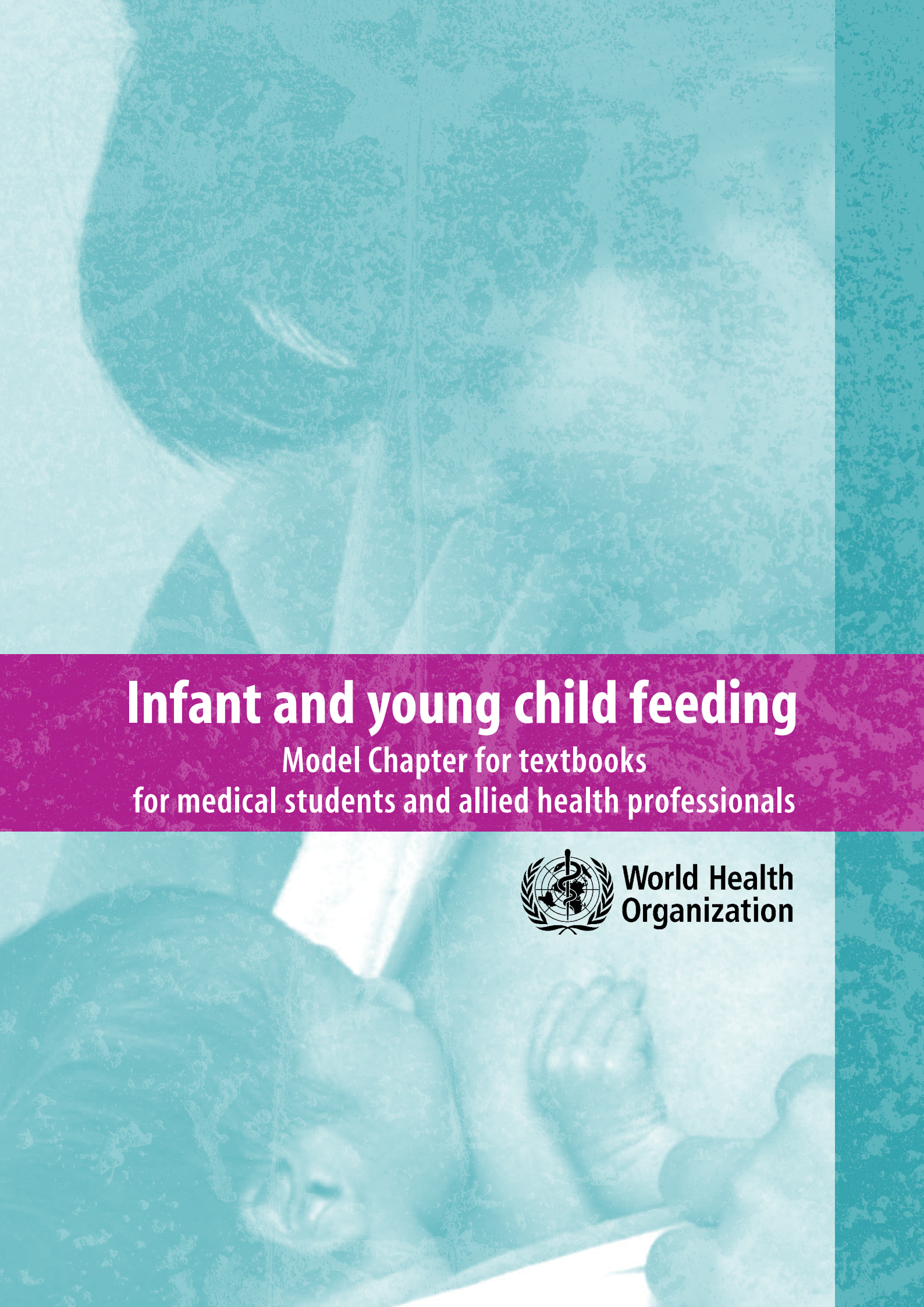

Infant and young child feeding

Model Chapter for textbooks for medical students and allied health professionals

World Health Organization

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WHO Library Cataloguing-in-Publication Data

Infant and young child feeding : model chapter for textbooks for medical students and allied health professionals.

1.Infant nutrition. 2.Breastfeeding. 3.Infant, Low birth weight. 4.Malnutrition – therapy. 5.Maternal health services – standards. 6.Teaching materials. 7.Textbooks. 8.Students, Medical. 9.Allied health personnel. I.World Health Organization.

ISBN 978 92 4 159749 4 (NLM classification: WS 125)

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Designed by minimum graphics
Printed in France

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Acknowledgments

The development of this Model Chapter was initiated by the Department of Child and Adolescent Health and Development of the World Health Organization, as part of its efforts to promote the integration of evidence-based public health interventions in basic training of health professionals. The Model Chapter is designed for use in textbooks used by health sciences faculties, as a result of the positive experience with the Model Chapter on Integrated Management of Childhood Illness.

The process of development of the *Model Chapter on infant and young child feeding* started in 2003. Drafts were presented in meetings with professors of health sciences schools in various regions and modifications made accordingly. There was an external review of the document in 2006, with the group of reviewers including Antonio da Cunha, Dai Yaohua, Nonhlanhla Dlamini, Hoang Trong Kim, Sandra Lang, Chessa Lutter, Nalini Singhal, Maryanne Stone-Jimenez and Elizabeth Rodgers. All of the reviewers have declared no conflict of interest. Even though the document was developed with inputs from many experts, some of them deserve special mention. Ann Brownlee edited an earlier version of the document, while Felicity Savage King wrote the final draft. Peggy Henderson conducted the editorial review. The three have declared no conflict of interest.

Staff from the Departments of Child and Adolescent Health and Development and Nutrition for Health and Development were technically responsible and provided oversight to all aspects of the developmental work.

While developing the Model Chapter, several updates of existing recommendations were conducted by WHO, and these were integrated into the Chapter. The updates include information on HIV and infant feeding (2007), management of uncomplicated severe acute malnutrition (2007), infant and young child feeding indicators (2008) and medical reasons for use of breast-milk substitutes (2008)

The chapter is expected to be updated by the year 2013.

Abbreviations

ARA	Arachidonic acid
ARVs	Anti-retroviral drugs
BFHI	Baby-friendly Hospital Initiative
BMS	Breast-milk substitute
cm	centimetre
Code	International Code of Marketing of Breast-milk Substitutes (including subsequent relevant World Health Assembly resolutions)
CRC	Convention on the Rights of the Child
DHA	Docosahexaenoic acid
EBM	Expressed breast milk
ENA	Essential Nutrition Actions
FIL	Feedback inhibitor of lactation
g	gram
GnRH	Gonadotrophic releasing hormone
ILO	International Labour Organization
IMCI	Integrated management of childhood illness
IUGR	Intrauterine growth retardation
Kcal	kilocalorie
KMC	Kangaroo mother care
LBW	Low birth weight
ml	millilitre
MTCT	Mother-to-child transmission of HIV
MUAC	Middle upper-arm circumference
NGO	Non-governmental organization
RUTF	Ready-to-use therapeutic food
SGA	Small for gestational age
slgA	secretory immunoglobulin A
VBLW	Very low birth weight
WHA	World Health Assembly

Introduction

Optimal infant and young child feeding practices rank among the most effective interventions to improve child health. In 2006 an estimated 9.5 million children died before their fifth birthday, and two thirds of these deaths occurred in the first year of life. Under-nutrition is associated with at least 35% of child deaths. It is also a major disabler preventing children who survive from reaching their full developmental potential. Around 32% of children less than 5 years of age in developing countries are stunted and 10% are wasted. It is estimated that sub-optimal breastfeeding, especially non-exclusive breastfeeding in the first 6 months of life, results in 1.4 million deaths and 10% of the disease burden in children younger than 5 years.

To improve this situation, mothers and families need support to initiate and sustain appropriate infant and young child feeding practices. Health care professionals can play a critical role in providing that support, through influencing decisions about feeding practices among mothers and families. Therefore, it is critical for health professionals to have basic knowledge and skills to give appropriate advice, counsel and help solve feeding difficulties, and know when and where to refer a mother who experiences more complex feeding problems.

Child health in general, and infant and young child feeding more specifically, is often not well addressed in the basic training of doctors, nurses and other allied health professionals. Because of lack of adequate knowledge and skills, health professionals are often barriers to improved feeding practices. For example, they may not know how to assist a mother to initiate and sustain exclusive breastfeeding, they may recommend too-early introduction of supplements when there are feeding problems, and they may overtly or covertly promote breast-milk substitutes.

This Model Chapter brings together essential knowledge about infant and young child feeding that health professionals should acquire as part of their basic education. It focuses on nutritional needs and feeding practices in children less than 2 years of age – the most critical period for child nutrition after which sub-optimal growth is hard to reverse. The Chapter does not impart skills, although it includes descriptions of essential skills that every health professional should master, such as positioning and attachment for breastfeeding.

The Model Chapter is organized in nine sessions according to topic areas, with scientific references at the end of each section. These references include articles or WHO documents that provide evidence and further information about specific points.

Useful resource materials are listed on the inside of the back cover. Training institutions may find it useful to have these resources available for students.

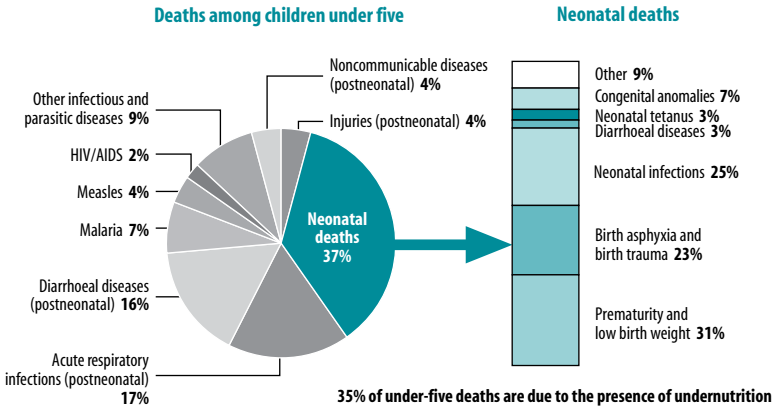
The Chapter is accompanied by a CD-ROM with reference materials. It includes an annotated listing of references presented in the Model Chapter, PowerPoint slides to support technical seminars on infant and young child feeding, and the document *Effective teaching: a guide for educating healthcare professionals* that can be used to identify effective methods and approaches to introduce the content. Proposed learning objectives and core competencies for medical students and allied health professionals in the area of infant and young child feeding are also part of the CD-ROM.

The importance of infant and young child feeding and recommended practices

1.1 Growth, health and development

Adequate nutrition during infancy and early childhood is essential to ensure the growth, health, and development of children to their full potential. Poor nutrition increases the risk of illness, and is responsible, directly or indirectly, for one third of the estimated 9.5 million deaths that occurred in 2006 in children less than 5 years of age (*1*,*2*) (**Figure 1**). Inappropriate nutrition can also lead to childhood obesity which is an increasing public health problem in many countries.

FIGURE 1
Major causes of death in neonates and children under five in the world, 2004



Sources: World Health Organization. *The global burden of disease: 2004 update*. Geneva, World Health Organization, 2008; Black R et al. Maternal and child undernutrition: global and regional exposures and health consequences. *Lancet*, 2008, 371:243–260.

Early nutritional deficits are also linked to long-term impairment in growth and health. Malnutrition during the first 2 years of life causes stunting, leading to the adult being several centimetres shorter than his or her potential height (*3*). There is evidence that adults who were malnourished in early childhood have impaired intellectual performance (*4*). They may also have reduced capacity for physical work (*5*,*6*). If women were malnourished as children, their reproductive capacity is affected, their infants may have lower birth weight, and they have more complicated deliveries (*7*). When many children in a population are malnourished, it has implications for national development. The overall functional consequences of malnutrition are thus immense.

The first two years of life provide a critical window of opportunity for ensuring children's appropriate growth and development through optimal feeding (*8*). Based on evidence of the effectiveness of interventions, achievement of universal coverage of optimal breastfeeding could prevent 13% of deaths occurring in children less than 5 years of age globally, while appropriate complementary feeding practices would result in an additional 6% reduction in under-five mortality (*9*).

1.2 The Global Strategy for infant and young child feeding

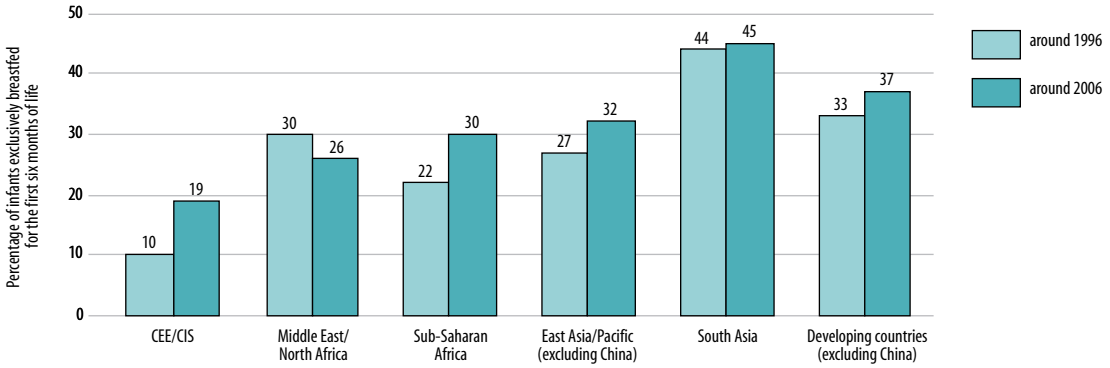
In 2002, the World Health Organization and UNICEF adopted the *Global Strategy for infant and young child feeding* (*10*). The strategy was developed to revitalise world attention to the impact that feeding practices have on the nutritional status, growth and development, health, and survival of infants and young children (see also **Session 9**). This Model Chapter summarizes essential knowledge that every health professional should have in order to carry out the crucial role of protecting, promoting and supporting appropriate infant and young child feeding in accordance with the principles of the *Global Strategy*.

1.3 Recommended infant and young child feeding practices

WHO and UNICEF's global recommendations for optimal infant feeding as set out in the *Global Strategy* are:

- exclusive breastfeeding for 6 months (180 days) (*11*);

FIGURE 2
Trends in exclusive breastfeeding rates (1996–2006)



Source: UNICEF. *Progress for children: a world fit for children. Statistical Review, Number 6*. New York, UNICEF, 2007.

- nutritionally adequate and safe complementary feeding starting from the age of 6 months with continued breastfeeding up to 2 years of age or beyond.

Exclusive breastfeeding means that an infant receives only breast milk from his or her mother or a wet nurse, or expressed breast milk, and no other liquids or solids, not even water, with the exception of oral rehydration solution, drops or syrups consisting of vitamins, minerals supplements or medicines (*12*).

Complementary feeding is defined as the process starting when breast milk is no longer sufficient to meet the nutritional requirements of infants, and therefore other foods and liquids are needed, along with breast milk. The target range for complementary feeding is generally taken to be 6 to 23 months of age,[1] even though breastfeeding may continue beyond two years (*13*).

These recommendations may be adapted according to the needs of infants and young children in exceptionally difficult circumstances, such as pre-term or low-birth-weight infants, severely malnourished children, and in emergency situations (see **Session 6**). Specific recommendations apply to infants born to HIV-infected mothers.

1.4 Current status of infant and young child feeding globally

Poor breastfeeding and complementary feeding practices are widespread. Worldwide, it is estimated that only 34.8% of infants are exclusively breastfed for the first 6 months of life, the majority receiving some other food or fluid in the early months (*14*). Complementary foods are often introduced too early or too late and are often nutritionally inadequate and unsafe.

Data from 64 countries covering 69% of births in the developing world suggest that there have been improvements in this situation. Between 1996 and 2006 the rate of exclusive breastfeeding for the first 6 months of life increased from 33% to 37%. Significant increases were made in sub-Saharan Africa, where rates increased from 22% to 30%; and Europe, with rates increasing from 10% to 19% (**Figure 2**). In Latin America and the Caribbean, excluding Brazil and Mexico, the percentage of infants exclusively breastfed increased from 30% in around 1996 to 45% in around 2006 (*15*).

1.5 Evidence for recommended feeding practices

Breastfeeding

Breastfeeding confers short-term and long-term benefits on both child and mother (*16*), including helping to protect children against a variety of acute and chronic disorders. The long-term disadvantages of not breastfeeding are increasingly recognized as important (*17,18*).

Reviews of studies from developing countries show that infants who are not breastfed are 6 (*19*) to 10 times (*20*) more likely to die in the first months of life than infants who are breastfed. Diarrhoea (*21*) and pneumonia (*22*) are more common and more severe in children who are artificially fed, and are responsible for many of these deaths. Diarrhoeal illness is also more common in artificially-fed infants even in situations with adequate hygiene, as in Belarus (*23*) and Scotland (*24*). Other acute infections, including otitis media (*25*), *Haemophilus influenzae* meningitis (*26*),

[1] When describing age ranges, a child 6–23 months has completed 6 months but has an age less than 2 years.

and urinary tract infection (*27*), are less common and less severe in breastfed infants.

Artificially-fed children have an increased risk of long-term diseases with an immunological basis, including asthma and other atopic conditions (*28*,*29*), type 1 diabetes (*30*), celiac disease (*31*), ulcerative colitis and Crohn disease (*32*). Artificial feeding is also associated with a greater risk of childhood leukaemia (*33*).

Several studies suggest that obesity in later childhood and adolescence is less common among breastfed children, and that there is a dose response effect, with a longer duration of breastfeeding associated with a lower risk (*34*,*35*). The effect may be less clear in populations where some children are undernourished (*36*). A growing body of evidence links artificial feeding with risks to cardiovascular health, including increased blood pressure (*37*), altered blood cholesterol levels (*38*) and atherosclerosis in later adulthood (*39*).

Regarding intelligence, a meta-analysis of 20 studies (*40*) showed scores of cognitive function on average 3.2 points higher among children who were breastfed compared with those who were formula fed. The difference was greater (by 5.18 points) among those children who were born with low birth weight. Increased duration of breastfeeding has been associated with greater intelligence in late childhood (*41*) and adulthood (*42*), which may affect the individual's ability to contribute to society.

For the mother, breastfeeding also has both short- and long-term benefits. The risk of postpartum haemorrhage may be reduced by breastfeeding immediately after delivery (*43*), and there is increasing evidence that the risk of breast (*44*) and ovarian (*45*) cancer is less among women who breastfed.

Exclusive breastfeeding for 6 months

The advantages of exclusive breastfeeding compared to partial breastfeeding were recognised in 1984, when a review of available studies found that the risk of death from diarrhoea of partially breastfed infants 0–6 months of age was 8.6 times the risk for exclusively breastfed children. For those who received no breast milk the risk was 25 times that of those who were exclusively breastfed (*46*). A study in Brazil in 1987 found that compared with exclusive breastfeeding, partial breastfeeding was associated with 4.2 times the risk of death, while no breastfeeding had 14.2 times the risk (*47*). More recently, a study in Dhaka, Bangladesh found that deaths from diarrhoea and pneumonia could be reduced by one third if infants were exclusively instead of partially breastfed for the first 4 months of life (*48*). Exclusive breastfeeding for 6 months has been found to reduce the risk of diarrhoea (*49*) and respiratory illness (*50*) compared with exclusive breastfeeding for 3 and 4 months respectively.

If the breastfeeding technique is satisfactory, exclusive breastfeeding for the first 6 months of life meets the energy and nutrient needs of the vast majority of infants (*51*). No other foods or fluids are necessary. Several studies have shown that healthy infants do not need additional water during the first 6 months if they are exclusively breastfed, even in a hot climate. Breast milk itself is 88% water, and is enough to satisfy a baby's thirst (*52*). Extra fluids displace breast milk, and do not increase overall intake (*53*). However, water and teas are commonly given to infants, often starting in the first week of life. This practice has been associated with a two-fold increased risk of diarrhoea (*54*).

For the mother, exclusive breastfeeding can delay the return of fertility (*55*), and accelerate recovery of pre-pregnancy weight (*56*). Mothers who breastfeed exclusively and frequently have less than a 2% risk of becoming pregnant in the first 6 months postpartum, provided that they still have amenorrhoea (see **Session 8.4.1**).

Complementary feeding from 6 months

From the age of 6 months, an infant's need for energy and nutrients starts to exceed what is provided by breast milk, and complementary feeding becomes necessary to fill the energy and nutrient gap (*57*). If complementary foods are not introduced at this age or if they are given inappropriately, an infant's growth may falter. In many countries, the period of complementary feeding from 6–23 months is the time of peak incidence of growth faltering, micronutrient deficiencies and infectious illnesses (*58*).

Even after complementary foods have been introduced, breastfeeding remains a critical source of nutrients for the young infant and child. It provides about one half of an infant's energy needs up to the age of one year, and up to one third during the second year of life. Breast milk continues to supply higher quality nutrients than complementary foods, and also protective factors. It is therefore recommended that breastfeeding on demand continues with adequate complementary feeding up to 2 years or beyond (*13*).

Complementary foods need to be nutritionally-adequate, safe, and appropriately fed in order to meet

the young child's energy and nutrient needs. However, complementary feeding is often fraught with problems, with foods being too dilute, not fed often enough or in too small amounts, or replacing breast milk while being of an inferior quality. Both food and feeding practices influence the quality of complementary feeding, and mothers and families need support to practise good complementary feeding (*13*).

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The physiological basis of breastfeeding

2.1 Breast-milk composition

Breast milk contains all the nutrients that an infant needs in the first 6 months of life, including fat, carbohydrates, proteins, vitamins, minerals and water (*1*,*2*,*3*,*4*). It is easily digested and efficiently used. Breast milk also contains bioactive factors that augment the infant's immature immune system, providing protection against infection, and other factors that help digestion and absorption of nutrients.

Fats

Breast milk contains about 3.5 g of fat per 100 ml of milk, which provides about one half of the energy content of the milk. The fat is secreted in small droplets, and the amount increases as the feed progresses. As a result, the *hindmilk* secreted towards the end of a feed is rich in fat and looks creamy white, while the *foremilk* at the beginning of a feed contains less fat and looks somewhat bluish-grey in colour. Breast-milk fat contains long chain polyunsaturated fatty acids (docosahexaenoic acid or DHA, and arachidonic acid or ARA) that are not available in other milks. These fatty acids are important for the neurological development of a child. DHA and ARA are added to some varieties of infant formula, but this does not confer any advantage over breast milk, and may not be as effective as those in breast milk.

Carbohydrates

The main carbohydrate is the special milk sugar lactose, a disaccharide. Breast milk contains about 7 g lactose per 100 ml, which is more than in most other milks, and is another important source of energy. Another kind of carbohydrate present in breast milk is oligosaccharides, or sugar chains, which provide important protection against infection (*4*).

Protein

Breast milk protein differs in both quantity and quality from animal milks, and it contains a balance of amino acids which makes it much more suitable for a baby. The concentration of protein in breast milk (0.9 g per 100 ml) is lower than in animal milks. The much higher protein in animal milks can overload the infant's immature kidneys with waste nitrogen products. Breast milk contains less of the protein casein, and this casein in breast milk has a different molecular structure. It forms much softer, more easily-digested curds than that in other milks. Among the whey, or soluble proteins, human milk contains more alpha-lactalbumin; cow milk contains beta-lactoglobulin, which is absent from human milk and to which infants can become intolerant (*4*).

Vitamins and minerals

Breast milk normally contains sufficient vitamins for an infant, unless the mother herself is deficient (*5*). The exception is vitamin D. The infant needs exposure to sunlight to generate endogenous vitamin D – or, if this is not possible, a supplement. The minerals iron and zinc are present in relatively low concentration, but their bioavailability and absorption is high. Provided that maternal iron status is adequate, term infants are born with a store of iron to supply their needs; only infants born with low birth weight may need supplements before 6 months. Delaying clamping of the cord until pulsations have stopped (approximately 3 minutes) has been shown to improve infants' iron status during the first 6 months of life (*6*,*7*).

Anti-infective factors

Breast milk contains many factors that help to protect an infant against infection (*8*) including:

- immunoglobulin, principally secretory immunoglobulin A (sIgA), which coats the intestinal mucosa and prevents bacteria from entering the cells;
- white blood cells which can kill micro-organisms;
- whey proteins (lysozyme and lactoferrin) which can kill bacteria, viruses and fungi;
- oligosacccharides which prevent bacteria from attaching to mucosal surfaces.

The protection provided by these factors is uniquely valuable for an infant. First, they protect without causing the effects of inflammation, such as fever, which can be dangerous for a young infant. Second, sIgA contains antibodies formed in the mother's body against the bacteria in her gut, and against infections that she has encountered, so they protect against bacteria that are particularly likely to be in the baby's environment.

Other bioactive factors

Bile-salt stimulated lipase facilitates the complete digestion of fat once the milk has reached the small intestine (*9*). Fat in artificial milks is less completely digested (*4*).

Epidermal growth factor (*10*) stimulates maturation of the lining of the infant's intestine, so that it is better able to digest and absorb nutrients, and is less easily infected or sensitised to foreign proteins. It has been suggested that other growth factors present in human milk target the development and maturation of nerves and retina (*11*).

2.2 Colostrum and mature milk

Colostrum is the special milk that is secreted in the first 2–3 days after delivery. It is produced in small amounts, about 40–50 ml on the first day (*12*), but is all that an infant normally needs at this time. Colostrum is rich in white cells and antibodies, especially sIgA, and it contains a larger percentage of protein, minerals and fat-soluble vitamins (A, E and K) than later milk (*2*). Vitamin A is important for protection of the eye and for the integrity of epithelial surfaces, and often makes the colostrum yellowish in colour. Colostrum provides important immune protection to an infant when he or she is first exposed to the micro-organisms in the environment, and epidermal growth factor helps to prepare the lining of the gut to receive the nutrients in milk. It is important that infants receive colostrum, and not other feeds, at this time. Other feeds given before breastfeeding is established are called *prelacteal feeds*.

Milk starts to be produced in larger amounts between 2 and 4 days after delivery, making the breasts feel full; the milk is then said to have "come in". On the third day, an infant is normally taking about 300–400 ml per 24 hours, and on the fifth day 500–800 ml (*12*). From day 7 to 14, the milk is called *transitional*, and after 2 weeks it is called *mature milk*.

2.3 Animal milks and infant formula

Animal milks are very different from breast milk in both the quantities of the various nutrients, and in their quality. For infants under 6 months of age, animal milks can be home-modified by the addition of water, sugar and micronutrients to make them usable as short-term replacements for breast milk in exceptionally difficult situations, but they can never be equivalent or have the same anti-infective properties as breast milk (*13*). After 6 months, infants can receive boiled full cream milk (*14*).

Infant formula is usually made from industrially-modified cow milk or soy products. During the manufacturing process the quantities of nutrients are adjusted to make them more comparable to breast milk. However, the qualitative differences in the fat and protein cannot be altered, and the absence of anti-infective and bio-active factors remain. Powdered infant formula is not a sterile product, and may be unsafe in other ways. Life threatening infections in newborns have been traced to contamination with pathogenic bacteria, such as *Enterobacter sakazakii*, found in powdered formula (*15*). Soy formula contains *phyto-oestrogens*, with activity similar to the human hormone oestrogen, which could potentially reduce fertility in boys and bring early puberty in girls (*16*).

2.4 Anatomy of the breast

The breast structure (**Figure 3**) includes the nipple and areola, mammary tissue, supporting connective tissue and fat, blood and lymphatic vessels, and nerves (*17,18*).

The mammary tissue – This tissue includes the alveoli, which are small sacs made of milk-secreting cells, and the ducts that carry the milk to the outside. Between feeds, milk collects in the lumen of the alveoli and ducts. The alveoli are surrounded by a basket of *myoepithelial*, or muscle cells, which contract and make the milk flow along the ducts.

Nipple and areola – The nipple has an average of nine milk ducts passing to the outside, and also muscle fibres and nerves. The nipple is surrounded by the circular pigmented *areola*, in which are located *Montgomery's glands*. These glands secrete an oily fluid that protects the skin of the nipple and areola during lactation, and produce the mother's individual scent that attracts her baby to the breast. The ducts beneath the areola fill with milk and become wider during a feed, when the oxytocin reflex is active.

FIGURE 3
Anatomy of the breast

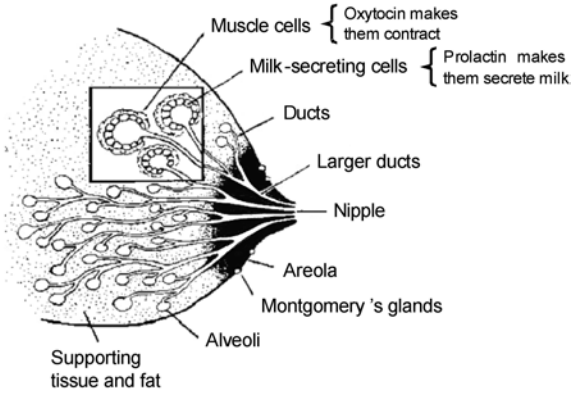
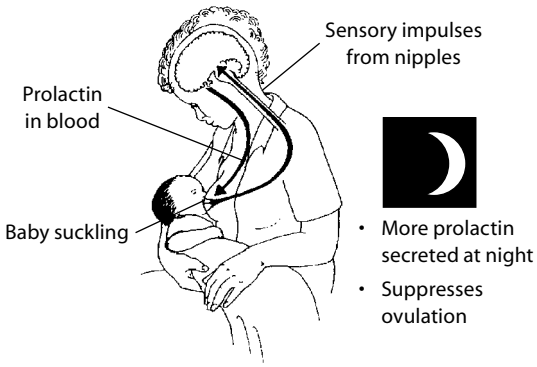


FIGURE 4
Prolactin



Secreted after feed to produce next feed

2.5 Hormonal control of milk production

There are two hormones that directly affect breastfeeding: *prolactin* and *oxytocin*. A number of other hormones, such as oestrogen, are involved indirectly in lactation (*2*). When a baby suckles at the breast, sensory impulses pass from the nipple to the brain. In response, the anterior lobe of the pituitary gland secretes prolactin and the posterior lobe secretes oxytocin.

Prolactin

Prolactin is necessary for the secretion of milk by the cells of the alveoli. The level of prolactin in the blood increases markedly during pregnancy, and stimulates the growth and development of the mammary tissue, in preparation for the production of milk (*19*). However, milk is not secreted then, because progesterone and oestrogen, the hormones of pregnancy, block this action of prolactin. After delivery, levels of progesterone and oestrogen fall rapidly, prolactin is no longer blocked, and milk secretion begins.

When a baby suckles, the level of prolactin in the blood increases, and stimulates production of milk by the alveoli (**Figure 4**). The prolactin level is highest about 30 minutes after the beginning of the feed, so its most important effect is to make milk for the next feed (*20*). During the first few weeks, the more a baby suckles and stimulates the nipple, the more prolactin is produced, and the more milk is produced. This effect is particularly important at the time when lactation is becoming established. Although prolactin is still necessary for milk production, after a few weeks there is not a close relationship between the amount of prolactin and the amount of milk produced. However, if the mother stops breastfeeding, milk secretion may stop too – then the milk will dry up.

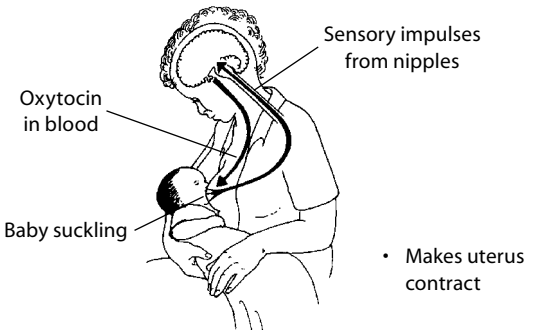
More prolactin is produced at night, so breastfeeding at night is especially helpful for keeping up the milk supply. Prolactin seems to make a mother feel relaxed and sleepy, so she usually rests well even if she breastfeeds at night.

Suckling affects the release of other pituitary hormones, including *gonadotrophin releasing hormone* (GnRH), follicle stimulating hormone, and luteinising hormone, which results in suppression of ovulation and menstruation. Therefore, frequent breastfeeding can help to delay a new pregnancy (see **Session 8** on Mother's Health). Breastfeeding at night is important to ensure this effect.

