomes and costs. *Matern Child Nutr*. 2017;13:e12366. PMID:27647492.
30. Truchet S, Honvo-Houéto E. Physiology of milk secretion. *Best Pr Res Clin Endocrinol Metab*. Published online 2017.
31. Jaafar SH, Ho JJ, Lee KS. Rooming-in for new mother and infant versus separate care for increasing the duration of breastfeeding. *Cochrane Database Syst Rev*. Published online 2016.
32. Weiss S. Protecting Infants from Sudden Unexpected Infant Death: Guidelines for Interventions during the Perinatal Period from the French National College of Midwives. *J Midwifery Womens Health*. 2022;67(Suppl. 1):S83-S92.
33. McFadden A, Gavine A, Renfrew MJ, et al. Support for healthy breastfeeding mothers with healthy term babies. *Cochrane Database Syst Rev*. Published online 2017.
34. Haute Autorité de Santé. Sortie de Maternité Après Accouchement: Conditions et Organisation Du Retour à Domicile Des Mères et de Leurs Nouveau-Nés. HAS; 2014:36. Accessed April 20, 2021. https://www.has-sante.fr/upload/docs/application/pdf/2014-03/recommandations_-_sortie_de_maternite_apres_accouchement.pdf
35. Elad D, Kozlovsky P, Blum O, et al. Biomechanics of milk extraction during breast-feeding. *Proc Natl Acad Sci U S A*. 2014;111(14):5230-5235. <https://doi.org/10.1073/pnas.1319798111>
36. McClellan HL, Kent JC, Hepworth AR, Hartmann PE, Geddes DT. Persistent Nipple Pain in Breastfeeding Mothers Associated with Abnormal Infant Tongue Movement. *Int J Environ Res Public Health*. 2015;12(9):10833-10845. <https://doi.org/10.3390/ijerph120910833>
37. Lau C. Development of infant oral feeding skills: what do we know? *Am J Clin Nutr*. 2016;103(2):616S-21S. PMID:26791183.
38. Fonseca MJ, Severo M, Santos AC. A new approach to estimating weight change and its reference intervals during the first 96 hours of life. *Acta Paediatr*. 2015;104:1028-1034.
39. DiTomasso D, Cloud M. Systematic Review of Expected Weight Changes After Birth for Full-Term, Breastfed Newborns. *J Obstet Gynecol Neonatal Nurs JGNN*. 2019;48(6):593-603. <https://doi.org/10.1016/j.jogn.2019.09.004>
40. Kellams A, Harrel C, Omega S, Gregory C, Rosen-Carole C. ABM Clinical Protocol #3: Supplementary Feedings in the Healthy Term Breastfed Neonate, Revised 2017. *Breastfeed Med Off J Acad Breastfeed Med*. 2017;12:188-198. <https://doi.org/10.1089/bfm.2017.29038.a1k>
41. Flaherman VJ, Schaefer EW, Kuzniewicz MW, Li SX, Walsh EM, Paul IM. Early weight loss nomograms for exclusively breastfed newborns. *Pediatrics*. 2015;135(1):e16-23. <https://doi.org/10.1542/peds.2014-1532>
42. Aldalili AYA, El Mahalli AA. Research Title: Factors Associated with Cessation of Exclusive Breastfeeding. *J Multidiscip Healthc*. 2021;14:239-246. <https://doi.org/10.2147/JMDH.S277819>
43. Morton J, Hall JY, Pessl M. Five steps to improve bedside breastfeeding care. *Nurs Womens Health*. 2013;17(6):478-488. <https://doi.org/10.1111/1751-486X.12076>
44. Felice JP, Cassano PA, Rasmussen KM. Pumping human milk in the early postpartum period: its impact on long-term practices



- for feeding at the breast and exclusively feeding human milk in a longitudinal survey cohort. *Am J Clin Nutr*. 2016;103(5):1267-1277. <https://doi.org/10.3945/ajcn.115.15733>
45. Westerfield KL, Koenig K, Oh R. Breastfeeding: Common Questions and Answers Am Fam Physician.
 46. Dugravier R, Molenat F, Fourmeret P, Salinier-Rolland C. Newborns' Bonding and Attachment, their Rhythms and Needs, Supporting Parents Appropriately: Guidelines for Interventions During the Perinatal Period from the French National College of Midwives. *J Midwifery Womens Health*. 2022;67(Suppl. 1):S38-S55.
 47. Donovan TJ, Buchanan K. Medications for Increasing Milk Supply in Mothers Expressing Breastmilk for Their Preterm Hospitalised Infants Cochrane. *Database Syst Rev*. 2012.
