# Infant Feeding in Emergencies

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## Module 2 Version 1.0

**for health and nutrition workers in emergency situations**

## Additional Material

developed through collaboration of:
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Left to right: Breastfeeding supplementer, Mike Golden. Peru, WHO/PAHO. Domasi Rural Health Clinic, Malawi, St Louis Nutrition Project, Heidi Sandige, 2003. Mother and child, Valid International.

# 6 Relactation

## 6.1 Indications for relactation

*Relactation* means re-establishing (restarting) breastfeeding. It is the best way of providing milk feeds for infants who are not breastfeeding, especially in emergency settings when artificial feeding is dangerous.
If possible it should be done by the infant's mother, but, if she is not available, by a caregiver who is willing to be a wet nurse and undergo the appropriate health checks (see Part 5.7).

Full Assessment Step 2 identifies mothers or caregivers who are interested in relactation, and they should be referred for Further Help with breastfeeding, (see Part 5.1).

### Age of mother

Most women can relactate if they want to, and can start producing breastmilk again. They can do this even if they have not breastfeed for several years and even after the menopause. Many women can produce enough milk to breastfeed an infant exclusively, or to feed more than one infant.
However, relactation is easier for women who stopped breastfeeding recently, or who are still breastfeeding occasionally.

### Age of infant

**Under six months**
It is easier to relactate when the infant is under six months old. Every effort should be made to start or re-establish breastfeeding for this age group, when breastfeeding is especially valuable and should be exclusive.

**Over six months**
Previously breastfed infants as old as 12 months can also restart breastfeeding.
Breastmilk is valuable also for these infants, particularly those who are sick, or who cannot tolerate artificial milk feeds.

**Prevent the need for relactation by ensuring supportive conditions for all women and Basic Aid for breastfeeding whenever needed.**
**These are easier to provide than the skilled help needed for relactation.**

## 6.2 Conditions for relactation

The three most important conditions are: **motivation, stimulation, and support.**

### Motivation

A mother or wet nurse needs to be highly motivated.
Some women are well motivated already and just need skilled help with technique.
Others need a lot of encouragement and information to be sufficiently motivated.

Some women periodically lose their confidence and need extra reassurance.
A health or nutrition worker needs time, skill and patience to keep a woman motivated; she needs to listen, talk with and encourage the woman often.

### Stimulation of the breasts

Stimulation of the breasts is essential, and is preferably done by the infant suckling.
Suckling releases prolactin which stimulates growth of the alveoli in the breast and the production of breastmilk.
The more frequently and the longer the infant suckles, the more milk is produced.
If an infant cannot suckle, breastmilk can be hand expressed.
Full stimulation of the breasts means removing as much milk as possible by suckling or expression, and doing so frequently.

### Ongoing support

Health and nutrition workers should be available to help whenever possible. They need to have an encouraging and friendly attitude to build the mother's confidence.
However, intensive day-to-day support takes a lot of time.
It may be necessary for the mother or caregiver to visit the clinic frequently, or to stay there for part of each day, to get the help that she needs.

Community health workers, mothers in support groups, other women and friends, or traditional birth attendants can be trained so they can also give support to relactating women (see Part 2).
Supportive family members are also important when available. Other women who have relactated are especially valuable.

## 6.3 How to help a woman to relactate

A woman who is willing to relactate needs the same supportive care that all breastfeeding women need, including adequate food and fluids (see Part 2).
She needs protection from violence, and access to a sheltered space with other breastfeeding women for help and support.
The general conditions to support relactation are outlined in Module 1 (p 36).

With Supportive Care, a woman with mild or moderate malnutrition can relactate immediately.
She does not need to wait until she is better to start breastfeeding.
If a woman is ill or severely malnourished, she should get appropriate treatment and start relactation when her condition improves.

Her infant may need a temporary artificial supplement. The supplement should be given in a way that encourages the infant to start breastfeeding. Do not give feeding bottles or pacifiers.
When the baby wants to suckle, s/he should do so from the breast.

### Before relactation starts

The health or nutrition worker (or other skilled helper) should explain to the mother that:
- It is possible to re-start breastmilk production while the infant is temporarily fed on other milk.
- Breastfeeding gives her infant the best chance of health and growth in the emergency situation.

The helper should:

- Talk with the woman several times, listen to her and try to understand how she feels.
- Try to decide the reason for her difficulties.
- Ensure that the woman is adequately motivated and believes that relactation is possible (but put no pressure on her, if she is unwilling).
- If possible, introduce her to other women who have relactated and can encourage her.

The helper should also explain to the woman:

- what she and the mother will do to start breastfeeding
- how long it may take, and her need to be patient and persistent
- how her infant will be fed while her milk production starts or increases.

The helper should also ask about practices that can interfere with breastfeeding.

- Factors that can reduce frequent and effective suckling:
  - periods of separation from the infant. *(Help the mother to stay with her baby.)*
  - feeding at fixed times or using a pacifier or bottle. *(Explain the need for feeding on demand.).*
- Medicines that can reduce milk production:
  - oestrogen-containing contraceptives *(Provide a non-oestrogen method.)*
  - thiazide diuretics. *(Try to find an alternative treatment.).*

The helper should discuss with the mother how she can avoid these practices and explain why it is important that she do so.

### Starting relactation

**Provide encouragement and support for the mother or wet nurse throughout relactation. At first this should be daily until she is confident and milk production starts and her milk starts to flow.**

- Encourage the mother (or wet nurse) to breastfeed whenever the child shows interest and is willing.
- Tell her that resting can help her to breastfeed frequently.
- Explain to the woman's family and friends that she needs practical help and, if possible some relief from other duties for a few weeks so she can breastfeed often. She must be able to do this without risk to her own or her family's survival. (See Module 1 pp 35-6 on conditions that make breastfeeding more feasible.)
- Advise the mother that only she should care for the child. She should hold the infant close to her, sleep with him or her, and give skin-to-skin contact as often as possible. Kangaroo Care may be helpful (see Part 5.2).

### If the infant is willing to suckle

**Infants who have breastfed previously may be willing to suckle the breast even before much milk is produced.**

If an infant is willing to suckle even a little, relactation is relatively easy. Many infants who have breastfed before are willing to suckle, even if there is not much milk being produced currently.

Encourage the woman to:

- Put the infant to the breast frequently, as often as s/he is willing, every one to two hours if possible and at least 8-12 times every 24 hours.
- Sleep with the infant so she can breastfeed at night.
- Let the infant *suckle on both breasts, and for as long as possible* at each feed - at least 10-15 minutes on each breast.
- Offer each breast more than once if the infant is willing to continue suckling.
- Make sure that the infant is well attached to the breast.
- *Cup feed* measured milk supplements, six times in 24 hours to begin with.
- Always put the infant to the breast to suckle before giving a cup feed.

A child who is more than six months old also needs complementary foods. These should be nutritious foods, not watery drinks (see Annex 1).

**Offer the breast whenever the baby shows interest in sucking anything.**

### If the infant is unwilling or unable to suckle

Infants who have never breastfed, or who have become used to feeding from a bottle with a teat may not want to suckle the breast.

- They need more help to take the breast and suckle effectively.
- Check the infant for illness, and arrange treatment if necessary. Suckling can start as soon as the infant's condition improves enough.
- Suggest extra skin-to-skin contact or Kangaroo Care (see Part 5.2 and IFE 2/29), offering the breast at any time that the infant shows any interest.
- Encourage the mother to start the relactation process by stimulating her breasts with 20-30 minutes of hand expression 8-12 times a day.

The woman and infant are likely to need help at each feed. It may be most convenient to admit them to a health facility for a few days, or to let them stay near the clinic for much of the day. In this way health workers have a better chance of providing feed-by-feed help and reassurance, and of making sure that the mother (or anyone else) does not give a bottle, pacifier or unnecessary artificial feed.

When relactation is well started, the mother and child can be discharged. They should be followed-up by community-level helpers each day and checked as often as possible by a health or nutrition worker.

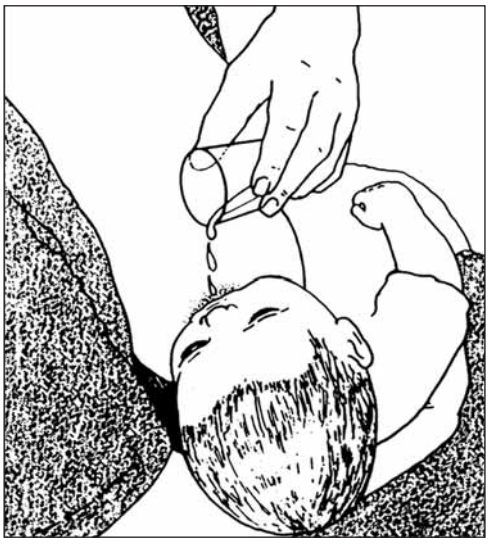
### Giving milk supplements

### The drop and drip technique

This is one way to give milk supplements during relactation. It encourages an infant to take an interest in the breast and to start suckling.
Drip milk from a dropper or a container directly onto the breast while the mother is attaching the infant to the breast.
However, after the infant is well attached and suckling, milk dripped in this way does not go into his/her mouth so easily.

IFE 2/35

**The drop and drip technique** **IFE 2/35**



### The breastfeeding supplementer technique

This method of giving milk supplements is useful for an infant who is unwilling to suckle at a breast which is not yet producing milk.
A breastfeeding supplementer consists of a tube that leads from a cup of supplement to the breast. It then goes along the nipple and into the infant's mouth.
The infant suckles and stimulates the breast, and at the same time draws the supplement through the tube, and so is fed and satisfied.
This feeding method is usually done under supervision at a health facility.

IFE 2/36

**Using a breastfeeding supplementer** **IFE 2/36**

Use a fine nasogastric tube or other fine plastic tubing. A gauge 8 tube is satisfactory. If there is no fine tube, use the best available.

Cut a small hole in the side of the tube, near the end of the part that goes into the infant's mouth (this is in addition to the hole at the end). This helps the flow of milk.

Fine plastic tubing is difficult to clean. So:

- Immediately after use rinse the tubing thoroughly with hot water and soap. Do this by drawing water through with a syringe or by sucking the tubing like a straw.
- Then sterilise with household bleach drawn through the tubing, or alternatively boil the tubes.
- Immediately before using the tube again, rinse again with clean water.
- Replace the tubing every few days.

Show the mother how to:

- Prepare a cup of supplement (expressed breastmilk or artificial milk) containing the amount that her infant needs for one feed.
- Put one end of the tube along her nipple, so that her infant suckles the breast and the tube at the same time. Tape the tube in place on her breast.
- Put the other end of the tube into the cup of supplement.
- Tie a knot in the tube if it is wide or put a paper-clip on it, or pinch it. This controls the flow, so that the infant does not finish the feed too fast.
- Control the flow of milk so that the infant suckles for about 30 minutes at each feed. Raising the cup makes the feed flow faster, lowering the cup makes it flow more slowly. As the infant gains strength, the woman can slow down the flow through the supplementer so that the infant suckles the breast longer.

Clean and sterilise the cup and the tube of the supplementer each time they are used, or teach the mother how to do this.

Encourage the woman to let the infant suckle at any time that s/he is willing – not just when she is giving a feed through the supplementer.
When the infant is willing to suckle at the breast without the supplementer, the mother can start giving the supplements by cup instead.

## Lactogogues

There are medicines called lactogogues that can increase a low breastmilk production by increasing prolactin levels.
It is uncertain how much they help when breastfeeding has stopped completely.
They are rarely necessary for relactation because full stimulation of the breasts is usually enough by itself.

**Full stimulation of the breasts is usually all that is needed for relactation.**

Only consider using a drug as an added stimulus if the methods described above have been tried for at least two weeks, and breastmilk has not been produced.
This is because:

- Relying on lactogogues can create dependency upon them among mothers and health and nutrition workers.
- Use of lactogogues early in the relactation process may reduce the amount of Basic Aid and Further Help that are offered.
- Lactogogues given as a "short cut" to relactation are unlikely to work.
- Lactogogues may also have some side effects on the mother and her infant.

### Lactogogues[1]

The drugs that are sometimes used are:
Domperidone 10-20 mg x 3-4 per day
Metoclopramide 10 mg x 3 per day

To discontinue both drugs:
Reduce by 10mg/day, and monitor the mother's milk supply

These are effective only if the woman receives adequate help and her breasts are fully stimulated as well.

## Words of caution

Domperidone is the safer option for a mother and her infant. It has few side-effects and the levels detected in breastmilk are minimal.

Metoclopramide has a number of significant side-effects, in particular it can cause depression in mothers. Its use needs to be balanced against the risks for the mother and infant, especially given the stresses of an emergency setting.

Once drugs are discontinued, good management of breastfeeding will ensure that breastmilk production continues.

If a woman or her family believe that a traditional drink or food will help a mother produce more milk, then taking it may help her psychologically. Most traditional 'remedies' are harmless. Usually they are high-nutrient foods such as oatmeal or millet porridge, or teas prepared from aromatic spices such as fenugreek, anise or fennel. It is important not to undermine a woman's faith in these drinks or foods, even if you do not believe in their efficacy. You may be able to provide warm teas, gruels, or other foods that breastfeeding women believe to be helpful, in a mother-baby tent. These can be part of ongoing support for relactation.

[1] Dosage recommendations, personal communication, Professor Thomas Hale. See also "Medications and Mothers' Milk, " 2004 edition, Pharmasoft (ISBN 0-9636219-8-X), pp 259, 548; author Thomas W. Hale (Professor of Pediatrics, Texas Tech University School of Medicine), and WHO website: http://www.who.int/child-adolescent health/New_Publications/NUTRITION/BF_Maternal_Medication.pdf

# 6.4 Feeding the infant during relactation

### What to give

While the mother is starting to produce breastmilk, she must feed her infant on the best available milk. This might be expressed breastmilk or artificial milk (see Part 9.4).

Supplements should be given by cup (see Annex 2) or supplementer so that the baby still needs to suckle frequently to stimulate the breasts.
If given by cup, let the infant suckle at the breast first, and cup feed afterwards.

The full amount of milk an infant needs is:

**150 ml per kg body weight per day**

At the start of relactation, give this 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.
As the amount of breastmilk increases, the infant needs less supplement, and the amount can be decreased (see below).

Infants over six months of age also need nutritious complementary foods (see Annex 11).

### Monitor weight

A health or nutrition worker should:
**Weigh the infant** once a week if possible. Low-birth-weight, sick or malnourished babies should be weighed more frequently.
An infant under six months of age should gain a minimum of
**125 grams a week, or 500 grams a month.**

### Ask how often the baby passes urine

Frequent urination (six or more wet nappies daily for babies aged under six months) with pale, dilute urine, is a useful day-to-day sign of adequate fluid intake in the exclusively milk-fed child.

### Ask about the infant's level of activity

An infant is probably getting enough to eat if s/he:

- wakes spontaneously every two to three hours demanding a feed
- feeds vigorously
- is lively and interacts socially in a way appropriate to his/her age.

An infant who is not getting enough to eat may be very quiet and undemanding because s/he lacks the energy to insist on being fed.

### Is breastmilk being produced yet?

Breastmilk production may start in a few days or a few weeks and is difficult to predict.
Some women produce a full supply in just a few days, especially if their infants were still breastfeeding sometimes when they started relactation.

But if an infant had stopped breastfeeding completely, it may take a few weeks, or more, before much breastmilk comes.

If a mother has never breastfed her infant, she may never produce enough breastmilk to establish exclusive breastfeeding.
However, some breastfeeding is better than no breastfeeding unless the woman is known to be HIV positive.
Enourage her to feed as much breastmilk as possible, with supplements of an appropriate artificial feed.
All breastmilk is nutritious and gives protective factors that artificial feeds cannot.

So it is better for a child to get some breastmilk from a relactating woman (unless she is known to be HIV positive), than be fed only on breastmilk substitutes.

A child aged over six months needs breastmilk and complementary foods. A woman who has relactated can breastfeed to two years and beyond like other women.

All women need encouragement to be patient, they must know that their milk may take a short or a long time to 'come in'.