Oxytocin

Oxytocin makes the myoepithelial cells around the alveoli contract. This makes the milk, which has collected in the alveoli, flow along and fill the ducts (*21*) (see **Figure 5**). Sometimes the milk is ejected in fine streams.

FIGURE 5
Oxytocin



Works before or during a feed to make the milk flow

The oxytocin reflex is also sometimes called the "let-down reflex" or the "milk ejection reflex". Oxytocin is produced more quickly than prolactin. It makes the milk that is already in the breast flow for the current feed, and helps the baby to get the milk easily.

Oxytocin starts working when a mother expects a feed as well as when the baby is suckling. The reflex becomes conditioned to the mother's sensations and feelings, such as touching, smelling or seeing her baby, or hearing her baby cry, or thinking lovingly about him or her. If a mother is in severe pain or emotionally upset, the oxytocin reflex may become inhibited, and her milk may suddenly stop flowing well. If she receives support, is helped to feel comfortable and lets the baby continue to breastfeed, the milk will flow again.

It is important to understand the oxytocin reflex, because it explains why the mother and baby should be kept together and why they should have skin-to-skin contact.

Oxytocin makes a mother's uterus contract after delivery and helps to reduce bleeding. The contractions can cause severe uterine pain when a baby suckles during the first few days.

Signs of an active oxytocin reflex

Mothers may notice signs that show that the oxytocin reflex is active:

- a tingling sensation in the breast before or during a feed;
- milk flowing from her breasts when she thinks of the baby or hears him crying;
- milk flowing from the other breast when the baby is suckling;
- milk flowing from the breast in streams if suckling is interrupted;
- slow deep sucks and swallowing by the baby, which show that milk is flowing into his mouth;
- uterine pain or a flow of blood from the uterus;
- thirst during a feed.

If one or more of these signs are present, the reflex is working. However, if they are not present, it does not mean that the reflex is not active. The signs may not be obvious, and the mother may not be aware of them.

Psychological effects of oxytocin

Oxytocin also has important psychological effects, and is known to affect mothering behaviour in animals. In humans, oxytocin induces a state of calm, and reduces stress (*22*). It may enhance feelings of affection between mother and child, and promote bonding. Pleasant forms of touch stimulate the secretion of oxytocin, and also prolactin, and skin-to-skin contact between mother and baby after delivery helps both breastfeeding and emotional bonding (*23*,*24*).

2.6 Feedback inhibitor of lactation

Milk production is also controlled in the breast by a substance called the *feedback inhibitor of lactation*, or FIL (a polypeptide), which is present in breast milk (*25*). Sometimes one breast stops making milk while the other breast continues, for example if a baby suckles only on one side. This is because of the local control of milk production independently within each breast. If milk is not removed, the inhibitor collects and stops the cells from secreting any more, helping to protect the breast from the harmful effects of being too full. If breast milk is removed the inhibitor is also removed, and secretion resumes. If the baby cannot suckle, then milk must be removed by expression.

FIL enables the amount of milk produced to be determined by how much the baby takes, and therefore by how much the baby needs. This mechanism is particularly important for ongoing close regulation after lactation is established. At this stage, prolactin is needed to enable milk secretion to take place, but it does not control the amount of milk produced.

2.7 Reflexes in the baby

The baby's reflexes are important for appropriate breastfeeding. The main reflexes are *rooting*, *suckling* and *swallowing*. When something touches a baby's lips or cheek, the baby turns to find the stimulus, and opens his or her mouth, putting his or her tongue down and forward. This is the *rooting reflex* and is present from about the 32nd week of pregnancy. When something touches a baby's palate, he or she starts to suck it. This is the *sucking reflex*. When the baby's mouth fills with milk, he or she swallows. This is the *swallowing reflex*. Preterm infants can grasp the nipple from about 28 weeks gestational age, and they can suckle and remove some milk from about 31 weeks. Coordination of suckling, swallowing and breathing appears between 32 and 35 weeks of pregnancy. Infants can only suckle for a short time at that

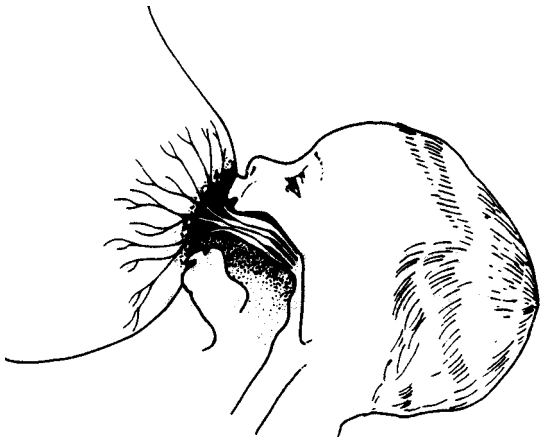
age, but they can take supplementary feeds by cup. A majority of infants can breastfeed fully at a gestational age of 36 weeks (*26*).

When supporting a mother and baby to initiate and establish exclusive breastfeeding, it is important to know about these reflexes, as their level of maturation will guide whether an infant can breastfeed directly or temporarily requires another feeding method.

2.8 How a baby attaches and suckles at the breast

To stimulate the nipple and remove milk from the breast, and to ensure an adequate supply and a good flow of milk, a baby needs to be *well attached* so that he or she can *suckle effectively* (*27*). Difficulties often occur because a baby does not take the breast into his or her mouth properly, and so cannot suckle effectively.

FIGURE 6
Good attachment – inside the infant's mouth



Good attachment

Figure 6 shows how a baby takes the breast into his or her mouth to suckle effectively. This baby is well attached to the breast.

The points to notice are:

- much of the areola and the tissues underneath it, including the larger ducts, are in the baby's mouth;
- the breast is stretched out to form a long 'teat', but the nipple only forms about one third of the 'teat';
- the baby's tongue is forward over the lower gums, beneath the milk ducts (the baby's tongue is in fact cupped around the sides of the 'teat', but a drawing cannot show this);
- the baby is suckling from the breast, not from the nipple.

As the baby suckles, a wave passes along the tongue from front to back, pressing the teat against the hard palate, and pressing milk out of the sinuses into the baby's mouth from where he or she swallows it. The baby uses suction mainly to stretch out the breast tissue and to hold it in his or her mouth. The oxytocin reflex makes the breast milk flow along the ducts, and the action of the baby's tongue presses the milk from the ducts into the baby's mouth. When a baby is well attached his mouth and tongue do not rub or traumatise the skin of the nipple and areola. Suckling is comfortable and often pleasurable for the mother. She does not feel pain.

Poor attachment

Figure 7 shows what happens in the mouth when a baby is not well attached at the breast.

The points to notice are:

- only the nipple is in the baby's mouth, not the underlying breast tissue or ducts;
- the baby's tongue is back inside his or her mouth, and cannot reach the ducts to press on them.

Suckling with poor attachment may be uncomfortable or painful for the mother, and may damage the skin of the nipple and areola, causing sore nipples and fissures (or "cracks"). Poor attachment is the commonest and most important cause of sore nipples (see **Session 7.6**), and may result in inefficient removal of milk and apparent low supply.

FIGURE 7
Poor attachment – inside the infant's mouth

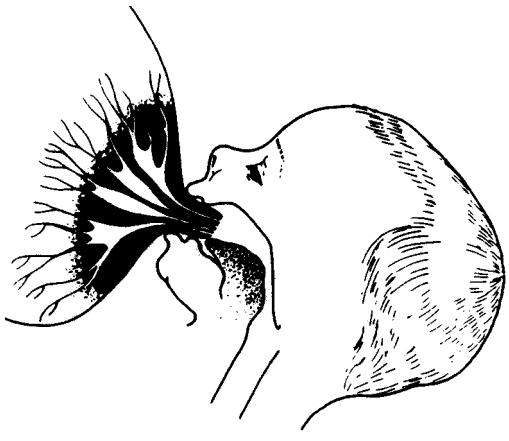
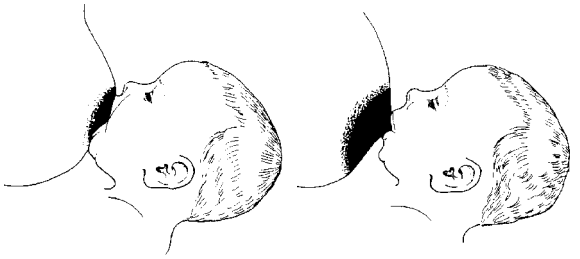


FIGURE 8
Good and poor attachment – external signs



Signs of good and poor attachment

Figure 8 shows the four most important signs of good and poor attachment from the outside. These signs can be used to decide if a mother and baby need help.

The four signs of good attachment are:

- more of the areola is visible above the baby's top lip than below the lower lip;
- the baby's mouth is wide open;
- the baby's lower lip is curled outwards;
- the baby's chin is touching or almost touching the breast.

These signs show that the baby is close to the breast, and opening his or her mouth to take in plenty of breast. The areola sign shows that the baby is taking the breast and nipple from below, enabling the nipple to touch the baby's palate, and his or her tongue to reach well underneath the breast tissue, and to press on the ducts. All four signs need to be present to show that a baby is well attached. In addition, suckling should be comfortable for the mother.

The signs of poor attachment are:

- more of the areola is visible below the baby's bottom lip than above the top lip – or the amounts above and below are equal;
- the baby's mouth is not wide open;
- the baby's lower lip points forward or is turned inwards;
- the baby's chin is away from the breast.

If any one of these signs is present, or if suckling is painful or uncomfortable, attachment needs to be improved. However, when a baby is very close to the breast, it can be difficult to see what is happening to the lower lip.

Sometimes much of the areola is outside the baby's mouth, but by itself this is not a reliable sign of poor attachment. Some women have very big areolas, which cannot all be taken into the baby's mouth. If the amount of areola above and below the baby's mouth is equal, or if there is more below the lower lip, these are more reliable signs of poor attachment than the total amount outside.

2.9 Effective suckling

If a baby is well attached at the breast, then he or she can suckle effectively. Signs of effective suckling indicate that milk is flowing into the baby's mouth. The baby takes slow, deep suckles followed by a visible or audible swallow about once per second. Sometimes the baby pauses for a few seconds, allowing the ducts to fill up with milk again. When the baby starts suckling again, he or she may suckle quickly a few times, stimulating milk flow, and then the slow deep suckles begin. The baby's cheeks remain rounded during the feed.

Towards the end of a feed, suckling usually slows down, with fewer deep suckles and longer pauses between them. This is the time when the volume of milk is less, but as it is fat-rich hindmilk, it is important for the feed to continue. When the baby is satisfied, he or she usually releases the breast spontaneously. The nipple may look stretched out for a second or two, but it quickly returns to its resting form.

Signs of ineffective suckling

A baby who is poorly attached is likely to suckle ineffectively. He or she may suckle quickly all the time, without swallowing, and the cheeks may be drawn in as he or she suckles showing that milk is not flowing well into the baby's mouth. When the baby stops feeding, the nipple may stay stretched out, and look squashed from side to side, with a pressure line across the tip, showing that the nipple is being damaged by incorrect suction.

Consequences of ineffective suckling

When a baby suckles ineffectively, transfer of milk from mother to baby is inefficient. As a result:

- the breast may become engorged, or may develop a blocked duct or mastitis because not enough milk is removed;
- the baby's intake of breast milk may be insufficient, resulting in poor weight gain;

- the baby may pull away from the breast out of frustration and refuse to feed;
- the baby may be very hungry and continue suckling for a long time, or feed very often;
- the breasts may be over-stimulated by too much suckling, resulting in oversupply of milk.

These difficulties are discussed further in **Session 7**.

2.10 Causes of poor attachment

Use of a feeding bottle before breastfeeding is well established can cause poor attachment, because the mechanism of suckling with a bottle is different. Functional difficulties such as flat and inverted nipples, or a very small or weak infant, are also causes of poor attachment. However, the most important causes are inexperience of the mother and lack of skilled help from the health workers who attend her. Many mothers need skilled help in the early days to ensure that the baby attaches well and can suckle effectively. Health workers need to have the necessary skills to give this help.

2.11 Positioning the mother and baby for good attachment

To be well attached at the breast, a baby and his or her mother need to be appropriately positioned. There are several different positions for them both, but some key points need to be followed in any position.

Position of the mother

The mother can be sitting or lying down (see **Figure 9**), or standing, if she wishes. However, she needs to be relaxed and comfortable, and without strain, particularly of her back. If she is sitting, her back needs to be supported, and she should be able to hold the baby at her breast without leaning forward.

Position of the baby

The baby can breastfeed in several different positions in relation to the mother: across her chest and abdomen, under her arm (See Figure 16 in **Session 6**), or alongside her body.

Whatever the position of the mother, and the baby's general position in relation to her, there are four key points about the position of the baby's body that are important to observe.

- The baby's body should be straight, not bent or twisted. The baby's head can be slightly extended at the neck, which helps his or her chin to be close in to the breast.

FIGURE 9
Baby well positioned at the breast

a) Sitting

b) Lying down

- He or she should be facing the breast. The nipples usually point slightly downwards, so the baby should not be flat against the mother's chest or abdomen, but turned slightly on his or her back able to see the mother's face.
- The baby's body should be close to the mother which enables the baby to be close to the breast, and to take a large mouthful.
- His or her whole body should be supported. The baby may be supported on the bed or a pillow, or the mother's lap or arm. She should not support only the baby's head and neck. She should not grasp the baby's bottom, as this can pull him or her too far out to the side, and make it difficult for the baby to get his or her chin and tongue under the areola.

These points about positioning are especially important for young infants during the first two months of life. (See also Feeding History Job Aid, 0–6 months, in **Session 5**.)

2.12 Breastfeeding pattern

To ensure adequate milk production and flow for 6 months of exclusive breastfeeding, a baby needs to feed as often and for as long as he or she wants, both day and night (*28*). This is called *demand feeding*, *unrestricted feeding*, or *baby-led feeding*.

Babies feed with different frequencies, and take different amounts of milk at each feed. The 24-hour intake of milk varies between mother-infant pairs from 440–1220 ml, averaging about 800 ml per day throughout the first 6 months (*29*). Infants who are feeding on demand according to their appetite obtain what they need for satisfactory growth. They do not empty the breast, but remove only 63–72% of available milk. More milk can always be removed, showing that the infant stops feeding because of satiety, not because the breast is empty. However, breasts seem to vary in their capacity for storing milk. Infants of women with low storage capacity may need to feed more often to remove the milk and ensure adequate daily intake and production (*30*).

It is thus important not to restrict the duration or the frequency of feeds – provided the baby is well attached to the breast. Nipple damage is caused by poor attachment and not by prolonged feeds. The mother learns to respond to her baby's cues of hunger and readiness to feed, such as restlessness, rooting (searching) with his mouth, or sucking hands, before the baby starts to cry. The baby should be allowed to continue suckling on the breast until he or she spontaneously releases the nipple. After a short rest, the baby can be offered the other side, which he or she may or may not want.

If a baby stays on the breast for a very long time (more than one half hour for every feed) or if he or she wants to feed very often (more often than every 1–1½ hours each time) then the baby's attachment needs to be checked and improved. Prolonged, frequent feeds can be a sign of ineffective suckling and inefficient transfer of milk to the baby. This is usually due to poor attachment, which may also lead to sore nipples. If the attachment is improved, transfer of milk becomes more efficient, and the feeds may become shorter or less frequent. At the same time, the risk of nipple damage is reduced.

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Complementary feeding

3.1 Guiding Principles for Complementary Feeding

After 6 months of age, it becomes increasingly difficult for breastfed infants to meet their nutrient needs from human milk alone. Furthermore most infants are developmentally ready for other foods at about 6 months. In settings where environmental sanitation is very poor, waiting until even later than 6 months to introduce complementary foods might reduce exposure to food-borne diseases. However, because infants are beginning to actively explore their environment at this age, they will be exposed to microbial contaminants through soil and objects even if they are not given complementary foods. Thus, 6 months is the recommended appropriate age at which to introduce complementary foods (*1*).

During the period of complementary feeding, children are at high risk of undernutrition (*2*). Complementary foods are often of inadequate nutritional quality, or they are given too early or too late, in too small amounts, or not frequently enough. Premature cessation or low frequency of breastfeeding also contributes to insufficient nutrient and energy intake in infants beyond 6 months of age.

The *Guiding principles for complementary feeding of the breastfed child*, summarized in **Box 1**, set standards for developing locally appropriate feeding recommendations (*3*). They provide guidance on desired feeding behaviours as well as on the amount, consistency, frequency, energy density and nutrient content of foods. The *Guiding principles* are explained in more detail in the paragraphs below.

BOX 1

Guiding principles for complementary feeding of the breastfed child

1. Practise exclusive breastfeeding from birth to 6 months of age, and introduce complementary foods at 6 months of age (180 days) while continuing to breastfeed.
2. Continue frequent, on-demand breastfeeding until 2 years of age or beyond.
3. Practise responsive feeding, applying the principles of psychosocial care.
4. Practise good hygiene and proper food handling.
5. Start at 6 months of age with small amounts of food and increase the quantity as the child gets older, while maintaining frequent breastfeeding.
6. Gradually increase food consistency and variety as the infant grows older, adapting to the infant's requirements and abilities.
7. Increase the number of times that the child is fed complementary foods as the child gets older.
8. Feed a variety of nutrient-rich foods to ensure that all nutrient needs are met.
9. Use fortified complementary foods or vitamin-mineral supplements for the infant, as needed
10. Increase fluid intake during illness, including more frequent breastfeeding, and encourage the child to eat soft, favourite foods. After illness, give food more often than usual and encourage the child to eat more.

▶ GUIDING PRINCIPLE 1. Practise exclusive breastfeeding from birth to 6 months of age and introduce complementary foods at 6 months of age (180 days) while continuing to breastfeed

Exclusive breastfeeding for 6 months confers several benefits to the infant and the mother. Chief among these is the protective effect against gastrointestinal infections, which is observed not only in developing but also in industrialized countries. According to the WHO growth standards, children who are exclusively breastfed have a more rapid growth in the first 6 months of life than other infants (*4*).

By the age of 6 months, a baby has usually at least doubled his or her birth weight, and is becoming more active. Exclusive breastfeeding is no longer sufficient to meet all energy and nutrient needs by itself,

and complementary foods should be introduced to make up the difference. At about 6 months of age, an infant is also developmentally ready for other foods (*5*). The digestive system is mature enough to digest the starch, protein and fat in a non-milk diet. Very young infants push foods out with their tongue, but by between 6 and 9 months infants can receive and hold semi-solid food in their mouths more easily.

▶ GUIDING PRINCIPLE 2. Continue frequent on-demand breastfeeding until 2 years of age or beyond

Breastfeeding should continue with complementary feeding up to 2 years of age or beyond, and it should be on demand, as often as the child wants.

Breast milk can provide one half or more of a child's energy needs between 6 and 12 months of age, and one third of energy needs and other high quality nutrients between 12 and 24 months (*6*). Breast milk continues to provide higher quality nutrients than complementary foods, and also protective factors. Breast milk is a critical source of energy and nutrients during illness (*7*), and reduces mortality among children who are malnourished (*8*, *9*). In addition, as discussed in **Session 1**, breastfeeding reduces the risk of a number of acute and chronic diseases. Children tend to breastfeed less often when complementary foods are introduced, so breastfeeding needs to be actively encouraged to sustain breast-milk intake.

▶ GUIDING PRINCIPLE 3. Practise responsive feeding applying the principles of psychosocial care

Optimal complementary feeding depends not only on what is fed but also on how, when, where and by whom a child is fed (*10*,*11*). Behavioural studies have revealed that a casual style of feeding predominates in some populations. Young children are left to feed themselves, and encouragement to eat is rarely observed. In such settings, a more active style of feeding can improve dietary intake. The term "*responsive feeding*" (see **Box 2**) is used to describe caregiving that applies the principles of psychosocial care.

A child should have his or her own plate or bowl so that the caregiver knows if the child is getting enough food. A utensil such as a spoon, or just a clean hand, may be used to feed a child, depending on the culture. The utensil needs to be appropriate for the child's age. Many communities use a small spoon when a child starts taking solids. Later a larger spoon or a fork may be used.

Whether breastfeeds or complementary foods are given first at any meal has not been shown to matter. A mother can decide according to her convenience, and the child's demands.

BOX 2

Responsive feeding

- Feed infants directly and assist older children when they feed themselves. Feed slowly and patiently, and encourage children to eat, but do not force them.
- If children refuse many foods, experiment with different food combinations, tastes, textures and methods of encouragement.
- Minimize distractions during meals if the child loses interest easily.
- Remember that feeding times are periods of learning and love – talk to children during feeding, with eye-to-eye contact.

▶ GUIDING PRINCIPLE 4. Practise good hygiene and proper food handling

Microbial contamination of complementary foods is a major cause of diarrhoeal disease, which is particularly common in children 6 to 12 months old (*12*). Safe preparation and storage of complementary foods can prevent contamination and reduce the risk of diarrhoea. The use of bottles with teats to feed liquids is more likely to result in transmission of infection than the use of cups, and should be avoided (*13*).

All utensils, such as cups, bowls and spoons, used for an infant or young child's food should be washed thoroughly. Eating by hand is common in many cultures, and children may be given solid pieces of food to hold and chew on, sometimes called "finger foods". It is important for both the caregiver's and the child's hands to be washed thoroughly before eating.

Bacteria multiply rapidly in hot weather, and more slowly if food is refrigerated. Larger numbers of bacteria produced in hot weather increase the risk of illness (*14*). When food cannot be refrigerated it should be eaten soon after it has been prepared (no more than 2 hours), before bacteria have time to multiply.

Basic recommendations for the preparation of safe foods (*15*) are summarized in **Box 3**.

BOX 3

Five keys to safer food

- Keep clean
- Separate raw and cooked
- Cook thoroughly
- Keep food at safe temperatures
- Use safe water and raw materials

▶ GUIDING PRINCIPLE 5. Start at 6 months of age with small amounts of food and increase the quantity as the child gets older, while maintaining frequent breastfeeding

The overall quantity of food is usually measured for convenience according to the amount of energy – that is, the number of kilocalories (kcal) – that a child needs. Other nutrients are equally important, and are either part of, or must be added to, the staple food.

Figure 10 shows the energy needs of infants and young children up to 2 years of age, and how much can be provided by breast milk. It shows that breast milk covers all needs up to 6 months, but after 6 months there is an energy gap that needs to be covered by complementary foods. The energy needed in addition to breast milk is about 200 kcal per day in infants 6–8 months, 300 kcal per day in infants 9–11 months, and 550 kcal per day in children 12–23 months of age. The amount of food required to cover the gap increases as the child gets older, and as the intake of breast milk decreases (*16*).

FIGURE 10
Energy required by age and the amount from breast milk

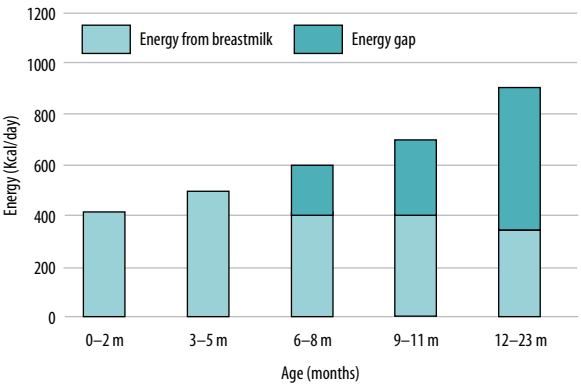


Table 1 summarizes the amount of food required at different ages,[1] the average number of kilocalories that a breastfed infant or young child needs from complementary foods at different ages, and the approximate quantity of food that will provide this amount of energy per day. The quantity increases gradually month by month, as the child grows and develops, and the table shows the average for each age range.

The actual amount (weight or volume) of food required depends on the *energy density* of the food offered. This means the number of kilocalories per ml, or per gram. Breast milk contains about 0.7 kcal per ml. Complementary foods are more variable, and usually contain between 0.6 and 1.0 kcal per gram. Foods that are watery and dilute may contain only about 0.3 kcal per gram. For complementary foods to have 1.0 kcal per gram, it is necessary for them to be quite thick and to contain fat or oil, which are the most energy-rich foods.

Complementary foods should have a greater energy density than breast milk, that is, at least 0.8 kcal per gram. The quantities of food recommended in Table 1 assume that the complementary food will contain 0.8–1.0 kcal per gram. If a complementary food is more energy dense, then a smaller amount is needed to cover the energy gap. A complementary food that is more energy-dilute needs a larger volume to cover the energy gap.

When complementary food is introduced, a child tends to breastfeed less often, and his or her intake of breast milk decreases (*17*), so the food effectively displaces breast milk. If complementary food is more energy diluted than breast milk, the child's total energy intake may be less than it was with exclusive breastfeeding, an important cause of malnutrition.

A young child's appetite usually serves as a guide to the amount of food that should be offered. However, illness and malnutrition reduce appetite, so that a sick child may take less than he or she needs. A child recovering from illness or malnutrition may require extra assistance with feeding to ensure adequate intake. If the child's appetite increases with recovery, then extra food should be offered.

[1] The age ranges should be interpreted as follows: a child 6–8 months is 6 months or older (≥ 180 days) but is not yet 9 months old (< 270 days).

TABLE 1
Practical guidance on the quality, frequency and amount of food to offer children 6–23 months of age who are breastfed on demand

AGE	ENERGY NEEDED PER DAY IN ADDITION TO BREAST MILK	TEXTURE	FREQUENCY	AMOUNT OF FOOD AN AVERAGE CHILD WILL USUALLY EAT AT EACH MEAL[a]
6–8 months	200 kcal per day	Start with thick porridge, well mashed foods Continue with mashed family foods	2–3 meals per day Depending on the child's appetite, 1–2 snacks may be offered	Start with 2–3 tablespoonfuls per feed, increasing gradually to ½ of a 250 ml cup
9–11 months	300 kcal per day	Finely chopped or mashed foods, and foods that baby can pick up	3–4 meals per day Depending on the child's appetite, 1–2 snacks may be offered	½ of a 250 ml cup/bowl
12–23 months	550 kcal per day	Family foods, chopped or mashed if necessary	3–4 meals per day Depending on the child's appetite, 1–2 snacks may be offered	¾ to full 250 ml cup/bowl

Further information

The amounts of food included in the table are recommended when the energy density of the meals is about 0.8 to 1.0 kcal/g.

If the energy density of the meals is about 0.6 kcal/g, the mother should increase the energy density of the meal (adding special foods) or increase the amount of food per meal. For example:

— for 6 to 8 months, increase gradually to two thirds cup
— for 9 to 11 months, give three quarters cup
— for 12 to 23 months, give a full cup.

The table should be adapted based on the energy content of local complementary foods.

The mother or caregiver should feed the child using the principles of responsive feeding, recognizing the signs of hunger and satiety. These signs should guide the amount of food given at each meal and the need for snacks.

[a] If baby is not breastfed, give in addition: 1–2 cups of milk per day, and 1–2 extra meals per day (*18*).

▶ GUIDING PRINCIPLE 6. Gradually increase food consistency and variety as the infant grows older, adapting to the infant's requirements and abilities

The most suitable consistency for an infant's or young child's food depends on age and neuromuscular development (*19*). Beginning at 6 months, an infant can eat pureed, mashed or semi-solid foods. By 8 months most infants can also eat finger foods. By 12 months, most children can eat the same types of foods as consumed by the rest of the family. However, they need nutrient-rich food, as explained in **Guiding principle 8**, and foods that can cause choking, such as whole peanuts, should be avoided.

A complementary food should be thick enough so that it stays on a spoon and does not drip off. Generally, foods that are thicker or more solid are more energy- and nutrient-dense than thin, watery or soft foods. When a child eats thick, solid foods, it is easier to give more kcal and to include a variety of nutrient-rich ingredients including animal-source foods. There is evidence of a critical window for introducing 'lumpy' foods: if these are delayed beyond 10 months of age, it may increase the risk of feeding difficulties later on. Although it may save time to continue feeding semi-solid foods, for optimal child development it is important to gradually increase the solidity of food with age.

▶ GUIDING PRINCIPLE 7. Increase the number of times that the child is fed complementary foods as the child gets older

As a child gets older and needs a larger total quantity of food each day, the food needs to be divided into a larger number of meals.

The number of meals that an infant or young child needs in a day depends on:

- *how much energy the child needs to cover the energy gap*. The more food a child needs each day, the more meals are needed to ensure that he or she gets enough.
- *the amount that a child can eat at one meal*. This depends on the capacity or size of the child's stomach, which is usually 30 ml per kg of the child's body weight. A child who weighs 8 kg will have a stomach capacity of 240 ml, about one large cupful, and cannot be expected to eat more than that at one meal.
- *the energy density of the food offered*. The energy density of complementary foods should be more than breast milk, that is, at least 0.8 kcal per gram. If the energy density of food is lower, a larger volume of food is needed to fill the gap, which may need to be divided into more meals.

As shown in **Table 1**, a breastfed infant 6-8 months old needs 2–3 meals a day, and a breastfed infant 9–23 months needs 3–4 meals a day. Depending on the child's appetite, 1–2 nutritious snacks may be offered. Snacks are defined as foods eaten between meals, often self-fed finger foods, which are convenient and easy to prepare. If they are fried, they may have a high energy density. The transition from 2 to 3 meals, and from smaller to larger meals, happens gradually between those ages, depending on the child's appetite and how he or she is developing.

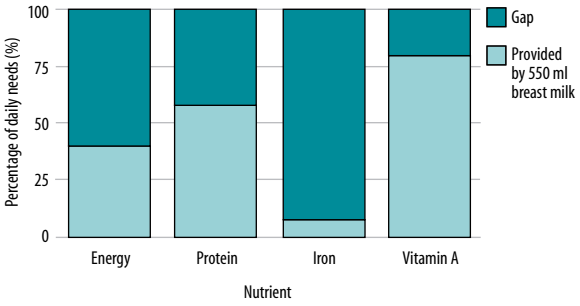
If a child eats too few meals, then he or she will not receive enough food to cover energy needs. If a child eats too many meals, he or she may breastfeed less, or may even stop breastfeeding altogether. In the first year of life, displacement of breast milk may reduce the quality and amount of the child's total nutrient intake.

▶ GUIDING PRINCIPLE 8. Feed a variety of nutrient-rich foods to ensure that all nutrient needs are met

Complementary foods should provide sufficient energy, protein and micronutrients to cover a child's energy and nutrient gaps, so that together with breast milk, they meet all his or her needs.

Figure 11 shows the energy, protein, iron and vitamin A gaps that need to be filled by complementary foods for a breastfed child 12–23 months of age. The light part of each bar shows the percentage of the child's daily needs that can be provided by an average intake of 550 ml of breast milk. The dark part of the bar shows the gap that needs to be filled by complementary foods.

FIGURE 11
Gaps to be filled by complementary foods for a breastfed child 12–23 months



The largest gap is for iron, so it is especially important that complementary foods contain iron, if possible from animal-source foods such as meat, organs, poultry or fish. Pulses (peas, beans, lentils, nuts) fed with vitamin C-rich foods to aid absorption provide an alternative, but they cannot replace animal-source foods completely.

Box 4 summarizes characteristics of good complementary foods.

BOX 4

Good complementary foods are:

- Rich in energy, protein and micronutrients (particularly iron, zinc, calcium, vitamin A, vitamin C and folate);
- Not spicy or salty;
- Easy for the child to eat;
- Liked by the child;
- Locally available and affordable.

The basic ingredient of complementary foods is usually the local staple. Staples are cereals, roots and starchy fruits that consist mainly of carbohydrate and provide energy. Cereals also contain some protein; but roots such as cassava and sweet potato, and starchy fruits such as banana and breadfruit, contain very little protein.

A variety of other foods should be added to the staple every day to provide other nutrients. These include:

- *Foods from animals or fish* are good sources of protein, iron and zinc. Liver also provides vitamin A and folate. Egg yolk is a good source of protein and

vitamin A, but not of iron. A child needs the solid part of these foods, not just the watery sauce.

- *Dairy products*, such as milk, cheese and yoghurt, are useful sources of calcium, protein, energy and B vitamins.
- *Pulses – peas, beans, lentils, peanuts, and soybeans* are good sources of protein, and some iron. Eating sources of vitamin C (for example, tomatoes, citrus and other fruits, and green leafy vegetables) at the same time helps iron absorption.
- *Orange-coloured fruits and vegetables* such as carrot, pumpkin, mango and papaya, and dark-green leaves such as spinach, are rich in carotene, from which vitamin A is made, and also vitamin C.
- *Fats and oils* are concentrated sources of energy, and of certain essential fats that children need to grow.