 48. Hall WA, Shearer K, Mogan J, Berkowitz J. Weighing preterm infants before & after breastfeeding: does it increase maternal confidence and competence? *MCN Am J Matern Child Nurs*. 2002;27(6):318-326; quiz 327. <https://doi.org/10.1097/00005721-200210000-00004>
 49. Kent JC. Volume and Frequency of Breastfeedings and Fat Content of Breast Milk Throughout the Day. *PEDIATRICS*. 2006;117(3):e387-e395. <https://doi.org/10.1542/peds.2005-1417>
 50. Valentine CJ, Wagner CL. Nutritional management of the breastfeeding dyad. *Pediatr Clin North Am*. 2013;60(1):261-274. <https://doi.org/10.1016/j.pcl.2012.10.008>
 51. Lecorguillé M, Camier A, Kadawathagedara M. Weight Changes, Nutritional Intake, Food Contaminants, and Supplements in Women of Childbearing Age, including Pregnant Women: Guidelines for Interventions during the Perinatal Period from the French National College of Midwives. *J Midwifery Womens Health*. 2022;67(Suppl. 1):S135-S148.
 52. Wayss C, Simon N, Tressou J, et al. [Polyunsaturated fatty acids consumption in lactating women in France: The INCA 2 study and evolution of essential fatty acids composition in breast milk from 1997 to 2014]. *Cah Nutr Diététique*. 2019;54(1):35-43. <https://doi.org/10.1016/j.cnd.2018.11.004>
 53. Forlenza GP, Paradise Black NM, McNamara EG, Sullivan SE. Ankyloglossia, exclusive breastfeeding, and failure to thrive. *Pediatrics*. 2010;125(6):e1500-e1504. <https://doi.org/10.1542/peds.2009-2101>
 54. Cheng F, Dai S, Wang C, Zeng S, Chen J, Cen Y. Do Breast Implants Influence Breastfeeding? A Meta-Analysis of Comparative Studies. *J Hum Lact*. Published online 2018.
 55. Elliott C. Using a silicone nipple shield to assist a baby unable to latch. *J Hum Lact Off J Int Lact Consult Assoc*. 1996;12(4):309-313. <https://doi.org/10.1177/089033449601200418>
 56. Morrison AH, Gentry R, Anderson J. Mothers' Reasons for Early Breastfeeding Cessation. *MCN Am J Matern Child Nurs*. 2019;44(6):325-330. <https://doi.org/10.1097/NMC.0000000000000566>
 57. Govoni L, Ricchi A, Molinazzi MT, et al. Breastfeeding pathologies: analysis of prevalence, risk and protective factors. *Acta Biomedica Atenei Parm*. 2019;90(4-S):56-62. <https://doi.org/10.23750/abm.v90i4-S.8240>
 58. Berens P, Eglash A, Malloy M, Steube AM. ABM Clinical Protocol #26: Persistent Pain with Breastfeeding. *Breastfeed Med Off J Acad Breastfeed Med*. 2016;11(2):46-53. <https://doi.org/10.1089/bfm.2016.29002.pjb>
 59. Morland-Schultz K, Hill PD. Prevention of and Therapies for Nipple Pain: A Systematic Review. *J Obstet Gynecol Neonatal Nurs*. 2005;34(4):428-437. <https://doi.org/10.1177/0884217505276056>
 60. Woolridge MW. Aetiology of sore nipples. *Midwifery*. 1986;2(4):172-176. [https://doi.org/10.1016/S0266-6138\(86\)80042-0](https://doi.org/10.1016/S0266-6138(86)80042-0)
 61. Fertitta L, Welfringer-Morin A, Rigourd V, et al. Neonatal staphylococcal scalded skin syndrome in a breastfed neonate. *J Eur Acad Dermatol Venerol*. 2020;34(1). <https://doi.org/10.1111/jdv.15889>
 62. Dennis CL, Jackson K, Watson J. Interventions for treating painful nipples among breastfeeding women. *Cochrane Database Syst Rev*. 2014;(12):CD007366. <https://doi.org/10.1002/14651858.CD007366.pub2>
 63. Sowa P, Grabek-Lejko D, Wesolowska M, Swacha S, Dżugan M. *Hydrogen Peroxide-Dependent Antibacterial Action of Melilotus Albus Honey Lett Appl Microbiol*. 65.; 2017.