### Signs that breastmilk is being produced

**Breast changes:**
- The breasts feel fuller or firmer, or may leak milk, or milk can be expressed.

**Less supplement consumed:**
- The infant (who breastfeeds first at each feed) takes less supplement while continuing to gain weight. This is not reliable over a short time, as the amount taken varies from day to day. Over a longer time, there should be a clear trend.

**Infant does not take second breast:**
- This may be a sign to reduce the amount of supplement offered, so that infant will again want to suckle both breasts at each feed.

**Stool changes:**
- The infant's stools become softer, more like the stools of a breastfed infant.

## How much breastmilk is being produced?

You can work out how much breastmilk a woman is producing by subtracting the amount of milk supplement a baby takes from the total amount of milk the baby needs. To do this:

1. Estimate the infant's total needs according to his or her weight (150ml/kg/day).
2. Ask the mother to give a breastfeed first and then offer the supplement.
3. Subtract the total daily amount of supplement that the infant takes from his or her total needs.

The difference is approximately the amount of breastmilk that the mother is producing. This calculation assumes that the infant is gaining weight, showing that s/he is taking all the milk needed for growth.

**Example**
A 6 kg infant needs..... about 900 ml of milk per day.
If the infant is taking.....450 ml of supplement per day
then the mother or wet nurses is producing..... about 450 ml of breastmilk per day.

## How to decrease the supplement

Start giving less of the supplement when there are signs that the woman is producing breastmilk and the infant is gaining weight.

**Reduce the supplement enough to encourage longer and more frequent breastfeeds, but not so much that the infant becomes too hungry or too inactive to feed properly.**

The mother or wet nurse can:

- reduce the total amount of supplement given in 24 hours by 50 ml and
- continue with the reduced amount for the next few days.

She may decide to give the supplement less frequently, perhaps only three or four times a day, or only one or two times late in the day.
She can reduce several supplementary feeds by 10-15 ml each, or reduce two feeds by 25 ml each.
She should continue to breastfeed without giving a supplement as often as the baby is willing.

If the infant:

- **shows by his urination and activity** that s/he is getting enough, and
- **after a week, has gained 125 g** or more of weight.

The woman can reduce the supplement again by another 50 ml.
Repeat the same process every few days, as long as weight gain, urine output, and activity continue to be adequate.

The amount of supplement can be reduced faster if the infant is not drinking all the supplement and is gaining weight (see Case Study below).

In some cases, relactation may take longer, especially with a wet nurse who stopped breastfeeding years before. Do not reduce the amount of milk supplement if the infant:

- shows signs of hunger that is not satisfied by more frequent or longer breastfeeding
- has not gained weight at the end of a week.

Continue to give the same amount for one more week.

If an infant continues to show signs of hunger despite unrestricted breastfeeding, or s/he still has not gained weight after another week, increase the supplement to the amount it was before it was reduced.

### Case study: Changing the balance of supplements and breastmilk

A baby named Roberto arrives in camp aged three months and weighing 5 kg. At Full Assessment, his mother, Maria, said that she had "lost her milk" and had stopped breastfeeding in the previous month, but she would like to start breastfeeding again.

**The first week**
The mother was given 750 ml of supplemental milk for Roberto. She gave it by cup after encouraging Roberto to suckle her breast, and she also encouraged him to suckle very frequently at other times. She kept him in skin-to-skin contact with her.

At the end of the first week, Roberto weighed 5.2 kg, a gain of 200g. He did not take all the milk from the cup; there was a total of about 50 ml of milk left over on each of the last two days.

The mother also noticed that a few drops of milk came out of her breasts when she tried to hand express her milk.

**1.** Was Roberto's weight gain in the first week adequate?
**2.** About how much breastmilk was Roberto's mother producing after a week?

**The second week**
The health worker praised Roberto's mother for having re-started her milk production.
She also watched a breastfeed and saw that Roberto was suckling effectively.
She explained that now they would be able to make faster progress.

They would try reducing the milk supplement by 50 ml a day.
So on the next six days, Roberto was given supplements of 700, 650, 600, 550, 500 and 450 ml.
Then the health worker saw Roberto and his mother again.
His mother said Roberto was suckling longer and more often, as well as taking the cup feeds.
She also could hear him swallowing during some breastfeeds.

At the end of the second week, Roberto weighed 5.35 kg, a gain of 150 g.

**3.** Was Roberto's weight gain in the second week adequate?
**4.** Should the amount of supplement continue to decrease, increase, or be kept at 450 ml?
**5.** What additional help might the mother need at the end of the second week?

**Possible answers:**

**1.** Yes, it was very good.
**2.** Probably about 50 ml per day.
**3.** Yes, it was still over 125 g/week.
**4.** The supplement can continue to decrease if the baby's weight continues to be monitored frequently.
**5.** The mother needs praise for the way her milk production is increasing. She needs to know that Robert's weight gain was good. She may need to be told that she is making very good progress back toward exclusive breastfeeding. As always, she needs to be listened to. Does she have doubts or satisfactions to express? She might want to decide whether she will give cup feeds of the supplement fewer times per day.

# 7 Breast conditions

## 7.1 Level of help required

During Full Assessment (see Part 3.3) you may have found that a mother has a difficulty with one or both breasts such as:

- concern about breast size and shape, flat or inverted nipples, or
- very large nipples, nipple pain (sometimes persistent) or breast pain and swelling.

The Levels of help tables in Part 4 indicate that these mothers need to be referred for Further Help. Some of them will require medical care and the other interventions described below. If there is no-one available to give Further Help for breastfeeding, give Basic Aid as this can help many breast problems.

For a mother with any of these conditions, it is important to:

- listen and learn about her worries and feelings
- talk to her and explain what the condition is and what can be done to help
- reassure her that she will recover and that she can continue to breastfeed.

Notice that many of the conditions can prevented by Baby-Friendly maternity care (see Part 2.2) which includes suckling soon after delivery and help with early breastfeeds. Also, giving Basic Aid as soon as a mother has a difficulty may prevent it from becoming more severe, and may prevent other problems arising.

## 7.2 Breast fullness and size

Women in emergency situations often become worried that their breasts do not feel full or firm. Thinning of the breasts may occur with weight loss, because the breasts lose some of the fat that gives them their full shape. However, the alveoli continue to make milk provided the baby is suckling effectively.

Breasts differ greatly in size and shape, but this does not affect milk production. All types of breasts can make breastmilk whether high and rounded, long and hanging, large and fat, or small and flat.

- If the mother is not worried, say nothing about the fullness or size of her breasts.
- If the mother is worried about fullness, explain (kindly and without being critical) that fullness and size is mostly due to fat. Reassure her that her breasts will produce perfect milk as long as her baby suckles.
- Praise her for breastfeeding and tell her that her milk is exactly what her baby needs.

## 7.3 Nipple conditions

Women (and health workers) are often concerned about nipple shape.
They may believe that difficulties with attachment are because a nipple is flat or inverted

(turned inwards). But the difficulty is almost always due to a poor breastfeeding technique.
It is important to remember that when a baby suckles, the nipple and tissues underneath the areola are stretched out to form a long teat in the baby's mouth (see IFE 2/2).
The nipple is only a small part of this teat, and its size is not important, provided the breast tissue can be stretched out.
Most nipples become softer and easier to stretch around the time of delivery.

### Flat nipples

Many nipples look very short or flat but if they can be stretched out they should not cause any difficulty.

To prevent problems arising:

- Allow the infant to suckle immediately after birth (see Part 2.2).
- Give the mother help with early feeds.
- Reassure her that a baby suckles the breast, not the nipple, and that the shape of the nipple is not important if the baby is well attached.
- Pay careful attention to the technique of positioning and attaching the baby at the breast (see Parts 1.1 and 4.2).

There is no need to prepare nipples during pregnancy as this is not effective.

Additional suggestions are to:

- Give extra help with attachment. Make sure that, as the mother is putting the baby on her breast, she:
  - aims the baby's chin below her nipple, so that his/her tongue gets right underneath the areola
  - gently touches the baby's mouth to encourage him or her to open it widely and to take a big mouthful of breast (but does not pull his/her mouth open)
- Avoid use of nipple shields (artificial teats that cover the mother's nipple) they reduce breastmilk intake and do not usually help.

### Inverted and large nipples

A few nipples are truly inverted. They may look indented (turned inwards) and do not stretch out easily.
Some nipples are very large or wide or long. This makes it difficult for a baby to take enough of the breast tissue into his or her mouth to suckle effectively, particularly in the first few weeks of life.

If a mother has nipples that are inverted or large, wide or long:

- Make sure that she understands about attachment and knows what she is trying to get her baby to do (see Additional suggestions above).
- Encourage her to give the baby plenty of skin-to-skin contact, with frequent opportunities to try to take the breast into his or her mouth. But tell her not to force him, or to force his mouth open.
- Show her different breastfeeding positions to try, such as lying down, holding the baby in the underarm position or lying or leaning forward so that her breast falls towards the baby's mouth (see Part 1.1).
- If it is possible to get a 20ml plastic syringe, you can use it to pull out an inverted nipple in the following way: cut off the adaptor end, put the plunger in backwards, put the smooth (uncut) end of the syringe over the nipple, and draw out the plunger. This will stretch out the nipple. Do this for half a minute to make the nipple stand out just before each breastfeed.
- Teach her to express her milk (see Annex 3) at least eight times a day, and to feed the expressed milk to the baby with a cup. Avoid bottles and pacifiers which encourage sucking with a more closed mouth and lips pushed forward.
- Keep on trying. Most babies want to suckle and they will find out how to open their mouths wide enough to take the nipple eventually. It may take a week or two.

### Nipple pain

A mother may complain of sore nipples or appear to be in pain or discomfort while feeding. This happens quite often in the first few days after delivery but also occurs at other times.
The commonest cause of sore or uncomfortable nipples is poor attachment.
Help with early feeds often prevents the problem.

When you watch a breastfeed, notice the appearance of the nipple as the baby releases the breast.
Even if the mother complains of pain there may be nothing to see because at first the nipple skin is not damaged.

But if a baby continues to suckle while poorly attached, it damages the nipple skin. Then you may notice a line across the end of the nipple like a fold in the skin which may disappear soon after the baby stops suckling. The line shows that the nipple is being squashed and hurt by poor attachment. Later a sore or crack may develop which may bleed or become infected.

Sometimes a mother does not say that suckling is uncomfortable until the baby's attachment improves, and then she feels the difference.

To help mothers with nipple pain:

- Ensure good attachment and effective suckling (see Basic Aid, Part 4.2). This often reduces the pain immediately. Continue breastfeeding. If there is a sore, it usually heals and breastfeeding becomes painless in one to three days.
- Suggest that the mother expresses a little breastmilk at the end of each feed and rubs it gently into the sore. Breastmilk promotes healing.
- If a sore is infected, give the mother a vaseline gauze dressing (if available) to cover the sore between feeds. If the sore is large and infected give a systemic antibiotic of a kind that is effective against resistant staphylococci.

### Persistent nipple pain

Nipple pain sometimes continues despite improved attachment.
If the pain is present between feeds, or if the nipple skin is dry and itchy, there may be thrush infection (infection with candida, sometimes called yeast).

To help a mother with persistent nipple pain:

- Examine the baby's mouth for white spots, and his or her bottom for a spotty red rash. These are signs that the baby may have thrush, which is also affecting the mother's nipples.
- Treat with gentian violet once daily: 0.25% solution for baby's mouth and bottom, and 0.5% solution for mother's nipples, for five days. You can also use Nystatin cream for nipples and oral drops for the baby if available.
- The mother can continue breastfeeding during the treatment; the medicine on her nipples will not harm the baby (who anyway has the same medicine in his/her mouth).
- Advise the mother not to use pacifiers or feeding bottles.
- Discourage use of soap or ointments on the nipples. Ordinary washing as for the rest of the body is all that is needed.

## 7.4 Breast pain and swelling

A woman may complain of pain and/or swelling of one or both breasts.
You may notice swelling or redness (in light-skinned women) of a breast when you observe a breastfeed.

To find the cause of the problem:

**Ask the mother:** "Do you have a fever or feel ill?"
**Look** at both breasts for a swollen appearance, shiny oedematous skin and/or red areas (in light-skinned women).

**Feel both breasts for:**

- general hardness and tenderness
- localised hardness, tenderness, and swelling or lumps.

Try to decide if the condition is:

- normal fullness
- engorgement
- a blocked duct
- mastitis
- an abscess.

### Normal fullness

A few days after a baby is born, the milk "comes in" and the breasts fill up with milk. The breasts may become very full and uncomfortable, and may contain several lumps.
However, the mother remains well, with no fever.
The breast and nipple skin remain healthy.
The milk continues to flow and may drip out between feeds.
The lumps become smaller after a feed.

To help a mother whose breasts are very full in this way:

- Reassure her that the fullness is normal and will settle in a few days.
- Encourage her to let the baby feed as often as s/he is willing.
- Show her how to express her milk a few times to keep the breasts comfortable.

Fullness is less troublesome if the baby starts to suckle soon after delivery and if s/he is well attached and suckling effectively.

### Engorgement

Sometimes the breasts become too full of milk and tissue fluid and the milk cannot flow out easily.
The breasts are painful and the woman may have fever for 24 hours.
The whole breast looks swollen, oedematous and shiny, and may be a little red (in light-skinned women).
The breasts feel hard and are tender.
The nipple may be stretched so tightly that it is difficult for the baby to attach and suckle effectively.

Engorgement can usually be prevented if the baby starts breastfeeding soon after delivery, and then continues to feed whenever s/he wants, with no restrictions.

To help a mother with engorgement:

- Give Basic Aid for breastfeeding (see Part 4.2) to ensure good attachment, and encourage her to feed the baby frequently.
- If the baby has difficulty attaching, help the mother to express her milk (see Annex 3) to soften the breasts until the baby can attach more easily.
- Gently massage the mother's back while she expresses, or while the baby suckles, to help the milk to flow.
- Use a warm compress, or bathe the breasts in warm water before a feed to help the milk to flow.
- Use a cold compress after a feed to help reduce the swelling.

### Blocked duct

Sometimes the milk is not removed from one part of a breast; it collects and forms a small hard lump.
The lump is tender, and the skin over it may look slightly red.
The lump is only in one place (localised) and the rest of the breast is healthy.
The woman remains well and has no fever.

To help a mother with a blocked duct:

- Ensure good attachment and encourage the mother to breastfeed frequently particularly from the affected breast.
- Show her how to gently massage over the lump, towards the nipple while the baby suckles. This should help the milk to flow out of the lump, and the lump then disappears. Sometimes a plug of thickened milk comes out of the nipple (the baby can safely swallow it).
- Avoid strong massage which may bruise the breast.
- Suggest that the mother tries feeding the baby in a different position, such as the underarm position (see Part 4.2).
- Advise her not to wear tight clothes over her breasts.

## Mastitis

Sometimes part of a breast becomes hot, hard and very painful. In light-skinned women, the area may look very red.
The woman feels ill and has a fever. This is mastitis.

Mastitis may happen when milk is not removed effectively, so it stays in the breast.
For example, mastitis may follow if the baby is not well attached, if there have been delays between feeds or if feeds have been short or hurried.
But often the cause is not clear.
Often there is no infection. If the milk stays in the breast for a long time, it can cause inflammation of the breast which gives the woman fever and pain.
However, infection may occur especially if there is an infected sore on the nipple.
The infection may develop into an abscess if not properly treated.

To treat mastitis:

- Explain to the mother that the most important part of treatment is to remove the milk from the affected breast by breastfeeding or by expressing it.
- Explain that the baby should continue to breastfeed. There is no need to stop unless breastfeeding is unbearable for her. Even if the breast is infected, the milk does not make the baby ill.
- Ensure that the baby is well attached and suckling effectively. Then encourage the mother to breastfeed as often and for as long as the baby is willing.
- Explain that if the baby does not breastfeed, or does not feed enough, the milk must be removed by expressing it (see Annex 3). Teach her how to do this.
- Encourage the mother to rest and ask other people to help with her duties. She can lie down with the baby and breastfeed him or her as often as possible.
- Reassure her that frequent, effective suckling usually results in improvement within 24 hours.
- Give anti-inflammatory analgesics (e.g. ibuprofen) to reduce the symptoms.
- Give an antibiotic effective against resistant staphylococci if:
  - the inflammation is extensive and the mother severely ill when first seen
  - there is a purulent, infected nipple sore, or improved removal of milk does not result in improvement in 24 hours.
- Continue encouraging breastfeeding and giving all the care listed above throughout the antibiotic treatment. Antibiotic treatment alone is not sufficient to cure mastitis. Antibiotics given to the mother will not harm the baby.