Vegetarian (plant-based) complementary foods do not by themselves provide enough iron and zinc to meet all the needs of an infant or young child aged 6–23 months. Animal-source foods that contain enough iron and zinc are needed in addition. Alternatively, fortified foods or micronutrient supplements can fill some of the critical nutrient gaps.

Fats, including oils, are important because they increase the energy density of foods, and make them taste better. Fat also helps the absorption of vitamin A and other fat-soluble vitamins. Some fats, especially soy and rapeseed oil, also provide essential fatty acids. Fat should comprise 30–45% of the total energy provided by breast milk and complementary foods together. Fat should not provide more than this proportion, or the child will not eat enough of the foods that contain protein and other important nutrients, such as iron and zinc.

Sugar is a concentrated source of energy, but it has no other nutrients. It can damage children's teeth, and lead to overweight and obesity. Sugar and sugary drinks, such as soda, should be avoided because they decrease the child's appetite for more nutritious foods. Tea and coffee contain compounds that can interfere with iron absorption and are not recommended for young children.

Concerns about potential allergic effects are a common reason for families to restrict certain foods in the diets of infants and young children. However, there are no controlled studies that show that restrictive diets have an allergy-preventing effect. Therefore, young children can consume a variety of foods from the age of six months, including cow milk, eggs, peanuts, fish and shellfish (*18*).

▶ GUIDING PRINCIPLE 9. Use fortified complementary foods or vitamin-mineral supplements for the infant as needed

Unfortified complementary foods that are predominantly plant-based generally provide insufficient amounts of certain key nutrients (particularly iron, zinc and vitamin B6) to meet recommended nutrient intakes during complementary feeding. Inclusion of animal-source foods can meet the gap in some cases, but this increases cost and may not be practical for the lowest-income groups. Furthermore, the amounts of animal-source foods that can feasibly be consumed by infants (e.g. at 6–12 months) are generally insufficient to meet the gap in iron. The difficulty in meeting the needs for these nutrients is not unique to developing countries. Average iron intakes in infants in industrialized countries would fall well short of recommended intake if iron-fortified products were not widely available. Therefore, in settings where little or no animal-source foods are available to many families, iron-fortified complementary foods or foods fortified at the point of consumption with a multinutrient powder or lipid-based nutrient supplement may be necessary.

▶ GUIDING PRINCIPLE 10. Increase fluid intake during illness, including more frequent breastfeeding, and encourage the child to eat soft, favourite foods. After illness, give food more often than usual and encourage the child to eat more

During an illness, the need for fluid often increases, so a child should be offered and encouraged to take more, and breastfeeding on demand should continue. A child's appetite for food often decreases, while the desire to breastfeed increases, and breast milk may become the main source of both fluid and nutrients.

A child should also be encouraged to eat some complementary food to maintain nutrient intake and enhance recovery (*20*). Intake is usually better if the child is offered his or her favourite foods, and if the foods are soft and appetizing. The amount eaten at any one time is likely to be less than usual, so the caregiver may need to give more frequent, smaller meals.

When the infant or young child is recovering, and his or her appetite improves, the caregiver should offer

an extra portion at each meal or add an extra meal or snack each day.

3.2 Recommendations for micronutrient supplementation

Micronutrients are essential for growth, development and prevention of illness in young children. As discussed earlier in **Guiding principle 9**, micronutrient supplementation can be an effective intervention in some situations. Recommendations are summarized below.

Vitamin A

WHO and UNICEF recommend universal supplementation with vitamin A as a priority in children aged 6–59 months in countries with a high risk of deficiency (**Table 2**). In these countries, a high dose of vitamin A should also be given to children with measles, diarrhoea, respiratory disease, chickenpox, other severe infections, or who live in the vicinity of children with vitamin A deficiency (*21*).

TABLE 2
High-dose universal distribution schedule for prevention of vitamin A deficiency

Infants 6–12 months of age	100 000 IU orally, every 4–6 months
Children > 12 months of age	200 000 IU orally, every 4–6 months

Iron

As a rule, fortified foods should be preferred to iron supplements for children during the complementary feeding period. Caution should be exercised with iron supplementation in settings where the prevalence of malaria and other infectious diseases is high. In malaria-endemic areas, universal iron supplementation is not recommended. If iron supplements are used, they should not be given to children who have sufficient iron stores as the risks of severe adverse events appear to be greater in those children. Prevention and management of anaemia in such areas requires a screening system to identify iron-deficient children, and the availability of and accessibility to appropriate anti-malarial and other anti-infective treatments (*22*,*23*).

Iodine

In 1994, WHO and UNICEF recommended universal salt iodization (USI) as a safe, cost-effective and sustainable strategy to ensure sufficient intake of iodine by all individuals. However, in areas with severe iodine deficiency, vulnerable groups – pregnant and lactating women and children less than 2 years – may not be adequately covered when USI is not fully implemented, and iodine supplementation may be necessary. The WHO/UNICEF Joint Statement on reaching optimal iodine nutrition in pregnant and lactating women and young children provides guidance for the categorization of countries and subsequent planning of an adequate response (*24*).

Zinc

Zinc supplementation is recommended as adjunct therapy in the management of diarrhoea. Zinc (20 mg/day) should be given to all children with diarrhoea for 10–14 days. In infants below 6 months of age, the dose of zinc should be 10 mg/day (*25*).

3.3 Local adaptation of complementary feeding recommendations

Table 3 lists types of foods, the principle nutrients they contain, and how they can be fed to children for good complementary feeding. To develop specific feeding recommendations that respond to the *Guiding principles* and that are locally acceptable and affordable, a process of adaptation is needed. It is useful to involve caregivers and families in the process of adaptation, and of deciding what is culturally appropriate (*26*). The following steps are usually required:

- Review existing national or local feeding guidelines.
- Develop a list of locally available foods.
- Find out the nutrient content of the local foods from food tables (*27*).
- Calculate the amount of various foods that would provide a child with his or her daily needs of the various nutrients – linear programming techniques can be used for this (*28*).
- Assess which foods and quantities of foods caregivers and families accept as suitable for children, and identify their feeding practices and preferences.
- Arrange trials of improved practices, asking mothers or other caregivers to choose new, improved feeding practices and try them out themselves.

TABLE 3
Appropriate foods for complementary feeding

WHAT FOODS TO GIVE AND WHY	HOW TO GIVE THE FOODS
BREAST MILK: continues to provide energy and high quality nutrients up to 23 months STAPLE FOODS: provide energy, some protein (cereals only) and vitamins ■ Examples: cereals (rice, wheat, maize, millet, quinoa), roots (cassava, yam and potatoes) and starchy fruits (plantain and breadfruit) ANIMAL-SOURCE FOODS: provide high quality protein, haem iron, zinc and vitamins ■ Examples: liver, red meat, chicken, fish, eggs (not good source of iron) MILK PRODUCTS: provide protein, energy, most vitamins (especially vitamin A and folate), calcium ■ Examples: milk, cheese, yogurt and curds GREEN LEAFY AND ORANGE-COLOURED VEGETABLES: provide vitamins A, C, folate ■ Examples: spinach, broccoli, chard, carrots, pumpkins, sweet potatoes PULSES: provide protein (of medium quality), energy, iron (not well absorbed) ■ Examples: chickpeas, lentils, cowpeas, black-eyed peas, kidney beans, lima beans OILS AND FATS: provide energy and essential fatty acids ■ Examples: oils (preferably soy or rapeseed oil), margarine, butter or lard SEEDS: provide energy ■ Examples: groundnut paste or other nut pastes, soaked or germinated seeds such as pumpkin, sunflower, melon, sesame	**Infants 6–11 months** ■ Continue breastfeeding ■ Give adequate servings of: — Thick porridge made out of maize, cassava, millet; add milk, soy, ground nuts or sugar — Mixtures of pureed foods made out of *matoke*, potatoes, cassava, *posho* (maize or millet) or rice: mix with fish, beans or pounded groundnuts; add green vegetables ■ Give nutritious snacks: egg, banana, bread, papaya, avocado, mango, other fruits, yogurt, milk and puddings made with milk, biscuits or crackers, bread or *chapati* with butter, margarine, groundnut paste or honey, bean cakes, cooked potatoes **Children 12–23 months** ■ Continue breastfeeding ■ Give adequate servings of: — Mixtures of mashed or finely cut family foods made out of *matoke*, potatoes, cassava, posho (maize or millet) or rice; mix with fish or beans or pounded groundnuts; add green vegetables — Thick porridge made out of maize, cassava, millet; add milk, soy, ground nuts or sugar ■ Give nutritious snacks: egg, banana, bread, papaya, avocado, mango, other fruits, yogurt, milk and puddings made with milk, biscuits or crackers, bread or *chapati* with butter, margarine, groundnut paste or honey, bean cakes, cooked potatoes

REMINDER:

Foods rich in *iron*
■ Liver (any type), organ meat, flesh of animals (especially red meat), flesh of birds (especially dark meat), foods fortified with iron

Foods rich in *Vitamin A*
■ Liver (any type), red palm oil, egg yolk, orange coloured fruits and vegetables, dark green vegetables

Foods rich in *zinc*
■ Liver (any type), organ meat, food prepared with blood, flesh of animals, birds and fish, shell fish, egg yolk

Foods rich in *calcium*
■ Milk or milk products, small fish with bones

Foods rich in *Vitamin C*
■ Fresh fruits, tomatoes, peppers (green, red, yellow), green leaves and vegetables

Obtain feedback on what works best in their circumstances.

Whether or not vitamin-mineral supplements should be included in the recommendations depends on the micronutrient content of locally-available foods, and whether children can eat enough suitable foods.

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Management and support of infant feeding in maternity facilities

4.1 The Baby-friendly Hospital Initiative

Many deliveries take place in hospitals or maternity facilities, and health care practices in these facilities have a major effect on infant feeding. To encourage breastfeeding from the time of childbirth, to prevent difficulties from arising and to overcome difficulties should they occur, mothers need appropriate management and skilled help. Support and counselling should be available routinely during antenatal care, to prepare mothers; at the time of birth to help them initiate breastfeeding; and in the postnatal period to ensure that breastfeeding is fully established. Mothers and other caregivers who are not able to breastfeed need counselling and support for alternative methods of infant feeding.

The Baby-friendly Hospital Initiative (BFHI) was launched in 1992 with the aim of transforming maternity facilities to provide this standard of care (*1*). Without the BFHI, practices often undermine breastfeeding, with damaging consequences for infant health. Hospitals become baby-friendly by implementing the Ten Steps to Successful Breastfeeding, summarized in **Box 5** (*2*), and complying with relevant sections of the International Code of Marketing of Breast-milk Substitutes and subsequent relevant Health Assembly resolutions (collectively referred to as the *Code*)[1] (*3*). Facilities that are working to achieve baby-friendly accreditation are formally assessed on their policies, training, and full implementation of all of the Ten Steps including compliance with the Code. Standards are defined in more detail in the global criteria, and tools for assessing practices according to these criteria have been developed by WHO and UNICEF and are used worldwide (*1*).

The baby-friendly approach has been shown to be effective in increasing exclusive breastfeeding rates (*4*,*5*). Evidence exists for the effectiveness of individual steps, but even more so for full implementation of all steps together (*6*).

[1] References to the Code generally imply also subsequent relevant Health Assembly resolutions.

BOX 5

The ten steps to successful breastfeeding

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

4.2 Policy and training

Fundamental to the implementation of the BFHI and other components of the *Global Strategy for Infant and Young Child Feeding*, is to have clear, well-supported policies, coupled with appropriate training of health workers. This is set out clearly in the first two of the **Ten Steps**.

▶ STEP 1: Have a written breastfeeding policy that is routinely communicated to all health care staff

A hospital policy and related guidelines should cover all aspects of management outlined by the Ten Steps, and all staff should be fully informed about the policy. To be accredited as baby-friendly, a hospital is required to avoid all promotion of breast-milk substitutes (BMS) and related products, bottles and teats, and not to accept free or low-cost supplies or to give out samples of those products (see **Session 9.1.2** on the *Code*).

▶ STEP 2: Train all health care staff in skills necessary to implement this policy

All health care staff with responsibility for mothers and babies should be trained to implement the policy, which includes being able to help mothers to initiate and establish breastfeeding, and to overcome difficulties. Training courses have been developed by WHO and UNICEF for this purpose (*7*,*8*).

4.3 Antenatal preparation

Preparation of mothers before they give birth is fundamental to the success of the BFHI.

▶ STEP 3: Inform all pregnant women about the benefits and management of breastfeeding

Women need information about:

- the benefits of breastfeeding and the risks of artificial or mixed feeding;
- optimal practices, such as early skin-to-skin contact, exclusive breastfeeding, rooming-in, starting to breastfeed soon after delivery, and why colostrum is important;
- what to expect, including how the milk "comes in", and how a baby suckles;
- what they will need to do: skin-to-skin contact, putting the baby to the breast, and appropriate patterns of feeding.

Some questions are usefully discussed in groups, while for others individual counselling is more appropriate. Opportunities for both are needed antenatally and postnatally, when mothers visit a health facility, or during contacts with a community health worker. At group sessions, women can raise doubts and ask questions, and discuss them together. Women who have concerns that they do not want to share with a group, or who have had difficult experiences before, need to discuss them privately.

Antenatal preparation of the breasts for breastfeeding is not helpful. Exercises to stretch flat or inverted nipples, and devices worn over the nipples during pregnancy, are not effective in increasing breastfeeding success (*9*). Providing skilled support to help the baby to attach soon after delivery is more effective.

4.4 Early contact

The first hour of a baby's life is of great importance for the initiation and continuation of breastfeeding, and to establish the emotional bond between mother and baby. Delays in initiation of breastfeeding after the first hour increase the risk of neonatal mortality, in particular neonatal deaths due to infections (*10*,*11*).

▶ STEP 4: Help mothers initiate breastfeeding within one half hour of birth

A baby should be delivered straight onto the mother's abdomen and chest, before delivery of the placenta or any other procedures, unless there are medical or obstetric complications that make it impossible (*12*,*13*). The baby must be dried immediately to prevent heat loss and then placed in skin-to-skin contact with the mother, usually in an upright position. Skin-to-skin contact means that both the mother's upper body and her baby should be naked, with the baby's upper body between the mother's breasts. They should be covered together to keep them warm. Skin-to-skin contact should start immediately after delivery or within at least half an hour; and should continue for as long as possible, but for at least one hour uninterrupted (*12*). Mothers usually find the experience a pleasure and emotionally meaningful.

Skin-to-skin contact is the best way to initiate breastfeeding. A few babies want to suckle immediately. Most babies remain quiet for some time, and only start to show signs of readiness to feed after 20–30 minutes or more; some take over an hour (*14*). Caregivers should ensure that the baby is comfortably positioned between the mother's breasts, but they should not try to attach the baby to the mother's breast; the baby can do this in his or her own time. Eventually a baby becomes more alert, and may start raising his or her head, looking around, making mouthing movements, sucking his or her hands, or massaging the breast with them. Some babies move towards and may find the areola and nipple by themselves, guided by their sense of smell (*15*). The mother can help move her baby closer to the areola and nipple to start suckling. Many babies attach well at this time, which helps them to learn to suckle effectively

(*14*,*16*). This early contact stimulates the flow of oxytocin, helps with release of the placenta, reduces the risk of haemorrhage (*17*,*18*) and facilitates emotional bonding of the mother and baby (*19*).

If a mother has been given an anaesthetic or analgesic (especially pethidine), the baby may be sedated and may take longer to become alert and seek the nipple (*20*). If there is a delay in the first breastfeed for any reason, the mother can express her colostrum and feed it to the baby by cup or spoon. She should be encouraged and given help to hold her baby in skin-to-skin contact whenever he or she needs comforting and at feeds.

4.5 Showing mothers how to breastfeed

All mothers need help to ensure that their babies are suckling effectively, and to express breast milk for the situations when this may be necessary.

▶ STEP 5: Show mothers how to breastfeed and how to maintain lactation even if they should be separated from their infants

Showing a mother how to breastfeed

- A mother needs help in the first few days to make sure that she is able to position and attach her baby correctly to the breast. The person giving support should watch her putting her baby to the breast, and assess the breastfeed, using the breastfeed observation job aid, described in **Session 5.4**. If a mother needs practical help, the helper can use either her own body or a model breast and doll or a picture to show the mother what to do. Minimal touching of the mother and baby should be needed.
- If the baby is well attached and suckling effectively, the mother should be praised to reinforce her good practices, and she should be reminded of the importance of demand feeding and exclusive breastfeeding.
- If the baby is not well attached, the mother should be helped to improve the baby's position and attachment (see **Box 6**, How to help a mother to position and attach her baby).

Showing a mother how to maintain lactation

- Mothers need to know how to express their milk, so that they can continue to feed their babies and keep up their milk supply if they are separated (see **Box 7**). Babies who are ill, or who suffered trauma during delivery, and some babies who are low birth

BOX 6

How to help a mother to position and attach her baby

- Help the mother to get into a comfortable and relaxed position, sitting or lying down.
- The helper should sit in a comfortable, convenient position.
- Explain to the mother how to hold her baby, according to the **four key points**:
  - with the head and body straight
  - facing the breast, and starting with his/her nose opposite the nipple
  - with his/her body close to her body
  - supporting the whole body.
- Show her how to support her breast:
  - with her fingers flat against her chest wall under her breast
  - with her thumb above the breast
  - her fingers should not be on the areola or near the nipple, because this can interfere with attachment.
- Explain or show the mother how to help her baby to attach by:
  - touching the baby's lips with her nipple
  - waiting until the baby's mouth is open wide
  - moving the baby quickly onto her breast
  - aiming her nipple up towards the roof of the baby's mouth
  - aiming his/her lower lip behind her nipple, so his/her chin touches the breast.
- Notice how the baby responds and ask her how the suckling feels.
- Look for signs of correct attachment. The four signs of good attachment are:
  - more of the areola is visible above the baby's top lip than below the lower lip
  - the baby's mouth is wide open
  - the baby's lower lip is curled outwards
  - the baby's chin is touching or almost touching the breast.
- If attachment is not good, or if the mother is uncomfortable, ask her to try again.
- Show her how to take the baby off the breast by slipping her little finger into the baby's mouth to release the suction.

BOX 7

How to express breast milk by hand

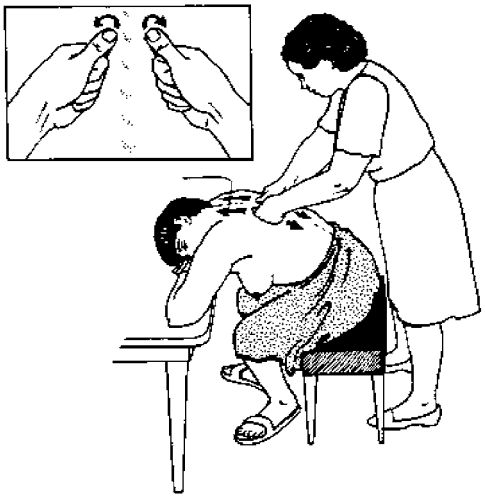
The mother should:

- Have a clean, dry, wide-necked container for the expressed breast milk;
- Wash her hands thoroughly;
- Sit or stand comfortably and hold the container under her nipple and areola;
- Put her thumb on top of her breast and her first finger on the underside of her breast so that they are opposite each other about 4 cms from the tip of the nipple;
- Compress and release her breast between her finger and thumb a few times. If milk does not appear, re-position her thumb and finger a little closer or further away from the nipple and compress and release a number of times as before. This should not hurt – if it hurts, the technique is wrong. At first no milk may come, but after compressing a few times, milk starts to drip out. It may flow in streams if the oxytocin reflex is active;
- Compress and release all the way around her breast, with her finger and thumb the same distance from the nipple;
- Express each breast until the milk drips slowly;
- Repeat expressing from each breast 5 to 6 times;
- Stop expressing when milk drips slowly from the start of compression, and does not flow;
- Avoid rubbing or sliding her fingers along the skin;
- Avoid squeezing or pinching the nipple itself.

weight or premature may be separated from the mother in a special care baby unit (see **Session 6.1** on low-birth-weight babies).

- If a baby is able to take oral or enteral feeds, breast milk is usually the best feed to give.
- If a baby cannot take oral feeds, then it is helpful for the mother to express her milk to build up and maintain the supply, for when the baby is able to start breastfeeding. Expressed breast milk (EBM) can be frozen and stored until the baby needs it (*21*). In some facilities that are able to operate adequate standards for milk banking, it may be possible to donate milk for other infants (*22*).

FIGURE 12
Back massage to stimulate the oxytocin reflex before expressing breast milk



A health worker or counsellor should explain to the mother the basic principles:

- Express both breasts each time.
- Express the milk into a cup, glass, jug or jar that has been thoroughly washed with water and soap.
- Store EBM in a glass with a cover indicating time and date.
- Keep EBM at room temperature for 8 hours or in a refrigerator for 24 to 48 hours. If she has a deep freeze she can store it for 3 months (*21*).

Stimulating the oxytocin reflex

Before the mother expresses her milk, she should stimulate her oxytocin reflex, to help the milk flow. She may do this herself by lightly massaging her breasts, or stimulating her nipples, and at the same time thinking about the baby, watching him or her if nearby, or looking at a photograph of him or her. She can also ask a helper to massage up and down her back on either side of her spine between her shoulder blades (see **Figure 12**).

4.6 Creating a supportive environment for breastfeeding

Maternity facilities should ensure that their practices are supportive, so that babies stay close to their mothers for demand feeding, and that babies are not given unnecessary supplements, fed by bottle, or given dummies (pacifiers).

▶ STEP 6: Give newborn infants no food or drink other than breast milk unless medically indicated

Foods and drinks given to a newborn baby before breastfeeding has started are called *prelacteal feeds*. Giving these feeds increases the risk of illnesses such as diarrhoea and other infections and allergies, particularly if they are given before the baby has had colostrum. Prelacteal feeds satisfy a baby's hunger and thirst, making him or her less interested in feeding at the breast, so there is less stimulation of breast milk production. If a bottle is used, it may interfere with the baby learning to suckle at the breast. Since prelacteal feeds can interfere with establishing breastfeeding, they should not be given without an acceptable medical reason (*23*). (See **Annex 1** for acceptable medical reasons for use of breast-milk substitutes).

▶ STEP 7: Practice rooming-in – allow mothers and infants to remain together – 24 hours a day

Babies should be allowed to stay in the same room as their mother, either in a cot beside her bed or in the bed with her, 24 hours a day (*24*). They should be separated only when strictly necessary, for example for a medical or surgical procedure. A cot should be beside the mother's bed, where she can easily see and reach her baby, not at the end of the bed, where it is more difficult. Studies have shown that babies cry less and mothers sleep as much when they are together as when the infant is in a separate room (*8*). Separating infants from their mothers may be associated with long-term psychological trauma (*25*).

Rooming-in is essential to enable a mother to breastfeed her baby on demand and for her to learn the cues such as wakefulness, rooting and mouthing, which show that her baby is ready for a feed. It is better to feed the baby in response to these cues than to wait until the baby is crying.

▶ STEP 8: Encourage breastfeeding on demand

Encourage mothers to breastfeed their babies as often as they want, day and night, whenever the baby shows signs of readiness to feed. This is called *demand feeding*, or *baby-led* or *unrestricted* breastfeeding (see **Session 2.12**).

A mother should let her baby stay on the breast until he or she comes off by him- or herself. The baby usually suckles more slowly, with fewer suckles and longer pauses, and then spits the nipple out, and lies back looking contented. After a few minutes, the mother should offer the other breast, but the baby may or may not want to take more. She can start on the other breast at the next feed. In the first few days, babies may want to feed very often, and this is beneficial because it stimulates milk production. The health worker should make sure that the baby is well attached and suckling effectively, and help the mother to understand that the baby will feed less often when breastfeeding is established.

▶ STEP 9: Give no artificial teats or pacifiers (also called dummies or soothers) to breastfeeding infants

Feeding a baby from a bottle with an artificial teat may make it more difficult for the baby to learn to attach well at the breast and may make it more difficult to establish breastfeeding satisfactorily (*26*). If an infant cannot feed from the breast, then the safest alternative is to feed from a cup (see **Figure 13** and **Box 8**). Even low-birth-weight and premature babies can cup feed. The reasons to feed with a cup include:

- Cups are easier to clean, and can be cleaned with soap and water, if boiling is not possible.
- Feeding from a cup does not interfere with the baby learning to suckle at the breast.
- A cup cannot be left for the baby to feed him- or herself. Someone has to hold the baby and give him some of the contact that he needs.
- Cup feeding is generally easier and better than spoon feeding: spoon feeding takes longer and requires an extra hand, and sometimes a baby does not get enough milk by spoon.

FIGURE 13
Feeding a baby by cup

BOX 8

How to cup feed a baby

- Hold the baby sitting upright or semi-upright on your lap – wrap the baby with a cloth to provide some support and to stop his or her hands from knocking the cup.
- Hold the cup of milk resting on the lower lip so that the rim touches the baby's upper lip.
- Tip the cup so that the milk just reaches the baby's lips.
- A younger baby will start to take milk into his mouth with his tongue. A term or older baby will suck the milk, spilling some of it.
- DO NOT POUR the milk into the baby's mouth. Just hold the cup to the baby's lips and let him or her take it him- or herself.
- When he or she has had enough, the baby closes his or her mouth and will not take any more. If the baby has not taken the calculated amount, he or she may take more at the next feed, or you may need to give feeds more often.
- Measure the intake over 24 hours – not just at each feed.

4.7 Follow-up support

The BFHI is effective in increasing breastfeeding in hospital, but rates may fall off rapidly after the neonatal period, and continuing support in the community is essential to sustain exclusive breastfeeding (*27*,*28*). A baby-friendly hospital therefore needs to be concerned about on-going support for mothers after discharge.

▶ STEP 10: Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic

This step addresses the need that mothers have for follow-up support for breastfeeding after they leave a maternity facility (see **Session 7**). Breastfeeding may not be established for a few weeks, and many problems can arise during this time. To be accredited as baby-friendly, a hospital must be able to refer a mother to an accessible source of ongoing skilled support. This may be outpatient care provided by the hospital, a health centre or clinic, a primary care worker or a community health worker trained in breastfeeding counselling, a peer counsellor, or a mother-to-mother support group.

Baby-friendly hospitals often find it very difficult to set up community groups, which may be more easily organised by health workers already based in the community. However, hospitals should encourage the establishment of these groups, help to train them, know who and where they are, and be in contact with them. They should refer women to them on discharge, and accept referrals from them of mothers who need more specialised help than the community resource itself can provide.

When a mother leaves a maternity facility, she should be given information about where support for breastfeeding is available in her locality, and how to access it. Community breastfeeding counselling is discussed further in **Sessions 5 and 9**.

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Continuing support for infant and young child feeding

5.1 Support for mothers in the community

Health workers do not always have the opportunity to ensure that mothers successfully establish breastfeeding. Mothers may give birth at home, or they may be discharged from a maternity facility within a day or so after delivery. Difficulties may arise in the first few weeks with breastfeeding, and later on when complementary foods are needed. Illness of infants and young children is often associated with poor feeding. Families and friends are usually a mother's main source of advice about feeding her children, but this advice is sometimes fraught by misconceptions.

Mothers need continuing support to maintain exclusive and continued breastfeeding, to implement other methods of infant feeding when breastfeeding is not possible, and to establish adequate complementary feeding when the child is 6 months of age and older (*1*). If a child becomes ill, the mother may require skilled support from a health worker to continue feeding her child. This support can be provided by trained personnel in the community, and in various other settings, such as a primary care facility or a paediatric department in a hospital.

There should be no missed opportunities for supporting feeding in any contact that a mother and child have with the health system, whether it involves doctors, midwives, nurses or community health workers. Lay or peer counsellors who have the skills and knowledge to support optimal infant and young child feeding can also contribute to improved feeding practices (*2*). Collectively, all these providers should ensure a continuum of care from pregnancy through the postnatal period into early childhood. When they help a mother, they should also talk to other family members, showing respect for their ideas, and helping them to understand advice on optimal feeding. In addition, they can share information and create awareness about the importance of appropriate infant and young child feeding through other channels, for example, by involving school children or extension workers from other sectors. This multi-pronged approach to promoting and supporting infant and young child feeding has been shown to be effective in many settings (*3*).

BOX 9

Key points of contact to support optimal feeding practices

- During antenatal care
- At the time of childbirth and in the immediate postpartum period
- In the postnatal period:
  - for healthy term babies on day 2–3, day 5–7, and around 3–4 weeks
  - for low-birth-weight babies more frequently: on day 2, day 3, day 5–7, day 14, and day 28
- At 6 weeks post partum for all mothers and babies
- During immunization contacts
- During well-baby clinics and/or growth assessment visits
- During sick child visits and their follow-up

Box 9 summarizes key points of contact that mothers might have with a health worker who is knowledgeable and skilled to support her in practising appropriate infant and young child feeding. Mothers who are not breastfeeding also need help with infant feeding at these times, and many of the skills needed by health workers to support them are similar.

5.2 Infant and young child feeding counselling

Infant and young child feeding counselling is the process by which a health worker can support mothers and babies to implement good feeding practices and help them overcome difficulties. Details of infant and young child feeding counselling depend on the child's age and the mother's circumstances. Generally, a health worker should:

Use good communication and support skills:

- Listen and learn
- Build confidence and give support.

Assess the situation:

- Assess the child's growth
- Take a feeding history
- Observe a breastfeed
- Assess the health of the child and the mother.

Manage problems and reinforce good practices:

- Refer the mother and child if needed
- Help the mother with feeding difficulties or poor practices
- Support good feeding practices
- Counsel the mother on her own health, nutrition and family planning.

Follow-up

5.3 Using good communication and support skills

If a health care worker is to effectively counsel a mother or other caregiver, he or she should have good communication skills. The same skills are useful in many situations, for example for family planning, and also in ordinary life. They may be described in slightly different ways and with different details in different publications, but the principles are the same. The tools described here include the basic skills useful in relation to infant and young child feeding. There are a number of similar tools that can be used for the same purpose.

The sections that follow provide concrete guidance on infant and complementary feeding counselling. They are written in a direct style and often address the reader with 'you' to make it more interesting and easier to absorb the content.

There are two groups of skills (see **Box 10**):

- *listening and learning skills* help you to encourage a mother to talk about her situation and how she feels in her own way, and they help you to pay attention to what she is saying;
- *building confidence and giving support skills* help you to give a mother information and suggest what she might do in her situation, so that she can decide for herself what to do. Supporting a mother is more useful than giving direct advice which she may not be able to follow, and which may even make her unwilling to talk to you again.

BOX 10

Communication and support skills

Listening and learning

- Use helpful non-verbal communication.
- Ask open questions.
- Use responses and gestures which show interest.
- Reflect back what the mother says.
- Empathize – show that you understand how she feels.
- Avoid words which sound judging.

Building confidence and giving support

- Accept what a mother thinks and feels.
- Recognize and praise what a mother and infant are doing right.
- Give practical help.
- Give a little, relevant information.
- Use simple language.
- Make one or two suggestions (e.g. small "do-able" actions), not commands

Listening and learning skills

Using helpful non-verbal communication. Non-verbal communication means how you communicate other than by speaking. Helpful non-verbal communication shows that the health worker respects the mother and is interested in her. It includes: keeping your head about level with the mother's, and not towering over her; making eye contact, nodding and smiling; making sure that there are no barriers, such as a table or conspicuous papers, between you and the mother; making sure that you do not seem to be in a hurry; touching her or the baby in a culturally appropriate way.

Asking open questions. "Open questions" often start with "how", "when", "who", "what", "why". To answer them it is necessary to give some information, so they encourage a person to talk, and conversation becomes easier. The opposite are "closed questions", which usually start with "Do you?", "Are you", "Is he?", "Has she?". A person can answer them with a "yes" or "no", thus giving little information. Open questions can also be more general, for example "Tell me more about…".

Using responses and gestures that show interest. Such responses include "Oh dear", "Really?", "Go

on…" or "Eeeeh". Gestures such as nodding and smiling are also responses that show interest. Showing interest encourages a mother to say more.

Reflecting back what the mother says. Reflecting is a very helpful way to show that you are listening and to encourage a mother to say more. It is best to reflect back using slightly different words from the mother, not to repeat exactly what she has said. You may only need to use one or two of the important words that she used to show that you have heard her.