 64. Firouzabadi M, Pourramezani N, Balvardi M. Comparing the effects of yarrow, honey, and breast milk for healing nipple fissure. *Iran J Nurs Midwifery Res*. 2020;25(4):282. https://doi.org/10.4103/ijnmr.IJNMR_133_19
 65. Herzhaft-Le Roy J, Xhignesse M, Gaboury I. Efficacy of an Osteopathic Treatment Coupled With Lactation Consultations for Infants' Biomechanical Sucking Difficulties. *J Hum Lact Off J Int Lact Consult Assoc*. 2017;33(1):165-172. <https://doi.org/10.1177/0890334416679620>
 66. Yoshida M, Shinohara H, Sugiyama T, Kumagai M, Muto H, Kodama H. Taste of Milk from Inflamed Breasts of Breastfeeding Mothers with Mastitis Evaluated Using a Taste Sensor. *Breastfeed Med*. 2014;9(2):92-97. <https://doi.org/10.1089/bfm.2013.0084>
 67. Zakarija-Grkovic I, Stewart F. Treatments for breast engorgement during lactation. *Cochrane Database Syst Rev*. 2020;9:CD006946. <https://doi.org/10.1002/14651858.CD006946.pub4>
 68. Witt AM, Bolman M, Kredit S, Vanic A. Therapeutic Breast Massage in Lactation for the Management of Engorgement, Plugged Ducts, and Mastitis. *J Hum Lact Off J Int Lact Consult Assoc*. 2016;32(1):123-131. <https://doi.org/10.1177/0890334415619439>
 69. World Health Organization. Mastitis Causes and Management. Published 2000. Accessed April 9, 2021. https://apps.who.int/iris/bitstream/handle/10665/66230/WHO_FCH_CAH_00.13_eng.pdf;jsessionid=44969A4EF03222DD395CFD87DEAD304?sequence=1
 70. Roberts KL, Reiter M, Schuster D. A Comparison of Chilled and Room Temperature Cabbage Leaves in Treating Breast Engorgement. *J Hum Lact*. 1995;11(3):191-194. <https://doi.org/10.1177/089033449501100319>
 71. Société ANSM. Rappel des règles de bon usage des anti-inflammatoires non stéroïdiens (AINS) – juillet 2013. *J Eur Urgences Réanimation*. 2013;25(3):197-200. <https://doi.org/10.1016/j.jeura.2013.09.002>
 72. Kvist LJ, Larsson B, Hall-Lord M, Steen A, Schälén C. The role of bacteria in lactational mastitis and some considerations of the use of antibiotic treatment. *Int Breastfeed J*. 2008;3(1):6. <https://doi.org/10.1186/1746-4358-3-6>
 73. Amir LH. ABM Clinical Protocol #4: Mastitis, Revised March 2014. *Breastfeed Med*. 2014;9(5):239-243. <https://doi.org/10.1089/bfm.2014.9984>
 74. Irusen H, Rohwer AC, Steyn DW, Young T. Treatments for breast abscesses in breastfeeding women. *Cochrane Database Syst Rev*. Published online 2015.
 75. Chen C, Luo LB, Gao D, et al. Surgical drainage of lactational breast abscess with ultrasound-guided Encor vacuum-assisted breast biopsy system. *Breast J*. 2019;25(5):889-897. <https://doi.org/10.1111/tbj.13350>
 76. Colin C, Delow AG, Peyron-Faure N, Rabilloud M, Charlot M. Breast abscesses in lactating women: evidences for ultrasound-guided percutaneous drainage to avoid surgery. *Emerg Radiol*. 2019;26(5):31154537.
 77. Mannel R, Dixon I. Breastfeeding was going well and now my nipples hurt: could my baby or I have a yeast infection? *J Hum Lact Off J Int Lact Consult Assoc*. 2015;31(2):319-320. <https://doi.org/10.1177/0890334415574264>
 78. Jiménez E, Arroyo R, Cárdenas N, et al. Mammary candidiasis: A medical condition without scientific evidence? *PLoS One*. 2017;13(7):e0181071. PMID:28704470.
 79. Amir LH, Donath SM, Garland SM, et al. Does Candida and/or Staphylococcus play a role in nipple and breast pain in lactation? A cohort study in Melbourne, Australia. *BMJ Open*. 2013;3(3). <https://doi.org/10.1136/bmjopen-2012-002351>



80. Buck ML, Amir LH, Cullinane M, Donath SM, Team CASTLES. Nipple pain, damage, and vasospasm in the first 8 weeks postpartum. *Breastfeed Med*. 2014;9(2):56-62. <https://doi.org/10.1089/bfm.2013.0106>.
81. Barrett ME, Heller MM, Stone HF, Murase JE. Raynaud phenomenon of the nipple in breastfeeding mothers: an underdiagnosed cause of nipple pain. *JAMA Dermatol*. Published online 2013.
82. Dias SA, Silva TQ, Venâncio DO, Chaves AFL, ACMACC L, Oliveira MGD. Breastfeeding self-efficacy among blind mothers. *Rev Bras Enferm*. 2018;71(6):30517400.
83. Powell RM, Mitra M, Smeltzer SC, et al. Breastfeeding Among Women With Physical Disabilities in the United States. *J Hum Lact*. 2018;34(2):29166569.
84. Fábelová L, Vandentorren S, Vuillermoz C, Garnier R, LioRET S, Botton J. Hair Concentration of Trace Elements and Growth in Homeless Children Aged <6years: Results From the ENFAMS Study. *Env Int*. Published online May 2018.
85. Barasinski C, Zaros C, Bercherie J, et al. Intervention during the Perinatal Period: Synthesis of the Clinical Practice Guidelines from the French National College of Midwives. *J Midwifery Womens Health*. 2022;67(Suppl. 1):S2-S16.