## Breast abscess

An abscess may result if mastitis or a blocked duct are not properly treated.
This happens if milk is not removed from the affected breast even if antibiotics are given.
The breast develops a very painful swelling and the woman is ill with fever.
The skin over the swelling may be discoloured.
It may be possible to feel that the swelling contains fluid.

To treat a breast abscess:

- Refer the mother for medical treatment because:
  - the abscess may need incision and drainage, or aspiration of the pus
  - and the woman needs antibiotics.
- Encourage her to continue breastfeeding. There is no need to stop, unless it is too painful (for example, when there is a wound near the nipple). The milk and medicines will not make the baby ill; healing will not be delayed.
- If necessary, help her to express her milk, to temporarily feed it to the baby from a cup and to re-establish breastfeeding as soon as possible.

# 8 The young severely malnourished infant

The nutritional management of severely malnourished infants aged less than six months was identified by the core group as a key issue to include in Module 2[1]. As there is little published evidence to guide the development of training material, Part 8 was reviewed by experienced academics, paediatricians, nutritionists and field teams[2]. The guidelines given here reflect the consensus reached by this review and are based on existing evidence and field experience.

There is an urgent need for more research in areas such as the management of supplemental suckling in emergencies, and the choice of supplemental milk. We invite you to send us your experiences on the nutritional care of severely malnourished infants aged less than six months. Part 8 will be updated as new evidence emerges.

## 8.1 Malnutrition in infants aged less than 6 months

In emergency situations, infants are defined as being severely malnourished if they have:

- **Weight-for-length of less than 70% of the median** (NCHS/WHO reference values)
- **oedema** (bilateral pitting oedema of at least the feet)

Infants less than 6 months old may become malnourished if they have:

- never been breastfed
- been only partially breastfed, combined with inadequate, unsafe artificial feeds and/or with inappropriate complementary feeds (e.g. watery, introduced too early)
- their mothers are dead or absent
- their mothers are malnourished, traumatised, ill, or unable to respond normally to their infants' needs
- they have some form of disability that affects their ability to suckle or swallow, and/or a developmental problem affecting feeding.

Infants may also be classified as malnourished if they:

- were low birth weight babies as a result of prenatal malnutrition or preterm birth and have failed to 'catch up'.

It is difficult to distinguish between these infants and those who became malnourished after birth.

### Care for infants with severe malnutrition

Severely malnourished infants need special care. This usually requires admission to a hospital or a Therapeutic Feeding Centre (TFC) for immediate nutrition and medical care, and later follow-up with outpatient or community based care.

[1] See ENN/GIFA report www.ennonline.net; Field Exchange, Issue 21; SCN Update on IFE 2004.
[2] Earlier drafts of this chapter were circulated to a cross-section of external experts and practitioners with terms of reference about the its appropriateness, safety and practicality. The list of reviewers and Terms of Reference can be obtained from the ENN, email; marie@ennonline.net

Nutritional management of these infants requires a combination of:

- improved or re-established breastfeeding (unless the infant has to be artifically fed)
- temporary or longer term appropriate therapeutic feeding
- nutritional, psychological, and medical care for their mothers.

Feeding severely malnourished young infants is labour intensive and requires staff skills that are different to those needed when treating older infants and children. Supporting and, if necessary, re-establishing or starting exclusive breastfeeding is the cornerstone of management and longer term survival of young infants, and takes much time and expertise. Training is essential for staff to understand the particular needs of malnourished infants aged less than six months.

## Role of breastfeeding for malnourished infants

The future survival of malnourished infants aged less than six months depends largely on the establishment or re-establishment of exclusive breastfeeding. To achieve this, breastfeeding or breastmilk should be part of the feeding management *from the beginning* if the mother is available or a wet-nurse[3] can be found.

*Supplementary suckling* can be used to re-establish or begin breastfeeding in malnourished infants.
*Supplementary suckling* means that the infant is suckling at the breast and at the same time is taking supplementary milk from a cup through a fine tube leading along the nipple. The infant is nourished by the supplementary milk while the suckling stimulates the breast to produce milk (see Parts 6.3 and IFE 2/36).

## Infants who are not breastfed

There are situations where an infant is not being breastfed and there may be no option of breastfeeding e.g. if a mother has never breastfed and is unwilling to try to breastfeed, or if a mother has died and/or no wet-nurse is available.
Nutritional management of non-breastfed infants follows the same principles as for breastfed infants.
Plans and preparation for discharge become especially important, as the infant's future nutritional security is more uncertain and the young infant especially vulnerable, particularly in emergency settings (see Part 9 on Artificial Feeding, Section B).

## Infants who show no signs of severe malnutrition

These infants can normally be supported at a breastfeeding corner. They include:

- infants whose mothers report that *they do not have enough breastmilk*
- *infants who are reported not to be gaining weight as expected*
- *low birth weight infants* if they are feeding well and showing no signs of illness and are gaining weight (See Part 5.2)
- *mild and moderately malnourished infants less than six months.*

**Mild and moderately malnourished** (see Parts 4.1 and 5.3) infants do not need to be admitted to a TFC. Avoiding admission to centres where there may be other sick children, and which may be crowded, reduces the risk of cross-infection of young infants who are particularly vulnerable. Instead they, like the others mentioned above, can be monitored and cared for at a breastfeeding corner (see Annex 14). Support to improve breastfeeding may be all the care needed, and can be life saving for these infants. Many of these infants gain weight if their mothers are given support to improve breastfeeding.

If management at the breastfeeding corner is not successful and monitoring shows a failure to gain weight, infants should be admitted and nutritionally managed as if they are severely malnourished. However, these infants do not require the systematic drug treatment of the severely malnourished infant. They need to be individually assessed medically for signs of illness. If they are ill, for example with an infection, additional treatment may be necessary. Malnourished infants more than 6 months old, but less than 65 cm long or weighing less than 4 kg can be managed the same as infants aged less than 6 months. These infants may have been LBW and/or have grown poorly after birth.

[3] In areas of high HIV prevalence, wet-nursing may not be feasible unless it is certain that a prospective wet-nurse is HIV-negative and can ensure that she remains so – see HIV and Infant Feeding Counselling: A Training Course WHO/UNAIDS/UNICEF (WHO/FCH/CAH/00.4).

## 8.2 Overview of management

**The medical treatment** of young infants is not described in this Module but details are given in some of the reference documents listed in Part 8.11. These should be available to all health and nutrition workers. The reference documents do not specifically cover the special nutritional needs of infants less than 6 months old or the effective management of breastfeeding. That is why these issues are the main focus of this section.

Severely malnourished young infants need:

1. **Diagnosis** of medical complications and treatment if any are found.
2. **Warmth** to treat and prevent hypothermia.
3. Initial re-feeding (for metabolic **stabilisation**) which may require milk feeds in addition to breastmilk, or where an infant is not breastfed instead of breastmilk.
4. Feeding for catch-up growth (nutrition **rehabilitation**).
5. **Continuous monitoring** of weight and feed intake.
6. **Follow-up** to reduce the risk of becoming malnourished again.

The table below summarises the management of young severely malnourished infants from initial admission through the different phases until recovery and discharge. Support to the mother is an integral part of this care.

**Table 8.1: Outline for the management for severely malnourished infants under six months of age**

| | |
|---|---|
| Initial assessment and treatment | Weigh and measure infant and diagnose and treat complications such as hypothermia, hypoglycaemia, dehydration, infections and septic shock. |
| Give the infant initial re-feeding | Feed the infant with appropriate milk feeds for initial recovery and metabolic stabilisation. |
| Feed and care for the mother | If the mother is available, feed and care for her physically and psychologically, to help restore her health, her ability to produce milk, and her ability to respond to her baby. |
| Keep mother and infant together | Keep mother and infant together, to help the mother care for and respond to the baby, and to give skin-to-skin contact (Kangaroo care) to warm the baby. Beds or mats are better for this than cots. |
| Continue and improve or re-establish breastfeeding | Breastfeeding is an integral part of management. Continue and improve or start to re-establish breastfeeding as soon as possible from the beginning of treatment, if necessary using the supplementary suckling technique. A mother may need to express breastmilk, if the infant is too weak to suckle. Show her how to do this. |
| Feed the infant for catch-up growth | As the infant starts to recover, feed him/her to achieve rapid catch-up growth, (nutrition rehabilitation). Give supplementary milk feeds using a breastfeeding supplementer if needed, as long as necessary, until exclusive breastfeeding is re-established. |
| Give adequate artificial feeding if breastfeeding impossible | If breastfeeding is not possible, give therapeutic feeds until the infant recovers then change to adequate artificial feeding in accordance with a local Agreed Criteria. |
| Discharge when gaining weight on breastfeeding alone **or** on a safe alternative | Discharge the infant from TFC when gaining weight for 5 days on breastfeeding alone (regardless of original body weight) **or** when the infant has changed completely to adequate artificial feeding with formula; and has had weight-for-length 80-85% of the median NCHS/WHO standards reference values for 3 days. |

## 8.3 Assessment and admission

- Weigh the infant, measure length if possible, and examine for signs of illness.
- If a complication is present, start treatment. The usual complications are hypothermia, hypoglycaemia, dehydration, infection, septic shock or congenital conditions. Check carefully to avoid over-diagnosis, particularly of dehydration, as fluid overload is dangerous. For further details see reference documents 1-4 in Part 8.11.

- Keep the infant warm, start Kangaroo care (see Part 5.2). A hot drink given to the adult can increase the heat she makes to warm her infant while in the Kangaroo position.
- Do a *Full Assessment* of feeding (see Part 3.3) to learn if the infant is breastfeeding effectively, and what other feeds have been given.

**Admission criteria for infants less than six months of age**

One or more of the following criteria should be met in order to admit an infant under six months to a TFC:

- severe wasting *(<70% of the median weight for length)* for infants 49cms or more
- visible severe thinness for infants less than 49cms
- bilateral oedema (as defined above)
- failure to gain weight at home or under management at a breastfeeding corner (see Annex14).

Assessment in this age-group has some difficulties:

- At present, weight-for-length can only be calculated for infants over 49cms, because charts do not exist below 49cm. Some agencies admit infants under 49cms if they weigh less than 2.1kg.
- Visible severe thinness can be used to identify severe wasting if measurements are not possible. It is more difficult to accurately measure very small infants than larger infants, especially with the equipment usually available in emergency situations.

## 8.4 Selecting the right feed type

All infants less than 6 months of age have special dietary needs because they:

- Are metabolically more vulnerable.
- Have higher water requirements than older infants. This is because:
  - small infants have a high ratio of surface area to weight so more water is lost from the skin. Water loss from the skin (evaporative loss) increases in hot conditions, and
  - small infants are less able to concentrate fluid in the kidneys, especially if they are malnourished.

The milks listed below and described in Annex 13 have been used successfully in different circumstances. The guidance given below should help you decide what to use. What is available and the context of an emergency situation also influences which milk to chose.

**Breastmilk / Breastfeeding**

- Suitable for initial re-feeding **but** only a limited quantity may be available if breastfeeding has been interrupted and infant not suckling. Can combine expressed breastmilk and appropriate therapeutic milk initially.
- Suitable for continuing catch-up growth in infants under 6 months if adequate milk production has been re-established, and if infant feeds often enough day and night.

**Commercial F75**

- Safe for initial re-feeding of severely malnourished infants under 6 months (and all ages) during stabilization phase. It is essential to use commercially prepared F75. Home-made F75 is higher in osmolarity.
- Necessary if infant has oedema.
- Not suitable for catch-up growth at any age.

**F100-D (F100 + one-third extra water)**

- Safe to use for initial re-feeding under 6 months if appetite appears to be reasonable, especially if infant is breastfeeding.
- Suitable for catch-up growth of infants under 6 months.

**Infant formula(as specified in Codex Alimentarius)**

- Safe to use in initial re-feeding under 6 months if reconstituted accurately and hygienically and the mother or carer has received proper counselling on re-lactation and what and how to feed the baby.
- Suitable for catch-up growth of infants under 6 months.

**Breastmilk** is the best milk for malnourished infants under six months of age, and breastfeeding needs to be actively supported from the beginning of treatment. Always emphasise the superiority of breastmilk. If infant has access to sufficient quantities of breastmilk this alone can be used in preference in all phases of treatment.

If an infant is too weak to suckle adequately, the mother's **expressed breastmilk** can be given by cup (see Part 5.4) or used for supplemental suckling (see Part 6.3 and IFE 2/37 p 29).

**Infant formula** is not usually used as it is normally more convenient to use the same preparation (F75 or F100) being used for older children. Also there is a risk of conveying a negative health education message if mothers see its use as promotional.

On the rare occasions when infant formula is needed, it should be purchased from normal channels and not received as a donation (see Module 1 Part 3.1).

**The other types of milk, listed in Annex 13, can be given to malnourished infants under 6 months of age:**

- as a temporary supplement to breastmilk - when there is a possibility of re-establishing exclusive breastfeeding and expressed breastmilk is not available
- when expressed breastmilk is available in insufficient amounts
- as the only food where there is no prospect of breastfeeding.

A *test feed* can be used to assess how well an infant is feeding. The infant is observed breastfeeding (see Part 3.3), and/or taking the prescribed amount of feed by mouth to see how well they manage.

**Feeds that should not be used for infants under six months:**

- **Home prepared milk feeds**
  - Home prepared milk-based feeds/modified animal milk recipes are unsuitable for young malnourished infants due to their higher osmolarity, and often inadequate micronutrient content. If breastmilk, infant formula, diluted F100, or F75 are not available, they can be used as a last resort, but for a minimum length of time.

- **Full strength F100**
  - Full strength F100 should not be used for infants under six months of age. This is because the renal solute load is too great and the water content too low for young infants, even during catch-up growth.

- **Cereals and other foods**
  - Some feeding programmes use therapeutic feeds made from cereals, or Ready to Use Therapeutic Foods (RUTF) (like Plumpy'nut or locally made versions).
    But these foods should not be given to infants under six months of age as they cannot digest cereals easily.

Similarly, do not give porridge and other complementary foods. Giving porridge may slow recovery as it replaces milk feeds. It is better to give increased amounts of breastmilk and adequate supplementary milk.

## Micronutrients and electrolytes

Give to all children aged under 6 months:

- A high dose of vitamin A (50,000 IU orally) on admission (see reference document 2 p17 in Part 8.11).
- 5mg folic acid on day 1 and, if using non commercial F75 or F100-D, give 1mg folic acid daily from day two.

Electrolytes/minerals and vitamins must be added to the feeds if commercial F75 and F100-D are not available and home-made F75 and/or infant formula has to be used.

Do not give iron during stabilization, but give 3mg/kg/day oral iron in two divided doses during rehabilitation (see reference document 2 p21-2 in Part 8.11).

## 8.5 Phases of treatment

Management of severely malnourished infants less than six months of age can be broken down into four phases of treatment.

### Stabilisation

The first phase is called *stabilisation* (or *initial treatment*). The aim of this phase is to achieve metabolic stabilisation in the infant while supporting breastfeeding where possible. This is done through careful feeding, medical management and supplementary suckling.
Depending on the circumstances breastmilk and/or a choice of F75, diluted F100 (F100-D) or infant formula are appropriate in this phase (see Annex 13).
Weight gain is not expected in this phase, and there may even be a fall in weight due to loss of oedema.

### Transition

Once stable, the infant enters the transition phase. Here feeding regimens will be altered in volume and type in preparation for rehabilitation. For breastfeeding infants the mother receives continued support, and supplemental suckling if started should continue. The breastmilk quantity should start to increase in the transition phase. If F75 was used during stabilisation, change to F100-D or infant formula.

### Rehabilitation

The next phase is called the *rehabilitation* (or sometimes the *recovery* or *catch-up growth*) phase. The aim of this phase is to provide enough feed to support rapid catch-up growth. During this phase, supplemental suckling if used is scaled down, and the infant should return to exclusive breast feeding. Non-breastfed infants are changed to a BMS suitable for preparation in the home.
Weight gain should be 10g/kg/day or more, if less than 5g/kg/day the infant is not responding to treatment.