Empathizing. Showing that you understand how she feels lets the woman know that you understand her feelings from her point of view, using phrases such as "you are worried", "you were very upset" or "that is hard for you". You can also empathize with good feelings, for example, "you must feel pleased".

Avoiding words that sound judging. These are words such as "right", "wrong", "good", "well", "badly", "properly", "enough". For example, the care provider should not say "Are you feeding your baby *properly*? Do you have *enough* milk?" This can make a mother feel doubtful, and that she may be doing something wrong. It is better to ask "How are you feeding your baby? How about your breast milk?" Sometimes asking "why" may sound judging, for example "Why did you give a bottle last night?" It is better to ask "What made you give a bottle?"

Confidence and support skills

Accepting what a mother thinks and feels. Accepting means not disagreeing with a mother or caregiver, but at the same time not agreeing with an incorrect idea. Disagreeing with someone can make her feel criticised, and reduce her confidence and willingness to communicate with you. Accepting involves responding in a neutral way. Later, you can give the correct information.

Recognizing and praising what a mother and baby are doing right. Health workers are trained to look for problems and may only see what is wrong and then try to correct it. Recognizing and praising a mother's good practices helps to reinforce them and build her confidence. You can also praise what a baby does, such as growing and developing well.

Giving practical help. Helping a mother or caregiver in other ways than talking, often quite simply, such as giving her a drink of water, making her comfortable in bed or helping her to wash are examples of practical help. When a mother has had a great deal of advice or has been struggling with her baby, this kind of practical help may be the best way to show that you understand, and she may be more receptive to new information and suggestions. Helping with her breastfeeding technique is also practical help, but of a different kind as it involves giving her information too. She may not be ready for that at first.

Giving a little relevant information. After you have listened to a mother or caregiver, think about her situation and decide what information is most relevant and useful at the time. You should avoid telling her too much, because she may become confused and forget what is most important. Sometimes the most useful information is a clear explanation of what she has noticed, for example the baby's behaviour, or changes in her breasts; or what to expect, for example how breast milk "comes in", or when and why the infant needs foods in addition to breast milk. Helping her to understand the process is better than immediately telling her what to do.

Using simple language. It is important to give information in a way that is easy for a person to understand, using simple, everyday words.

Making suggestions, not commands. If you tell a mother what to do, she may not be able to do it, but it can be difficult for her to disagree with you. She may just say "yes" and not come back. Giving a suggestion allows her to discuss whether or not she can follow it. You can make other suggestions, encourage her to think of more practical alternatives and help her to decide what to do. This is particularly important in the case of infant and young child feeding, when there often are different options.

5.4 Assessing the situation

5.4.1 Assessing the child's growth

Assessing a child's growth provides important information on the adequacy of the child's nutritional status and health. There are several measures to assess growth, including weight-for-age, weight-for-height, and height-for-age. In the past, many countries used weight-for-age to assess both children's growth and their present nutritional status. National growth curves were based on weight-for-age. With the availability of the WHO growth standards (*4*), countries may revisit their growth charts and introduce weight-for-height as the standard for measuring nutritional status, and provide training for health workers. It is recommended to use separate standards for boys and girls.

When counselling on infant and young child feeding, it is important to understand growth charts. If growth is not recorded correctly, and charts are not interpreted accurately, incorrect information can be given to a mother, leading to worry or loss of confidence. The following sections explain briefly the different measures.

Weight-for-age

Weight-for-age reflects body weight relative to the child's age on a given day. A series of weights can tell you whether or not a child's weight is increasing over time, so it is a useful indicator of growth. This indicator is used to assess whether a child is underweight or severely underweight, but it is not used to classify a child as overweight or obese. Because weight is relatively easily measured, this indicator is commonly used, but it cannot be relied upon in situations where the child's age cannot be accurately determined. Also, it cannot distinguish between acute malnutrition and chronic low energy and nutrient intake. Examples of weight-for-age charts for boys and girls are included in **Annex 2**.

NOTE: If a child has oedema of both feet, fluid retention increases the child's weight, masking what may actually be very low weight. The growth chart should be marked to show that the child has oedema. A child with oedema is automatically considered severely undernourished and should be referred for specialized care.

Weight-for-length/height[1]

Weight-for-length/height reflects body weight in proportion to attained growth in length or height. This indicator is especially useful in situations where children's ages are unknown (e.g. refugee settlements). Weight-for-length/height charts help identify children with low weight-for-height who may be wasted or severely wasted. These charts also help identify children with high weight-for-length/height who may be at risk of becoming overweight or obese. However, assessing weight-for-height requires two measurements – of weight and height – and this may not be feasible in all settings.

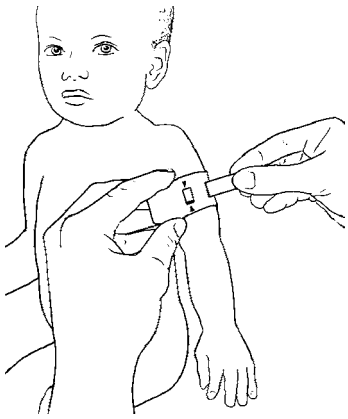
Length/height-for-age

Length/height-for-age reflects attained growth in length or height at the child's age at a given visit. This indicator can help identify children who are stunted (or short) due to prolonged undernutrition or repeated illness. Children who are tall for their age can also be identified, but tallness is rarely a problem unless it is excessive and may reflect uncommon endocrine disorders. Acute malnutrition does not affect height.

Mid-upper arm circumference

Another useful way to assess a child's present nutritional status is to measure the mid-upper arm circumference (MUAC) (*5*). MUAC below 115 mm is an accurate indicator of severe malnutrition in children 6–59 months of age (*6*). MUAC should be measured in all children who have a very low weight-for-age (see **Figure 14**). MUAC can also be used for rapidly screening all children in a community for severe malnutrition. Management of severe malnutrition is discussed in **Session 6**.

FIGURE 14
Measuring mid-upper arm circumference



Deciding whether a child is growing adequately or not

The curved lines printed on the growth charts will help you interpret the plotted points that represent a child's growth status. The line labelled "0" on each chart represents the median, which is, generally speaking, the average. The other curved lines are z-score lines,[2] which indicate distance from the average.

Z-score lines on the growth charts are numbered positively (1, 2, 3) or negatively (–1, –2, –3). In general, a plotted point that is far from the median in either

[1] *Length* of children less than 2 years of age is measured lying down, while standing *height* is measured for children 2 years of age or older.

[2] Z-scores are also known as standard deviations (SD).

direction (for example, close to the 3 or –3 z-score line) may represent a growth problem, although other factors must be considered, such as the growth trend, the health condition of the child and the height of the parents.

Identifying growth problems from plotted points

Growth problems can be identified by interpreting the plotted points in the child's Growth Record. Read plotted points as follows:

A point between the z-score lines –2 and –3 is "below –2."

A point between the z-score lines 2 and 3 is "above 2."

Table 4 below provides a summary of definitions of growth problems according to z-scores. Notice that the child falls into a category if his or her growth indicator is plotted above or below a particular z-score line. If the growth indicator is plotted exactly on the z-score line, it is considered in the less severe category. For example, weight-for-age on the –3 line is considered "underweight" as opposed to "severely underweight." Measurements in the shaded boxes are in the normal range.

Low weight-for-age

If a child has been weighed only once, the information does not say much about the child's growth, but only about the child's body weight relative to the standard for his or her age. Some infants are constitutionally small, and others are born with low birth weight due to prematurity or intrauterine growth restriction. These children may have low weight-for-age, but they may grow satisfactorily following the lowest standard curve. There is a need for full assessment and appropriate counselling. When the child is followed up and weighed again, the situation may become clearer.

However, low weight-for-age can also be a sign of poor feeding or illness. If weight-for-age is below the -2 z score line the child is *underweight*; if the weight-for-age is below the -3 z-score line (the lowest standard curve) the child is *severely underweight*. A child who is severely underweight is at risk of severe *malnutrition*, and needs special attention urgently.

Growth faltering

If a child's weight is not increasing, or if it is increasing more slowly than the standard curve for more than 1 month in babies less than 4 months of age, or 2 months in older children, then the child has *growth*

TABLE 4
Identifying growth problems from plotted points

Z-SCORE	GROWTH INDICATORS		
	LENGTH/HEIGHT-FOR-AGE	WEIGHT-FOR-AGE	WEIGHT-FOR-LENGTH/HEIGHT
Above 3	See note 1	See note 2	Obese
Above 2			Overweight
Above 1			Possible risk of overweight (See note 3)
0 (median)			
Below –1			
Below –2	Stunted (See note 4)	Underweight	Wasted
Below –3	Severely stunted (See note 4)	Severely underweight (See note 5)	Severely wasted

Explanation of Notes:

Note 1: A child in this range is very tall. Tallness is rarely a problem, unless it is so excessive that it may indicate an endocrine disorder such as a growth-hormone-producing tumour. Refer a child in this range for assessment if there is suspicion of an endocrine disorder (e.g. if parents of normal height have a child who is excessively tall for his or her age).

Note 2: A child whose weight-for-age falls in this range may have a growth problem, but this is better assessed with weight-for-length/height.

Note 3: A plotted point above 1 shows possible risk of overweight. A trend towards the 2 z-score line shows definite risk of overweight.

Note 4: It is possible for a stunted or severely stunted child to be overweight.

Note 5: This is referred to as very low weight in Integrated Management of Childhood Illness training modules.

faltering. Growth faltering is common in the first 2 years of life, and may be the first sign of inadequate feeding in an otherwise healthy child. The child may be less active than others of the same age. Sometimes growth faltering is due to illness or abnormality. When a child is ill, the weight may decrease. Following a period of growth faltering, a recovering child should gain weight more rapidly than the standard curves until he or she returns to his or her original growth trend.

Loss of weight

If a child's growth curve is falling, the child may be ill with an infection, for example, tuberculosis or AIDS. Children who are losing weight need a full assessment according to the Integrated Management of Childhood Illness (IMCI) guidelines and should be referred if they have any serious illness or danger sign. If acute malnutrition due to a shortage of food in the household is the likely reason for the weight loss, and there are no other complications, the child can be managed in the community (see **Session 6.2**). Close follow-up is needed to ensure that weight gain is achieved within two weeks.

Rapid rise in the growth curve

Any sharp increase in a child's growth requires attention. If a child has been ill or undernourished, a rapid rise is expected during the re-feeding period as the child experiences "catch-up" growth. Otherwise, a sharp increase may indicate inappropriate feeding practices that can lead to overweight.

If a child has gained weight rapidly, it is important to look also at height. If only the weight increased, this is a problem. If weight and height increased proportionately, this is probably catch-up growth from previous undernutrition. In this situation, the weight-for-age and height-for-age curves should both rise, but the weight-for-height growth curve follows along the standard curves.

Even if a child is overweight and trying to lose weight, he or she should not have a sharp decrease in the growth curve, as losing too much weight rapidly is undesirable. The overweight child should instead maintain his weight while increasing in height, i.e. the child should "grow into his weight."

5.4.2 Taking a feeding history

During any contact with a mother and child, it is important to ask how feeding is progressing.

BOX 11

Feeding History Job Aid, infants 0–6 months

Age of child
Particular concerns about feeding of child

Feeding
- Milk (breast milk, formula, cow milk, other)
- Frequency of milk feeds
- Length of breastfeeds/quantity of other milks
- Night feeds
- Other foods in addition to milk (when started, what, frequency)
- Other fluids in addition to milk (when started, what, frequency)
- Use of bottles and how cleaned
- Feeding difficulties (breastfeeding/other feeding)

Health
- Growth chart (birth weight, weight now, length)
- Urine frequency per day (6 times or more, if less than 6 months)
- Stools (frequency, consistency)
- Illnesses

Pregnancy, birth, early feeds (where applicable)
- Antenatal care
- Feeding discussed at antenatal care
- Delivery experience
- Rooming-in
- Pre-lacteal feeds
- Postnatal help with feeding

Mother's condition and family planning
- Age
- Health – including nutrition and medications
- Breast health
- Family planning

Previous infant feeding experience
- Number of previous babies
- How many breastfed and for how long
- If breastfed – exclusive or mixed-fed
- Other feeding experiences

Family and social situation
- Work situation
- Economic situation
- Family's attitude to infant feeding practices

Simple open questions can generate a great deal of information.

Taking a feeding history in infants 0–6 months of age

When a child is not growing well or the mother has a feeding difficulty, it is useful to conduct a detailed feeding history. The Feeding History Job Aid for infants 0–6 months in **Box 11** summarizes key topics to cover in a counselling session with a mother with an infant less than 6 months of age. The form is not a questionnaire, and it may not be necessary to cover all topics in a conversation with the mother. Concentrate on those that are relevant according to the child's age and situation. Ask the mother about the child and how he or she is fed, about herself, the family and their social situation using listening and learning skills.

Taking a feeding history in children 6–23 months of age

To learn more details about how a child over the age of 6 months is fed, you need to follow the history for younger infants (**Box 11**), and in addition ask relevant questions listed in **Box 12**. Again, this is not a questionnaire, but a reminder about the important things to learn which will help you to counsel and guide the mother to feed her child adequately.

These questions are combined into the Food Intake Reference Tool (see **Session 5.6**), which you can use to help you decide on the information and messages that a mother needs when you counsel her.

5.4.3 Observing a breastfeed

At all contacts with lactating mothers of infants under 2 months of age, observe a breastfeed. After the age of 2 months, include an observation if a mother has any feeding difficulty or if the infant has growth faltering or low weight-for-age.

The Breastfeed Observation Job Aid in **Box 13** is a tool to assist in observing a breastfeed. If the baby has just breastfed or is fast asleep, it may take some time before he or she is ready to breastfeed again. To initiate an observation:

- Ask the mother whether she could offer her baby the breast and to breastfeed in her usual way.
- Try to observe a complete feed, to see how long the baby suckles for, and if he or she releases the breast by him- or herself.

If the mother has obvious difficulties, it may be appropriate to interrupt the feed in order to help her to improve positioning and attachment while the baby is still hungry (see **Session 4.5**).

The signs of good positioning and attachment are explained in more detail in **Session 2.8**.

While observing a feed, make a tick in the small box beside any sign observed. If a sign is not seen, simply leave the box empty.

Signs down the left side of the form show that breastfeeding is going well. Signs down the right side of the form show that there may be a difficulty. If there are some ticks down the right side, then the mother needs help, even if there are also ticks down the left side.

BOX 12

Feeding History Job Aid, children 6–23 months

- Is the child still breastfed?
  - How many times per day? Day and night?
  - If using expressed breast milk, how is the milk stored and given?
- What other foods is the child receiving?
  - How many meals and snacks each day?
  - How much food at each meal?
  - What is the consistency of the main meals?
  - Do meals include: animal-source foods, dairy products, dark green vegetables or red or orange fruits or vegetables, pulses (beans, lentils, peas, nuts), oil?
  - Who helps the child to eat?
  - What bowl does the child get food from (his or her own bowl, or the family pot)?
  - Is the child given any vitamin or mineral supplements?
  - How does the child eat during sickness?

5.4.4 Assessing the health of the child and the mother

Assessing the health of the child

During feeding counselling it is important to assess the health status of the child using the systematic approach described in the *IMCI* guidelines (*7,8*), and manage the child accordingly.

Decide if the child has:

- cough or difficult breathing
- diarrhoea
- fever
- ear problems
- malnutrition or anaemia.

BOX 13

Breastfeed Observation Job Aid

Mother's name..... Date.....

Baby's name..... Baby's age.....

Signs that breastfeeding is going well:	Signs of possible difficulty:
GENERAL	
Mother:	*Mother:*
☐ Mother looks healthy	☐ Mother looks ill or depressed
☐ Mother relaxed and comfortable	☐ Mother looks tense and uncomfortable
☐ Signs of bonding between mother and baby	☐ No mother/baby eye contact
Baby:	*Baby:*
☐ Baby looks healthy	☐ Baby looks sleepy or ill
☐ Baby calm and relaxed	☐ Baby is restless or crying
☐ Baby reaches or roots for breast if hungry	☐ Baby does not reach or root
BREASTS	
☐ Breasts look healthy	☐ Breasts look red, swollen, or sore
☐ No pain or discomfort	☐ Breast or nipple painful
☐ Breast well supported with fingers away from nipple	☐ Breasts held with fingers on areola
☐ Nipple stands out, protractile	☐ Nipple flat, not protractile
BABY'S POSITION	
☐ Baby's head and body in line	☐ Baby's neck and head twisted to feed
☐ Baby held close to mother's body	☐ Baby not held close
☐ Baby's whole body supported	☐ Baby supported by head and neck
☐ Baby approaches breast, nose opposite nipple	☐ Baby approaches breast, lower lip to nipple
BABY'S ATTACHMENT	
☐ More areola seen above baby's top lip	☐ More areola seen below bottom lip
☐ Baby's mouth open wide	☐ Baby's mouth not open wide
☐ Lower lip turned outwards	☐ Lips pointing forward or turned in
☐ Baby's chin touches breast	☐ Baby's chin not touching breast
SUCKLING	
☐ Slow, deep sucks with pauses	☐ Rapid shallow sucks
☐ Cheeks round when suckling	☐ Cheeks pulled in when suckling
☐ Baby releases breast when finished	☐ Mother takes baby off the breast
☐ Mother notices signs of oxytocin reflex	☐ No signs of oxytocin reflex noticed

Recognize if the child has any signs of severe illness that require immediate referral:

- unconscious or lethargic
- severely malnourished
- not able to eat or drink
- not able to breastfeed even after help with attachment
- copious vomiting after all feeds.

Also check for conditions that can interfere with breastfeeding:

- blocked nose (makes suckling and breathing difficult)
- jaundice (baby may be sleepy and suckle less)
- thrush (*Candida*) (baby may take short feeds only, or may refuse to feed)
- cleft lip or palate (makes attachment difficult and baby may have low milk intake)
- tongue tie (makes attachment difficult, may cause sore nipples and low milk intake).

Assessing the health of the mother

During feeding counselling it is also important to enquire about the mother's own health status, her mental health, her social situation and her employment. These are all factors that will affect her ability to care for her young child. Important topics to address are listed in the Feeding History Job Aid (**Box 11**), and include:

- Observe the state of her nutrition, general health and breast health as part of the observation of a breastfeed.
- Try to learn her ideas about another pregnancy, and if she is adequately informed about family planning and has access to appropriate counselling.
- If a mother seems to have serious clinical or mental health problems or if she is taking regular medication, make an additional physical examination and refer as necessary for specialized treatment (see **Session 8**).
- If not recorded on medical records, ask the mother if she has been tested for HIV. If not, encourage her to do so (depending on current national guidance).

5.5 Managing problems and supporting good feeding practices

The results of the assessment are used to classify the mother and baby according to their situation and to decide on management. **Figure 15** summarizes three categories of actions that may be required, namely: *Refer urgently*; *Help with difficulties and poor practices and refer, if necessary*; *Support for good feeding practices*.

5.5.1 Refer urgently

Refer the infant or young child urgently to hospital if he or she:

- is unconscious or lethargic, and thus may be very ill;
- is severely malnourished;
- is not able to drink or eat anything;
- is not able to breastfeed even after help with attachment;
- vomits copiously, which may be both a sign of serious illness and of danger because he or she will not be able to take medications or fluids for rehydration.

There may be a need to give one or more treatments in the clinic before the infant or child leaves for hospital:

- Oral or intramuscular antibiotic for possible severe infection;
- Rectal or intramuscular antimalarial for severe malaria;
- If a child is still able to breastfeed, particularly if malnourished, ask the mother to continue offering the breast while being referred. Otherwise give sugar water to prevent low blood sugar (hypoglycaemia) by mixing 2 teaspoons (10 g) of sugar with half a glass (100 ml) of water;
- Ensure warmth, especially for newborn babies and malnourished children.

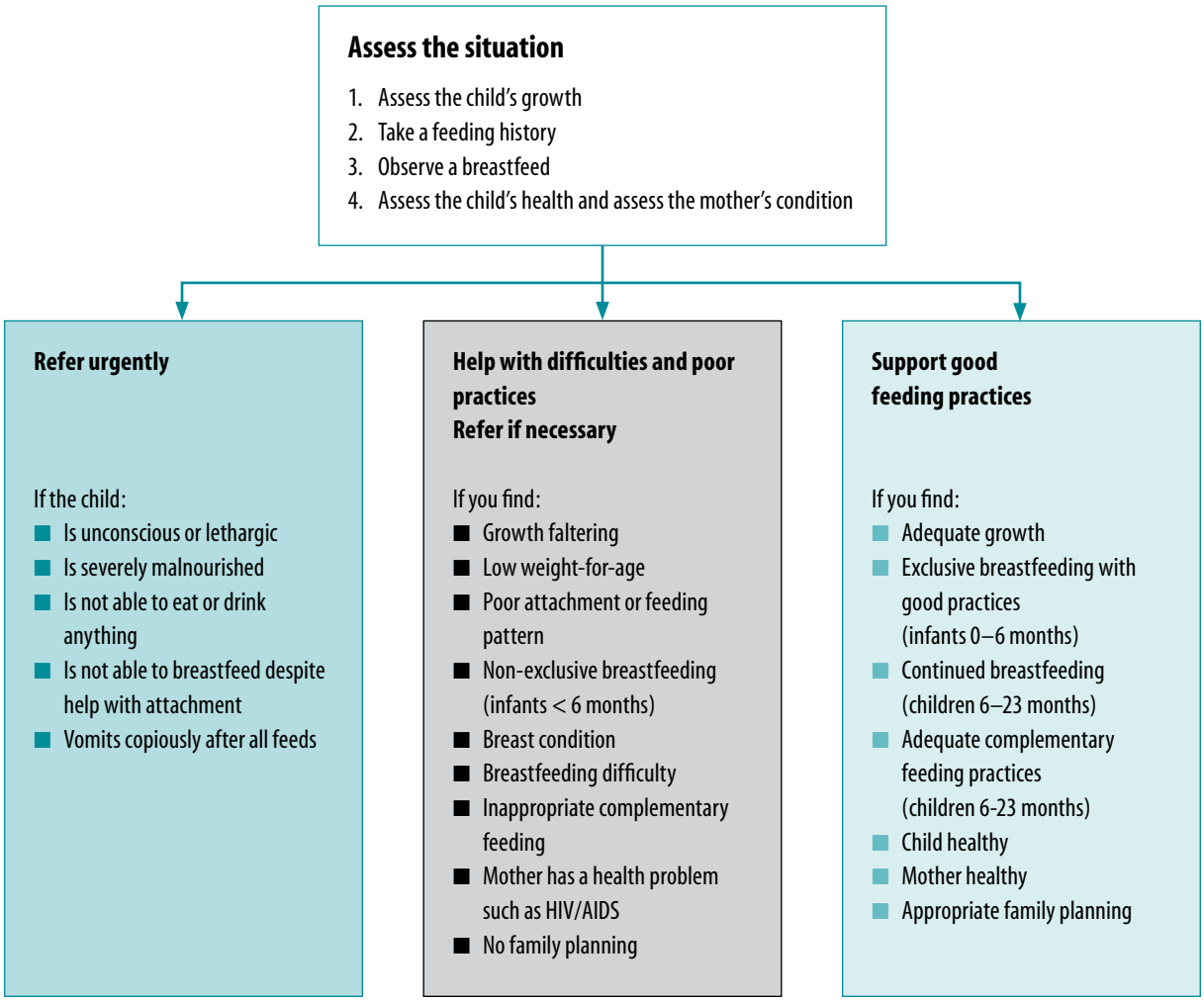
5.5.2 Help with difficulties and poor practices

Breastfeeding

Most feeding difficulties and poor practices can be managed with outpatient care or care in the community.

You may be concerned about poor practices, even though the mother is not aware of particular difficulties. You may need to help a mother to position and attach her baby at the breast to establish optimal and effective breastfeeding (see **Session 4.5**) and discuss with her how to improve her breastfeeding pattern.

FIGURE 15
Assessing and classifying infant and young child feeding



A mother may ask for help with a difficulty that she herself has become aware of. **Session 7** describes the most common feeding difficulties and summarizes key steps in their management.

Non-urgent referral may be necessary if more specialized help is needed than is available at your level. Refer children with:

- poor growth that continues despite health centre or community care;
- breastfeeding difficulties that do not respond to the usual management;
- abnormalities including cleft lip and palate, tongue tie, Down syndrome, cerebral palsy.

Complementary feeding

Sometimes a child over 6 months of age may be malnourished or growing poorly, or may not be eating well. Mothers and other caregivers may not complain of difficulties with complementary feeding, but their practices are not optimal. In either situation, you should recognise the need to counsel them about improving the way in which they feed the child.

Use the Food Intake Reference Tool (**Table 5**) to find out if the child is fed according to recommendations. Decide what information the mother needs, and what she is able to do to improve the child's feeding.

The first column contains questions about what the child has eaten in the previous 24 hours, to help you learn how the child is fed. The second column shows the ideal practice and the third column suggests a key

message to help you decide what information to give the mother about what she should do.

Sometimes a child may be gaining weight too fast compared to height and the child is at risk of becoming overweight. Using the Food Intake Reference Tool is still helpful to assess the child's diet, although it may be necessary to add some specific questions related to the consumption of energy-rich, centrally processed foods.

Mother's health

Mothers may need help to adopt better practices, or to overcome difficulties with their own health, nutrition, or family planning. **Session 8** discusses important issues that a health worker should address with mothers in an infant and young child feeding counselling contact.

Non-urgent referral may be necessary to obtain more specialized help than is available at health centre level. Refer mothers if they:

TABLE 5
Food Intake Reference Tool, children 6–23 months

FEEDING PRACTICE	IDEAL PRACTICE	KEY MESSAGE TO USE IN COUNSELLING THE MOTHER
Growth curve rising?	Growth follows the reference curve	Explain child's growth curve and praise good growth
Child received breast milk?	Frequently on demand, day and night	Breastfeeding for 2 years or longer helps a child to develop and grow strong and healthy
Child ate sufficient number of meals and snacks yesterday, for his or her age?	■ Child 6–8 months: 2–3 meals plus 1–2 snacks if hungry ■ Child 9–23 months: 3–4 meals plus 1–2 snacks if hungry	A growing child needs to eat often, several times a day according to age
Quantity of food eaten at main meal yesterday appropriate for child's age?	■ Child 6–8 months: start with a few spoons and gradually increase to approx. ½ cup at each meal ■ Child 9–11 months: approx. ½ cup at each meal ■ Child 12–23 months: approx. ¾ to 1 cup at each meal	A growing child needs increasing amounts of food
How many meals of a thick consistency did the child eat yesterday? (Use consistency photos as needed)	■ Child 6–8 months: 2–3 meals ■ Child 9–23 months: 3–4 meals	Foods that are thick enough to stay on the spoon give more energy to the child
Child ate an animal-source food yesterday (meat/fish/offal/bird/eggs)?	Animal-source foods should be eaten daily	Animal-source foods are especially good for children to help them grow strong and lively
Child ate a dairy product yesterday?	Give diary products daily	Milk, cheese and yogurt are especially good for children
Child ate pulses, nuts or seeds yesterday?	If meat is not eaten, pulses or nuts should be eaten daily – with vitamin-rich fruits to help absorb iron	Peas, beans, lentils and nuts help children to grow strong and lively, especially if eaten with fruit
Child ate red or orange vegetable or fruit, or a dark green vegetable yesterday?	A dark green vegetable or red or orange vegetable or fruit should be eaten daily	Dark green leaves and red or orange coloured fruits and vegetables help the child to have healthy eyes and fewer infections
Small amount of oil added to child's food yesterday?	A little oil or fat should be added to a meal each day	Oil gives a child more energy, but is only needed in small amounts
Mother assisted the child at meal times?	Mother assists and encourages the child to eat, but does not force	A child needs to learn to eat: encourage and give help responsively and with lots of patience
Child had his or her own bowl, or ate from family pot?	Child should have his or her own bowl of food	If a child has his/her own bowl, it makes it easier to see how much the child has eaten
Child took any vitamin or mineral supplements?	Vitamin and mineral supplements may be needed if child's needs are not met by food intake	Explain how to use vitamin and mineral supplements if they are needed
Child ill or recovering from an illness?	Continue to feed during illness and recovery	Encourage the child to drink and eat during illness, and provide extra food after illness to help the child recover quickly

- have a breast condition that does not respond to the usual management, or that requires medication or other treatment that is not available at the health facility;
- are on medication that may affect breastfeeding (see **Session 8**);
- have tested positive for HIV, and infant feeding counselling for this situation is not available at the health facility (see **Session 6.5**).

Child's health

Assessing the child according to the IMCI guidelines will help you decide whether the child needs urgent referral or treatment for a common childhood condition, such as diarrhoea, pneumonia or malaria. It will also help you decide whether a child needs vaccination or a micronutrient supplement, such as vitamin A.

5.5.3 Support good feeding practices

An important part of counselling a mother is active support and reinforcement of good feeding practices. Mothers may not be aware how important and valuable it is to continue them. Support and reinforcement are equally important if all her practices are already good, or if you are encouraging her to improve some which are not optimal. Praise helps to build her confidence.

Box 14 summarises the main points for supporting good practices.

5.5.4 Counsel the mother on her own health, nutrition and fertility

Feeding counselling also provides a unique opportunity to counsel mothers about their own nutrition and to ensure that they are fully informed and able to access family planning. If the mother is taking medication, there is only rarely a reason to advise her to stop breastfeeding. **Session 8** provides some more details on these issues and can be used for reference.

5.6 Follow-up

Follow-up and continuing care of all children is important, whether they have feeding difficulties or not, in order to support good practices, prevent difficulties and manage difficulties if they arise. Follow-up may take place at a health facility or on a home visit.

BOX 14

Supporting good feeding practices

If the infant is less than 6 months old:

- If the baby is growing well, point this out to the mother and praise her and the baby.
- Check breastfeeding position and attachment, and that the infant is suckling effectively.
- Check that the pattern of breastfeeding is optimal: feeding on demand day and night; letting the baby come off the breast by him- or herself; finishing the first breast and then offering the other one.
- Praise the mother's good practices, and encourage her to continue them.
- Explain about exclusive breastfeeding, remind the mother that she does not need to give anything else before the baby is 6 months old, and that feeding bottles are dangerous.
- Explain that this way of feeding the baby helps her to make plenty of milk.
- Explain about family planning methods and breastfeeding (see **Session 8.4**).
- At about 5 months of age, start to discuss complementary foods.
- Introduce complementary foods from 6 months (180 days) of age.

If the infant is more than 6 months old:

Praise the mother if the infant:

- is growing well, and is healthy
- is still breastfeeding.

Praise the mother or caretaker for the following good practices:

- if the infant has meals and snacks with sufficient frequency and quantity.
- if the quality of feeds is adequate, with appropriate variety of foods and adequate consistency.
- if she is assisting the baby to feed appropriately.
- if she is giving the child his or her own bowl.
- if she gives extra food to a child recovering from illness.

Remind the mother when to bring the child for immunization.

Remind the mother when to bring the child to a qualified health provider for signs of illness.

Follow-up of the infant or young child with feeding difficulties

Infants up to 6 months of age

- For a newborn with feeding difficulties, reassess after 1–2 days.
- For an infant older than one month with feeding difficulty: reassess after 2–5 days, depending on the severity of the infant's condition and convenience of the mother.

Reassessment includes:

- a general enquiry on progress;
- an enquiry about the mother's experience trying suggestions discussed at a previous contact;
- weighing the child and assessing growth;
- observation of a breastfeed;
- examination of the mother's breasts;
- assessment of the infant's health;
- if the mother has been expressing breast milk, checking whether she is managing to do this effectively and that her technique is satisfactory.

Continuing management:

- If the infant is not gaining weight or has persistent feeding difficulties, offer additional help and follow up again after 2–5 days, or consider referral. A child who has not gained weight on two consecutive visits or within 1 month needs to be referred.
- If the infant has gained weight and feeding difficulties are resolved, he or she should return for further follow-up after 2–4 weeks, and thereafter at the same time as children with no difficulties.

Children 6–23 months of age

Follow up after 5–7 days an infant or young child over 6 months of age with feeding difficulties. This reassessment should include:

- a general enquiry on progress, including breastfeeding and complementary feeding;
- an enquiry about the mother's experience trying suggestions discussed at previous contact;
- weighing the child and monitoring growth;
- general assessment of the infant's condition.

Continuing management:

- If the child is not gaining weight or has persistent feeding difficulties, offer additional help with new suggestions and follow-up again after 1–2 weeks.
- Make a home follow-up visit if possible and if not already made.
- If the child is still not gaining weight after 2 months, consider referral.
- If the infant or young child has gained weight and feeding difficulties are resolved, he or she should continue follow-up at the same frequency as children with no difficulties.
- A child with overweight should not have a sharp decline in weight as losing too much weight is undesirable. An overweight child should instead maintain weight while increasing height, i.e. the child should 'grow into his or her weight'.

Follow-up of children with no feeding difficulty

Infants and young children without any feeding difficulties also need follow-up at regular intervals for growth assessment and infant and young child feeding counselling, as described in the introduction to this Session.

Suggested intervals for feeding counselling and growth assessment for healthy full-term babies are:

- within 6 hours of delivery, and again within 2–3 days: birth weight, feeding counselling (position and attachment, colostrum and how milk "comes in", exclusive breastfeeding and optimal feeding pattern, expressing milk);[1]
- around day 7: feeding counselling and weighing (positioning and attachment, exclusive breastfeeding and optimal feeding pattern, avoidance of supplements);
- around 4 weeks: feeding counselling and assessing growth (positioning and attachment, exclusive breastfeeding and feeding pattern, sustaining confidence in breast-milk supply, avoiding supplements despite growth spurt);
- at 6 weeks: feeding counselling and assessing growth, postpartum care for the mother (family planning including the lactational amenorrhoea method (LAM, see **Session 8.4**)), immunization;

[1] Low-birth-weight babies may require additional support, in particular in the first weeks of their life (see **Session 6** for further guidance).

- At 3 and 4 months of age: continue assessing growth, continue to support exclusive breastfeeding and help with any difficulties, advise on immunization;
- At 5–6 months of age: continue assessing growth, provide guidance on starting complementary feeding;
- At 8–9 months, and 11–12 months: continue assessing growth, counselling on progress of complementary feeding and continued breastfeeding, advise on immunization.
- Every 2–3 months after these other contacts have stopped, up to at least 2 years of age.
- At other contacts with health care workers, for example, immunization or because the child is sick.

References

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Appropriate feeding in exceptionally difficult circumstances

One of the operational targets of the *Global Strategy for Infant and Young Child Feeding* addresses specifically the needs of mothers and children in exceptionally difficult circumstances. These circumstances include babies who are low birth weight, and infants and young children who are malnourished, who are living in emergency situations, or who are born to mothers living with HIV.

6.1 Low-birth-weight babies

A baby weighing less than 2500 g at birth is low birth weight (LBW). A baby less than 1500 g is very low birth weight (VLBW). LBW can be a consequence of preterm birth (before 37 weeks of completed gestation), small for gestational age (SGA, defined as weight for gestation less than the 10th percentile), or a combination of both. Intrauterine growth restriction (IUGR), defined as slower than normal velocity of growth, is usually responsible for SGA.

Being born with low birth weight is a disadvantage for the infant. LBW directly or indirectly may contribute to 60% to 80% of all neonatal deaths. LBW infants are also at higher risk of early growth retardation, infection, developmental delay, and death during infancy and childhood (*1*).

Nevertheless, experience from developed and developing countries has shown that appropriate care of LBW infants, including their feeding, temperature maintenance, hygienic cord and skin care, and early detection and treatment of infections can substantially reduce excess mortality (*2*,*3*).

This section deals with feeding low-birth-weight babies. It summarizes what, how, when and how much to feed to low-birth-weight babies. **Table 6** summarizes the information that is discussed in more detail in other parts of this Session.

6.1.1 What to feed?

A baby's own mother's milk is best for LBW infants of all gestational ages. Breast milk is especially adapted to the nutritional needs of LBW infants, and strong and consistent evidence (*1*) shows that feeding mother's own milk is associated with lower incidence of infections and better long-term outcomes.

Not all LBW infants are able to feed from the breast in the first days of life. For infants who are not able to breastfeed effectively, feeds have to be given by an alternative, oral feeding method (cup/paladai/spoon/direct expression into mouth) or by intra-gastric tube feeding (see **Session 4.6**).

In these situations, the options available for feeding the LBW infant are, in order of preference (*1*):

- expressed breast milk (EBM) (from his or her own mother);
- donor breast milk (*4*);

TABLE 6
Feeding low-birth-weight babies

	FEEDING LOW-BIRTH-WEIGHT BABIES		
	> 36 WEEKS GESTATIONAL AGE	32–36 WEEKS GESTATIONAL AGE	< 32 WEEKS GESTATIONAL AGE
WHAT	breast milk	breast milk, expressed or suckled from the breast	expressed breast milk
HOW	breastfeeding	cup, spoon, paladai (in addition to feeding at the breast)	intra-gastric tube
WHEN	■ start within one hour of birth ■ breastfeed at least every 3 hours	■ start within one hour of birth or as soon as the baby is clinically stable ■ feed every 2–3 hours	■ start 12–24 hours after birth ■ feed every 1–2 hours
HOW MUCH	feed on demand	see **Tables 7 and 8**	see **Tables 7 and 8**

- infant formula:
  - — standard infant formula for infants with birth weight >1500 g
  - — pre-term formula for infants with birth weight <1500 g;

A LBW baby who is not able to breastfeed usually needs care in a special newborn care unit. Every effort should be made to enable a mother to stay in or near this unit. Otherwise, she should spend as much time there as possible every day. When breastfeeding is established, care can continue at home with close follow-up.

A baby should have as much skin-to-skin contact with his or her mother as possible, to help both bonding and breastfeeding. If a baby is too sick to move, the mother should at least be able to talk to him or her, and to have hand contact.

A mother should be given skilled help to express her milk and to establish lactation starting, if possible, within 6 hours of birth. She should express at least 8 times in 24 hours, expressing at home if she is not staying in the health facility. The EBM can be given every 1–3 hours according to the age and weight of the baby.

Supplements of vitamin D and phosphate may be recommended as soon as oral or intra-gastric feeding commences for VLBW infants, and supplements of iron are recommended for all LBW infants from the age of 6 to 8 weeks.

6.1.2 How to feed?

Babies of 36 weeks gestational age or more can often suckle well enough at the breast to feed themselves fully. Help the mother to have skin-to-skin contact with the baby, and to let the baby try to suckle as soon as possible after delivery. Show the mother how to hold the baby in the underarm position, or hold with the arm from the side opposite the breast (see **Figure 16**). These positions are especially useful for very small babies. Make sure that the baby is well attached at the breast. When a LBW baby first suckles, he or she may pause quite often and for long periods during a feed, and may need to continue feeding for an hour. It is important not to take the baby off the breast during these pauses.

The baby should be allowed to suckle every three hours, or more frequently on demand. If a baby has difficulty suckling effectively, tires quickly at the breast or does not gain adequate weight, offer

FIGURE 16
Useful positions to hold a LBW baby for breastfeeding

a) The underarm position

b) Holding with the arm opposite the breast

expressed milk by cup after the breastfeed, or give alternate breast and cup feeds.

Babies of 32 to 36 weeks gestational age need to be fed partly or fully on EBM by cup or spoon until full breastfeeding can be established. Feeds can start as soon as the baby is clinically stable, if possible within one hour of birth, and should be given 2–3 hourly. To stimulate breastfeeding, these babies should be allowed to suckle or lick the breast as much as they wish. Expressing

BOX 15

How to express breast milk directly into a baby's mouth

Ask the mother to:

- Wash her hands
- Hold her baby skin-to skin, positioned as for a breastfeed, with the baby's mouth close to her nipple
- Express some drops of milk onto her nipple
- Wait until her baby is alert and opens the mouth widely
- Stimulate the baby if he or she appears sleepy
- Let the baby smell and lick the nipple and attempt to suck
- Let some breast milk fall into the baby's mouth
- Wait until the baby swallows before expressing more drops of breast milk
- When the baby has had enough, he or she will close the mouth and will take no more milk
- Ask the mother to repeat this every 1 to 2 hours if her baby is very small, or every 2 to 3 hours if her baby is bigger.

some breast milk directly into the baby's mouth gives the baby the taste of milk and stimulates the *sucking* and *swallowing* reflexes (see instructions in **Box 15**). Thereafter, offer the full amount of feed by cup (**Table 8**). The baby may not finish all the cup feed as he or she may have already had some milk from the breast. Reduce the cup feeds slowly if the baby starts suckling well. Bottle feeding should be avoided, as it may interfere with the baby learning to breastfeed.

Babies less than 32 weeks gestational age usually need to be fed by gastric tube. They should not receive any enteral feeds in the first 12–24 hours. **Table 7** shows the quantity of milk that a LBW baby fed by gastric tube needs each day and **Table 8** shows how much is needed at each feed. The quantity needs to be exact. However, babies less than < 1500g may need to receive some of these requirements as intravenous fluids, as they may not tolerate full enteral feeds.

The quantities in the table are calculated according to the baby's need for:

- 60 ml/kg on day 1, increasing by 10 or 20 ml per day over 7 days up to 160 ml/kg/day.
- 8 feeds in 24 hours.

If a baby has more than 8 feeds in 24 hours, the amount per feed must be reduced accordingly, to achieve the same total volume in 24 hours.

TABLE 7
Recommended fluid intake for LBW infants

DAY OF LIFE	FLUID REQUIREMENTS (ml/kg/day)		
	2000–2500 g	1500–2000 g	1000–1500 g
Day 1	60	60	60
Day 2	80	75	70
Day 3	100	90	80
Day 4	120	115	90
Day 5	140	130	110
Day 6	150	145	130
Day 7	160+	160	150*

* if the infant is on intravenous fluids, do not increase above 140 ml/kg/day

TABLE 8
Recommended feed volumes for LBW infants

DAY OF LIFE	FEED VOLUMES (ml)		
	2000–2500 g (3-HOURLY)	1500–2000 g (3-HOURLY)	1000–1500 g (EVERY 2 HOURS)*
Day 1	17	12	6
Day 2	22	16	7
Day 3	27	20	8
Day 4	32	24	9
Day 5	37	28	11
Day 6	40	32	13
Day 7	42	35	16

If the baby is cup feeding, add 5 ml per feed to allow for spillage and variability of infant's appetite.

* For infants with birth weight <1250 g who do not show signs of feeding readiness, start with small 1–2 ml feeds every 1–2 hours and give the rest of the fluid requirement as intravenous fluids.

Cup feeds

A baby who is cup fed (see **Figure 17**) needs to be offered 5 ml extra at each feed. This slightly larger amount allows for spillage with cup feeding. It is important to keep a record of the 24-hour total and ensure that it meets the required total ml/kg per day for the baby's weight.

FIGURE 17
Cup feeding a low-birth-weight baby

Quantities after 7 days

If the baby is still having EBM by cup or gastric tube after 7 days, increase the quantity given by 20 ml/kg each day until the baby is receiving 180 ml/kg per day. As the baby begins to breastfeed more frequently, the amount of EBM given by gastric tube or cup may be gradually reduced.

The baby's weight needs to be monitored. Babies weighing over 1500 grams at birth can be expected to regain their original birth weight after 1–2 weeks, while for babies with a birth weight below 1500 grams, this may take 2–3 weeks. Thereafter, average

weight gain should be 10–16 g/kg/day, with smaller babies gaining weight more rapidly. If weight gain is less than expected, the baby may not be able to take adequate amounts of milk. Common reasons include infection, hypothermia, thrush, anaemia, or infrequent feeds or less than required amounts of milk being offered. These should be corrected.

Discharge

A LBW baby can be discharged from hospital when he or she is:

- Breastfeeding effectively or the mother is confident using an alternative feeding method;
- Maintaining his or her own temperature between 36.5 °C and 37.5 °C for at least 3 consecutive days;
- Gaining weight, at least 15 g/kg for 3 consecutive days; and
- The mother is confident in her ability to care for her baby.

Before discharging a mother and her LBW baby from hospital, a discussion should take place with her on how she can be supported at home and in the community. If a mother lives a long distance from the hospital and it is difficult for her to return for a follow-up visit, her baby should not be discharged until he or she fully meets the criteria. If possible, the mother should stay with her baby to establish breastfeeding before discharge. She should be given the name and contact details of any local breastfeeding support groups, whether health facility or community based.

6.1.3 Follow up of LBW babies

The baby should have follow-up visits at least once 2–5 days after discharge, and at least weekly until fully breastfeeding and weighing more than 2.5 kg. Ideally these should be home visits by a community breastfeeding counsellor, or visits by the mother to a nearby health facility. Further follow-up can then continue monthly as for a term baby.

6.1.4 Kangaroo mother care

Kangaroo mother care (KMC) is a way in which a mother can give her LBW or small baby benefits similar to those provided by an incubator (*5*). The mother has more involvement in the baby's care; and she has extended skin-to-skin contact, which helps both breastfeeding and bonding, probably because it stimulates the release of prolactin and oxytocin from her pituitary gland. KMC helps a mother to develop a close relationship with her baby, and increases her confidence.

FIGURE 18
Baby in Kangaroo mother care position

Management

The mother keeps her baby in prolonged skin-to-skin contact day and night, in an upright position between her breasts (**Figure 18**). The baby is supported in this position by the mother's clothes, or by cloths tied around her chest. The baby's head is left free so that he or she can breathe, and the face can be seen. The baby wears a nappy for cleanliness and a cap to keep the head warm.

KMC has been shown to keep the baby warm, to stabilize his or her breathing and heart rate, and to reduce the risk of infection. It helps the mother to initiate breastfeeding earlier, and the baby to gain weight faster. Most routine care can be carried out while the baby remains in skin-to-skin contact. When the mother has to attend to her own needs, skin-to-skin contact can be continued by someone else, for example by the father or a grandparent, or the baby can be wrapped and put into a cot or on a bed until KMC can be continued.

It is not essential for a baby to be able to coordinate sucking and swallowing to be eligible for KMC. Other methods of feeding can be used until the baby is able to breastfeed. Close contact with the mother means that the baby is kept very near to her breasts, and can easily smell and lick milk expressed onto her nipple.

He or she can be given breast milk by direct expression into his mouth until able to attach well.

KMC should be continued for as long as necessary, which is usually until the baby is able to maintain his or her temperature, is breathing without difficulty and can breastfeed without the need for alternative methods of feeding. It is usually the baby who indicates that he or she is ready and 'wants to get out'. If the mother lives near the hospital or health facility the baby may be discharged breastfeeding and/or using an alternative feeding method, such as cup feeding with the mother's EBM.

The mother and her baby should be monitored regularly. In the first week after discharge, the baby should be weighed daily, if possible, and a health care worker should discuss any difficulties with the mother, providing her with support and encouragement. Monitoring should continue until the baby weighs more than 2.5 kg. When the baby becomes less tolerant of the position, the mother may reduce the time in KMC and then stop altogether over about a week. Once the baby has stopped KMC, monthly follow-up should be continued to monitor feeding, growth and development until the baby is several months old.

6.2 Severe malnutrition

Severe malnutrition in children 6–59 months of age is defined as weight-for-height less than -3 z-scores, or the presence of oedema of both feet, or a mid-upper arm circumference (MUAC) of less than 115 mm (see **Session 5.4**). Children with a MUAC <115 mm should be treated for severe malnutrition regardless of their weight-for-height.

There are no defined cut-off points for MUAC for infants less than 6 months. In this age group, visible severe wasting and oedema, in conjunction with difficulties in breastfeeding, are criteria for identifying infants who are severely malnourished.

Severely malnourished children are in need of special care both during the early rehabilitation phase and over the longer term. They are at risk of life-threatening complications such as hypoglycaemia, hypothermia, serious infections, dehydration, and severe electrolyte disturbances.

Malnourished infants and young children should be assessed clinically to look for associated complications. Above the age of 6 months, if the general condition of the child is good, and in particular if the appetite is maintained, the child can be treated at home with provision of a ready-to-use therapeutic food (RUTF), in addition to breastfeeding and complementary feeding, with weekly or bi-weekly follow-up by a trained health care provider (*6*).

The first form of RUTF was invented in the late 1990s. Products qualifying to be called RUTF are energy-dense mineral- and vitamin-enriched foods equivalent in formulation to Formula 100 (F100), which is recommended by WHO for the treatment of malnutrition in in-patient settings. However, recent studies have shown that RUTF promotes faster recovery from severe acute malnutrition than standard F100. It has little available water (low water activity), which means that it is microbiologically safe, will keep for several months in simple packaging and can be made easily using low-tech production methods. RUTF is eaten uncooked, and is an ideal vehicle to deliver many micronutrients that might otherwise be broken down by cooking. RUTF is useful to treat severe malnutrition without complications in communities with limited access to appropriate local diets for nutritional rehabilitation. As full replacement of the normal diet, 150–220 kcal/kg per day should be provided until the child has gained 15% to 20% of his or her weight.

However, if a child has severe malnutrition with an associated complication, most commonly an infection, the child should be admitted to hospital (*7,8*). Infections are the most common complications, and can manifest themselves by lack of appetite only. The initial management should include prevention or treatment of hypoglycaemia, hypothermia, dehydration and infection, and regular feeding and monitoring. A special therapeutic formula diet, F75, is required. In the initial phase, a child's metabolic state is fragile, and feeding must be cautious, with frequent small feeds of low osmolarity and low in lactose. If a child is breastfed, this should be continued while ensuring that adequate amounts of F75 are given. When a child improves and his or her appetite is returning, he or she should be given a special diet adapted for catch-up growth. A child aged more than 6 months can be offered RUTF. If intake is satisfactory, treatment can continue at home, with weekly or bi-weekly follow-up.

For infants aged less than 6 months, continued frequent breastfeeding is important, in addition to any necessary therapeutic feeds. If breastfeeding has been discontinued or if breast-milk production has decreased, it can often be re-established by use of the supplementary suckling technique with therapeutic feeding (see **Session 6.4**). Relactation by supplementary suckling, or by allowing the baby to suckle as often as he or she is willing while cup feeding, is an important

part of management (*9*). Malnutrition often has its origin in inadequate or disrupted breastfeeding.

6.3 Infants and young children living in emergency situations

Why infant and young child feeding is exceptionally vulnerable in emergencies

In emergencies infants and young children are more likely than older children or adults to become ill and die from malnutrition and disease (*10*). Optimal feeding is often disrupted because of lack of basic resources such as shelter and water, and physical and mental stress on families. Breastfeeding may stop because mothers are ill, traumatised, or separated from their babies, and yet it is particularly valuable in emergency situations (*11*). Artificial feeding is more dangerous because of poor hygiene, lack of clean water and fuel, and unreliability of supplies. There may be no food suitable for complementary feeding, or facilities for preparing feeds and storing food safely.

Breast-milk substitutes including infant formula and feeding bottles may be sent to emergency situations in inappropriate amounts by donors who believe that they are urgently required, but who are poorly informed about the real needs. Without proper controls, these supplies are often given freely to families who do not need them, and stocks run out before more arrive for those who might have a genuine need (*12*). The result is inappropriate and unsafe use of breast-milk substitutes, and a dangerous and unnecessary increase in early cessation of breastfeeding. Babies may be given unsuitable foods, such as dried skimmed milk, because nothing else is available.

Management in emergencies

The principles and recommendations for feeding infants and young children in emergency situations are exactly the same as for infants in ordinary circumstances. For the majority, the emphasis should be on protecting, promoting and supporting breastfeeding, and ensuring timely, safe and appropriate complementary feeding. Most malnourished mothers can continue to breastfeed while they are being fed and treated themselves. A minority of infants will need to be fed on breast-milk substitutes, short term or long term. This may be necessary if their mothers are dead or absent, or too ill or traumatised to breastfeed, and no wet-nurses are available; or for infants who have been artificially fed prior to the emergency or whose HIV-positive mothers choose not to breastfeed.

Supportive general conditions

A number of general conditions can greatly benefit infant and young child feeding, and staff who are managing an emergency response should endeavour to establish them:

Recognition of vulnerable groups: Pregnant women, infants under 6 months, and young children between 6 and 24 months should be counted and registered separately. Newborn infants should be registered immediately, and the household made eligible for an additional ration for the breastfeeding mother and food suitable for complementary feeding of young children, when appropriate.

Adequate food, water and nutrients: Mothers should receive an adequate general ration, and sufficient drinking water. If the full general ration is not available, food and micronutrient supplements should be provided as a priority for pregnant and lactating women.

Shelter and privacy: Shelters for families should be provided in preference to communal shelters. Breastfeeding women need private areas (as culturally appropriate) at distribution or registration points, and rest areas in transit sites.

Community support: Women need support from their family and communities, so the population should be helped to settle in familiar groups.

Reduction of demands on time: People spend hours queuing for relief commodities such as food, water, and fuel, which is difficult for mothers caring for young children. Priority access for mothers and other caregivers enables them to give children more time. Sanitary washing facilities should be set up near the area assigned to women with infants.

Specific help with feeding in emergencies

In addition to supportive general conditions, mothers need help with infant and young child feeding specifically. An emergency response should aim to include the following forms of support:

Baby-friendly maternity care: The Ten Steps for Successful Breastfeeding (see **Session 4.1**, **Box 5**) should be implemented at both health facilities and for home deliveries. Skilled support from trained breastfeeding counsellors and community groups is needed antenatally and in the first weeks after delivery.

Availability of suitable complementary foods: In addition to breast milk, infants and young children from 6 months onwards need complementary foods that

are hygienically prepared and easy to eat and digest. Blended foods, especially if they are fortified with essential nutrients, can be useful for feeding older infants and young children. However, their provision should not interfere with promoting the use of local ingredients and other donated commodities for preparing suitable complementary foods (see **Session 3**). The use of feeding bottles should continue to be discouraged.

Skilled help in the community to:

- teach mothers how to breastfeed and continue to support them until their infant reaches 24 months;
- teach mothers about adequate complementary feeding from 6 months of age using available ingredients;
- support mothers to practise responsive feeding;
- identify and help mothers with difficulties, and follow them up at home if possible;
- monitor the growth of infants and young children, and counsel the mother accordingly.

Adequate health services to:

- support breastfeeding and complementary feeding;
- help mothers to express their milk and cup feed any infant who is too small or sick to breastfeed;
- search actively for malnourished infants and young children so that their condition can be assessed and treated;
- admit mothers of sick or malnourished infants to the health or nutrition rehabilitation clinic with their children;
- help mothers of malnourished infants to relactate and achieve adequate breastfeeding before discharge from care, in addition to necessary therapeutic feeding.

Controlled use of breast-milk substitutes (BMS): Breast-milk substitutes should be procured and distributed as part of the regular inventory of foods and medicines, in quantities only as needed (see also UNHCR policy (*13*)). There should be clear criteria for their use, agreed by the different agencies that are involved for each particular situation (*14*), but usually including the following:

- If a child's mother has died or is unavoidably absent.
- If a mother is very ill (temporary use may be all that is necessary).
- If a mother is relactating (temporary use).
- If a mother tests HIV-positive and chooses to use a breast-milk substitute (see **Session 6.5**).
- If a mother rejects the infant, for example after rape (temporary use may be all that is necessary).
- If an infant (born before the emergency) is already dependent on artificial feeding (use BMS to at least six months or use temporarily until relactation is achieved).

For an infant identified according to agreed criteria as in need of BMS, supplies should be provided for as long as the infant needs them. Caregivers should receive guidance about hygienic and appropriate feeding with BMS (*10*). Every effort should be made to prevent "spill over" of artificial feeding to mothers and babies who do not need it, by teaching the caregiver privately to prepare feeds, and by taking care not to display containers of BMS publicly.

6.4 Relactation

The re-establishment of breastfeeding is an important management option in emergency situations, and for infants who are malnourished or ill (*9*).

Motivation and support

Most women can relactate any number of years after their last child, but it is easier for women who stopped breastfeeding recently, or if the infant still suckles sometimes. A woman needs to be highly motivated, and well supported by health care workers. Continuing support can be provided by community health workers, mother support groups, women friends, older women and traditional birth attendants.

Stimulation of the breasts

Stimulation of the breasts is essential, preferably by the infant suckling as often and for as long as possible. Many infants who have breastfed before are willing to suckle, even if there is not much milk being produced currently. Suckling causes release of prolactin, which stimulates growth of alveoli in the breast and the production of breast milk. The mother and infant must stay together all the time. Skin-to-skin contact, or kangaroo mother care (see **Session 6.1.4**) are helpful. If the infant is willing to suckle, the mother should put him or her to the breast frequently, at least 8–12 times every 24 hours, ensuring that attachment is good. If

the infant is not willing to suckle, she can start the relactation process by stimulating her breasts with gentle breast massage and then with 20–30 minutes of hand expression 8–12 times a day.

Supplementary feeds for the infant

The infant needs a temporary supplement, which can be expressed milk, artificial milk or therapeutic formula. The full amount of supplement should be given initially, in a way that encourages the infant to resume breastfeeding, by cup or supplementer (see below). Avoid using feeding bottles or pacifiers. Whenever the baby wants to suckle, he or she should do so from the breast. For infants who are not willing to suckle at the breast, the supplementary suckling technique is useful.

The supplementary suckling technique

This technique usually needs to be practised under supervision at a health facility. A breastfeeding supplementer consists of a tube which leads from a cup of supplement to the breast, and which goes along the nipple and into the infant's mouth. The infant suckles and stimulates the breast at the same time drawing the supplement through the tube, and is thereby nourished and satisfied (see **Figure 19**). A fine nasogastric tube (gauge 8) or other fine plastic tubing should be used. The mother can control the flow by raising or lowering the cup so that the infant suckles for about 30 minutes at each feed. If the tube is wide, a knot can be tied in it, or it can be pinched. The cup and tube should be cleaned and sterilized each time she uses them.

Encourage the mother to let the infant suckle on the breast at any time that he or she is willing – not just when she is giving the supplement. When the infant is willing to suckle at the breast without the supplement, then she can start giving breast milk by cup instead. This should be more feasible in home conditions.

Quantity of supplement to give

The full amount of milk normally required by a term baby is 150 ml/kg body weight per day. To start relactation, give the full amount of supplement each day. Divide this into six to twelve feeds depending on the infant's age and condition. Young, weak or sick infants will need more frequent, smaller, feeds.

Monitor the infant's weight and urine production (see **Session 7.10**). When the infant is gaining weight, and there are signs of breast-milk production, the supplement can be reduced, by 50 ml per day every few days.

FIGURE 19
Using supplementary suckling to help a mother to relactate

Signs that breast milk is being produced

Breast-milk production may start in a few days or a few weeks. Signs include:

- *Breast changes*: The breasts feel fuller or firmer, or milk leaks or can be expressed.
- *Less supplement consumed*: The infant takes less supplement while continuing to gain weight.
- *Stool changes*: The infant's stools become softer, more like those of a breastfed infant.

Lactogogues

Drugs (called lactogogues) are sometimes used to stimulate increased lactation, if the above measures are not effective by themselves. Drugs used are *metoclopramide* (given 10 mg 3 times a day for 7–14 days) or *domperidone* (given 20–40 mg 3 times a day for 7–10 days). However, drugs help only if the woman also receives adequate help and her breasts are fully stimulated by the infant suckling.

Follow-up

When relactation is well under way, the mother-baby pair can be discharged for daily community-level follow-up, with checks as often as possible from health and nutrition workers.

6.5 Infants of HIV-positive mothers

Feeding infants of HIV-positive mothers is a major concern of governments and agencies concerned with infant feeding. The aim of preventing mother-to-child transmission of HIV (MTCT) through breastfeeding

needs to be balanced with the need to support optimal nutrition of all infants through exclusive and continued breastfeeding and adequate complementary feeding.

Mother-to-child transmission of HIV

In 2007, about 2.5 million children under 15 years of age were living with HIV, and an estimated 420 000 children were newly infected. The predominant source of HIV infection in young children is MTCT. The virus may be transmitted during pregnancy, labour and delivery, or during breastfeeding (*15*). Without intervention, an estimated 5%–20% of infants born to HIV-infected women acquire the infection through breastfeeding. Transmission can occur at any time while a child is breastfeeding, and continuing to breastfeed until the child is older increases the overall risk. Exclusive breastfeeding in the first few months of life carries a lower risk of HIV transmission than mixed feeding (*16*).

The main factors which increase the risk of HIV transmission through breastfeeding include (*15*):

- acquiring HIV infection during breastfeeding, because of high initial viral load;
- the severity of the disease (as indicated by a low CD4+ count or high RNA viral load in the mother's blood, or severe clinical symptoms);
- poor breast health (e.g. mastitis, sub-clinical mastitis, fissured nipples);
- possibly, oral infection in the infant (thrush and herpes);
- non-exclusive breastfeeding (mixed feeding);
- longer duration of breastfeeding;
- possibly, nutritional status of the mother.

Current feeding recommendations (17,18)

The United Nations recommendations for feeding of infants by mothers who are HIV- infected include:[1]

- The most appropriate infant feeding option for an HIV-infected mother depends on her individual circumstances, including her health status and the local situation, but should take consideration of the health services available and the counselling and support she is likely to receive.
- Exclusive breastfeeding is recommended for HIV-infected mothers for the first 6 months of life unless replacement feeding is acceptable, feasible, affordable, sustainable and safe for them and their infants before that time (see Box 16 for definitions).
- When replacement feeding is acceptable, feasible, affordable, sustainable and safe, avoidance of all breastfeeding by HIV-infected mothers is recommended.
- All HIV-exposed infants should receive regular follow-up care and periodic re-assessment of infant feeding choices, particularly at the time of infant diagnosis and at 6 months.
- At 6 months, if adequate feeding from other sources cannot be ensured, HIV-infected women should continue to breastfeed their infants and give complementary foods in addition, and return for regular follow-up assessments. All breastfeeding should stop once an adequate diet without breast milk can be provided.
- Breastfed infants and young children who are HIV-infected should continue to breastfeed according to recommendations for the general population.

Women who need anti-retroviral drugs (ARVs) for their own health should receive them, as they are the women most likely to transmit HIV through breastfeeding. Comparative studies in women who do not yet require treatment on the safety and efficacy of ARVs taken during breastfeeding solely to reduce transmission are ongoing. There is increasing evidence from observational studies that women taking ARVs are likely to have a low risk of transmission (*18*).

Five priority areas for national governments in the context of the *Global Strategy* are proposed in *HIV and Infant Feeding: Framework for Priority Action* (*19*) that has been endorsed by nine United Nations agencies:

1. Develop or revise (as appropriate) a comprehensive national infant and young child feeding policy, which includes HIV and infant feeding.
2. Implement and enforce the International Code of Marketing of Breast-milk Substitutes and subsequent relevant World Health Assembly resolutions.
3. Intensify efforts to protect, promote and support appropriate infant and young child feeding practices in general, while recognising HIV as one of a number of exceptionally difficult circumstances.

[1] A full listing can be found in Annex 1 of the HIV and Infant Feeding Update (*18*).

4. Provide adequate support to HIV-positive women to enable them to select the best feeding option for themselves and their babies and to successfully carry out their infant feeding decisions.
5. Support research on HIV and infant feeding, including operations research, learning, monitoring and evaluation at all levels, and disseminate findings.

Counselling about feeding options (20,21)

All women should be made aware of the risk of MTCT in general, and that there is an increased risk of transmission if they become infected during breastfeeding. Women and their partners should be encouraged to accept HIV testing and counselling during pregnancy, so that they know their status, and so that they can take advantage of help that is available and make appropriate decisions before the baby is born.

Counselling about feeding options for HIV-positive women needs to start during pregnancy. HIV-positive women and their partners should be informed about:

- the risks of mother-to-child transmission of the virus;
- feeding options that are appropriate and feasible in the local context, considering national policies;
- the advantages and disadvantages of each feeding option.

They should also be made aware that:

- replacement feeding carries an increased risk for the child of morbidity and mortality associated with malnutrition and infectious diseases other than HIV, when compared with breastfeeding;
- mixed feeding carries both the risk of transmission of HIV and the risk of other infections and is the worst option;
- it is important for the mother to take care of her own health and nutrition, but that breastfeeding will not affect her health adversely;
- giving antiretroviral drugs to either the mother or the infant while breastfeeding can significantly reduce the risk of transmission;
- it is particularly important to practise safer sex when the baby is breastfeeding, because of the greater risk of transmission of HIV to the infant should the mother be infected at this time.