### Discharge and Follow-up

The final phase is to prepare the mother/caregiver and infant for discharge and to follow them up when they go home.

When catch-up growth is complete, the infant should continue to gain weight at the slower rates expected for infants of the same age (5-10g/kg/d) - as seen in growth monitoring charts, for example.

After discharge, the weights and feeding of infants should be monitored at least weekly for 3 months and mothers/caregiver given continued support if they are breastfeeding.

## 8.6 Monitoring progress

The importance of close monitoring during each phase of treatment must be emphasised, and staff may need training to understand that this is a priority.

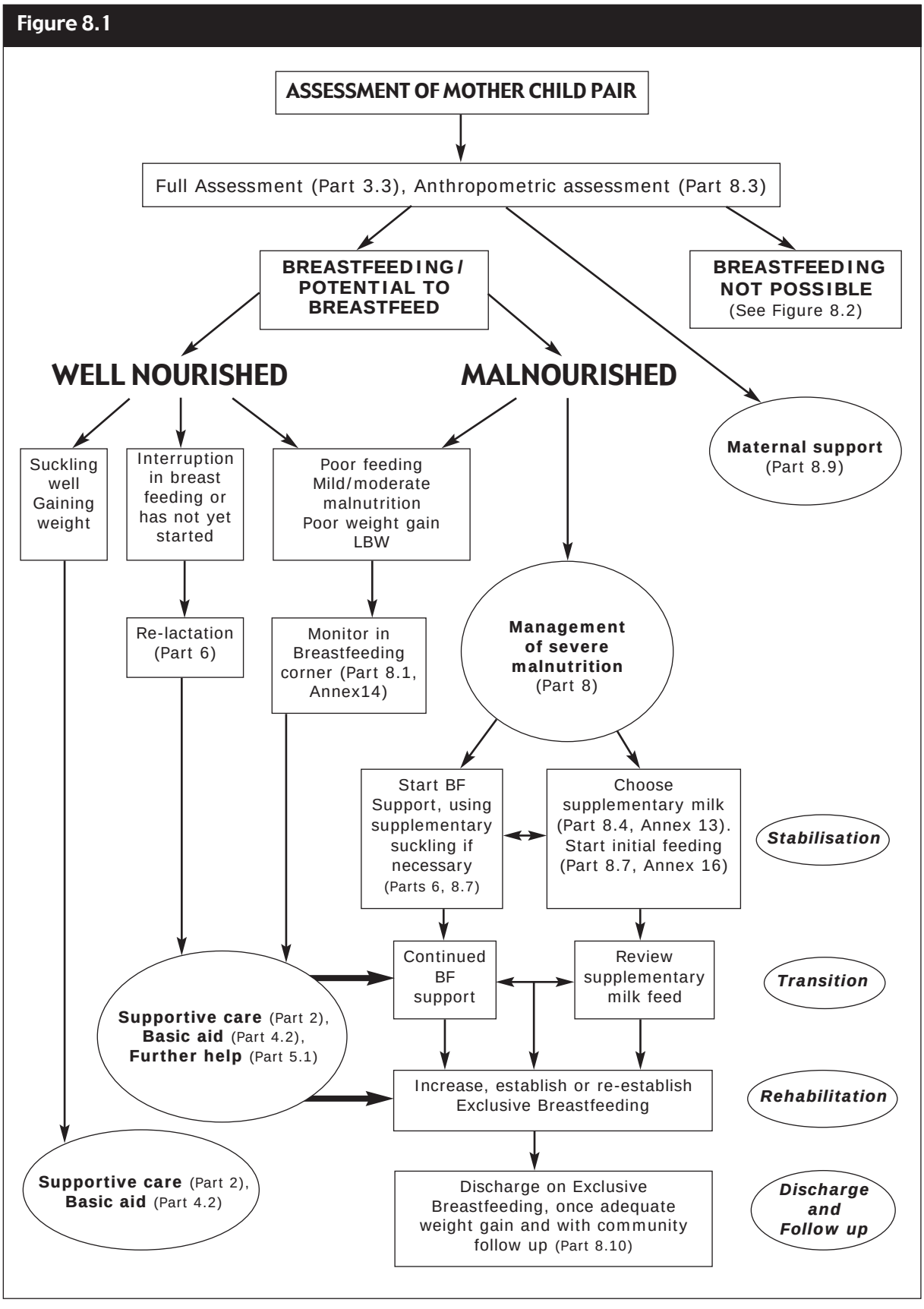
- Record and review the total intake of supplementary milk feeds and/or number of breastfeeds per 24 hours.
- Monitor weight gain, urinary output, activity level and other signs that breastmilk is being produced (see Part 6.4).

**Tips for monitoring weight:**

- Infants should be weighed daily on appropriate scales, with an accuracy , ideally, to at least 20g.
- It is important to check scales are being properly used (e.g. zeroed if necessary after each measurement).
- Infants should be weighed entirely nude – weight of clothes can make a big difference to the small changes in weights seen in such small infants.
- Using a basin to weigh young infants is more practical for small, sick infants, and easier to clean than hanging pants.
- Weight gain needs to be calculated as grams per kilo body weight per day. However a useful rule of thumb for minimum acceptable weight gain during catch-up growth in young infants (weighing less than 4kgs on admission) is 20g every day.

# 8.7 Management when breastfeeding is possible

**Figure 8.1**



## Stabilisation

Breastfeeding is an integral part of management from the very beginning of treatment. Continue and improve, or start to re-establish, breastfeeding as soon as possible; if necessary use the supplementary suckling technique (see Parts 6.3 and IFE 2/36 p7).
If the infant is too weak to suckle, the mother should express her breastmilk and feed it by cup or supplementer.

If a mother initially finds it difficult to express the full volume of breastmilk required, then a combination of expressed breastmilk plus supplementary milk feed (e.g. F75 or F100-D or infant formula) can be used. If an infant appears lethargic, or is very reluctant to suckle at the breast at all, or has oedema, then s/he should be started on F75.

1. Select the type of milk feed (see Part 8.4 and Annex 13).

2. Using the table in Annex 16, calculate the amount needed for 24 hours according to the infant's weight on admission, and then the amount needed at each feed. Give the full amount of milk feed over 24 hours, making no allowance for any intake from breastmilk. Give one feed immediately on admission. Give a 2-hourly amount if the infant is very ill or a 3-hourly amount if the condition is satisfactory. Continue to give 3-hourly feeds (if these are tolerated) or 2-hourly feeds (if infant remains very ill) but give the same total volume in 24 hours.

3. If the infant is able to suckle, give the supplementary milk feeds by breastfeeding supplementer while the infant is suckling at the breast. This is the supplementary suckling technique and is preferable to other methods of feeding a young malnourished infant.

4. If the infant is not able to suckle, give feeds by cup, dropper, syringe, or naso-gastric tube. At each feed try the supplementary suckling technique before using other methods, only use these methods if infant is not taking milk by supplementary suckling.

   It is particularly important to monitor the total 24-hour intake of milk feed and number of breastfeeds when supplemental milk is being provided by naso-gastric tube, especially in very small infants. An infant cannot refuse a naso-gastric feed and so it is easier to overfeed than when feeding orally.

   As soon as oral feeds have started, ask the mother to offer her breast, to see if the infant is willing and able to suckle. The breast should be offered 1/2 - 1 hour before giving the therapeutic feed when the baby is more likely to be hungry and so more likely to suckle.

5. When the infant is suckling at the breast, continue to give the same total volume of supplementary milk over 24 hours. Suckling at the breast stimulates an increase in production of breastmilk and this provides the increased amount of feed that the infant requires as s/he recovers and starts to gain weight.

### Frequency and numbers of feeds

If you feed every 2 hours, this means giving 12 feeds in 24 hours with some feeds being given at night. This can be very difficult to do except perhaps for one or two days at the start of treatment – but it is the best and safest way of feeding during the stabilization phase.

Sometimes staff are not available at night, and mothers become exhausted if they have to keep waking up to feed. The result may be that feeds are missed, so that the total volume required for recovery is not given. 3-hourly feeds (8 times in 24 hours) are more likely to be given as required.

Sometimes, if there are no night staff, mothers are admitted only during the day, and go home with their infants at night. In such situations, you may need to divide the total 24-hour intake between fewer feeds (such as 6 feeds), and to give all the feeds during the day.

At other times, especially during the night, the infant should stay with the mother and continue to breastfeed if possible. Continuing to breastfeed at night is the key to successful day care. Even if the infant takes only a small amount of breastmilk, it stimulates milk production, is nutritionally valuable and may be life-saving.

The total volume of supplementary milk taken over 24 hours is the most important measure, and must be carefully monitored.

6. Continue to give the full amount of supplementary milk as well as breastfeeding as much as possible, until:

   - any oedema has disappeared
   - the infant's appetite improves
   - there is evidence of breastmilk production (milk can be expressed, breasts feel fuller See Part 6.4).

   These events usually occur about two to seven days after initial re-feeding begins.

7. As the infant's general condition improves, s/he will start to show an interest in taking milk, for example, taking the supplementary milk through the supplementer quickly, and finishing all feeds, sucking on the syringe, suckling the breast more strongly, or lapping from a cup.

The infant now moves into the transition phase.

### Transition

- Observe breastfeeds, to ensure that the infant feeds effectively, and for as often and as long as possible. Breastfeeding should last at least 20 minutes and start half to 1 hour before supplementary feeds are due.

- If F75 was initially used as the supplementary milk, then change to F100-D or infant formula. Continue to offer the same total amount of supplementary milk according to the infant's weight on admission.

### Rehabilitation Phase

As breastmilk production increases, the infant gains weight. This happens partly because, although the intake of supplementary milk remains the same, the increased breastmilk adds to the total intake.

Eventually as breastmilk production increases, the infant may take less supplementary milk.

When the infant is having mainly breastmilk and is gaining weight, you can reduce the amount of additional milk feeds offered and then stop them, while you monitor the infant's progress on breast milk alone (see below).

### Monitoring progress

Weigh the infant every day if possible, or at least every 2 days

- If the infant loses weight over 3 days, reassess both the supplementary feeds and the breastfeeds that are given, (amount, technique, frequency and duration, both day and night) and check the infant medically, especially for infection.

  If indicated, give medical treatment and/or correct the breastfeeding technique and the therapeutic feeds, keeping the 24-hour total volume of therapeutic feed the same.

- If the infant is not gaining weight, but is well, and is breastfeeding well, increase each supplemental feed by 5mls over 24hrs and maintain this amount of supplementary milk. Also let him/her suckle more: this will stimulate the production of more breastmilk, which may take 1-2 weeks to increase.

- If the infant gains weight despite not increasing the volume of supplementary feeds, then this means that the amount of breastmilk produced is increasing.

- If the infant gains weight but does not finish all the supplementary feed, then breastmilk is increasing and the infant has had enough.

### Reducing the volume of supplementary feed

Start reducing the volume of supplementary milk when the baby is gaining weight for 2-3 days, at least 20g per day, is free from illness (they should be free from illness if gaining this much weight), and there is evidence of breastmilk production.

- Reduce the volume of supplementary milk by one third and feed this amount for 2-3 days.

- If weight gain continues to be satisfactory, reduce the amount of supplementary milk again by a similar amount until none is given.
- If weight gain is not satisfactory when the volume of supplementary milk is reduced, increase the volume to the previous level for the next 2 days, then try again.

After supplementary milk feeds have stopped, keep the infant in the TFC for 5 days on breastfeeding alone to ensure that a satisfactory weight gain of at least 20g per day continues.

Breastfeeding is adequate for continuing and completing catch-up growth, provided the infant is getting enough. This can be checked from the infant's weight gain.

Ensure that the mother breastfeeds frequently (8–12 times/24 hours) and keeps the baby at the breast for as long as s/he is willing, day and night.

Continue outpatient follow-up to ensure that satisfactory progress continues.

**ALTERNATIVE METHOD:**

*Some experienced field workers (see below) recommend more rapid reduction of supplementary milk. When you have experience caring for these small infants, try this simpler method. An important pre-requisite is to be able to monitor their progress closely, so that you can respond quickly if they do not gain weight:*

- *Reduce the volume of therapeutic feed to half the original volume when satisfactory weight gain is established*
- *If satisfactory weight gain continues for 2 days, stop supplementary formula on day 3.*

### Case study: A rapid transition to exclusive breastfeeding

In a TFC in Liberia in 1998, 16 infants under six months old with weights-for-length of under 70% of reference were breastfed eight times in 24 hours. They were also offered the breast an hour later with F100-D* fed by breastfeeding supplementer. So they had a total of 16 feeds in 24 hours.

The cup for the supplementer was kept 20-30 cm below the level of the baby's mouth so the baby could control the flow of milk.

This combined feeding was needed for an average of 13 days. The infants' mean weight gain during the supplemented feeding period was 14.7g/kg/day.
When the infants' weights-for-length reached 85% of the reference, the supplemental milk was reduced by half for one day and then stopped completely. In these two days the amount of supplemental milk given went from about 560 ml to none.

After this the infants remained in the centre with their mothers for at least four more days on exclusive breastfeeding. Trained staff observed breastfeeds, encouraged and supported the mothers and checked the babies' positioning and attachment. During these days, the mean weight gain was 9.4g/kg/day on breast milk alone, which is adequate for continued catch-up growth.

It was found that other mothers already using the technique were of great support and encouragement to new admissions. Mothers also needed regular updates from health and nutrition workers on their infant's progress. They needed reassurance that almost all mothers can produce adequate amounts of milk, even if they themselves are underweight.

*Each packet of F100 was diluted with 2.8 litres of water to make it 70 kcal/100 ml.

*Summarised from a report by Mary Corbett in Field Exchange 9, March 2000*

### How to increase or re-establish breastfeeding

A mother may produce less milk if:

- the infant has not been suckling frequently or strongly enough
- she has been ill or severely malnourished
- she is unable to respond to her infant.

To increase her breastmilk a mother needs:

- food and care for herself
- her infant to suckle frequently and for as long as possible at each feed (see Part 6, Relactation).

For a description of how to help a mother relactate and how to use the supplementary suckling technique (see Part 6.3). In summary:

The infant's suckling stimulates the breast to produce milk, so the more s/he suckles, the more breastmilk is likely to be produced. Infants suckle more strongly if offered the breast before supplementary milk feeds are given. If they suckle only after another milk feed, when they are not hungry, they suckle less, and do not stimulate the breasts sufficiently to increase milk production. Frequent suckling should be encouraged as occasional suckling is also less effective.

Supplementary suckling can be used to re-establish or begin breastfeeding in malnourished infants. Mothers need strong reassurance that supplementary suckling works, and that they will produce enough milk to make their babies better.

It is often helpful to record the number of breastfeeds by day and night. This shows everyone that breastfeeding is an important part of treatment. If you record the amounts of supplementary milk feeds, also record the numbers of breastfeeds, even though you cannot measure the exact intake.

**Case Study: Supplementary suckling in malnourished infants under six months in Burundi**

Infants under 6 months of age are admitted to the TFC if they do not have enough strength to suckle, or if the mother's milk supply is clearly decreased. The two criteria are often found together because mothers often experience problems with breastfeeding in a crisis situation, perhaps because of psychological trauma or intensive stress, and also, because of fatigue and lack of food in quantity or quality.
To allow the infants to recover, we use the supplementary suckling method, which gives them the quantity of milk they need and, at the same time, stimulates lactation. The mothers also receive two extra meals of porridge and a minimum of 2 litres of fluid to drink per day.

At first this protocol seems strange to the mothers, but with health education, they accept it. The main problem is that sometimes, they "forget" to breastfeed the child before the supplementary suckling. So, health workers need to be very alert. They need as much attention as other children in the TFC and in planning as many staff are allocated to care for infants under 6 months as for older infants. These staff duties must be protected and maintained, even if the overall number of admissions to the TFC increases.

Infants under 6 months are particularly vulnerable to infections, and are cared for in a specially designated area to protect them.

Source: Florence Le Guelinel, ACF Burundi, 2003

### How to re-establish breastfeeding

If the baby is not breastfeeding at all, start initial re-feeding using milk feeds (see Annex 13) and ask the mother to offer her breast, to assess how well the infant can suckle.