BOX 16

Definitions of Acceptable, Feasible, Affordable, Sustainable and Safe

Acceptable:
The mother perceives no significant barrier to choosing a feeding option for cultural or social reasons or for fear of stigma and discrimination.

Feasible:
The mother (or other family member) has adequate time, knowledge, skills and other resources to prepare feeds and to feed the infant, as well as the support to cope with family, community and social pressures.

Affordable:
The mother and family, with available community and/or health system support, can pay for the costs of replacement feeds – including all ingredients, fuel and clean water – without compromising the family's health and nutrition budget.

Sustainable:
The mother has access to a continuous and uninterrupted supply of all ingredients and commodities needed to implement the feeding option safely for as long as the infant needs it.

Safe:
Replacement foods are correctly and hygienically prepared and stored, and fed in nutritionally adequate quantities, with clean hands and using clean utensils, preferably by cup.

HIV-positive women should be given guidance to help them decide what is the best infant feeding method for their own situation, and they should be taught how to carry out their chosen method safely. Usually, only the two main feeding options (replacement feeding and exclusive breastfeeding) need to be discussed during counselling, but others may be explained if the woman appears interested.

Support for the chosen feeding method

If an HIV-positive mother chooses to give replacement feeding, she will need to be taught how to measure ingredients and how to prepare breast-milk substitutes hygienically (see **Box 17**) (*20*,*21*,*22*). Programmes should try to improve conditions that make replacement feeding safer for HIV-infected mothers and families (*23*).

If an HIV-positive mother chooses to breastfeed her baby herself, she should be given support to help her to breastfeed exclusively (*17*), with a good technique to ensure a plentiful supply of milk and to prevent mastitis and sore nipples; and guidance about treating these conditions early should they occur (see **Session 7.7**).

If an HIV-positive mother chooses to stop breastfeeding early, she will need help to change to replacement feeding and to stop breastfeeding completely over a time period of a few days to 2–3 weeks. She will need support to:

- express her breast milk and accustom the baby to cup feeding of EBM;
- gradually reduce breastfeeds, and replace them with EBM;
- change from EBM to replacement feeds given by cup; if the baby is receiving replacement feeds and EBM at the same time, then the EBM should be heat treated;
- comfort the baby by cuddling, rubbing and rocking, and by giving him or her a finger or forearm to suck on. Also accustom the baby to means of comfort provided by people other than the mother;
- keep her breasts healthy, by expressing enough milk to prevent engorgement until milk production stops. The milk should be discarded, or if used to feed the infant, it should be heat treated;
- disclose to a member of the family the reasons for stopping breastfeeding if she has not already done so, and gain the family's support for the transition period.

HIV-positive women who choose to express and heat treat their milk, need guidance on expression, heat treatment, cup feeding and quantities of EBM to give. If a family decides on a wet-nurse, she will need all the support that a breastfeeding mother needs, and counselling about avoiding any risk of HIV infection while she is feeding the baby (*24*).

All mothers and caregivers should receive follow-up care for at least 2 years to ensure that the child is adequately fed and growing and that other foods are introduced when the child is 6 months old (see **Session 3** and below)

Home-modified animal milk is no longer recommended as a replacement feeding option to be used for all of the first 6 months of life. It does not provide all the nutrients that an infant needs, and the

BOX 17

Replacement feeding

Replacement feeding is the process of feeding a child who is not breastfeeding with a diet that provides all the nutrients the child needs, until the child is fully fed on family food.

Replacement feeding includes replacement of breast milk with a suitable breast-milk substitute in the first 6 months of life, and ensuring adequate complementary food and replacement of breast milk from 6 months to 2 years. This is the period during which a child is at greatest risk from malnutrition.

To replace breast milk, a child needs a breast-milk substitute of suitable composition, and of which the supply is reliable and uninterrupted. Heat-treated expressed breast milk can also be used (though not strictly a replacement feed, it needs hygienic preparation and measuring so is included here).

To prepare feeds, a mother or caretaker needs water, soap, fuel and utensils, time to make the feeds, and knowledge of how to prepare them accurately and hygienically. She needs detailed guidance on how to measure milk, water and other ingredients and how to clean utensils.

Commercial infant formula must be prepared carefully according to the instructions on the label, and given in quantities appropriate for the child's weight and age. Information about the volume of feeds is also included on the label.

Heat-treated breast milk. The mother expresses enough milk for one or two feeds, and then heats it to boiling in a small pan, or in a small metal container standing in a pan of water. She leaves the milk to cool in a clean, covered container, and feeds it by cup.

Volume of milk required :

- Give 150 ml of prepared milk per kg of the child's body weight per day, divided into 8 feeds in 24 hours.
- For the first few days of life, start with 60 ml/kg per day on the first day, and increase the total by 20 ml/kg per day, dividing into 8 feeds in 24 hours.

After complementary foods are introduced, milk feeds continue at approximately the same amount as is given to the child at 6 months of age, but may vary according to availability of milk and other foods and the child's demands.

micronutrient mix originally recommended to be added to it is not available (*25*). For women who choose replacement feeding, home-modified animal milk should only be used for short times when commercial infant formula is not available. For infants 6 months of age and older, undiluted animal milks can be added to the diet, and serve as a suitable substitute for breast milk. The recommended volumes are 200–400 ml per day if adequate amounts of other animal source foods are consumed regularly, otherwise 300–500 ml per day (*26*).

Baby-friendly hospitals and HIV

Baby-friendly hospitals have a responsibility to care for and support both HIV-positive and HIV-negative women.

- If a mother is HIV-positive, and after counselling has chosen replacement feeding, this is an acceptable medical reason for giving artificial feeds, and is thus compatible with a hospital being baby-friendly. The staff should support her in her choice, and teach her how to prepare feeds safely. However, they should give this help privately, and not in front of other women who may not be HIV-positive. This is necessary both to comply with the Code, and also to prevent the spillover of artificial feeding to women who do not need it. These women may lose confidence and interest in their own milk if they see replacement feeds being prepared.
- If an HIV-positive mother chooses breastfeeding, the staff have an equal responsibility to support her to breastfeed exclusively, and to ensure that she learns a good technique.
- For women who are HIV-negative or of unknown status, staff should make sure that they are fully informed and supported to breastfeed optimally.

Although baby-friendly hospitals should not accept free or low-cost supplies of breast-milk substitutes from manufacturers or distributors, the government may supply them or the hospital or mothers may purchase them for use during the hospital stay. Only the quantity that is actually needed should be available in the hospital, and distribution should be carefully controlled.

A course for hospital administrators provides guidance for how to implement the baby-friendly *Ten Steps* in settings with high HIV prevalence (*27*).

6.6 Feeding non-breastfed children 6–23 months of age

Guiding principles

Sometimes young children between the ages of 6 months and 2 years are not breastfed. Reasons include when their mother is unavailable, or has died, or is HIV-positive. These children need extra food to compensate for not receiving breast milk, which can provide one half of their energy and nutrient needs from 6 to 12 months, and one third of their needs from 12–23 months (*26*).

To feed children aged 6–23 months satisfactorily, all the principles of safe, adequate complementary feeding apply, as described in **Session 3**. However, to cover the requirements that would otherwise be covered by breast milk, a child needs to be fed a larger quantity of the foods containing high-quality nutrients.

This can be achieved by giving the child:

- extra meals, to help ensure that sufficient amounts of energy and nutrients are eaten;
- meals of greater energy density, to help ensure that sufficient energy is consumed;
- larger quantities of foods of animal origin to help ensure that enough nutrients are eaten;
- nutrient supplements, if foods of animal origin are not available.

Extra meals

Non-breastfed children need to eat meals 4–5 times per day with additional nutritional snacks 1–2 times per day as desired.

Energy density of meals

Foods of thick consistency, or with some added fat, help to ensure an adequate intake of energy for a child.

Foods of animal origin

Some meat, poultry, fish, or offal should be eaten every day to ensure that the child gets enough iron and other nutrients (see **Table 3** in **Session 3.3**).

Dairy products are important to provide calcium. A child needs 200–400 ml of milk or yoghurt every day if other animal source foods are eaten, or 300–500 ml per day if no other animal source foods are eaten.

Vegetable foods

The child should be given pulses daily to help provide iron and vitamins, with vitamin C-rich foods to help iron absorption.

The child should also be given orange and yellow fruits and dark-green leafy vegetables to provide vitamin A and other vitamins.

Micronutrient supplements

If the child receives no foods of animal origin, then it is necessary to give vitamin and mineral supplements to ensure sufficient intake, particularly of iron, zinc, calcium and vitamin B12.

Follow-up of Infants and young children who are not breastfed

The same principles of follow-up and referral apply to non-breastfed children as to breastfed children (see **Session 5.6**). They should be followed up regularly for at least 2 years to ensure that their feeding is adequate, and that they are growing and remaining well-nourished.

All infants of HIV-positive mothers, at whatever age they stop breastfeeding, should be followed up for at least 2 years to ensure that their feeding is adequate, and to establish if they are HIV-positive themselves.

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Management of breast conditions and other breastfeeding difficulties

This section discusses the symptoms, causes and management of breastfeeding difficulties referred to in Session 5, classified under "Help with difficulties and poor practices. Refer if necessary". Those discussed here include breast conditions and other breastfeeding difficulties, twins, a mother separated from her baby, a child with sickness, abnormality or a condition that interferes with suckling, and conditions of the mother. Growth faltering and non-exclusive breastfeeding are discussed in Session 5.4; complementary feeding difficulties in Session 5.5; and low–birth-weight infants in Session 6.1.

7.1 Full breasts

Symptoms: Full breasts occur from 3–5 days after delivery when the breast milk "comes in". The mother feels uncomfortable and her breasts feel heavy, hot and hard. Sometimes they are lumpy. The milk flows well, and sometimes drips from the breast.

Cause: This is normal fullness.

Management: The baby needs to be well attached, and to breastfeed frequently to remove the milk. The fullness decreases after a feed, and after a few days the breasts become more comfortable as milk production adjusts to the baby's needs.

7.2 Breast engorgement (*1*)

Symptoms: The breasts are swollen and oedematous, and the skin looks shiny and diffusely red. Usually the whole of both breasts are affected, and they are painful. The woman may have a fever that usually subsides in 24 hours. The nipples may become stretched tight and flat which makes it difficult for the baby to attach and remove the milk. The milk does not flow well.

Cause: Failure to remove breast milk, especially in the first few days after delivery when the milk comes in and fills the breast, and at the same time blood flow to the breasts increases, causing congestion. The common reasons why milk is not removed adequately are delayed initiation of breastfeeding, infrequent feeds, poor attachment and ineffective suckling.

Management:

- The mother must remove the breast milk. If the baby can attach well and suckle, then she should breastfeed as frequently as the baby is willing. If the baby is not able to attach and suckle effectively, she should express her milk by hand or with a pump a few times until the breasts are softer, so that the baby can attach better, and then get him or her to breastfeed frequently.
- She can apply warm compresses to the breast or take a warm shower before expressing, which helps the milk to flow. She can use cold compresses after feeding or expressing, which helps to reduce the oedema.
- Engorgement occurs less often in baby-friendly hospitals which practise the Ten Steps and which help mothers to start breastfeeding soon after delivery.

7.3 Blocked duct

Symptoms: A tender, localised lump in one breast, with redness in the skin over the lump.

Cause: Failure to remove milk from part of the breast, which may be due to infrequent breastfeeds, poor attachment, tight clothing or trauma to the breast. Sometimes the duct to one part of the breast is blocked by thickened milk.

Management: Improve removal of milk and correct the underlying cause.

- The mother should feed from the affected breast frequently and gently massage the breast over the lump while her baby is suckling.
- Some mothers find it helpful to apply warm compresses, and to vary the position of the baby (across her body or under her arm).
- Sometimes after gentle massage over the lump, a string of the thickened milk comes out through the nipple, followed by a stream of milk, and rapid relief of the blocked duct.

7.4 Mastitis (*2*)

Symptoms: There is a hard swelling in the breast, with redness of the overlying skin and severe pain. Usually only a part of one breast is affected, which is different from engorgement, when the whole of both breasts are affected. The woman has fever and feels ill. Mastitis is commonest in the first 2–3 weeks after delivery but can occur at any time.

Causes: An important cause is long gaps between feeds, for example when the mother is busy or resumes employment outside the home, or when the baby starts sleeping through the night. Other causes include poor attachment, with incomplete removal of milk; unrelieved engorgement; frequent pressure on one part of the breast from fingers or tight clothing; and trauma. Mastitis is usually caused in the first place by milk staying in the breast, or *milk stasis*, which results in *non-infective inflammation*. Infection may supervene if the stasis persists, or if the woman also has a nipple fissure that becomes infected. The condition may then become *infective mastitis*.

Management: Improve the removal of milk and try to correct any specific cause that is identified.

- Advise the mother to rest, to breastfeed the baby frequently and to avoid leaving long gaps between feeds. If she is employed, she should take sick leave to rest in bed and feed the baby. She should not stop breastfeeding.
- She may find it helpful to apply warm compresses, to start breastfeeding the baby with the unaffected breast, to stimulate the oxytocin reflex and milk flow, and to vary the position of the baby.
- She may take analgesics (if available, ibuprofen, which also reduces the inflammation of the breast; or paracetamol).
- If symptoms are severe, if there is an infected nipple fissure or if no improvement is seen after 24 hours of improved milk removal, the treatment should then include penicillinase-resistant antibiotics (e.g., flucloxacillin). However antibiotics will not be effective without improved removal of milk.

7.5 Breast abscess (*2*)

Symptoms: A painful swelling in the breast, which feels full of fluid. There may be discoloration of the skin at the point of the swelling.

Cause: Usually secondary to mastitis that has not been effectively managed.

Management: An abscess needs to be drained and treated with penicillinase-resistant antibiotics. When possible drainage should be either by catheter through a small incision, or by needle aspiration (which may need to be repeated). Placement of a catheter or needle should be guided by ultrasound. A large surgical incision may damage the areola and milk ducts and interfere with subsequent breastfeeding, and should be avoided. The mother may continue to feed from the affected breast. However, if suckling is too painful or if the mother is unwilling, she can be shown how to express her milk, and advised to let her baby start to feed from the breast again as soon as the pain is less, usually in 2–3 days. She can continue to feed from the other breast. Feeding from an infected breast does not affect the infant (unless the mother is HIV-positive, see **Session 7.7**).

Sometimes milk drains from the incision if lactation continues. This dries up after a time and is not a reason to stop breastfeeding.

7.6 Sore or fissured nipple

Symptoms: The mother has severe nipple pain when the baby is suckling. There may be a visible fissure across the tip of the nipple or around the base. The nipple may look squashed from side-to-side at the end of a feed, with a white pressure line across the tip.

Cause: The main cause of sore and fissured nipples is poor attachment. This may be due to the baby pulling the nipple in and out as he or she suckles, and rubbing the skin against his or her mouth; or it may be due to the strong pressure on the nipple resulting from incorrect suckling.

Management: The mother should be helped to improve her baby's position and attachment. Often, as soon as the baby is well attached, the pain is less. The baby can continue breastfeeding normally. There is no need to rest the breast – the nipple will heal quickly when it is no longer being damaged.

7.7 Mastitis, abscess and nipple fissure in an HIV-infected woman (*2*)

If a woman is HIV-infected, mastitis, breast abscess and nipple fissure (especially if the nipple is bleeding or oozing pus) may increase the risk of HIV transmission to the infant. The recommendation to increase the frequency and duration of feeds is not appropriate for a mother who is HIV-positive.

Management for a woman who is HIV-positive:

- She should avoid breastfeeding on the affected side while the condition persists.
- She should remove the milk from the affected breast by expression, to help the breast to recover and to maintain the flow of milk. She should be helped to make sure that she can express her milk effectively.
- If only one breast is affected, the baby can continue to feed on the unaffected breast, and can feed more often from that side to increase production and ensure an adequate intake.
- Give antibiotics for 10–14 days, rest and analgesics as required, and incision if there is an abscess, as for an HIV-negative woman.
- She can resume breastfeeding from the affected breast when the condition subsides.
- Some mothers decide to stop breastfeeding at this time if they are able to give replacement feeds safely. They should continue to express enough milk to allow the breasts to recover, until milk production ceases.
- If both breasts are affected, she will not be able to feed the baby from either side, and will need to consider other feeding options as a permanent solution. She may decide to heat-treat her own milk and give that, or to give formula. She should feed the baby by cup.

7.8 *Candida* infection (thrush) in mother and baby (*3*)

Symptoms:

In the mother:

- Sore nipples with pain continuing between feeds, pain like sharp needles going deep into the breast, which is not relieved by improved attachment.
- There may be a red or flaky rash on the areola, with itching and depigmentation.

In the baby:

- White spots inside the cheeks or over the tongue, which look like milk curds, but they cannot be removed easily.
- Some babies feed normally, some feed for a short time and then pull away, some refuse to feed altogether, and some are distressed when they try to attach and feed, suggesting that their mouth is sore.
- There may be a red rash over the nappy area ("diaper dermatitis").

Cause: This is an infection with the fungus *Candida albicans*, which often follows the use of antibiotics in the baby or in the mother to treat mastitis or other infections.

Management: Treatment is with gentian violet or nystatin. If the mother has symptoms, both mother and baby should be treated. If only the baby has symptoms, it is not necessary to treat the mother.

Gentian Violet paint:
Apply 0.25% solution to baby's mouth daily for 5 days, or until 3 days after lesions heal.

Apply 0.5% solution to mother's nipples daily for 5 days.

Nystatin:
Nystatin suspension 100,000 IU/ml; apply 1 ml by dropper to child's mouth 4 times daily after breastfeeds for 7 days, or as long as the mother is being treated.

Nystatin cream 100,000 IU/ml; apply to nipples 4 times daily after breastfeeds. Continue to apply for 7 days after lesions have healed.

7.9 Inverted, flat, large and long nipples (*3*)

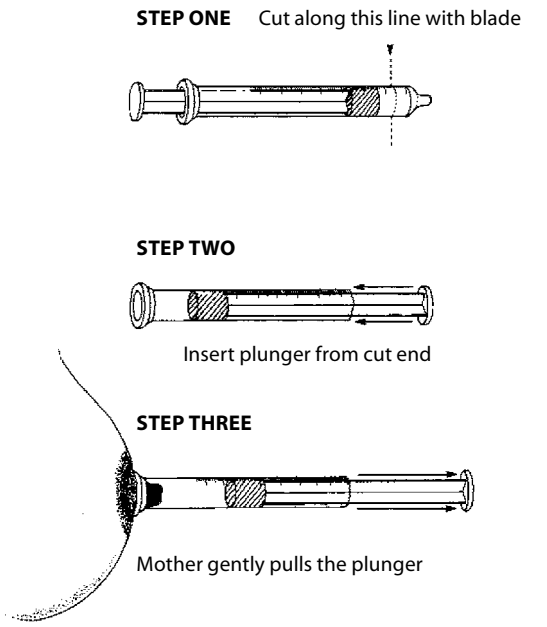
Signs to look for: Nipples naturally occur in a wide variety of shapes that usually do not affect a mother's ability to breastfeed successfully. However, some nipples look flat, large or long, and the baby has difficulty attaching to them. Most flat nipples are *protractile* – if the mother pulls them out with her fingers, they stretch, in the same way that they have to stretch in the baby's mouth. A baby should have no difficulty suckling from a protractile nipple. Sometimes an inverted nipple is *non-protractile* and does not stretch out when pulled; instead, the tip goes in. This makes it more difficult for the baby to attach. Protractility often improves during pregnancy and in the first week or so after a baby is born. A large or long nipple may make it difficult for a baby to take enough breast tissue into his or her mouth. Sometimes the base of the nipple is visible even though the baby has a widely-open mouth.

Cause: Different nipple shapes are a natural physical feature of the breast. An inverted nipple is held by tight connective tissue that may slacken after a baby suckles from it for a time.

Management: The same principles apply for the management of flat, inverted, large or long nipples.

- Antenatal treatment is not helpful. If a pregnant woman is worried about the shape of her nipples, explain that babies can often suckle without difficulty from nipples of unusual shapes, and that skilled help after delivery is the most important thing.
- As soon as possible after delivery, the mother should be helped to position and try to attach her baby. Sometimes it helps if the mother takes a different position, such as leaning over the baby, so that the breast and nipple drop towards the baby's mouth.
- The mother should give the baby plenty of skin-to-skin contact near the breast, and let the baby try to find his or her own way of taking the breast, which many do.
- If a baby cannot attach in the first week or two, the mother can express her breast milk and feed it by cup.
- The mother should keep putting the baby to the breast in different positions, and allowing him or her to try. She can express milk into the baby's mouth, and touch the lips to stimulate the rooting reflex and encourage the baby to open his or her mouth wider.
- As a baby grows, the mouth soon becomes larger, and he or she can attach more easily.
- Feeding bottles or dummies, which do not encourage a baby to open the mouth wide, should be avoided.
- For flat or inverted nipples, a mother can use a 20 ml syringe, with the adaptor end cut off and the plunger put in backwards to stretch out the nipple just before a feed (see **Figure 20**).

FIGURE 20
Preparing and using a syringe for treatment of inverted nipples



7.10 Perceived insufficiency and low breast-milk production

Symptoms: The commonest difficulty that mothers describe is a feeling that they do not have enough milk. In many cases, the baby is in fact getting all the milk that he or she needs, and the problem is the mother's perception that the milk supply is insufficient.

In some cases, a baby does have a low intake of breast milk, insufficient for his or her needs. Occasionally, this is because the mother has a physiological or pathological low breast-milk production (*4*). Usually, however, the reason for a low intake is a faulty technique or pattern of feeding. If the breastfeeding technique or pattern improves, the baby's intake increases. When a baby takes only part of the milk from the breast, production decreases, but it increases again when the baby takes more.

Symptoms which make a mother think that her breast milk is insufficient include:

- the baby crying a lot, and seeming not to be satisfied with feeds;
- the baby wanting to feed very often or for a long time at each feed;
- the breasts feeling soft;
- not being able to express her milk.

These symptoms can occur for other reasons, and they do not necessarily show that a baby's intake is low.

If a mother is worried about her milk supply, it is necessary to decide if the baby is taking enough milk or not.

If the baby has a low milk intake, then it is necessary to find out if it is due to breastfeeding technique, or low breast-milk production.

If the baby's intake is adequate, then it is necessary to decide the reasons for the signs that are worrying the mother.

LOW BREAST-MILK INTAKE

Signs: There are two reliable signs that a baby is not getting enough milk:

- poor weight gain.
- low urine output.

Passing meconium (sticky black stools) 4 days after delivery is also a sign of the baby not getting enough milk.

Poor weight gain

Babies' weight gain is variable, and each child follows his or her own pattern. You cannot tell from a single weighing if a baby is growing satisfactorily – it is necessary to weigh several times over a few days at least (see **Annex 3** for tables showing the range of weights for babies of different birth weights).

Soon after birth a baby may lose weight for a few days. Most recover their birth weight by the end of the first week, if they are healthy and feeding well. All babies should recover their birth weight by 2 weeks of age. A baby who is below his or her birth weight at the end of the second week needs to be assessed.

From 2 weeks, babies who are breastfed may gain from about 500 g to 1 kg or more each month. All these weight gains are normal. The baby should be checked for illness or congenital abnormality and urine output. The technique and pattern of breastfeeding, and the mother-baby interaction should also be assessed, to decide the cause of poor weight gain, as explained below.

Low urine output

An exclusively breastfed baby who is taking enough milk usually passes dilute urine 6-8 times or more in 24 hours. If a baby is passing urine less than 6 times a day, especially if the urine is dark yellow and strong smelling, then he or she is not getting enough fluid. This is a useful way to find out quickly if a baby is probably taking enough milk or not. However, it is not useful if the baby is having other drinks in addition to breast milk.

Causes: The reasons for a low breast-milk intake are summarised in **Table 9**, and classified as breastfeeding factors; psychological factors with mother; mother's physical condition; and baby's condition (illness or abnormality).

Breastfeeding factors

A low breast-milk intake may be due to:

- *delayed initiation* of breastfeeding, so that milk production does not adjust in the early days to match the infant's needs;
- *poor attachment*, so that the baby does not take the milk from the breast efficiently;
- *infrequent feeds*, feeds at fixed times or no night feeds, so that the baby simply does not suckle enough; breastfeeding less than 8 times in 24 hours in the first 8 weeks, or less than 5–6 times in 24 hours after 8 weeks;
- *short feeds*, if a mother is very hurried, or if she takes the baby off the breast during a pause before he or she has finished, or if the baby stops quickly because he is wrapped up and too hot, then he or she may not take as much milk as needed, especially the fat-rich hind milk;
- *using bottles or pacifiers* which replace suckling at the breast, so the baby suckles less. Babies who use pacifiers tend to breastfeed for a shorter period. Pacifiers may be a marker or a cause of breastfeeding failure (*5*). They may interfere with attachment, so the baby suckles less effectively;
- *giving other foods or drinks* causes the baby to suckle less at the breast and take less milk, and also stimulates the breast less, so less milk is produced.

Psychological factors of the mother

A mother may be depressed, lacking in confidence, worried, or stressed; or she may reject the baby or dislike the idea of breastfeeding. These factors do not directly affect her milk production, but can interfere with the way in which she responds to her baby, so that she breastfeeds less. This can result in the baby taking less milk, and failing to stimulate milk production.

Mother's physical condition

A few mothers have low milk production for a pathological reason including endocrine problems (pituitary failure after severe haemorrhage, retained piece of placenta) or poor breast development. A few mothers have a physiological low breast-milk production, for no apparent reason, and production does not

TABLE 9
Reasons why a baby may not get enough breast milk

BREASTFEEDING FACTORS	MOTHER: PSYCHOLOGICAL FACTORS	MOTHER: PHYSICAL CONDITION	BABY'S CONDITION
■ Delayed start	■ Lack of confidence	■ Contraceptive pill, diuretics	■ Illness
■ Feeding at fixed times	■ Depression	■ Pregnancy	■ Abnormality
■ Infrequent feeds	■ Worry, stress	■ Severe malnutrition	
■ No night feeds	■ Dislike of breastfeeding	■ Alcohol	
■ Short feeds	■ Rejection of baby	■ Smoking	
■ Poor attachment		■ Retained piece of placenta	
■ Bottles, pacifiers		■ Pituitary failure (rare)	
■ Other foods or fluids (water, teas)		■ Poor breast development (very rare)	
THESE ARE COMMON		**THESE ARE NOT COMMON**	

increase when the breastfeeding technique and pattern improve.

Other factors that can reduce milk production temporarily include hormone-containing contraceptive pills, pregnancy, severe malnutrition, smoking and alcohol consumption.

Baby's condition

A baby may fail to gain weight, or may fail to breastfeed well and stimulate milk production because of illness, prematurity or congenital abnormality, such as a palate defect, heart condition or kidney abnormality. It is always important to consider these factors and to examine a baby carefully before concluding that a mother has low breast-milk production.

Conclusion

The common reasons for a baby not getting enough breast milk are due to poor technique or mismanagement of breastfeeding, which can be overcome. Only a few mothers have long-term difficulty with milk production.

PERCEIVED INSUFFICIENCY

Signs: If a baby is gaining weight according to the expected growth velocity, and is passing dilute urine 6 or more times in 24 hours, then his or her milk intake is adequate. If the mother thinks that she does not have enough milk, then it is *perceived insufficiency*.

Causes: *Poor attachment is likely to be the cause if a baby*:

- wants to feed very often (more often than 2 hourly all the time, with no long intervals between feeds);
- suckles for a long time at each feed (more than one half hour, unless newborn or low birth weight);
- is generally unsettled.

Management of perceived insufficiency and low breast milk production: A health worker may use counselling skills to listen and learn, to take a feeding history and to understand the difficulty, particularly if there may be psychological factors affecting breastfeeding. A breastfeed should be observed, checking the baby's attachment. The mother's physical condition and the baby's condition and weight should also be noted. A health worker should decide if the difficulty is due to *low milk intake*, or *perceived insufficiency*.

If the difficulty is *low milk intake, a health worker should*:

- decide the reason for the low milk intake;
- treat or refer the baby, if there is any illness or abnormality;
- help the mother with any of the less common causes, for example if she is using oestrogen-containing contraceptive pills. Referral may be necessary;
- discuss how the mother can improve her breastfeeding technique and pattern and improve the baby's attachment;
- use counselling skills to help her with any psychological factors, and to build her confidence in her milk supply.

If the difficulty is *perceived insufficiency, the health worker should*:

- decide the reason;
- explain the difficulty, and what might help;

- discuss how the mother can improve her breastfeeding technique and pattern, and help her to improve the baby's attachment;
- if the baby has reflux, suggest that she holds him or her in a more upright position;
- use counselling skills to help the mother with any psychological factors, and to build her confidence in her milk supply.

7.11 Crying baby

Signs or symptoms: The baby cries excessively, and is difficult to comfort. The pattern of crying may suggest the cause.

Cause:

- *Pain or illness*. This may be the case when a baby suddenly cries more than before.
- *Hunger due to sudden faster growth*, common at ages 2 weeks, 6 weeks and 3 months (sometimes called a "growth spurt"). If the baby feeds more often for a few days, the breast milk supply increases and the problem resolves.
- *Sensitivity to substances from the mother's food*. This may be any food, but is commonly milk, soy, egg or peanuts. Caffeine in coffee, tea and colas, and substances from cigarette smoke can also upset a baby. If the mother avoids the food or drink that may be causing the problem, the baby cries less.
- *Gastro-oesophageal reflux*. The baby cries after feeds, often on lying down, and may vomit a large amount of the feed, more than the slight regurgitation that is very common. The opening between the oesophagus and the stomach (cardiac orifice) is weak, allowing milk to flow back into the oesophagus, which can cause pain.
- *Colic*. Often crying occurs at certain times of day, typically the evening. The baby may pull up his legs as if in pain. He or she wants to feed but is difficult to comfort. The cause is not clear. Babies with colic usually grow well, and the crying decreases after 3–4 months. Carrying the baby more, using a gentle rocking movement, and pressure on the abdomen with the hands, or against the shoulder, may help.
- *High-needs babies*. Some babies cry more than others, and they need to be carried and held more. This problem is less common in communities where mothers carry their babies with them, and keep them in the same bed.

Management:

- If a specific cause, such as pain or illness, can be identified, it should be treated.
- The mother can try a change in her diet, such as stopping drinking milk or coffee for a week, to see if there is an improvement.
- Holding the baby upright may help reflux, or medication may be suggested.
- For colic or a high-needs baby, the mother can carry and rock the baby with gentle pressure on the abdomen. She may need reassurance that the crying will lessen as the baby grows.

7.12 Oversupply of breast milk

Symptoms:

- The baby cries as if he or she has colic and wants to feed often.
- The baby may have frequent loose stools, which may be green.
- He or she may grow well, or may have poor weight gain, suggesting low milk production.
- The mother may have a forceful oxytocin reflex, so that her milk flows fast. This can make the baby choke and pull away from the breast during feeds.

Cause:

- The baby may be poorly attached, and suckling a lot but not removing the milk efficiently. Constant suckling may stimulate the breast to produce a lot of milk.
- The mother may take her baby off the first breast before he or she has finished to put him on the second breast. The baby may get mostly low-fat fore milk, and suckle more to get more energy, and so stimulate the breasts to make more milk.
- Large amounts of foremilk overload the baby with lactose, causing loose stools and colicky behaviour.

Management:

- The mother should be helped to improve her baby's attachment.
- The mother should offer only one breast at each feed, until the baby finishes by him- or herself. The baby will get more fat-rich hindmilk. She should offer the other breast at the next feed.

- If a forceful oxytocin reflex continues, she can lie on her back to breastfeed, or hold the breast with her fingers closer to the areola during feeds.

7.13 Refusal to breastfeed

Symptoms: The baby refuses to breastfeed, and may cry, arch his or her back, and turn away when put to the breast. The mother may feel rejected and frustrated, and be in great distress.

Causes: There may be a physical problem such as:

- illness, an infection, or a sore mouth, for example thrush (see **Session 7.8**);
- pain, for example bruising after a traumatic delivery or gastro-oesophageal reflux;
- sedation, if the mother received analgesics during labour.

The baby may have difficulty or frustration with breastfeeding because of:

- sucking on a bottle or pacifier;
- difficulty attaching to the breast;
- pressure applied to his or her head by someone helping with positioning;
- the mother shaking her breast when trying to attach him or her.

The baby may be upset by a change in the environment including:

- a changed routine, the mother resuming employment or moving house;
- a different carer, or too many carers;
- a change in the mother's smell – for example, if she uses a different soap or perfume.

Management: If a cause is identified, it should be treated or removed, if possible.

The mother could consider how she can reduce the time she spends away from the baby, or avoid other changes that may be upsetting. She can be helped to improve her breastfeeding technique, and how to avoid the use of bottles and pacifiers. She can also be helped to:

- keep her baby close, with plenty of skin-to-skin contact, and no other carers for a time;
- offer her breast whenever the baby shows signs of interest in suckling;
- express milk into the baby's mouth;
- avoid shaking her breast or pressing the baby's head to force him or her to the breast;
- feed the baby by cup, if possible with her own breast milk, until he or she is willing to take the breast again.

7.14 Twins

Management

Twins who are low birth weight need to be managed accordingly (see **Session 6.1**).

For larger twins, management should be as for singletons, with early contact, help to achieve good attachment at the breast, and exclusive on-demand feeding from birth, or from as soon as the mother is able to respond. Early effective suckling can ensure an adequate milk supply for both infants.

Mothers may need help to find the best way to hold two babies to suckle, either at the same time, or one at a time. They may like to give each baby its own breast, or to vary the side. Holding one or both babies in the underarm position for feeding, and support for the babies with pillows or folded clothes is often helpful. Building the mother's confidence that she can make enough milk for two, and encouraging relatives to help with other household duties, may help her to avoid trying to feed the babies artificially.

7.15 Caesarean section

Management

Initiating breastfeeding

Mothers and babies delivered by caesarean section can breastfeed normally, unless there is some other complication, such as illness or abnormality.

If the mother has had spinal or epidural anaesthesia, the baby should be delivered onto her chest, and she can start skin-to-skin contact and initiate breastfeeding during the first hour in a similar way to that after vaginal delivery.

If she has had a general anaesthetic, she should start skin-to-skin contact and initiate breastfeeding as soon as she is able to respond, usually about 4 hours after delivery. A baby who is full term and in good condition can wait for the first feed until the mother responds. Babies who are at risk of hypoglycaemia may need an alternative feed until they can start breastfeeding (see **Session 6.1**). Any other feeds should be given by cup so that they do not interfere with later establishment of breastfeeding.

Later feeds

After caesarian section, a mother should continue to feed her baby on demand, but she will need help for a few days to hold the baby, to learn how to breastfeed lying down, and to turn over and to position herself comfortably for feeds (see **Session 2.11**). Hospital staff and family members can all help her in this way.

Most mothers can breastfeed normally after a caesarean delivery if they are given appropriate help. Difficulties in the past have often been because mothers did not receive enough help to establish breastfeeding in the post-operative period, and because babies were given other feeds meanwhile.

If a baby is too ill or too small to fed from the breast soon after delivery, the mother should be helped to express her milk to establish the supply, starting within 6 hours of delivery or as soon as possible, in the same way as after a vaginal delivery (see **Session 4.5**). The EBM can be frozen for use when the baby is able to take oral feeds.

If the mother is too ill to breastfeed, the baby should be given artificial milk or banked breast milk by cup until the mother is able to start breastfeeding.

7.16 Mother separated from her baby

SHORT-TERM SEPARATION SUCH AS EMPLOYMENT OUTSIDE THE HOME

The commonest reason for a mother being separated from her baby for part of the day is because she is employed outside the home, for example when maternity leave is not adequate to enable her to continue breastfeeding exclusively for 6 months.

Management

Options should be discussed with the mother. She should be encouraged to breastfeed the baby as much as possible when she is at home, and to consider expressing her milk to leave for someone else to give to her baby.

Expressing her milk for the baby

A trained health worker should teach her how to express and store her breast milk (see **Session 4.5**), how to feed her baby by cup (**Session 4.6**), and why it is best to avoid using a feeding bottle.

How to maintain her milk supply

She should:

- breastfeed her baby whenever she is at home, such as at night and weekends;
- sleep with her baby, so that she can breastfeed at night and early in the morning;
- express milk in the morning before she leaves for work;
- express her milk while she is at work to keep up the supply. She can refrigerate the milk if this is possible, or keep it for up to 8 hours at room temperature and bring it home. If this is not possible, she may have to discard it. She needs to understand that the milk is not lost – her breasts will make more. If a mother does not express when at work, her milk production will decrease.

TEMPORARY SEPARATION FOR OTHER REASONS

A mother and her baby may be separated and unable to breastfeed if either of them is ill and admitted to hospital, or if the baby is LBW or has problems at birth and is in the Special Care Baby Unit (see **Session 6.1**).

Management

While separated, encourage the mother to express her milk as often as the baby would feed, in order to establish or keep up the supply. If facilities are available, she can store her milk by freezing it (see **Session 4.5**). Help the baby to start breastfeeding as soon as he or she is able and can be with the mother again.

7.17 Illness, jaundice and abnormality of the child

ILLNESS

Symptoms related to feeding

- The infant may want to breastfeed more often than before.
- Local symptoms such as a blocked nose, or oral thrush can interfere with suckling. The infant may suckle for only a short time and not take enough milk.
- The infant may be too weak to suckle adequately, or may be unable to suckle at all.
- During surgery an infant may not be able to receive any oral or enteral feeds.

Management: Infants and young children who are ill should continue to breastfeed as much as possible,

while they receive other treatment. Breast milk is the ideal food during illness, especially for infants less than 6 months old, and helps them to recover.

Babies under 6 months of age

If a baby is in hospital, the mother should be allowed to stay with him or her, and to have unrestricted access so that she can respond to and feed the baby as needed.

If a baby has a blocked nose

The mother can be taught how to use drops of salted water or breast milk, and clear the baby's nose by making a wick with a twist of tissue. She can give shorter more frequent breastfeeds, allowing the baby time to pause and breathe through the mouth until the nose clears.

If a baby has a sore mouth because of thrush (*Candida*)

The mother's nipple and the baby's mouth should both be treated with gentian violet or nystatin (see **Session 7.8**).

If a baby is not able to breastfeed adequately, but can take oral or enteral feeds

The mother can express her milk (see **Session 4.5**). She should express as often as the baby would feed, that is 8 times in 24 hours, to keep up her milk supply. The mother can feed her EBM to the baby by cup or nasogastric tube or syringe. She should be encouraged to let the baby suckle whenever he or she wants to.

If a baby is not able to take any oral or enteral feeds

The mother should be encouraged to continue expressing to keep up her milk supply. Her expressed milk can be stored safely and given to the baby as soon as he or she starts enteral feeds. She can resume breastfeeding as the baby recovers. She may be able to freeze unused milk for later use. If the hospital has milk-banking facilities, the milk may be used for another child.

If breast-milk production decreases during an illness

A decrease in production is especially likely if a mother has breastfeeding difficulties or if she has given inappropriate supplements. Feeding difficulties and supplements may have contributed to the infant's illness, and are an important cause of malnutrition. The mother needs help to increase her milk supply again. The mother should be encouraged to relactate, and to feed her infant using supplementary suckling to stimulate breast-milk production (see **Session 6.4**). With appropriate skilled support, many mothers can resume exclusive breastfeeding within 1–2 weeks.

Infants and young children over 6 months of age

A young child may prefer breastfeeding to complementary foods while he or she is ill, and breastfeed more than before. Milk production may increase, so that the mother notices increased fullness of her breasts. She should be encouraged to stay with her child in hospital and to breastfeed on demand.

The mother or caregiver should continue to offer complementary foods, which may need to be given more often, in smaller quantities and of a softer consistency than when the child is well. Offer extra food during recovery as the child's appetite increases.

JAUNDICE

Symptoms

Early jaundice appears between 2 and 7 days of life. It is usually physiological, and clears after a few days. Jaundice can make a baby sleepy so that he or she suckles less. Early initiation of breastfeeding and frequent breastfeeding reduce the severity of early jaundice.

Prolonged jaundice starts after the seventh day of life and continues for some weeks. It is usually due to hormones or other substances in the mother's milk, so it is sometimes called "breast-milk jaundice" which is harmless and clears by itself. If the jaundice is due to a more serious condition there are usually other signs, such as pale stools, dark urine, or enlarged liver and spleen.

Management

Early jaundice

Water and glucose water do not help, and may make a baby suckle less at the breast. Taking more breast milk helps jaundice to clear more quickly, so the mother should be encouraged to breastfeed as often as her baby is willing. She can also express her milk after feeds and give some extra by cup or tube. If she is feeding her baby on expressed breast milk, she should give 20% extra. If jaundice is severe, phototherapy (light treatment) may be needed.

Prolonged jaundice

The baby should be referred for clinical assessment, to exclude a serious condition. The mother should

continue breastfeeding until the infant has been fully assessed.

ABNORMALITIES

Symptoms

Cleft lip and/or palate: attachment and suckling may be difficult because of the anatomical gap. If only the lip is affected, the breast covers the cleft, and the baby may be able to suckle effectively. Sometimes a baby with a cleft palate can suckle quite well, if there is enough palate for the tongue to press the nipple against.

Tongue-tie: the strip of tissue underneath the tongue, called the *frenulum*, is too short and holds the tongue down. This can make attachment difficult, which may cause sore nipples. The baby may not suckle effectively and may have a low intake of breast milk.

Muscular weakness: babies with Down syndrome or cerebral palsy have difficulty attaching to the breast and suckling because of the weakness.

Congenital heart or kidney problems: a baby fails to grow, but there is no apparent difficulty with breastfeeding or breast-milk supply. These abnormalities are not obvious, and require careful examination of the baby.

Management

Cleft lip and/or palate

The baby should be referred for surgery, which usually takes place in one or more stages after some months. It is important for the baby to grow and to be well nourished before undergoing surgery.

The mother can be helped to hold the baby in an upright sitting position at the breast with the baby's legs on either side of the mother's thigh. This makes swallowing easier and may help the baby to breastfeed, fully or partially. She can express her milk and feed it to the baby by cup or spoon until surgical help is available, or an orthopaedic device is provided to facilitate breastfeeding.

The family may need a great deal of support and help to accept the baby, to persist with feeding, and to believe that the baby will look almost normal and will be able to lead a normal life if he or she has surgery.

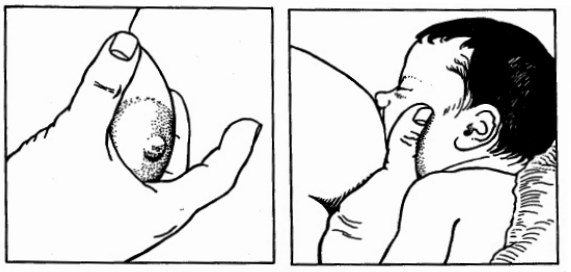
Tongue-tie

If tongue-tie is causing problems with feeding, the baby will need referring for cutting of the frenulum. This is effective and can now be done simply and safely (*6*).

Muscular weakness

The mother should be shown how to help the baby to attach to the breast by using the dancer hand position (**Figure 21**). She supports the baby's chin and head to keep the mouth close on to the breast. These babies may feed slowly, and it may be necessary for the mother to express her milk and give some feeds by cup or tube. The mother will need extra support and counselling to bond with her baby, to feel that she is doing the best for him or her, and to persist.

FIGURE 21
Dancer hand position



Heart, kidney or other abnormalities

Consider these possibilities in a baby who fails to grow despite good breastfeeding practices. Examine the baby carefully, and refer for further assessment.

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Mother's health

When counselling a mother on infant and young child feeding, it is important to remember her own health, and care for her as well as the baby. Issues to address include any illness she may have, her nutritional status and food intake, maternal medication, and birth spacing and family planning.

8.1 Mother's Illness

If a mother has an illness or other condition, it is important to consider what effect it might have on breastfeeding. She may need extra support to enable her to breastfeed, for example if she has a disability, or is mentally ill. If a mother is very ill and unable to breastfeed, options for feeding her infant or child until she can resume will need to be considered.

If a mother has *tuberculosis*, she and her infant should be treated together according to national guidelines, and breastfeeding should continue (*1*).

If a mother has *hepatitis* (A, B, or C) breastfeeding can continue normally as the risk of transmission by breastfeeding is very low (*2*).

If a mother is *HIV-positive*, she needs counselling about different feeding options and support for her choice (see **Session 6.5**).

8.2 Maternal nutrition (*3*)

During lactation, a mother's intake should be increased to cover the energy cost of breastfeeding: by about 10% if the woman is not physically active, but 20% or more if she is moderately or very active. A diet that is poor in quantity or quality may affect her energy and ability to breastfeed or to feed and care for her infant or child. In practice, a lactating mother uses about 500 kilocalories (roughly equivalent to one extra meal) each day to make 750 ml of breast milk for an infant. Some nutrients come from her body stores, laid down during pregnancy. Others need to come from an increased intake.

A woman who is well nourished with a varied diet and who eats according to her appetite will usually take enough food to cover any extra needs. However, a woman with a poor diet may not have laid down body stores in pregnancy. She needs to eat an extra meal with a variety of foods each day to cover her needs and protect those stores that she has.

It is generally helpful to advise the woman to eat a greater amount and variety of foods, such as meat, fish, oils, nuts, seeds, cereals, beans, vegetables, cheese and milk, to help her feel well and strong. It is important to determine if there are taboos about foods, and to advise against any harmful taboos. Pregnant and lactating women can eat any foods normally included in the local diet – these will not harm the breastfeeding baby. Very thin women and adolescents require special attention, and they may need more intensive nutrition counselling. Family members, such as the partner and mother-in-law, also influence a mother's feeding practices. They can help to ensure that the woman eats enough and avoids hard physical work.

If extra food is not available, this should not prevent a mother from breastfeeding. Even when a woman is moderately malnourished, she continues to produce good quality breast milk. Only when a woman is seriously malnourished does the quantity of breast milk decrease. Where household resources are scarce, breast milk is likely to be the most complete and safest food for the baby, and breastfeeding the most efficient way for the mother to use her own and her family's resources to feed the child.

Mothers with specific micronutrient deficiencies may need supplements of fortified products both for their own health and that of their breastfeeding infants.

8.3 Medication and drugs (*4*)

Some medications taken by a mother may pass into her milk. There are very few medicines for which breastfeeding is absolutely contra-indicated. However there are some medicines that can cause side-effects in the baby – they may warrant use of a safer alternative or avoidance of breastfeeding temporarily. **Table 10** provides a guidance for medicines listed in the *Eleventh*

TABLE 10
Breastfeeding and mother's medication

Breastfeeding contraindicated	Anticancer drugs (antimetabolites); Radioactive substances (stop breastfeeding temporarily)
Continue breastfeeding	
Side-effects possible *Monitor baby for drowsiness*	Selected psychiatric drugs and anticonvulsants (see individual drug)
Use alternative drug if possible	Chloramphenicol, tetracyclines, metronidazole, quinolone antibiotics (e.g. ciprofloxacin)
Monitor baby for jaundice	Sulfonamides, dapsone, sulfamethoxazole+trimethoprim (cotrimoxazole), sulfadoxine+pyrimethamine (fansidar)
Use alternative drug (may inhibit lactation)	Estrogens, including estrogen-containing contraceptives, thiazide diuretics, ergometrine
Safe in usual dosage *Monitor baby*	Most commonly used drugs Analgesics and antipyretics: short courses of paracetamol, acetylsalicylic acid, ibuprofen; occasional doses of morphine and pethidine Antibiotics: ampicillin, amoxicillin, cloxacillin and other penicillins, erythromycin Antituberculosis drugs, anti-leprosy drugs (see dapsone above) Antimalarials (except mefloquine, fansidar) Anthelminthics, antifungals Bronchodilators (e.g. salbutamol), corticosteroids, antihistamines, antacids, drugs for diabetes, most antihypertensives, digoxin Nutritional supplements of iodine, iron, vitamins

WHO Model List of Essential Drugs (*4*), while **Annex 1** includes an additional summary of medicines with side-effects.

8.4 Family planning and breastfeeding

The harmful effects of pregnancies too close together are well recognized. Birth-to-pregnancy intervals of 6 months or shorter are associated with a higher risk of maternal mortality. Birth-to-pregnancy intervals of around 18 months or less are associated with a significantly higher risk of neonatal and infant mortality, low birth weight, small size for gestational age and preterm birth. Couples should be advised to wait at least 24 months after a live birth and 6 months after a miscarriage before attempting the next pregnancy (*5*).

8.4.1 Lactational Amenorrhoea Method (6,7)

Breastfeeding is an important method of family planning, because it is available to women who are unable for social or other reasons to obtain or use modern contraceptives, and it is under their control. Hormones produced when a baby suckles prevent ovulation, and so delay the return of menstruation and fertility after childbirth (see **Session 2.5**). This is called the *Lactation Amenorrhoea Method (LAM)*, and all mothers of infants and young children should know about it. They also need to know the limitations of LAM, including when they are not protected against pregnancy, even if they are breastfeeding.

LAM is effective under the following three conditions (see **Box 18**):

The mother must be amenorrhoeic – that is, she must not be menstruating. If she menstruates, it is a sign that her fertility has returned, and she can become pregnant again.

The baby must breastfeed exclusively,[1] and feed frequently during both day and night. If the baby has any artificial feeds, or complementary food, then he

[1] Evidence shows that LAM remains effective even if a baby is fully or nearly fully breastfed (meaning that the child may have received vitamins, minerals, water, juice or ritualistic feeds infrequently in addition to breastfeeds), as long as the vast majority of feeds are breastfeeds

or she suckles less, and the mother may ovulate. If there is a gap of 6 hours or more between breastfeeds, ovulation may occur.

The baby must be less than 6 months old. After 6 months, a woman is more likely to be fertile, even if she has not started to menstruate. After this age, babies should have complementary food, and they suckle less often.

If these three conditions are met, then a woman's risk of becoming pregnant is less than 2%, which is as reliable as other family planning methods. It is not necessary to use another method for contraception. Even after 6 months, if she has not menstruated and the baby is still breastfeeding frequently, she is partially protected. This can be useful if she cannot use another method. However, if she menstruates at any time, then she is not protected at all. If she wishes to avoid pregnancy she should start another method immediately. A few women do start to menstruate 2 or 3 months after delivery, even though they are breastfeeding exclusively.

Women should use another family planning method from 6 months if they want to be sure that they do not conceive. It is also recommended that a woman use another method if she does not want to rely on exclusive breastfeeding – for example, if she has to go back to work and cannot breastfeed her baby while she is away from home. If she is not exclusively breastfeeding, she should start another method of family planning no later than 6 weeks after delivery, at her final postnatal check.

While LAM will protect a woman against pregnancy, it will not protect her against HIV infection. Depending on the woman's circumstances, it may be advisable for her to ask her partner to use condoms, or for her to use female condoms for additional protection.

8.4.2 Other methods of family planning when breastfeeding

It is important to discuss other methods of family planning with breastfeeding mothers, as well as LAM, and to help them to choose a suitable method.

Non-hormonal methods are all suitable. They have no effect on lactation.

- *Intra Uterine Devices* are very suitable.
- *Condoms, diaphragms and spermicides* are suitable, provided a couple can use them correctly. They may help to supplement the partial protection by breastfeeding after the baby is 6 months old.

BOX 18

Lactational amenorrhoea method

No other method needed if:	**Use another method if:**
■ No menstruation	■ Menstruation has returned
AND	*OR*
■ Baby LESS than 6 months old	■ Baby MORE than 6 months old
AND	*OR*
■ Baby exclusively breastfed	■ Other foods and fluids have been introduced

Hormonal methods can have an effect on lactation, and reduce breast-milk production. None should be used within 6 weeks of delivery.

Progestogen-only methods such as *depo-provera*, *norplant* and progestogen-only pills can be used from 6 weeks after delivery.

Combined oestrogen-progesterone methods such as the "combined pill" or the monthly injection are the least suitable, as they may sometimes reduce a mother's milk supply even after 6 weeks. It is better to avoid them altogether if possible. However, if no other method is available, then it is better for both mother and child if she uses the combined pill than if she risks an early pregnancy. Encourage her to continue breastfeeding frequently, to make sure that her breast-milk production does not decrease.

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Policy, health system and community actions

The Global Strategy for Infant and Young Child Feeding (*1*) is the overarching framework for action by governments and all concerned parties to ensure that the health and other sectors are able to protect, promote and support appropriate infant and young child feeding practices. The *Global Strategy* was endorsed unanimously by WHO Member States in the 55th World Health Assembly in 2002 and adopted by UNICEF's Executive Board in the same year.

The *Global Strategy* reaffirms and builds on the *Innocenti Declaration on the Protection, Promotion and Support of Breastfeeding* that was adopted in 1990 and revitalized in 2005. It identifies four operational targets (*2*):

- Appoint a national breastfeeding co-ordinator with appropriate authority, and establish a multisectoral national breastfeeding committee composed of representatives from relevant government departments, non-governmental organisations (NGOs) and health professional associations;
- Ensure that every facility providing maternity services fully practises all of the "Ten steps to successful breastfeeding" set out in the WHO/UNICEF statement on breastfeeding and maternity services (*3*);
- Give effect to the principles and aim of the International Code of Marketing of Breast-milk Substitutes and subsequent relevant Health Assembly resolutions in their entirety (*4*);
- Enact imaginative legislation protecting the breastfeeding rights of working women and establishing means for its enforcement (*5*).

The *Global Strategy* includes five additional targets, namely:

- Develop, implement, monitor and evaluate a comprehensive policy on infant and young child feeding, in the context of national policies and programmes for nutrition, child and reproductive health, and poverty reduction;
- Ensure that the health and other relevant sectors protect, promote and support exclusive breastfeeding for 6 months and continued breastfeeding up to 2 years of age or beyond, while providing women access to the support they require – in the family, community and workplace – to achieve this goal;
- Promote timely, adequate, safe and appropriate complementary feeding with continued breastfeeding;
- Provide guidance on feeding infants and young children in exceptionally difficult circumstances, and on the related support required by mothers, families and other caregivers;
- Consider what new legislation or other suitable measures may be required, as part of a comprehensive policy on infant and young child feeding, to give effect to the principles and aim of the Code.

To implement the *Global Strategy*, actions at international, national and local level are needed to:

- Strengthen policies and legislation to *protect* infant and young child feeding;
- Strengthen health system and health services to *support* optimal infant and young child feeding;
- Strengthen actions to *promote and support* optimal infant and young child feeding practices within families and communities.

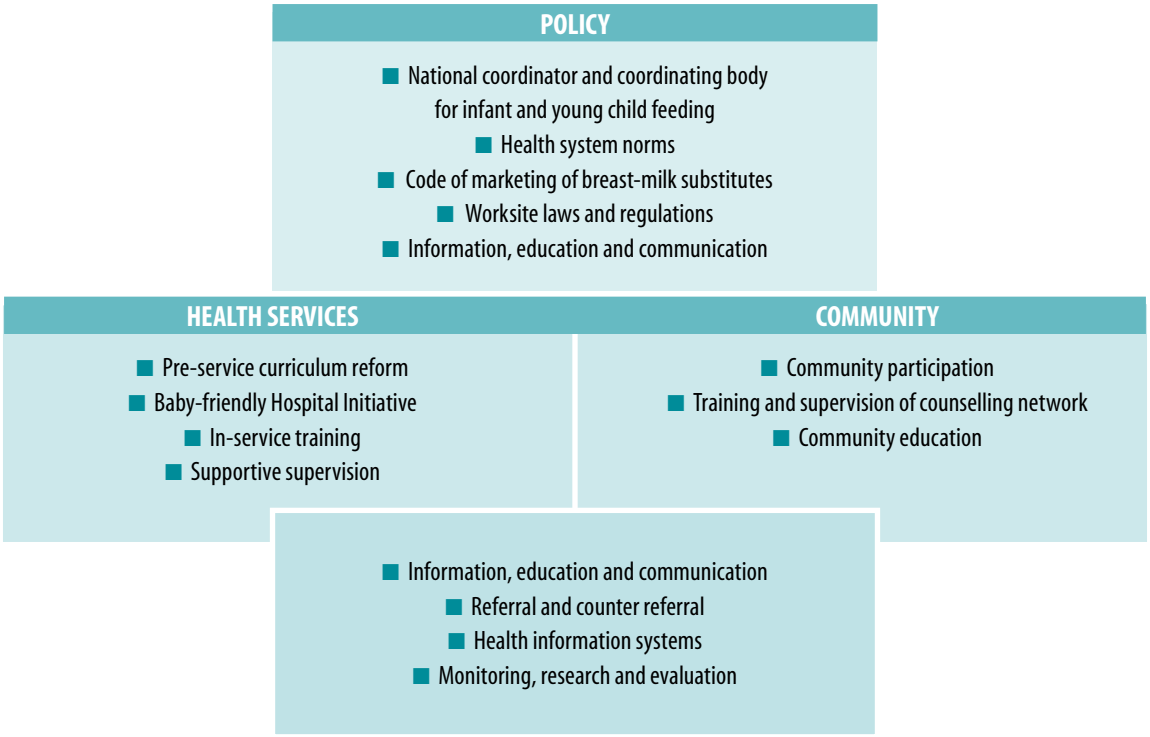
9.1 Strengthening national policies and legislation

A primary obligation of governments is to formulate, implement, monitor and evaluate a comprehensive national policy on infant and young child feeding (see **Figure 22**), to ensure a better use of resources and coordination of efforts.

Internationally recognized policy instruments to promote, protect and support optimal infant and young child feeding practices include the:

- *United Nations Convention on the Rights of the Child (CRC)*

FIGURE 22
Elements of a comprehensive infant and young feeding programme



(Source: Wellstart International, 1996)

- *International Code of Marketing of Breast-milk Substitutes*, and subsequent relevant WHA resolutions
- *International Labour Organization (ILO) Maternity Protection Convention 2000 (183)*.

9.1.1 Convention on the Rights of the Child

The *CRC* is an instrument for protecting and fulfilling the rights of children (*6*). It was adopted by United Nations member states almost universally in November 1989, and countries which have agreed to it (also referred to as States Parties) are required to report regularly to the United Nations about progress in implementation.

Article 24 of the CRC addresses child health and nutrition, and some quotations are particularly relevant. States Parties agree to "take appropriate measures to diminish infant and child mortality", and "to combat disease and malnutrition … through the provision of adequate nutritious foods and clean drinking water"; and to "ensure that all segments of society, particularly parents and children, are informed, have access to education and are supported in the use of basic knowledge of child health and nutrition, and the advantages of breastfeeding". The CRC is an important tool to hold governments to account on progress in the area of infant and young child feeding. The periodic review and reporting process also provides an entry point for making recommendations to strengthen national plans and actions in the area of infant and young child feeding.

9.1.2 International Code of Marketing of Breast-milk Substitutes and subsequent relevant Health Assembly resolutions – the Code

The *Code* was adopted by WHO Member States in 1981 in response to the realization that wide-spread marketing of breast-milk substitutes was leading to adverse health outcomes in infant and young children all over the world (*4*). Progress in the implementation of the *Code* is reported every alternate year in the World Health Assembly (WHA), and through this process, a series of resolutions to further clarify the *Code* have been adopted by WHO Member States.

Manufacturers of infant formula often promote and market their products in ways which encourage mothers and health workers to believe that breastfeeding

and artificial feeding are equivalent. This undermines mothers' confidence in breast milk and in their ability to breastfeed according to global recommendations. The *Code* seeks to regulate the marketing of breast-milk substitutes, including infant formula and other milk products, foods and drinks, and bottle-fed complementary foods, when they are presented as replacements for breast milk. The *Code* also seeks to regulate the marketing of feeding bottles and teats.

The *Code* addresses the quality and availability of the products, and information concerning their use. It provides recommendations concerning the marketing of industrially-prepared complementary foods, encouraging the use of locally-available foods. Thus the *Code* does not seek to ban products, but to control promotion that may influence families to use them when they are not needed.

Health workers have important responsibilities to comply with the provisions of the *Code* (*7*). For example, health care facilities should not be used for the purpose of promoting or displaying infant formula or other products within the scope of the *Code*. If preparation of formula feeds has to be demonstrated, this should be done only by trained health workers and only to mothers or family members who need to use formula, or who have made an informed decision to do so. Health workers should explain clearly the dangers of using the products.

Health facility administrators and staff need to understand and fulfil their responsibilities under the *Code*. These include:

- to encourage and protect breastfeeding;
- not to accept financial or material inducements to promote these products;
- not to give samples of infant formula to pregnant women, mothers of infants and young children, or members of their families.

The fact that HIV can be transmitted through breast milk should not undermine efforts to implement the *Code*. HIV-positive mothers, as all women, need to be protected from commercial promotion of infant formula and other products, and to remain free to make an informed decision regarding infant feeding. The *Code* fully covers their needs.

9.1.3 ILO Maternity Protection Convention, 2000 (No. 183)

Maternity protection at work is essential for safeguarding the health and economic security of women and their children. This consensus is reflected in the international labour standards of the ILO, which set out basic requirements of maternity protection at work. ILO Maternity Protection Convention No. 183, adopted by ILO Member States in 2000 (*5*), covers:

- 14 weeks of maternity leave, including 6 weeks of compulsory postnatal leave;
- cash benefits during leave of at least two thirds of previous or insured earnings;
- access to medical care, including prenatal, childbirth and postnatal care, as well as hospitalization when necessary;
- health protection: the right of pregnant and nursing women not to perform work prejudicial to their health or that of their child;
- breastfeeding: minimum one daily break, with pay;
- employment protection and non-discrimination.

Few countries have ratified this Convention, although many countries have adopted some provisions through ratification of previous ILO maternity protection conventions. Health professionals have an important role to advocate for good legislation on maternity protection, and hospitals and other health facilities should offer maternity leave and breastfeeding support for their own personnel.

9.2 Strengthening the health system and health services

Health workers have a critical role in protecting, promoting and supporting infant and young child feeding. The advice given by health workers has been identified as one of the key determinants influencing mothers' feeding practices. Health workers therefore should have the necessary knowledge and skills to counsel caregivers and help them overcome feeding difficulties when they occur. They should comply with the *Code* and ensure that breast-milk substitutes are not displayed in the health facility but only introduced to those mothers and babies who need them.

To protect, promote and support optimal infant and young child feeding, health services should:

- Adhere to the *Code* and maternity protection legislation for their own workers;
- Implement and maintain the BFHI (see **Session 4**);
- Ensure that health workers are trained and supported to provide *breastfeeding counselling and complementary feeding counselling* (see **Session 5**);

- Implement the *IMCI strategy*;
- Integrate infant and young child feeding support with other health care activities, for example, as promoted in the *Essential Nutrition Actions* approach;
- Provide support for caregivers and children in exceptionally difficult circumstances, including cases of low birth weight and malnutrition, in emergency situations, and for those living with HIV (see **Session 6**).

9.2.1 Integrated Management of Childhood Illnesses

WHO and UNICEF developed the IMCI strategy to reduce child mortality and promote the healthy growth and development of children (*8*). The IMCI strategy combines preventive and curative interventions to combat the major causes of child mortality. It promotes a continuum of care by focusing on actions in the health system and at the family and community levels.

IMCI includes the promotion of appropriate feeding practices among both healthy and sick children. In countries where IMCI has been evaluated, feeding practices improved, and children showed less growth faltering (*9,10*). IMCI is an important delivery strategy for infant and young child feeding interventions through which many children can be reached and coverage improved.

9.2.2 Essential Nutrition Actions

While IMCI focuses on child health services, the *Essential Nutrition Actions (ENA)* approach promotes integration of concise nutrition messages and interventions into multiple entry points in the health care system (*11*).

The ENA approach promotes seven essential nutrition actions:

- exclusive breastfeeding from birth to 6 months;
- appropriate complementary feeding from 6 months with continued breastfeeding up to 24 months or beyond;
- appropriate feeding of infants and young children during and after illness;
- adequate nutrition of women;
- control of vitamin A deficiency;
- control of anaemia through iron supplementation and de-worming of women and children;
- control of iodine deficiency disorders.

These actions should be implemented at all critical times when mothers and children have contact with health services, including during:

- antenatal care;
- labour, delivery and immediate post-partum care;
- postnatal care and family planning;
- immunization;
- growth monitoring and promotion;
- well-baby and sick child visits.

The ENA approach is a useful complement to IMCI and may guide programme planning and management for infant and young child feeding at various levels.