If the infant can suckle:

- Make sure that the baby is well attached to the breast and able to suckle effectively.

- Actively encourage the mother to breastfeed about half to one hour **before** giving the supplementary feed, because this is when the baby is most likely to be hungry and willing to suckle. It is a good idea to tell a mother to breastfeed at an exact time before giving a supplementary milk feed (an hour is a convenient period to monitor). This helps to ensure that breastfeeding is remembered and carried out.
- The mother should try to keep the baby suckling for at least 20 minutes every 3 hours, longer if the infant is willing. Explain the value of the energy-rich hind milk that comes at the end of a breastfeed.
- Encourage the mother to breastfeed the infant at any other time that s/he is willing between therapeutic milk feeds.
- Record the breastfeeds both day and night and if possible their duration (as well as recording supplementary milk feeds).

Continue to give the full volume of supplementary milk feeds as indicated in Annex 16. Give them by supplementer if possible, (otherwise by cup, dropper, syringe or naso-gastric tube). Keep the volume the same according to the infant's initial weight.

**IFE 2/37**

Mother using breastfeeding supplementer IFE 2/37

**If the infant is NOT able to suckle or is suckling weakly:**

If the mother is willing, encourage her to start expressing her milk (see Annex 3).

- Show her how to hand express all that she can at least 8-12 times a day. This will stimulate her breasts to make more milk.
- Measure the expressed milk and feed it to the baby by naso-gastric tube, syringe, dropper or cup, in the same way as the supplementary milk. Give the expressed breastmilk in addition to the full amount of supplementary milk.
- Build the mother's confidence by praising her for her patience and persistence and for whatever amount of breastmilk she expresses. Even a small amount of breastmilk is good for the infant.
- Encourage the mother to offer her breast to the baby from time to time. Tell her to let the baby breastfeed whenever she or he shows an interest in suckling.
- When the baby starts to suckle, give some or all of the supplementary feeds by supplementary suckling technique if possible.
- If the mother is reluctant to express her milk but her baby is too weak to suckle effectively, use supplementary suckling with the cup held as high as the baby's mouth. The milk should drip slowly into the baby's mouth, even with very weak suckling. As the baby gains strength, lower the cup.

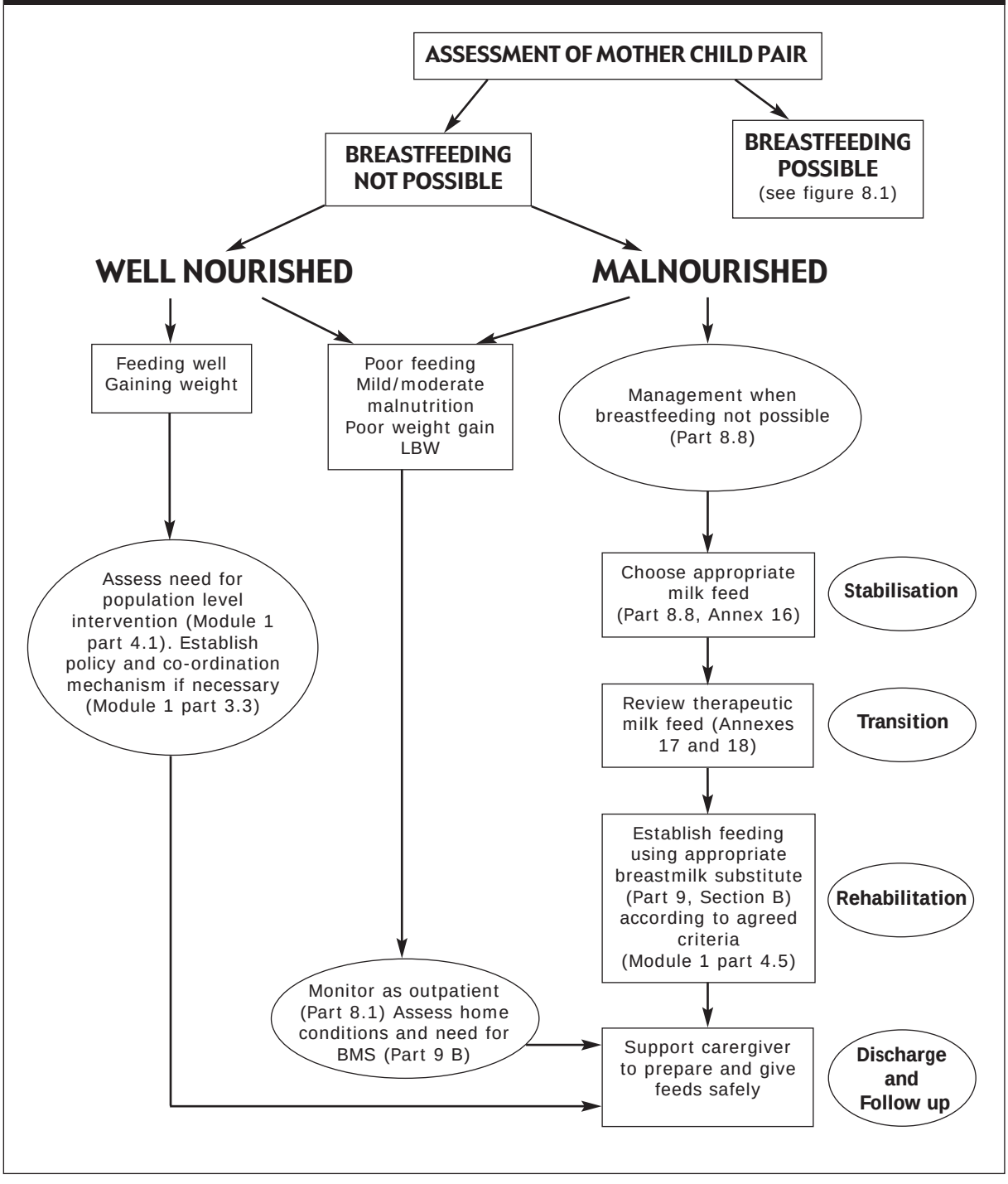
**If a mother is giving her baby Kangaroo Care (see Part 5.2):**

The mother can keep the baby in place while she expresses her milk and cup feeds him or her. Skin-to-skin contact may help to increase the amount of milk she can produce. She may need to loosen her clothes and move the baby to one side.

## 8.8 Management when breastfeeding is not possible

Management follows the same principles as outlined in sections above. Specific management for this group is noted below. Part 9 is also relevant to the care and management of infants who are not breastfed.

**Figure 8.2**




### Stabilisation

**1.** Choose the milk feed (see Annex 13).
- F75 is the most suitable milk for non-breastfed infants during this phase.
- If F75 is not available, then diluted F100 (F100-D) or infant formula are safe options to use.

2. Calculate the appropriate volume according to the infant's weight on admission (see table in Annex 16).
   - Give the full volume for 24 hours by cup, dropper, syringe or naso-gastric tube, in 3-hourly or 2-hourly feeds according to the infant's condition.

3. Continue to give the full volume of milk until the infant shows signs of recovery:
   - any oedema has disappeared
   - his/her appetite has improved.

No weight gain is expected at this time.

### Transition

This phase should continue for 4-5 days.
When the infant shows the signs of recovery listed above:

- Switch feeds from F75 to F100-D or infant formula to allow catch-up growth.
- Increase the volume by 30%, as shown in table in Annex 17.
- Monitor the infant's weight. Weigh daily and use appropriate scales (see Part 8.6).

### Rehabilitation

- After 4-5 days, increase the volume of milk feed by another 30%, as in Annex 18.
- If the infant is still hungry after having taken all the feed, give more. Increase the feeds by 5 ml per feed.
- Continue until catch-up growth is completed, and the infant weighs 80 –85% of the median weight-for height NCHS/WHO standards.
- If necessary (e.g. if an infant is being fed F100-D during rehabilitation) change to an adequate alternative, such as infant formula (commercial or home modified) fed by cup in preparation for discharge.

### How to change from therapeutic feeds to infant formula

**Either** replace one feed of F100-D each day with a feed of infant formula to see if the infant accepts the change; then each day replace one more feed with infant formula.
**Or** add an increasing proportion of infant formula to the therapeutic feed so the taste changes gradually.

Show the infant's caregiver how to prepare feeds (see Part 9.8) and how to clean utensils carefully (see Part 9.7). The caregiver should give the feeds under supervision while the infant is still in the TFC, until the staff can see that she is confident and can prepare and give feeds correctly.

Artificial feeding should be in accordance with locally Agreed Criteria (see Module 1, part 4.5) and needs to be monitored and supervised. Details about artificial feeding options are given in Part 9, Section B.

## 8.9 Feeding and caring for mothers

### Feeding mothers

A mother of a severely malnourished infant needs to be fed so she can care well for her child (see Part 5.5). She needs high-quality food containing a minimum of 2500 kcal/day, adequate fluids (an extra litre per day), and enough micronutrients, to ensure that her milk contains sufficient nutrients for her infant (see Part 2.1).

If a mother is severely malnourished, feed her according to the established guidelines described in Reference Document 2, (WHO 1999), pp 37-9 in Part 8.11.

> *Mothers' and health workers' confidence in breastfeeding is often shaken when they see a malnourished infant attached to the breast. If there is a rush to rehabilitate the infant, forgetting about the mother, then there is a risk of discharging a healthy infant with no secure supply of food.*
>
> Mary Corbett, Field Exchange 9, March 2000

### Listening to mothers

Mothers in emergency situations are often traumatised and depressed, and they may not interact with or respond to their babies. At this stage, technical messages about infant feeding are not useful. It is helpful to get mothers to talk about their experiences and their feelings and doing so can help to resolve their problems. Then they may be able to respond better to their babies again.

- Listen to a mother throughout this process, learn her difficulties, and help her to talk about them, including any that affect her ability to breastfeed and to care for her child.
- Encourage women to listen to each other in support groups (Part 5.6).
- Usually the best help comes from other women, of the same culture and social standing, who have had a malnourished infant that responded well to treatment. The regimen in the TFC must not be too strict.

**Case study: Psychosocial factors affecting infant and young child feeding**

In a TFC in Kabul, many admissions were of infants under six months of age. Several factors were found to interfere with feeding and contribute to malnutrition in these infants. These factors may also be important in other situations.

Cultural factors – many mothers do not start breastfeeding immediately. They give other fluids to the infant instead. Some feed their infants only 2-3 times a day. Breastfeeding and adequate breastmilk production is thus not well established.

Poor education and support of mothers – women reside with their husband's family and often have poor/conflict relationships with their mothers-in-law. A first time mother is offered little advice and support for breastfeeding her new infant. If she has difficulty, she reports that she "does not have enough milk" which seems quite acceptable in Kabul. Instead of supporting the mother, the family buys tins of milk to give to the infant.

Mental health of women – many mothers have signs of depression and anxiety, and, as a result, have difficulties relating to their babies. They do not sleep well; they have nightmares and repeated worries. An association between maternal depression and infant malnutrition is well documented, and in Kabul it is very clearly seen.

Interaction with newborn infants. In many communities it is not felt necessary to stimulate young infants by talking, playing, and socialising with family members. Infants are swaddled (wrapped up tightly), covered and left on their own. Poor development and malnutrition may result.

Source (adapted from): Cécile Bizouerne, field psychologist, ACF Afghanistan, 2003

### Keeping mothers and infants together

Separating mothers from their children endangers breastfeeding, care and warmth for the infant, feeding and care of other children, and increases mothers' anxieties.

So keep mothers and infants together. This can be in a breastfeeding corner (see Annex 14). The treatment of these infants is different from that of other children, and it is easier to look after them together. The arrangement also helps to provide the mothers with privacy and security.

If there are other children, keep them with the mother too if possible (see Part 5.5). Keeping mothers and infants together does not cause cross infection.
Mothers and infants can be kept together more easily if they have beds or mats to sleep on together, instead of putting the infants in cots.

**Case study: Supporting young mothers of malnourished or low birth weight infants in Bangladesh**

We have found that very young and malnourished mothers giving birth to very low birth weight infants can have difficulty breastfeeding and often feel not able to feed regularly enough. Mothers attending the TFC often do not feed the child at night. They may also share their own rations, needed for their own weight gain, therefore any catch up is difficult to attain. Motivating mothers in child development issues can be difficult when the mothers themselves are often thoroughly depressed and undernourished.

To meet the needs of young mothers, our TFC now has a separate breastfeeding corner, which provides privacy for young mothers to feed their infants. More experienced mothers are encouraged to support those who are not comfortable with feeding practices, in this more relaxed environment. This has been a welcome and successful initiative in allowing younger mothers to overcome their shyness and lack of confidence, especially within the very conservative refugee community with whom we work.

Source: Orla O'Neill, Concern Bangladesh, 2003

## 8.10 Discharge and follow-up

### Discharge

Any in-patient stay in a TFC or hospital should be as short as possible to avoid cross infection and defaulting. So discharge mothers and babies as soon as it is safe to do so.

Breastfeeding infants can be discharged from a TFC when the infant has gained a minimum of 20 grams per day on breastfeeding alone for 5 days, regardless of the total body weight or weight-for-height.

Artificially fed infants can be discharged when:

- The infant has changed over completely to adequate artificial feeding.
- The caregiver has been trained to give the feeds correctly.
- Weight is 85% median weight-for-height NCHS/WHO standard, and has remained at this level for 3 days. However if the follow up service is very good, infants can be discharged at 80% of median weight-for-height.

### Follow-up

To ensure that infants discharged from an inpatient TFC or hospital care continue to maintain weight gain and nutritional status they should be followed up:

- at least weekly and, ideally, more frequently initially after discharge, and
- for a minimum of 3 months.

This may be as out patients or at a Supplementary Feeding Programme (SFP), at a breastfeeding corner or in the community.
At an SFP, mothers should receive a ration for themselves. Older infants should also receive a ration - in this case, the lactating mother will be expected to eat at least some of the infant's ration themselves, to maintain their own nutritional status while breastfeeding.

At each follow-up visit:

- Monitor the infant's weight gain and health.
  The very rapid catch-up growth of the rehabilitation phase will slow to a more usual rate after discharge (see Part 8.5).
- Give Supportive care to the mother or wet nurse, or other caregiver (see Part 2).
- Give Basic Aid for breastfeeding if needed, e.g. if there are doubts about milk production (see Part 4.2)
- Monitor the supply and use of infant formula, if used.

In addition, arrange community follow-up to maintain the mother, wet nurse, or other caregiver's confidence.

## 8.11 References

1. *Management of the Child with a Serious Infection or Severe Malnutrition: IMCI guidelines for care at the first-referral level in developing countries* (WHO/FCH/CAH/00.1).
2. *Management of severe malnutrition: a manual for physicians and other senior health workers* (WHO, 1999).

The guidelines for dealing with the medical complications of malnutrition given in these two manuals can be used for infants aged less than 6 months.

Other manuals that provide valuable information are:

3. *Assessment and treatment of Malnutrition in Emergency Situations. A Manual of Therapeutic Care and Planning for a Nutritional Programme.* Claudine Prudhon.
4. Action Contra la Faim/Action Against Hunger 2002.
5. *Nutrition Guidelines.* Medecins Sans Frontieres 1995, currently under revision. The revised draft is available on NutritionNet *(http://www.nutritionnet.net.)*

A listing of current WHO/TALC materials (July 2004) for managing severe malnutrition is given in Annex 15.

## 8.12 Teaching Tips

Trainers can use the following exercise to evaluate the training on this chapter.

**Case Study: Initial re-feeding of a malnourished infant**

Muhonja is three months old and weighs 3.2 kg. She arrives with her mother, who has been giving some breastfeeds and some dilute infant formula, with occasional drinks of water and sometimes tea in a feeding bottle. Muhonja is weak and drowsy, and her body feels cold, even though her mother has her wrapped in two blankets. She suckles weakly when put to the breast. She looks thin but has no oedema.

The doctor diagnoses severe malnutrition, hypoglycaemia and hypothermia, and treats her with 50 ml of 10% glucose given by naso-gastric tube. Because Muhonja has both hypoglycaemia and hypothermia, the doctor suspects severe infection, and starts her on antibiotics.