9.3 Strengthening family and community practices

The support that mothers receive in their families and communities also greatly influences their ability to adequately feed their infants and young children. When mothers live in an environment in which exclusive breastfeeding is the norm, they will be less likely to introduce other foods or fluids too early. Activities to create a breastfeeding culture and ensure that mothers, other caregivers and the wider community have knowledge and skills about appropriate infant and young child feeding practices is therefore essential as a complement to a supportive health system (*12*).

Appropriate actions in the community that can be carried out in partnership with the health sector include:

- behaviour change communication;
- training and support of community health workers;
- training and support of lay or peer counsellors;
- fostering breastfeeding support groups.

9.3.1 Behaviour change communication

Mothers do not make infant or young child feeding decisions alone. Other people in the family and community influence them. To improve practices, a communication strategy must address the beliefs of these other people, so that there is a change in family and community norms.

When developing a communication strategy, it is useful to understand the stages of an individual person's

change. A person often moves from pre-awareness of a recommended practice to awareness, contemplation of trying the new practice, trial of the practice, adoption of the practice, maintenance, and finally advocacy of the new practice (*13*).

When communicators understand this process, they can identify the stage of their target group, and then can design a strategy to move them to the next stage. For someone in the "pre-awareness" stage, the most important need is information. If a person is contemplating trying out what he or she has learned, it is useful to encourage him or her, and to provide opportunities to try it. If a person is already trying a new practice, the health workers should emphasise the benefits and help him or her to overcome resistance from family or community, through home visits and support groups.

Moving from one stage of change to another requires a mixture of communication approaches, including mass, electronic and print media; community advocacy and events; and interpersonal communication (community groups, individual counselling, mother-to-mother support groups and home visits). These approaches need to be directed towards mothers and family members, community leaders, and others who are influential in the community.

9.3.2 Training and support of community health workers

Community health workers can be important agents of change in a community and provide services to support infant and young child feeding (*14*). However, to do so effectively they need to be trained in the requisite knowledge and skills, and be supported by supervisors and more highly-skilled health workers to practise accordingly. WHO and UNICEF have developed several courses that can be used for such training (*15*,*16*). Research shows that infant and young child feeding counselling provided by community health workers can improve caregiver knowledge and practices and lead to improved health outcomes including child growth.

9.3.3 Training and support of lay and peer counsellors

Health workers often do not have enough time to provide all the help that mothers and families need. Peer and lay counsellors can extend the reach of health services, and provide more easily-accessible infant and young child feeding counselling (*17*). Peer counsellors have a similar background to those whom they help; they typically are women who have given birth to at least one child and breastfed successfully. Lay counsellors may not have so much in common with those whom they help, and may not have breastfeeding experience. However, both can be effective if committed and well trained. They may provide individual counselling, visit the homes of pregnant or breastfeeding women, lead support groups, give talks to community groups, or work alongside a community health worker in a health facility.

Peer and lay counsellors can be trained in necessary skills using local adaptations of the courses developed for health workers (*18*). They need an on-going connection to someone who can support them to sustain their efforts, and to whom they can refer difficult cases. This support may be a health worker or a health facility, or a NGO.

9.3.4 Fostering breastfeeding support groups

Breastfeeding support groups, or *mother-to-mother support groups*, enable mothers to encourage and assist each other to establish and sustain breastfeeding (*19*). They can also support appropriate complementary feeding. A hospital that is designated *Baby-friendly* is required, when discharging a mother, to refer her to a *breastfeeding support group*, if there is one nearby, and to foster and promote the establishment of such groups (see Step 10 in **Session 4.7**).

Group meetings are led by members with experience and some training, but depend on a sense of equality and acceptance, which encourages mothers to share experiences, ask questions and help each other in a familiar, non-threatening community setting. Breastfeeding support groups can be initiated by health workers from primary and referral level facilities, community health workers, or lay or peer counsellors.

9.3.5 Health workers' roles in supporting community-based approaches

Involvement of the health sector is necessary for community-based approaches to succeed (*12*). Health workers' supporting roles include:

- Helping with the training of lay or peer counsellors;
- Providing feedback to lay or peer counsellors when they refer infants with feeding difficulties;
- Initiating and participating in breastfeeding support group meetings to provide information and discuss appropriate feeding practices;

- Encouraging women's groups formed for other reasons, such as micro-enterprise, community service, or for economic, social, political or religious reasons, to include support for optimal infant and young child feeding in their activities;
- Participating in other community activities where appropriate infant feeding can be promoted (such as health fairs, community meetings and radio programmes);
- Protecting, promoting and supporting appropriate feeding practices whenever they are in contact with mothers, caregivers or families.

9.4 Assessing progress in coverage of effective interventions

In 2008, WHO and partners issued a set of indicators for assessing infant and young child feeding practices (*20*). The indicators are intended for use in large-scale population-based surveys such as Demographic and Health Surveys, and Multiple Indicator Cluster Surveys. They provide information on key dimensions of appropriate infant and young child feeding, in accordance with the Guiding principles for complementary feeding of the breastfed child (*21*) and the Guiding principles for feeding non-breastfed children 6–23 months of age (*22*). A summary list of the core indicators and their definitions is in **Annex 4**. In addition to population-based coverage data, periodic assessment of quality care in health facilities (*23*) and of progress towards the attainment of the operational targets defined by the *Global Strategy* is also important to increase the proportion of infants and young children who are reached by effective feeding interventions (*24*).

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ANNEX 1

Acceptable medical reasons for use of breast-milk substitutes[1]

Introduction

Almost all mothers can breastfeed successfully, which includes initiating breastfeeding within the first hour of life, breastfeeding exclusively for the first 6 months and continuing breastfeeding (along with giving appropriate complementary foods) up to 2 years of age or beyond.

Exclusive breastfeeding in the first six months of life is particularly beneficial for mothers and infants.

Positive effects of breastfeeding on the health of infants and mothers are observed in all settings. Breastfeeding reduces the risk of acute infections such as diarrhoea, pneumonia, ear infection, *Haemophilus influenza*, meningitis and urinary tract infection (*1*). It also protects against chronic conditions in the future such as type I diabetes, ulcerative colitis, and Crohn's disease. Breastfeeding during infancy is associated with lower mean blood pressure and total serum cholesterol, and with lower prevalence of type-2 diabetes, overweight and obesity during adolescence and adult life (*2*). Breastfeeding delays the return of a woman's fertility and reduces the risks of postpartum haemorrhage, pre-menopausal breast cancer and ovarian cancer (*3*).

Nevertheless, a small number of health conditions of the infant or the mother may justify recommending that she does not breastfeed temporarily or permanently (*4*). These conditions, which concern very few mothers and their infants, are listed below together with some health conditions of the mother that, although serious, are not medical reasons for using breast-milk substitutes..

Whenever stopping breastfeeding is considered, the benefits of breastfeeding should be weighed against the risks posed by the presence of the specific conditions listed.

INFANT CONDITIONS

Infants who should not receive breast milk or any other milk except specialized formula

- Infants with classic galactosemia: a special galactose-free formula is needed.
- Infants with maple syrup urine disease: a special formula free of leucine, isoleucine and valine is needed.
- Infants with phenylketonuria: a special phenylalanine-free formula is needed (some breastfeeding is possible, under careful monitoring).

Infants for whom breast milk remains the best feeding option but who may need other food in addition to breast milk for a limited period

- Infants born weighing less than 1500 g (very low birth weight).
- Infants born at less than 32 weeks of gestation (preterm).
- Newborn infants who are at risk of hypoglycaemia by virtue of impaired metabolic adaptation or increased glucose demand (such as those who are preterm, small for gestational age or who have experienced significant intrapartum hypoxic/ischaemic stress, those who are ill and those whose mothers are diabetic (*5*)) if their blood sugar fails to respond to optimal breastfeeding or breast milk feeding.

MATERNAL CONDITIONS

Mothers who are affected by any of the conditions mentioned below should receive treatment according to standard guidelines.

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[1] Reference: WHO/UNICEF. *Acceptable medical reasons for use of breast-milk substitutes*. World Health Organization, Geneva, 2008.

Maternal conditions that may justify permanent avoidance of breastfeeding

- HIV infection:[1] if replacement feeding is acceptable, feasible, affordable, sustainable and safe (AFASS) (*6*).

Maternal conditions that may justify temporary avoidance of breastfeeding

- Severe illness that prevents a mother from caring for her infant, for example sepsis.
- Herpes simplex virus type 1 (HSV-1): direct contact between lesions on the mother's breasts and the infant's mouth should be avoided until all active lesions have resolved.
- Maternal medication:
  - sedating psychotherapeutic drugs, anti-epileptic drugs and opioids and their combinations may cause side effects such as drowsiness and respiratory depression and are better avoided if a safer alternative is available (*7*);
  - radioactive iodine-131 is better avoided given that safer alternatives are available – a mother can resume breastfeeding about two months after receiving this substance;
  - excessive use of topical iodine or iodophors (e.g., povidone-iodine), especially on open wounds or mucous membranes, can result in thyroid suppression or electrolyte abnormalities in the breastfed infant and should be avoided;
  - cytotoxic chemotherapy requires that a mother stops breastfeeding during therapy.

Maternal conditions during which breastfeeding can still continue, although health problems may be of concern

- Breast abscess: breastfeeding should continue on the unaffected breast; feeding from the affected breast can resume once treatment has started (*8*).
- Hepatitis B: infants should be given hepatitis B vaccine, within the first 48 hours or as soon as possible thereafter (*9*).
- Hepatitis C.
- Mastitis: if breastfeeding is very painful, milk must be removed by expression to prevent progression of the condition (*8*).
- Tuberculosis: mother and baby should be managed according to national tuberculosis guidelines (10).
- Substance use[2] (*11*):
  - maternal use of nicotine, alcohol, ecstasy, amphetamines, cocaine and related stimulants has been demonstrated to have harmful effects on breastfed babies;
  - alcohol, opioids, benzodiazepines and cannabis can cause sedation in both the mother and the baby.

  Mothers should be encouraged not to use these substances and given opportunities and support to abstain.

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[1] The most appropriate infant feeding option for an HIV-infected mother depends on her and her infant's individual circumstances, including her health status, but should take consideration of the health services available and the counselling and support she is likely to receive. When replacement feeding is acceptable, feasible, affordable, sustainable and safe (AFASS), avoidance of all breastfeeding by HIV-infected women is recommended. Mixed feeding in the first 6 months of life (that is, breastfeeding while also giving other fluids, formula or foods) should always be avoided by HIV-infected mothers.

[2] Mothers who choose not to cease their use of these substances or who are unable to do so should seek individual advice on the risks and benefits of breastfeeding depending on their individual circumstances. For mothers who use these substances in short episodes, consideration may be given to avoiding breastfeeding temporarily during this time.

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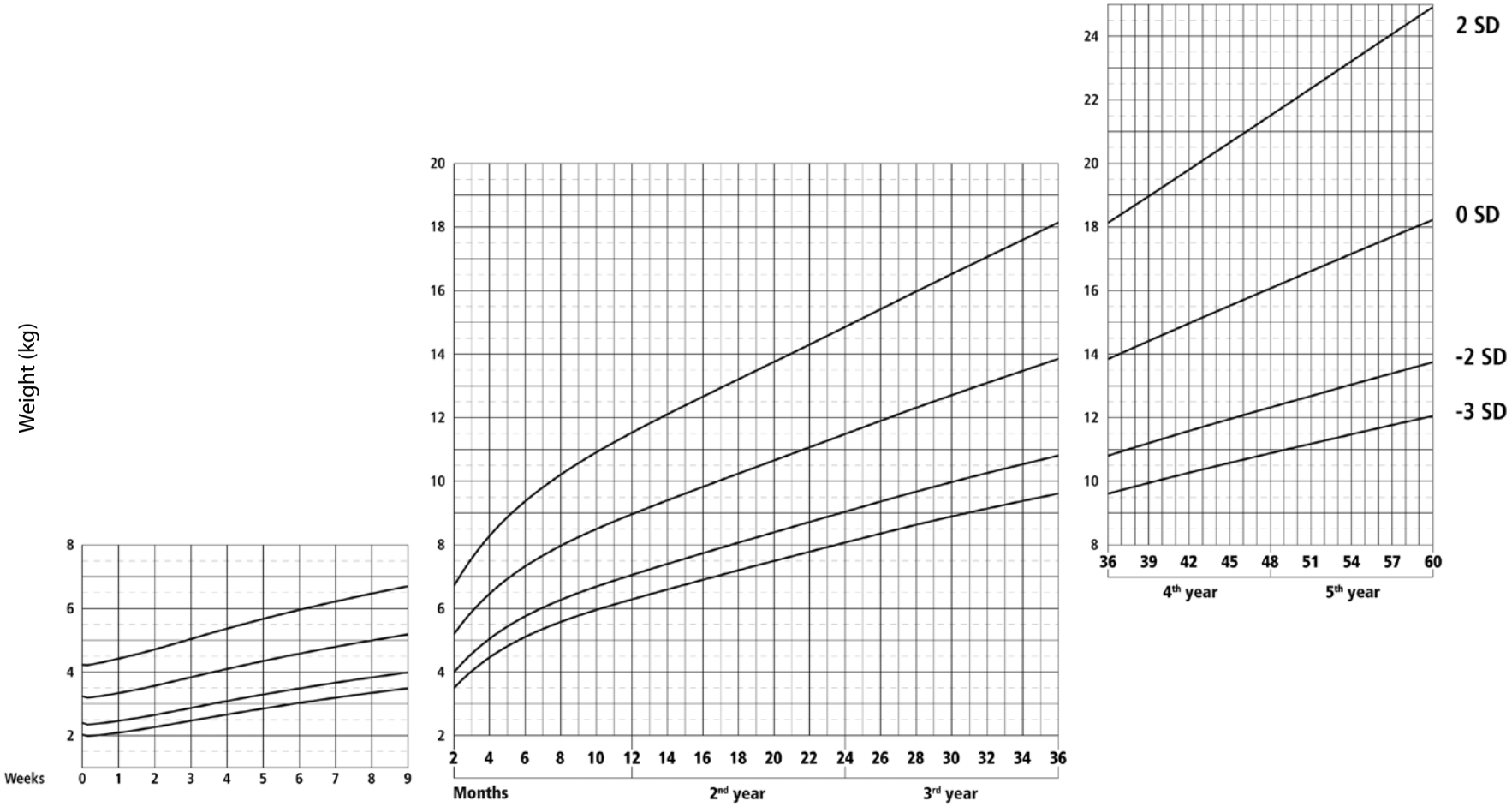
Further information on maternal medication and breastfeeding is available at the following United States National Library of Medicine (NLM) website: http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?LACT

ANNEX 2

Growth standards

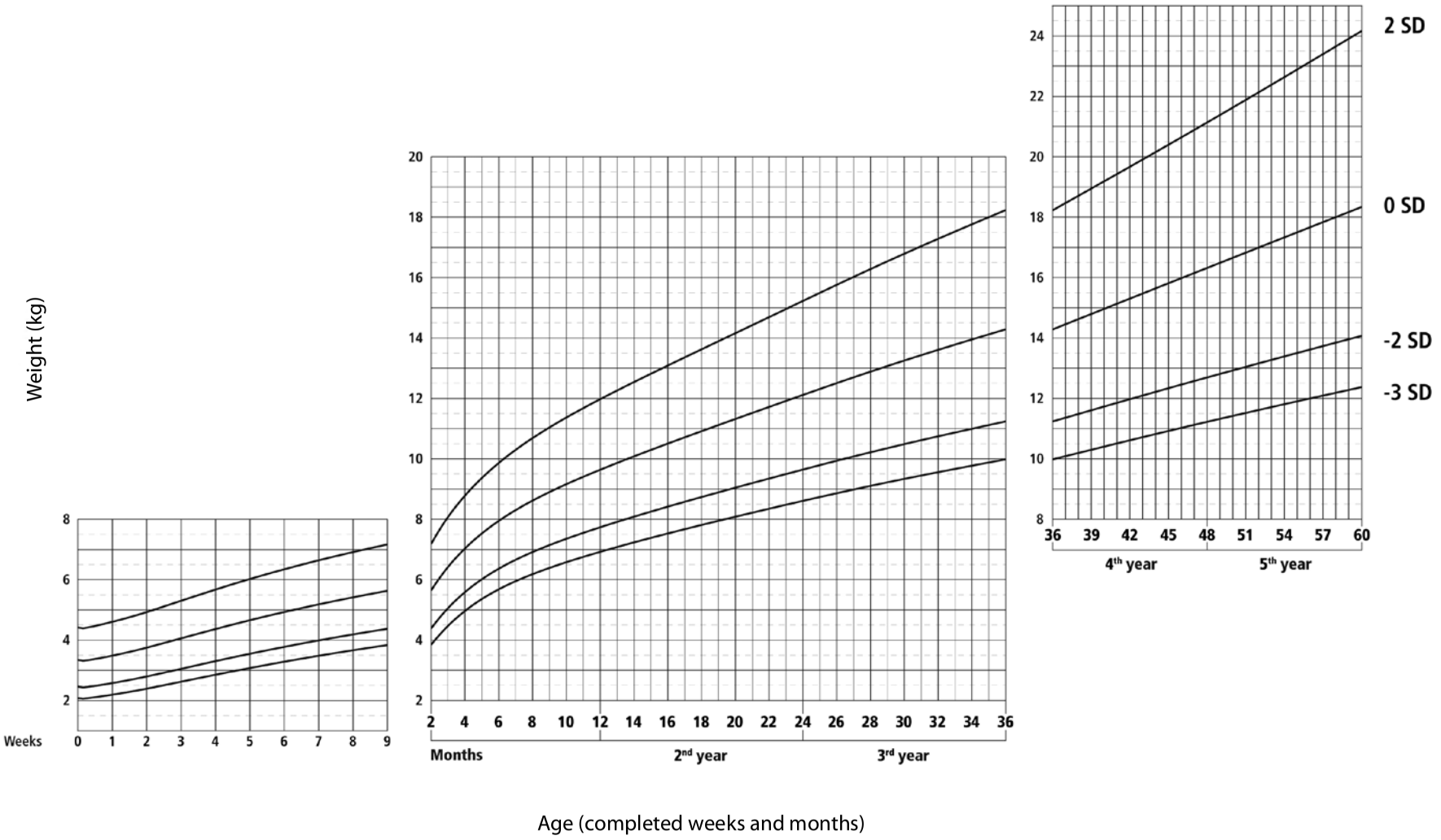
In 1993 the World Health Organization (WHO) undertook a comprehensive review of the uses and interpretation of anthropometric references. The review concluded that the NCHS/WHO growth reference, which had been recommended for international use since the late 1970s, did not adequately represent early childhood growth and that new growth curves were necessary. The World Health Assembly endorsed this recommendation in 1994. The WHO Multicentre Growth Reference Study (MGRS) was undertaken in response to that endorsement and implemented between 1997 and 2003 to generate new curves for assessing the growth and development of children the world over. The MGRS collected primary growth data and related information from 8440 healthy breastfed infants and young children from diverse ethnic backgrounds and cultural settings (Brazil, Ghana, India, Norway, Oman and USA). The weight-for-age charts presented in this Annex are part of these standards. The selection of standard deviations (SD) curves and the presentation of the charts are adapted for use in the IMCI context, with weekly divisions in the first two months and monthly divisions from 2 to 60 months of age. Expanded reference tables necessary for construction of national child health records are available at http://www.who.int/childgrowth/standards/weight_for_age/en/index.html, where there are detailed instructions on how to use them.

IMCI – Weight-for-age (girls)



Age (completed weeks and months)

IMCI – Weight-for-age (boys)



Age (completed weeks and months)

ANNEX 3

Growth velocity (weight-for-age) tables[1]

TABLE 1
Boys weight increments (g) by birth-weight groups

		BIRTH WEIGHT (g)					
AGE (DAYS)	CENTILE	2000–2500	2500–3000	3000–3500	3500–4000	4000+	ALL
0–7	**Median**	150	150	150	150	50	150
	25th	—*	0	0	0	-50	0
	10th	—*	-150	-150	-250	-250	-150
	5th	—*	-200	-250	-300	-250	-250
	(n)	(7)	(88)	(142)	(100)	(46)	(383)
7–14	**Median**	275	250	250	250	275	250
	25th	—*	150	150	100	150	150
	10th	—*	0	50	0	50	0
	5th	—*	-100	-50	-50	-100	-50
	(n)	(6)	(88)	(141)	(100)	(46)	(381)
14–28	**Median**	600	700	650	700	725	650
	25th	—*	550	550	500	550	550
	10th	—*	450	450	400	400	450
	5th	—*	450	350	350	400	350
	(n)	(7)	(95)	(154)	(113)	(48)	(417)
28–42	**Median**	600	550	550	550	548	550
	25th	—*	500	450	450	450	450
	10th	—*	350	350	350	300	350
	5th	—*	300	300	300	300	300
	(n)	(7)	(95)	(156)	(113)	(46)	(417)
42–60	**Median**	450	650	650	650	611	650
	25th	—*	550	500	500	400	500
	10th	—*	450	400	400	300	400
	5th	—*	450	350	350	217	350
	(n)	(7)	(96)	(153)	(113)	(47)	(416)

Note: Results are based on empirical centiles.
(n) number of subjects assessed.
* n is too small to estimate lower centiles.

[1] Reference: WHO Multicentre Growth Reference Study Group. *WHO Child Growth Standards. Growth velocities based on weight, length and head circumference: Methods and development*. Geneva, World Health Organization, 2009.

TABLE 2
Girls weight increments (g) by birth-weight groups

		BIRTH WEIGHT (g)					
AGE (DAYS)	CENTILE	2000–2500	2500–3000	3000–3500	3500–4000	4000+	ALL
0–7	**Median**	0	150	100	100	150	100
	25th	—*	0	0	0	0	0
	10th	—*	-100	-100	-150	-100	-100
	5th	—*	-150	-200	-250	-200	-200
	(n)	(18)	(109)	(147)	(85)	(25)	(384)
7–14	**Median**	200	200	200	200	200	200
	25th	—*	100	100	100	100	100
	10th	—*	0	0	0	50	0
	5th	—*	-100	-50	-100	0	-50
	(n)	(18)	(108)	(147)	(84)	(25)	(382)
14–28	**Median**	500	600	550	550	600	550
	25th	—*	450	436	450	450	450
	10th	—*	400	350	300	300	350
	5th	—*	300	300	250	200	300
	(n)	(20)	(124)	(176)	(93)	(28)	(441)
28–42	**Median**	500	500	465	457	525	500
	25th	—*	382	400	325	375	382
	10th	—*	300	300	295	300	300
	5th	—*	300	250	200	300	250
	(n)	(20)	(127)	(174)	(92)	(28)	(441)
42–60	**Median**	550	550	500	585	550	550
	25th	—*	400	400	408	334	400
	10th	—*	300	300	350	155	300
	5th	—*	300	289	250	150	288
	(n)	(18)	(127)	(175)	(92)	(28)	(440)

Note: Results are based on empirical centiles.
(n) number of subjects assessed.
* n is too small to estimate lower centiles.

ANNEX 4

Indicators for assessing infant and young child feeding practices[1]

CORE INDICATORS

Breastfeeding initiation

1. **Early initiation of breastfeeding:** Proportion of children born in the last 24 months who were put to the breast within one hour of birth.

$$\frac{\text{Children born in the last 24 months who were put to the breast within one hour of birth}}{\text{Children born in the last 24 months}}$$

Exclusive breastfeeding

2. **Exclusive breastfeeding under 6 months:** Proportion of infants 0–5 months of age who are fed exclusively with breast milk.

$$\frac{\text{Infants 0–5 months of age who received only breast milk during the previous day}}{\text{Infants 0–5 months of age}}$$

Continued breastfeeding

3. **Continued breastfeeding at 1 year:** Proportion of children 12–15 months of age who are fed breast milk.

$$\frac{\text{Children 12–15 months of age who received breast milk during the previous day}}{\text{Children 12–15 months of age}}$$

Introduction of complementary foods

4. **Introduction of solid, semi-solid or soft foods:** Proportion of infants 6–8 months of age who receive solid, semi-solid or soft foods.

$$\frac{\text{Infants 6–8 months of age who received solid, semi-solid or soft foods during the previous day}}{\text{Infants 6–8 months of age}}$$

Dietary diversity

5. **Minimum dietary diversity:** Proportion of children 6–23 months of age who receive foods from 4 or more food groups.

$$\frac{\text{Children 6–23 months of age who received foods from} \geq 4 \text{ food groups during the previous day}}{\text{Children 6–23 months of age}}$$

[1] Reference: WHO, UNICEF, IFPRI, UC Davis, USAID, FANTA, Macro International. *Indicators for assessing infant and young child feeding practices*. Geneva: World Health Organization, 2008.

Meal frequency

6. **Minimum meal frequency:** Proportion of breastfed and non-breastfed children 6–23 months of age who receive solid, semi-solid, or soft foods (but also including milk feeds for non-breastfed children) the minimum number of times or more.

   The indicator is calculated from the following two fractions:

$$\frac{\text{Breastfed children 6–23 months of age who received solid, semi-solid or soft foods the minimum number of times or more during the previous day}}{\text{Breastfed children 6–23 months of age}}$$

   and

$$\frac{\text{Non-breastfed children 6–23 months of age who received solid, semi-solid or soft foods or milk feeds the minimum number of times or more during the previous day}}{\text{Non-breastfed children 6–23 months of age}}$$

Summary infant and young child feeding indicator

7. **Minimum acceptable diet:** Proportion of children 6–23 months of age who receive a minimum acceptable diet (apart from breast milk).

   This composite indicator will be calculated from the following two fractions:

$$\frac{\text{Breastfed children 6–23 months of age who had at least the minimum dietary diversity and the minimum meal frequency during the previous day}}{\text{Breastfed children 6–23 months of age}}$$

   and

$$\frac{\text{Non-breastfed children 6–23 months of age who received at least 2 milk feedings and had at least the minimum dietary diversity and the minimum meal frequency during the previous day}}{\text{Non-breastfed children 6–23 months of age}}$$

Consumption of iron-rich or iron-fortified foods

8. **Consumption of iron-rich or iron-fortified foods:** Proportion of children 6–23 months of age who receive an iron-rich food or iron-fortified food that is specially designed for infants and young children, or that is fortified in the home.

$$\frac{\text{Children 6–23 months of age who received an iron-rich food or a food that was specially designed for infants and young children and was fortified with iron, or a food that was fortified in the home with a product that included iron during the previous day}}{\text{Children 6–23 months of age}}$$

OPTIONAL INDICATORS

Considering the need to limit the number of indicators and quantity of data to be collected to a minimum, it is proposed that the indicators described above are the most critical for population-based assessment and programme evaluation. However, to ensure continuity in monitoring of previously used indicators and recognizing that some programmes may wish to measure additional indicators, the following optional indicators are recommended:

Breastfeeding

9. **Children ever breastfed:** Proportion of children born in the last 24 months who were ever breastfed.

$$\frac{\text{Children born in the last 24 months who were ever breastfed}}{\text{Children born in the last 24 months}}$$

10. **Continued breastfeeding at 2 years:** Proportion of children 20–23 months of age who are fed breast milk.

$$\frac{\text{Children 20–23 months of age who received breast milk during the previous day}}{\text{Children 20–23 months of age}}$$

11. **Age-appropriate breastfeeding:** Proportion of children 0–23 months of age who are appropriately breastfed.

    The indicator is calculated from the following two fractions:

$$\frac{\text{Infants 0–5 months of age who received only breast milk during the previous day}}{\text{Infants 0–5 months of age}}$$

    and

$$\frac{\text{Children 6–23 months of age who received breast milk, as well as solid, semi-solid or soft foods, during the previous day}}{\text{Children 6–23 months of age}}$$

12. **Predominant breastfeeding under 6 months:** Proportion of infants 0–5 months of age who are predominantly breastfed

$$\frac{\text{Infants 0–5 months of age who received breast milk as the predominant source of nourishment during the previous day}}{\text{Infants 0–5 months of age}}$$

Duration of breastfeeding

13. **Duration of breastfeeding:** Median duration of breastfeeding among children less than 36 months of age.

$$\frac{\text{The age in months when 50\% of children 0–35 months did not receive breast milk during the previous day}}{\text{Bottle feeding of infants}}$$

14. **Bottle feeding:** Proportion of children 0–23 months of age who are fed with a bottle.

$$\frac{\text{Children 0–23 months of age who were fed with a bottle during the previous day}}{\text{Children 0–23 months of age}}$$

Milk feeding frequency for non-breastfed children

15. **Milk feeding frequency for non-breastfed children:** Proportion of non-breastfed children 6–23 months of age who receive at least 2 milk feedings.

$$\frac{\text{Non-breastfed children 6–23 months of age who received at least 2 milk feedings during the previous day}}{\text{Non-breastfed children 6–23 months of age}}$$

Useful resource materials

WHO/UNICEF. *Global strategy for infant and young child feeding*. Geneva, World Health Organization, 2003
http://www.who.int/child_adolescent_health/documents/9241562218/en/index.html
http://webitpreview.who.int/entity/nutrition/publications/gs_infant_feeding_text_eng.pdf

WHO/UNICEF. *Planning Guide for national implementation of the Global Strategy for Infant and Young Child Feeding*. Geneva, World Health Organization, 2007
http://www.who.int/child_adolescent_health/documents/9789241595193/en/index.html

WHO. *The International Code of Marketing of Breast-milk Substitutes*. Geneva, World Health Organization, 1981
http://www.who.int/nut/documents/code_english.PDF

WHO. *The International Code of Marketing of Breast-milk Substitutes: frequently asked questions*. Geneva, World Health Organization, 2008
http://www.who.int/child_adolescent_health/documents/9241594292/en/index.html

WHO/UNICEF. *Baby-friendly Hospital Initiative: revised, updated and expanded for integrated care*. Geneva, World Health Organization, 2009. **http://www.who.int/nutrition/topics/bfhi/en/index.html**

WHO. *The optimal duration of exclusive breastfeeding: report of an expert consultation*. Geneva, World Health Organization, 2001
http://www.who.int/nutrition/publications/optimal_duration_of_exc_bfeeding_report_eng.pdf

WHO. *Optimal feeding of low-birth-weight infants: a review*. Geneva, World Health Organization, 2006
http://www.who.int/child_adolescent_health/documents/9241595094/en/index.html

WHO. *Evidence on the long-term effects of breastfeeding*. Geneva, World Health Organization, 2007
http://www.who.int/child_adolescent_health/documents/9241595230/en/index.html

PAHO. *Guiding principles for complementary feeding of the breastfed child*.
Washington: Pan American Health Organization, World Health Organization, 2003
http://www.who.int/child_adolescent_health/documents/a85622/en/index.html

WHO. *Guiding principles for feeding non-breastfed children 6–24 months of age*. Geneva, World Health Organization, 2005. **http://www.who.int/child_adolescent_health/documents/9241593431/en/index.html**

WHO, UNICEF, UNFPA, UNAIDS, FAO, UNHCR, WFP, WB, IAEA. *HIV and infant feeding: a framework for priority action*. Geneva, World Health Organization, 2003
http://www.who.int/child_adolescent_health/documents/9241590777/en/index.html

WHO, UNICEF, UNFPA, UNAIDS. *HIV and infant feeding: Update*. Geneva, World Health Organization, 2007
http://www.who.int/child_adolescent_health/documents/9789241595964/en/index.html

WHO, UNICEF, UNFPA, UNAIDS. *HIV transmission through breastfeeding: A review of available evidence, 2007 update*. Geneva, World Health Organization, 2008
http://www.who.int/child_adolescent_health/documents/9789241596596/en/index.html

WHO, UNICEF, WFP, UN-SCN. *Community-based management of severe acute malnutrition: A joint statement*. Geneva, World Health Organization, 2007
http://www.who.int/child_adolescent_health/documents/a91065/en/index.html

WHO, UNICEF, IFPRI, UC Davis, USAID, FANTA, Macro International. *Indicators for assessing infant and young child feeding practices*. Geneva, World Health Organization, 2008
http://www.who.int/child_adolescent_health/documents/9789241596664/en/index.html

For more information, please consult
http://www.who.int/child_adolescent_health/en/ *and* **http://www.who.int/nutrition/en/**

The *Model Chapter on Infant and Young Child Feeding* is intended for use in basic training of health professionals. It describes essential knowledge and basic skills that every health professional who works with mothers and young children should master. The *Model Chapter* can be used by teachers and students as a complement to textbooks or as a concise reference manual.

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ISBN 978 92 4 159749 4