### Questions:

1. What additional immediate treatment is needed to treat Muhonja's hypoglycaemia?
2. What immediate treatment does she need to warm her?
3. How should she be fed during the first 24-48 hours after admission? How much and how often?
4. If Muhonja's mother can express 10 ml of breastmilk for a feed, what should be given at that feed?
5. What else can Muhonja's mother do to help?

### Answers:

1. Start feeding her immediately with 40ml therapeutic milk (suggest F75 or, if not available, diluted F100). This is the amount recommended for a child of her weight, who is very ill and who cannot tolerate feeds more often than 2 hourly. This means she gets 12 feeds per day (see table in Annex 15). If she is too drowsy and weak to take feeds orally, give by naso-gastric tube. Feeding is important for treating both hypothermia and hypoglycaemia.
2. Remove all her clothing except a nappy/pants and cap. Give Kangaroo Care (see Part 5.2) by putting her in skin-to-skin contact with her mother, inside her mother's clothing. Keep them in skin-to-skin contact day and night.
3. She should breastfeed, or have expressed breastmilk at least 2 hourly; after breastfeeding she should be given the therapeutic milk either by supplementer or cup.
4. 10 ml breastmilk followed by 40ml therapeutic milk. Continue feeding therapeutic milk every 2 hours (12 feeds a day).
5. The mother can stay with her child and feed her by cup. She can keep the baby warm through Kangaroo Care. She can tell staff if her baby becomes limp and drowsy again, or if her breathing becomes fast. She can record the baby's urine and stools, and any vomiting. As Muhonja begins to recover, the mother can offer the breast very frequently to build up her milk production. She can begin to play with her to stimulate her.

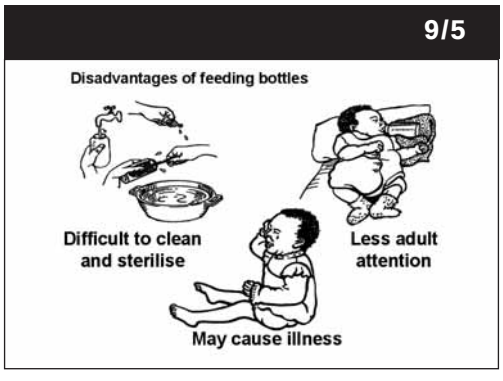
# 9 When infants are not breastfed

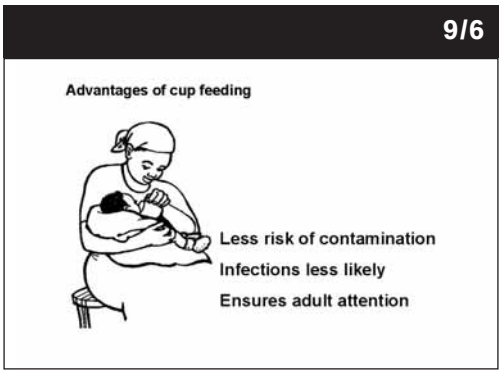
Breastfeeding is the best way to feed babies. Part 9 deals with infant feeding if breastfeeding is not possible. This is sometimes called artificial feeding or replacement feeding The foods for artificial feeding are called breast milk substitutes[1] (BMS).

There are increased risks linked to artificial feeding (see Module 1). In most emergency settings these risks are further increased because necessary supplies may be unreliable, and hygiene can be particularly difficult to maintain.

In any situation, particularly in emergencies, the recommended method of giving artificial feeds is by cup rather than by bottle. This is because using bottles increases the risk of disease and poor care. Even in developed countries under good conditions, the incidence of diarrhoea and other diseases, and of hospitalisation, is increased when infants are bottle-fed.

> *The use of bottles and teats should be actively discouraged.*
> *Use of cups should be actively promoted*
>
> 6.1.6 Operational guidance




However, many emergencies occur in areas and among cultures where many women have been bottle feeding before the onset of the emergency. In these situations it may not be practical to expect mothers to switch from bottle to cup immediately. So Part 9 provides advice about how to keep bottles safe and clean and how to care for children who are bottle fed.

[1] Breastmilk substitutes (BMS): any food being marketed or otherwise represented as a partial or total replacement for breastmilk, whether or not suitable for that purpose.

Part 9 is divided into three sections:

**A** Infant feeding interventions among populations
**B** Supporting caregivers to feed infants who are not breastfed
**C** Feeding infants in institutions

# A Infant feeding interventions among populations

There are emergency situations where support of artificial feeding for some of a population is required. Key aspects of supporting safe infant feeding at a population level have been dealt with in Module 1. These include key policies and guidelines (Part 3), assessment and analysis, co-ordination (Part 4), policy gaps and establishing common policies (Part 3.3). Agreed criteria, conditions and management of artificial feeding is dealt with in Part 4.5 and 4.6, while decisions where HIV is prevalent are covered in Part 3.4.

The practicalities of devising and implementing an emergency programme, where some of the infants are artificially fed, requires considerable planning and resources.
The challenge of a population-based intervention is to create the conditions to support safe artificial feeding while, at the same time, supporting and protecting infants who are exclusively breastfed, or with the potential to exclusively breastfeed (e.g. new-borns, mixed feeders). Technical guidance on the support of Breastfeeding (Part 2.4), managing infants who are not breastfed (Section B), and the management of severe malnutrition in infants under six months (Part 8) should be used to guide staff training and programme activities.

This section deals with some additional considerations when managing artificial feeding at a population level. The main aim is to give priority to activities that help to prevent illnesses and deaths among infants and young children. Only those who have been trained in safe and appropriate artificial feeding in an emergency should do so.

## 9.1 Approach to supporting artificial feeding in a population

Any approach to support artificial feeding in a population should include:

- background information
- early assessment
- co-ordinated approach
- programme considerations
- calculating requirements
- monitoring
- surveillance.

### Background information

Sources of information may include large-scale surveys, e.g. UNICEF Multiple Indicator Cluster Surveys (MICS), and data from the Ministry of Health and local and international agencies working in an area before the emergency.

### Early assessment

Early assessment of how many women, infants and young children there are in a population and of infant feeding practices is essential (see Module 1, Part 4.1).

To estimate infant feeding needs at a population level you will need information on:

- population size
- number of infants aged under 6 months and 6-12 months
- proportion of infants artificially fed in each age group
- number of unaccompanied infants and young children
- number of pregnant and lactating women.

For an initial estimate of infant feeding practice, especially in the early stages of an emergency, refer to already-existing infant feeding data for the population (for example, DHS surveys).

If the proportion of artificially fed infants is not directly assessed, then initial requirements may be estimated from a initial basic assessment to guide immediate needs. A guide to calculating infant formula needs in the early stages of an emergency is given in Annex 4.

### Co-ordinated approach

Early in an intervention, an agency or group of agencies should be designated to take responsibility for the co-ordination of infant and young child feeding activities (see operational guidance, Module 1, Annex 2, 6.1 ).

### Programme considerations

Ultimately, programmes must enable any women who artificially feed to do so safely and correctly, any women who are supplementing breastfeeding with artificial feeds to be supported to breastfeed exclusively, and any lactating women to have access to breastfeeding counselling and support.

In devising a programme, you will need to:

- consider influences on infant feeding
- prevent threats to breastfeeding
- identify subgroups with special needs
- set realistic programme objectives
- prioritise infants under 6 months
- consider sensible danger limitation.

### Influences on infant feeding

In an emergency situation, there are many factors that influence infant feeding practices and safety in addition to nutrition programme activities. These factors may include water and sanitation conditions, health facilities and traditional infant feeding practices. There are also factors related to the particular emergency. All these things will influence the decisions made on infant feeding activities and how successful or not they will be.

### Prevent threats to breastfeeding

Well-meaning, but poorly considered, interventions (for example, a general distribution of baby bottles) may promote inappropriate infant feeding practices, and also increase the risks of infant illness and death. Giving infant formula to mothers of artificially fed infants, without giving items of the same value to breastfeeding mothers, may threaten breastfeeding. One option may be to use a voucher-exchange scheme, in which all registered mothers receive a voucher that can be exchanged for infant formula or a food ration of at least the same value.

### Identify subgroups with special needs

During an emergency, there may be sub-groups of infants who need finding and given special support. These include infants in institutions, (e.g. orphanages), unaccompanied infants, and hospitalised infants without individual caregivers, (e.g. HIV/AIDS infants) (see Section C below on institutional feeding).

### Set realistic programme objectives

Where some young infants are mixed feeders (i.e. breastfeeding and artificial feeding), one of the programme objectives may be to increase the proportion of exclusive breastfeeders. Another programme objective may be to achieve 100% exclusive breastfeeding rates in all new-borns. In both cases, infant formula requirements should decrease with time, if successful. Where a population are established artificial feeders, then increasing exclusive breastfeeding rates may take longer and artificial feeding requirements may not decrease quickly.

### Prioritise infants under 6 months

Where some infants are artificially fed, the priority should be infants aged under 6 months because they are completely dependent on a milk based diet. The decision whether or not to provide infant formula to infants aged 6 – 12 months depends on the situation. Considerations may include pre-emergency feeding practices, infants' nutritional status (e.g. prevalence of anaemia), complementary foods available and emergency resources (e.g. are there sufficient in-country supplies to provide for older infants).

**Case study: Assessment of needs of older infant – a pragmatic approach**

Prior to the 2003 Iraq crisis, infants aged 6-12 months had received infant formula in the general food ration through the Food for Oil programme. Background health information indicated a high prevalence of iron deficiency anaemia. Commercial complementary foods had also been included in the pre-emergency ration but supplies had not been re-established. In the initial phase of the intervention, given this situation, it was considered appropriate to provide infants 6 – 12 months with infant formula during only the initial phase of the intervention, (i.e. the first six months), with a view to improving complementary feeding and the nutrition of these older infants in the short term, and protecting breastfeeding rates and phasing out formula supply in the longer term.

Source: SC UK report, Iraq, 2003

In a population where some of the infants under six months are not exclusively breastfed, therapeutic feeding centres and referral hospitals need to develop the capacity to manage young severely malnourished infants (see Part 8).

### Sensible danger limitations

It may not be feasible to immediately implement recommended feeding practices in an emergency. For example, if a population are using bottles to artificially feed their infants, it may not be practical, nor acceptable to caregivers, to immediately change to feeding with cups and spoons. Instead, a bottle exchange scheme (swapping new, clean bottles in exchange for old ones), and individual advice on household sterilisation and bottle cleaning may be a more realistic approach. Then, focusing on reducing bottle feeding in mixed feeders, where there is a good chance to re-establish breastfeeding, may help to target resources where they probably will have the greatest impact.

Annex 6 includes an exercise for planning an infant feeding intervention, using a log frame to plan activities (allow one hour).

## 9.2 Requirements for artificial feeding

To manage artificial feeding in an emergency, we need to estimate requirements of:

- the amount of artificial formula needed
- other supplies, e.g cooking and feeding equipment
- staffing
- transportation and storage as well as availability/source of artificial feeds.

### Estimating the amount of artificial formula

Calculating requirements for a large number if infants will depend on a number of factors. These include information on feeding practice from early needs assessment (see Part 9.1), whether the proportion of artificially fed infants is expected to decrease with time (as breastfeeding rates increase) and whether infants aged 6-12 months are given formula.

On average, an infant needs 3.5 kg of formula powder each month.
Annex 5 shows how to calculate the amount of formula an individual infant needs.

### Other supplies

In an intervention to support artificial feeding, you will need:

- a safe and secure water source
- a designated preparation area (e.g. tent)
- a sufficient heat source (e.g. adequate fuel and area to boil water)
- preparation equipment
- feeding utensils.

Requirements will vary depending on the nature of the programme and whether the intervention involves:

- household based feeding support (see Section B below)
- central preparation of artificial feeds, (for example, when the camp is first set-up and individual facilities are not adequate and resources are limited), or
- designated preparation sites (e.g. Mother and Baby Tents in a camp).

### Staffing

Adequate numbers of capable and trained, skilled staff are essential to support a programme.

Local capacity should be assessed early, (e.g. availability of UNICEF, WHO or MOH trained staff) as well as local training capacity, (e.g. established IBFAN training programme).

Targeted training (e.g. training breastfeeding counsellors on expert lactation support, and health and nutrition workers on all aspects of infant feeding practice), should be a core activity of any intervention.

### Transportation and storage

In general, infant formula is most economical to transport in powdered form for reconstitution, rather than as liquid ready-to-feed formula. Ready-to-feed formula have been used where cheaper road transportation is possible, and/or where water supply and hygiene conditions are poor. (See Part 9.13 on storage).

### Availability/source

The availability and source of supplies may be influenced by a number of factors (see Part 9.11).

In an emergency, donations of infant formula should not be accepted (see operational guidance, Module 1, Annex 2, 6.1). You should report unsolicited donations or offers of donations to the co-ordinating agency for infant feeding.

## 9.3 Monitoring and surveillance

Any infant feeding intervention should have established goals, measurable objectives and activities that are monitored.
Annex 6 gives an exercise for planning activities for an intervention.

There are currently no reliable anthropometric indicators to assess malnutrition in an infant younger than 6 months. So this age group are often not included in nutrition surveys.
However, survey data on illness, death and infant feeding practices should be collected on infants under six months.
Using standard indicators in surveys makes it possible to compare findings with other surveys and pre-emergency information.

When infant formula is used, markets should be monitored to see whether the distributed formula is being sold ('spillover'), or whether prices of formulas change. This monitoring could be one of the tasks of community outreach workers.

The provisions of the International Code of Marketing of Breastmilk Substitutes apply in emergencies (see Module 1 Part 3.1). Suspected violations of the Code, such as inappropriate distribution or unsolicited donations of infant formula, should be reported to the designated co-ordinating agency on infant feeding, or the competent national authority.

## B Supporting caregivers to feed infants who are not breastfed

For infants who are not breastfed, some form of milk is essential for at least the first six months. This milk must be a suitable breastmilk substitute (BMS). Infants under six months should be fed a milk diet only (See Part 1.4 on age appropriate feeding).

The supply of this milk must be reliable and uninterrupted.

Water, fuel, utensils and time will be all be needed to safely prepare artificial feeds.
From about 6 months of age, a child needs adequate complementary foods, but it is also useful if some kind of milk is part of the diet up to two years of age or more.

In order to reduce the dangers associated with artificial feeding, caregivers should know:

- what BMS to give
- how much and how often to feed BMS
- how to keep feeding utensils clean and safe
- how to prepare the feeds
- how to give the feeds.

Parts 9.4 – 9.9 give you the information you can use to assess artificial feeding in an infant. See Full Assessment Step 3, Part 9.10.

# 9.4 What breastmilk substitutes to give

**Q: Ask participants to list suitable breast milk substitutes for infants aged under 6 months dependent on this milk alone.**

*Examples of suitable breastmilk substitutes:*

- Infant formula made in accordance with the Codex Alimentarius standards.
- Home-prepared modified milk made with fresh animal milk, or powdered full cream milk or Ultra Heat
  Treated (UHT) milk. These milks must be diluted with water and sugar, and micronutrient supplements added.

All animal milk should be heated when used for feeding infants.
See Annex 7 for full details and preparation guidelines.

**Q: Ask participants what they would give in the short term if suitable milks were not available.**

*Examples of unsuitable breastmilk substitutes:*

Use these only when suitable milks are not available and then only temporarily. Replace with breastmilk or more suitable breastmilk substitutes as soon as possible.

- Home-prepared formula without any micronutrients added.
- Dried skimmed milk (DSM, or NFDM – non-fat dried milk) and other low fat milks.
  DSM needs substantial and precise modification with other ingredients – oil, sugar, minerals and vitamins – to meet the nutritional requirements of infants.

*Milks that should never be used:*

- Therapeutic milk products, such as F75 and F100. These are for use only in Therapeutic Feeding Centres and are not suitable breastmilk substitutes for household use.
- Unmodified animal milks for infants under six months.
- Sweetened condensed milk. This is unsuitable, as it contains too much sugar and insufficient fat, protein and other nutrients.
- Cereal gruels, water and watery drinks such as juices and teas. These are sometimes mistakenly given instead of milk feeds, but are nutritionally unsuitable. They should never be given to infants under six months of age, even as temporary supplements.

**Q: Ask what foods and drinks other than milk are sometimes used to feed infants below 6 months?**

➔ Make a list on a flipchart of what participants report.
For each one, discuss if it is possible or unsuitable, and why, and mark it accordingly.
Below is a list of some foods and drinks that might be included in some areas.

| | |
|---|---|
| Coconut milk | unsuitable |
| Dilute cereals, gruels | unsuitable |
| Flavoured milks | unsuitable |
| Juices | unsuitable |
| Sodas | unsuitable |
| Sugar drinks | unsuitable |
| Teas | unsuitable |

## 9.5 How much to give and how often to feed with BMS

Table A in Annex 5, shows how much prepared formula (whether commercial or home-prepared) an infant needs at different times in the first six months. Table B shows how often an infant should feed depending on the age and weight.

### How to calculate an infant's daily requirements of breast milk substitute

This calculation uses infant formula as an example.

The amounts of prepared formula needed are based on average daily intakes of infants according to age and weight (see Annex 5).

Young infants should be fed approximately every 3 hours (that is 8 feeds in 24 hours). This can be reduced to 4 hourly feeds (that is 6 feeds in 24 hours) by the age of 3 months.

**Exercise to calculate an infant's daily feed volumes**

Ask participants to calculate the volume of milk per feed for a 1 month old infant who weighs 3 kg.

*Answer guide*

Infant´s weight = 3kg
Volume of milk required per day = 150ml x 3 = 450mls per day
Amount per feed = 450ml divided by 8 feeds = 56mls per feed

= 8 feeds x 60 mls*

**Amounts rounded for ease of measurement and therefore approximate.*

Health workers can help a caregiver to calculate from Table B in Annex 5 and from her infant's age or weight:

- how much formula the infant needs each day
- how many feeds the infant needs each day (including at night)
- how much formula the infant needs at each feed.

Write down the quantities for her, or draw symbols for the numbers of feeds and the amounts of ingredients.

## 9.6 Feeding the non-breast-fed child 6 – 24 months of age

The feeding needs of the non-breastfed infant over six months of age will depend on whether infant formula and animal milk products are available or not, and whether other animal foods are available.

**Q: Ask what milks can be used to feed infants 6 -24 months of age, and what milks are unsuitable?**

➔ Make a list on a flipchart of what participants report.
For each one, discuss if it is possible or unsuitable, and why, and mark it accordingly.
Below is a list of some foods and drinks that might be included in some areas.

Acceptable milk sources for children aged 6-24 months:

- Full cream milk, including goat, buffalo, cow, sheep, camel milk, Ultra High Temperature (UHT)
- Evaporated milk (reconstituted)
- Fermented milk
- Expressed breast milk (heat-treated if HIV positive).

The following milks are unsuitable as sources of nutrients:

- Condensed milk
- Skimmed and semi-skimmed milk (semi-skimmed milks may be acceptable after 12 months)
- Coffee creamer
- Soy milk (unless it is a soy-based infant formula).

Drinks with low nutrient value, such as tea, coffee and sugary drinks such as soda should be avoided.
Juices should be limited to <250ml per day, to make sure that they do not replace more nutrient dense foods.

**Q: Ask how much milk does a child 6 -24 months of age need?**

If adequate amounts of other animal source foods are eaten regularly, the amount of milk needed ranges from 200-400ml/d.
Otherwise, the amount of milk needed ranges from 300-500ml/d.

Non-breastfed infants over six months also need additional fluids to drink.
They need at least 400-500ml/d of additional fluids (in addition to water contained in foods) in a temperate climate, and 800-1000ml per day in a hot climate.
Plain, clean (boiled, if necessary) water should be offered several times a day.

Diets that do not provide animal source foods regularly cannot meet the nutrient requirements of this age-group unless fortified products or nutrient supplements are used.

If milk and other animal source foods are not eaten regularly, both grains and legumes should be eaten daily to ensure adequate protein quality (see Annex 12). Rich food sources of micronutrients will be needed to meet the needs of the child.

The *meal frequency* will depend on the energy density of the foods, the variety available and the usual amounts that the infant eats at each meal. Meals should be given 4-5 times per day, with additional nutritious snacks 1-2 times per day (see Annex 12).

> *For those infants requiring infant formula, supply should be continued for as long as the infants concerned need it (until breastfeeding is re-established or until at least 6 months and a maximum of 12 months of age).*
>
> Operational Guidance 6.2.5

## 9.7 How to keep feeding utensils clean and safe

All utensils (cups, spoons, measures) must be properly cleaned to ensure that feeds are prepared as safely as possible.

**Q: Ask participants how to clean and store feeding utensils.**

Check that the following points are covered in the answers:

- After use, wash utensils thoroughly first in cold water and then in hot soapy water. This needs to be done immediately, before milk has hardened and stuck to the surface, making a breeding place for germs from which it is difficult to remove them.
- Store the clean utensils in a clean dry container with lid or cover with a clean cloth until the next time they are used.

### Cleaning a cup

A cup must be washed and scrubbed in hot soapy water each time it is used. If possible, dip the cup into boiling water or pour boiling water over it just before use. Boiling is not essential for open cups.

### Cleaning a feeding bottle

- Always sterilise bottles and teats before using for the first time (see box on sterilisation).
- Then, every time after using the bottle, it must be cleaned inside in all corners with a bottle brush (a long thin brush with bristles all round that reaches the bottom of the bottle).
- Bottles and teats must then be *sterilised.* Not doing so increases the risk of diarrhoea and other illness, particularly in the circumstances of most emergencies, where hygiene and sanitation conditions are typically poor.

**Two methods of sterilising equipment**

**Disinfection**

Items such as bottles and accessories can be chemically disinfected using sodium hypochlorite (bleach) solution (diluting 15 ml 1% sodium hypochlorite in 1 litre of water) that is prepared freshly each day. Other products should be prepared according to the manufacturer´s instructions.

Immerse equipment completely for one hour in the disinfectant solution. The preparation of disinfectant solutions should be checked regularly.

The disinfectant solution should be thrown away at the end of every day.

**Boiling (moist heat)**

Place the items to be sterilised in a large pan.
Cover bottles and teats with boiling water – make sure the bottles are filled with water and completely covered with water.
Bring to the boil and continue a rolling boil for 5 minutes – this is where the water is bubbling continuously.
Allow to cool in the water, covered by a sterilised lid.

After sterilisation, the equipment must be dried properly, by draining.
After drying the equipment must be protected from contamination. Bottles should be left upside down on sterilised draining stands and ideally sterile cloths can be draped over smaller equipment. Cloths should not be used for drying due to the risk of contamination.

*Other sterilisation methods,* e.g. autoclaving, using an oven or terminal heating are more likely to be used in large facilities, e.g. in hospitals or orphanages (see Annex 10).

## 9.8 Preparing and storing feeds

The best way to check that a caregiver can prepare feeds properly, is to show her how to prepare a feed and then watch the her do the same wherever she lives.

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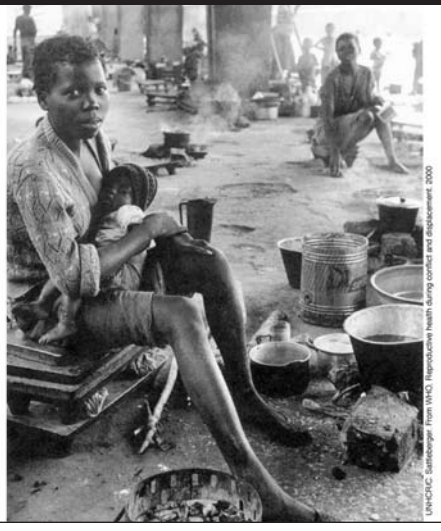
**"Household" conditions when there is no house** **IFE 2/32**



When preparing feeds, always check the instructions on the label of a commercial formula as different brands may vary.
The methods of preparation are the same for home-modified formula. However, details of ingredients, measuring and mixing may differ.

If a cup is used to feed the infant, you will need to prepare and calibrate a measure for water. You can do this by:

- Getting a measuring jug for 60, 120, and 180 ml (if not available, use a feeding bottle).
- Using your measure, put 60, 120, or 180 ml of water into a cup, and make a scratch on the side. The caregiver will use this cup to measure amounts of water in the future and to feed the infant.

As the infant grows, so the amount of milk to be prepared will increase.

### Ten steps for safe preparation of a breastmilk substitute feed

**Q: Write the following 10 steps up on a flip chart / transparency and ask participants to describe what they would tell or show mothers for each step.**

1. Wash hands
2. Keep it clean
3. Check the date
4. Boil it
5. Measure it
6. Mix it up
7. Test the temperature
8. Store it
9. Use it or lose it
10. Finish up

Then ask them to look at the table in Annex 9 for a guide to each step.

## 9.9 Helping the caregiver use breastmilk substitutes safely

UNICEF/95-0545/R. LEMOYNE

A Bosnian refugee's hand rests protectively on her sleeping baby. She has covered the feeding bottle with tape, perhaps also considering this protective. Supportive, non-critical listening and learning will tell the health worker whether the mother is boiling the bottle before each use, a more important protection.

To help the caregiver use breastmilk substitutes safely, the health or nutrition worker needs to:

- Show the caregiver how to clean and sterilise utensils and prepare feeds.
- Watch the caregiver cleaning utensils and preparing feeds using her own utensils and, ideally, where she will normally prepare the feeds.
- Give clear instruction in the caregiver's own language (spoken and, where appropriate, written or using pictures).
- Give instruction only to the caregiver who needs to give the artificial feeds[2].
- Give a clear explanation of the risks of using infant formula.

> *Distribution of infant formula to an individual mother should always be linked to education, demonstrations and practical training about safe preparation, and to follow-up at the distribution site and at home by skilled health workers. Follow-up should include regular monitoring of infant weight at the time of distribution (no less than bimonthly).*
>
> Operational Guidance 6.3.3

## Points to discuss with the caregiver

- The best type of milk for the infant. You will need to consider its nutrient value, the cost and the reliability of supply as well as any disadvantages.
- The resources the caregiver will need, including extra fuel, water and utensils.
- The time it will take to prepare feeds. If no refrigerator is available, the infant will need a freshly prepared feed eight times a day at first, and at least six times a day after s/he weighs about five kg.
- How to sterilise water by bringing it to a rolling boil.
- How to prepare fresh feeds for the infant at night. The caregiver may be able to measure milk and boiled water separately during daylight, and then mix them as needed without much light.
- Explain the advantages of cup feeding and how to cup feed (see Annex 2 and IFE 9.6). This will help caregivers and others in the community understand that cup feeding is safer than bottle feeding, and that it is less work to clean a cup.
  - If suitable open plastic cups are available as a supply item, offer to exchange one for any feeding bottle, and if the cup becomes scratched, to replace it.
  - If families insist on using feeding bottles, discuss the extra precautions needed to clean and sterilise them and the need for extra fuel and water.
- Discuss why it is important to hold the baby and interact with him or her throughout each feed, to stimulate his/her development.

## Temporary use of breastmilk substitutes

Infants may need artificial supplements temporarily, usually as part of Further Help (see Part 5.1) for breastfeeding, in the following situations:

- when their mothers are ill or severely malnourished
- while their mothers are recovering and the breastmilk supply is built up again
- while relactation is started
- if they have become used to supplements, while exclusive breastfeeding is re-established
- when they are ill and unable to suckle directly from the breast, or
- if their mother has a breast condition which makes suckling difficult, while the condition is being treated.

The same principles about the choice of artificial feed and its preparation should be applied as when an infant is completely artificially fed, unless the infant is severely malnourished (see Part 8).

[2] In accordance with the International Code of Marketing of Breastmilk Substitutes (Module 1 pp 42-44).

However there are some differences:

- Use of a less suitable breastmilk substitute (see Part 9.4) may be less of a nutritional risk, if it is used for only a short time and if partial breastfeeding continues or restarts quickly, than if the formula is the infant's only food over a long time. The ideal nutritional composition of breastmilk helps to overcome the deficiencies of the artificial feed.
- Cup feeding is more important when it is expected that breastfeeding will restart because the use of a feeding bottle may interfere with suckling.
- It is more complicated to calculate of quantities of formula needed if an infant is also having breastmilk.

## 9.10 Full Assessment Step 3: Observing artificial feeding

Full Assessment Step 3 (see Part 3.3 for Steps 1 and 2) first considers whether the household has the resources necessary for storage and preparation, and has a reliable supply of the selected breastmilk substitute. Without these resources, artificial feeding cannot be adequately carried out even if caregivers are well informed and experienced.

IFE 2/33

**Full Assessment Step 3: Observing artificial feeding** **IFE 2/33**

What resources are available in the household?

| | |
|---|---|
| **Breastmilk substitute** | ___Suitable breastmilk substitute (or ingredients and recipe)<br>___Expiry date clear, not past<br>___Instructions in user's own language<br>___Household member able to read instructions<br>___Supply assured until need no longer exists. |
| **Storage** | ___Safe storage for ingredients, feeds<br>___Water boiled (special clean container, cover)<br>___Refrigeration available (if feeds made in advance). |
| **Preparation faciliites** | ___Adequate fuel for preparation<br>___Adequate drinking water for preparation<br>___Adequate other water, soap for utensils, hands<br>___Clean surface, (clean cloth to cover utensils)<br>___Means of measuring milk and water (not bottle). |
| **Extra time** | ___Time to prepare 6-8 fresh feeds/day. |

Full Assessment Step 3 next looks at **how the caregiver uses household resources** to prepare, give, and complete an age-appropriate feed.

IFE 2/34

**Full Assessment Step 3: Observing artificial feeding** **IFE 2/34**

How does the caregiver manage the feeding?

| | |
|---|---|
| **Preparation** | ___Caregiver washes hands<br>___Cup washed with soap and water<br>___Bottle and teat washed and boiled before this use<br>___Caregiver measures milk and water correctly. |
| **Feeding technique** | ___Infant fed with cup, takes most of milk<br>___Infant fed with bottle, artificial teat<br>___Infant fed with another method: _____ |
| **Interaction and end** | ___Infant is held throughout feed<br>___Caregiver interacts lovingly during feed<br>___Infant finishes milk<br>___None of feed kept for giving to infant later. |
| **Adequacy of milk feeds** | ___Correct number and amount of milk feeds for age or weight. |
| **Age-appropriate feeding** | ___Under 6 months, only milk is given<br>___Over 6 months, milk and complementary foods are given. |

## Practice of FA Step 3: Observing artificial feeding (resources)

Using the form below, practice observing a caregiver's resources for artificial feeding. There are also a few questions that you may need to ask. However, the caregiver may tell you enough in response to an open question such as "How is the feeding going for you?"

It is best to give no advice or help during the observation (as with breastfeeding). You will be able to give help more effectively later.

**What resources are available in the household?**

**Ask:**
- What general supplies (water, fuel, soap etc) are the family getting?
- When will the next distribution provide more?
- Are there are difficulties in getting supplies?
- How much formula (or ingredients or feeds) is the family getting each month (or other dispensing interval)?
- For how many months is the family sure that the supply will be provided?

**Look at:**
- the storage facilities for ingredients for feeds
- the amounts of the general supplies remaining
- the labels on formula tins, for language and expiry date
- the caregiver's means of measuring water and milk.

You may make notes on the form if this does not make the caregiver uncomfortable.

### Practice form: FA Step 3 - resources

*What resources are available in the household?*

| | |
|---|---|
| **Breastmilk substitute** | ___Breastmilk substitute (or ingredients and recipe provided is suitable for age<br>___Quantity used since last distribution is appropriate<br>___Quantity remaining is sufficient until next distribution<br>___Caregiver has no difficulty obtaining sufficient formula or other ingredients; assured to age 6 months at least<br>___Expiry date clearly marked, and not past<br>___Instructions written in user's own language<br>___Preparer or another household member is able to read label instructions. |
| **Storage** | ___Safe storage/tightly closed containers used for ingredients<br>___Milk feeds prepared in advance only if refrigeration available<br>___Any drinking water boiled in advance is stored in special container (clean, with a cover). |
| **Preparation facilities** | ___Adequate fuel is available for boiling water (and for boiling bottle and teat at each feed, if used)<br>___Adequate drinking water is available for preparing several feeds per day (at least 1 litre)<br>___Adequate other water and soap are available for washing utensils and hands<br>___Clean surface is available to put utensils on (and a clean cloth to cover them)<br>___Suitable means of measuring milk and water (if a feeding bottle,the top is cut off). |
| **Extra caregiver time** | ___Time to prepare 6-8 fresh feeds per day, if no refrigeration. |

## Practice of FA Step 3: Observing artificial feeding (procedures)

Use the form below. It is best not to ask questions about anything observable, such as the washing of hands and utensils, the measuring of ingredients, or the feeding technique. As before, give no advice or help during the observation.

**How does the caregiver manage the feeding?**

**Ask:**
- How old is the infant?
- How much does s/he weigh?
- How many feeds do you give in a day and night?

**Look at:**
- how the caregiver prepares the feed, including washing hands and utensils, boiling water and utensils (if bottle used) and measuring ingredients
- how the caregiver gives the feed to the infant
- how the caregiver cleans up after the feed.

### Practice form: FA Step 3 - procedures

*How does the caregiver manage the feeding?*

| | |
|---|---|
| **Preparation** | ___Caregiver washes hands<br>___Cup (or bottle and teat if used) covered, in clean place<br>___Bottle and teat (if used) are boiled just before the feed,<br>___Bottle and teat (if used) have been soaking in bleach, and are now rinsed with clean boiled water<br>___Water to prepare feed is brought to a rolling boil<br>___Caregiver measures proportions of milk and water correctly. |
| **Feeding technique** | ___Infant is fed with cup, and takes most or all of the milk<br>___Infant is fed with feeding bottle<br>___Infant is fed with another method: |
| **Interaction and end of feed** | ___Infant is held throughout the feed<br>___Caregiver interacts lovingly with the infant during the feed<br>___Infant finishes the milk feed<br>___None of this feed is kept for the infant to take later (Milk could be drunk by mother or older child). |
| **Adequacy of milk feeds** | ___Number of feeds given per day appropriate to age or weight<br>___Amount given at each feed appropriate. |
| **Age-appropriate feeding** | ___Under 6 months, only milk is given<br>___Over 6 months, milk and complementary foods are given. |

## Follow-up after Full Assessment Step 3

After completing Full Assessment Step 3, the health nutrition or community worker who made the visit first praises the caregiver for all that she is doing well.

She also:

- is supportive of the caregiver's efforts, and is not critical
- discusses any difficulties and helps her to think of ways to overcome them. This must include any difficulties in ensuring that the milk provided is used only for the infant
- explains again this infant's exact needs, number of feeds per day, amount of each feed and the risks of him/her not having the right amount
- shows the caregiver how to clean (and if necessary sterilize) utensils, and prepare and give the feeds more safely

- tries to gain the confidence of other family members or neighbours, and encourage them to help the caregiver
- arranges for further follow-up of the infant, both in the clinic, and at home with reassessment with FA Step 3 if necessary.

The health and nutrition worker may also report to the camp management in order to:

- inform them about the difficulties caregivers experience
- advocate for improved resources for preparation and storage
- ensure sustained supplies of milk and other ingredients for infants meeting the Agreed Criteria, and encourage compliance with the International Code of Marketing of Breastmilk Substitutes.

## C Feeding infants in institutions

Sometimes in emergencies, groups of infants need feeding support. For example, this may occur where there are unaccompanied infants at a refugee camp or where NGOs are asked to support institutional care, e.g. orphanages.

The guidance given in this section is based on current recommendations[4] and shared field experiences[5] and aims to help workers to support groups of infants as safely and practically as possible.

### Principles

In the first phase of an intervention to support institutional feeding, the priority is avoiding (or reducing) excess death and illness. It may not be feasible to immediately implement standard guidelines. Instead the focus should be on limiting any immediate risks associated with existing practices. Once an intervention is underway, then there may be more time and capacity to improve feeding practices.

### Practicalities

To safely manage artificial feeding in an institution, you will need:

- A reliable source of appropriate feeds.
- A well organised facility in which there is:
  - a centralised production area
  - appropriate storage
  - a clean preparation area
  - areas for personnel to wash
  - correct preparation of the right amount of milk
  - correct methods of washing up.
- Safe feeding.
- Good infant care.
- Infection control.

## 9.11 Source of artificial feeds

For practical and nutritional purposes, infant formula is likely to be the most appropriate breastmilk substitute to use in institutional feeding.

Commercial infant formula products are usually:

- non-sterile powders
- sterile liquids (e.g. liquid concentrate, or ready-to-feed (RTF) formula).

Since powdered formula are not sterile, there is a risk that they might be contaminated with micro-organisms such as E sakazakii and Salmonella. Infants who may be particularly vulnerable to infection are low birth weight infants or infants born prematurely, and infants whose mothers are HIV positive. See Part 9.14 for preventative measures.

[4] Preparation of formula for infants: guidelines for healthcare facilities. The American Dietetic Association,1991.
[5] Orphanage experiences of MSF France in Khartoum, Sudan , OpenHeart Orphange, Malawi, and Red Cross Paediatric Hospital, South Africa.

The choice of which to use depends on resources (RTF is more expensive), availability (RTF may not be locally available), transportation and storage (RTF is much bulkier) and preparation facilities (RTF does not require reconstitution with water).

Where an institution had an established supply of breastmilk substitutes before the emergency, this may be the best source of artificial feeds. However, prepare plans and procedures for emergency provision of a alternative infant milk in case there are problems with the supply chain. This might include an emergency stock of infant formula, and/or an acceptable short-term milk replacement using locally available ingredients (see Annex 7).

A secure sustainable supply of infant formula needs to be made, in line with the provisions of the International Code (preferably generic).

## 9.12 Preparing larger quantities of feeds

When preparing individual feeds of formula follow the instructions on the particular product and use the scoop included in the pack or tin (see Annex 7).

When feeding large numbers of infants, it may be more practical to prepare the milk feeds in bigger amounts.

You can calculate the amounts of milk and water needed to prepare larger volumes. by multiplying up the scoop weight of the particular product. If the weight of formula powder in one scoop is not written on the tin, carefully weigh the amount of powder in one scoop, using an appropriate scale.

**Exercise**

The instructions on the label of Formula X say to add 1 level scoop of infant formula to 30 ml cooled, boiled water. The tin contains 450g of formula. One scoop contains 4.5g.

If 100 infants require a milk feed and the average feed volume is 150ml, how much formula and water will need to be mixed?

**Answer Guide**

Total volume of feed needed: 100 infants x 150ml = 15000ml = 15 litres of milk.

If 4.5 g formula makes (approximately) 30mls feed, so 450 g (1tin) formula makes 3 litres of feed.

So to make 15 litres (3 litres x 5) of feed, you need 5 tins of formula and 15 litres of water.

Add 5 tins of 450g to 15 litres of cooled boiled water.

Since the measured powdered formula is being added to 15 litres, more than 15 litres of milk will be prepared.

When reconstituting larger volumes of artificial milk, add the powder gradually and whisk between additions until all of the milk powder has been well dispersed.

## 9.13 Organising feed preparation

### Centralised production area

A centralised production area for preparing and distributing artificial feeds and cleaning bottles and equipment (i.e. a milk room) is necessary. Ideally, this is a separate room or tent, or if this is not possible, a protected section of an area where there is no risk of contaminating the feed can be used.

Separate sections to organise within a milk room/area are storage, preparation, and wash-up areas.

Other considerations for locating a milk room should include physical separation from ill children and "soiled" areas (e.g. toilets or waste disposal), away from the traffic flow of personnel, and yet near where the milk will be given.

## Preparation

Only water that has been sterilised through boiling (brought to a rolling boil) should be used to reconstitute powdered infant formula. Chemically softened water is not appropriate for using to prepare infant formula.

When preparing infant formula, an'aseptic technique' should be used to reduce the risk of contamination. This means reconstituting powdered formula or liquid concentrate with safe boiled water under hygienic conditions, and storing it in a clean container in a refrigerator, or using it immediately (see Storage below).

An aseptic technique includes having:

- Surfaces of floors, walls and ceilings made of material that can be easily cleaned.
- The preparation area cleaned, disinfected and tidied daily. Avoid dry cleaning (e.g. sweeping, dusting) during the day.
- Work surfaces cleaned with an antibacterial solution (e.g. 70% alcohol or specific sanitising agent) before and after each cycle of feed preparation.
- All non-disposable feeding utensils, such as bottles, cups, beakers, bottle rings, bottle teats and teat covers, sterilised before use (see box on sterilisation).
- Multiple use teats boiled before re-use and checked regularly for thinning or cracking.
- Disposable products, e.g. bottles and teats, sterile and ready to use.
- Good ventilation. Clean, dry air is important to reduce the risk of contamination from insects, dust and condensation. Try to avoid condensation that may be generated by boiling and steaming. While a ventilation system is ideal, this may not always be possible. Air currents from fans and open doors tend to lift dust, so try to position these away from key preparation areas.

## Storage

**Q Ask participants how the items below should be stored.**

Show the table below to compare with the answers given.

**Table 9.1 Guidance on storage times for infant formula**

| Item | Store | Length of time | Additional considerations |
|---|---|---|---|
| Unopened liquid and powdered infant formula | cool dry areas (0-30° celcius) | to expiry date | Rotate using a first-in, first-out inventory method. Throw away out-of-date formula. |
| Opened infant formula powder | cool dry area | If in original container, for up to four weeks | Note the manufacturers instructions. Label with the opening time and date. |
| Opened commercial liquid formula | refrigerator | Up to 48 hours | Covered in original container. |
| Prepared formula | refrigerator | See table 9.2 below | Store close to preparation area but outside it so that staff can get the feeds without having to enter the preparation area. |

Ideally a refrigerator is used to store prepared milk and only prepared milk should be stored in the refrigerator.

Where there are limited or no refrigeration facilities, then artificial milks must be freshly prepared for each feed time and any surplus or leftover milk thrown away.

Prepared infant formula should be cooled to below 6 degrees Celsius (the usual temperature of a refrigerator) or to when the feed is cool to touch, within one hour following preparation.

Prepared infant formula removed from the refrigerator should be fed to the infant within 30 minutes of removal.

Table 9.2 gives the recommended keeping times for prepared formula feeds, but take into account the local temperature which may vary through the day – if the temperatures are high, then the safe keeping times of non-refrigerated formula will be reduced.

**Table 9.2 Storage times for prepared infant formula**

| Formula | Use within |
|---|---|
| Prepared infant formula, unrefrigerated | 1 hour*, ideally immediately |
| Prepared infant formula, refrigerated | 24 hours |
| Formula remaining in bottle at end of bottle feeding | Throw away |

*depends on ambient temperatures, may be shorter if temperatures higher.

## Washing – up

If equipment is washed up in the same room as the feeds are prepared, then arrange to prepare feeds and wash up at different times. For example, once preparation has been completed for one feed period, the room and all utensils can be thoroughly cleaned ready for the next feed.

Washing up should be organised using a 1-2-3 system of wash-up, rinse and disinfect. All equipment and utensils should then be sterilised and stored to avoid contamination (see Part 9.7 on individual feed preparation). If not used within 3 weeks, equipment should be re-sterilised.

At the end of every day, bottle brushes should be cleaned carefully, left to disinfect for one hour, drained and air-dried. Drying cloths can be a source of contamination.

## Personal hygiene

Handwashing is the most important way of controlling infection. A proper handwashing method is essential for people handling formula (see box, how to wash your hands).
Separate facilities for washing hands, with supplies (e.g. nail brushes, soap), are needed near a feed preparation area. Liquid or powdered soap is better than bars of soap (which may become contaminated with germs).

Ideally, staff preparing formula should remove hand and ear jewellery, change from personal clothing to a uniform and cover their hair with a clean scarf or hat outside the preparation area but within the healthcare facility.

### How to wash your hands

Using a sufficient amount of soap, begin scrubbing at the elbow, then proceed to the mid-arms and hands. Hold the hands and forearms higher than the elbows to prevent dirty water running onto the hands. Continue scrubbing for three minutes.

## 9.14 Infant care

Training of staff responsible for caring for the infants is critical. This should include care practices such as feeding and washing young infants, and interaction, play and stimulation of infants.
Assigning infants to named staff, or named key workers who have a greater responsibility to individual infants, may help improve a bond between infants and carergivers.
In a busy facility, there is always the risk that play activities are not carried out, as other duties take priority – every effort should be made to encourage and protect this playtime.

Sometimes unaccompanied infants may be looked after within a health facility, for example, in a section of a hospital. Then, care should be taken to reduce the risk of cross-infection from ill patients and to avoid "medicalisation" of feeding.

Severely malnourished infants should be referred to an appropriate health facility, e.g. a hospital or therapeutic feeding programme or, if not available, managed according to current recommendations (see Part 8).

When infants become ill with an infectious disease within a health or care facility, they should be isolated from other healthy infants until free of infectious disease. The recommendations on isolation should follow international standards if it is for a health facility setting and be according to type of infection for other settings.

Particular attention should be paid to feeding ill infants – if possible by a designated carergiver.

All infants should receive routine vaccinations according to national protocols.

## 9.15 Controlling contamination of infant formula

Key ways to control contamination of infant formula are:

- Prevention of external (outside) contamination of formula, or overgrowth of organisms present in prepared formula. Extra precautions to be taken in handling, storage and preparation.
- Reducing the risks of infection with micro-organisms that may be present in powdered infant formula (intrinsic contamination) due to the manufacturing process.
- Detection as soon as possible of any infection, or intoxication, due to contaminated formula.
- Prompt investigation and institution of control procedures if needed.

Immunocompromised infants, including new-borns (especially those very premature) and HIV positive infants are particularly at risk of infection.

When caring for high risk infants, it may be safer to use commercially sterile liquid formula or formula that has undergone an effective decontamination procedure, such as using boiling water to reconstitute formula, or heating reconstituted formula (see Annex 10)[6].

### Prevention

Preventive procedures depend on the size of the unit and the resources available but should include:

- Handwashing (see box in Part 9.13 for technique).
- Aseptic technique in formula preparation.
- Housekeeping and cleaning of preparation room as well as all areas where infant formula is fed.
- Appropriate storage of formula and keeping to expiry dates.
- Quality control checks for any heating, cooling and cleaning equipment.
- Ideally staff should not work if they are ill or have a suspected infectious disease, particularly gastrointestinal illness. But this may be difficult to manage in practice. With minor, non-GI related illness where staffing demands make exclusion impractical, then hygiene procedures are even more important.

[6] Recommendation of joint FAO/WHO workshop on E sakazakii and other micro-organisms in powdered infant formula, Februrary, 2004. Summary at www.who.int/foodsafety/micro/meetings/feb2004/en.

### Dealing with infection outbreaks

Reported outbreaks of infection are often related to poor storage procedures (improper handling, excessive temperatures or keeping the product beyond its recommended time).

Routine microbiologic sampling of prepared formula for infants is not particularly effective in reducing infection rates. Rather, investing what time and resources are available in staff training, surveillance of procedures and upkeep of equipment is more useful.

In extreme circumstances, e.g. outbreak of diarrhoea linked to formula milk, then terminal heating may be employed as a temporary measure (see Annex 10).

### Case Study: Challenges of institutional feeding

Around the 1999 Kosovo crisis, we came across around 25 unaccompanied infants and young children in the main hospital in Pristina. Most spent all their time in a room on the paediatric ward under the care of the nurses, while four young infants were being looked after on the neonatal ward.

All slept and spent their all their time in cots, where many were tied to the sides. Milk was the main nutrient source, with little complementary feeding - formula milk for young infants, and cows milk (UHT) for older infants and young children. All were typically fed lying on their backs, sometimes with bottles propped up to feed. While none were severely malnourished using weight-for-height criteria, micronutrient status was questionable and feeding, psychosocial and speech development greatly impaired.

Where to start? First we targeted the kitchen, to check how milk was prepared and what type of milk was used. Formula sources included local purchase and various donations from NGOs. Carers were employed, one of their primary roles being to “mother” the infants and children. Young infants were continued on infant formula, but were now fed in the carers arms, rather than in their cot. Access to a playroom close by was established. Older infants were introduced to beakers and complementary foods. We began with mashed bananas for all. NATO troops, stationed at the hospital and hearing of their plight, kept arriving with gifts of bananas!

Marie McGrath, (SC UK), Kosovo, 1999