



MSF Nutrition Training Package

Module 6 Session 21 Nutritional Treatment: Breastfeeding & Non-Breastfeeding infants 0-6m	Duration: 55 min + 15 min optional	Reccomended Prerequisite Sessions: M9 - S31 Other Recommended Preparation: Sections on infants <6m in the ATFC and ITFC protocols
General Objective: To understand the nutritional treatment prescribed for infants 1-6m (breastfeeding and non-breastfeeding).		

Target Profiles:	
Must attend	Supervisors, Nurses, Nutrition Assistants, CHWs, Doctors, Health Promotors, Psychosocial worker.
Should attend	-
Could attend	

Specific Objectives
 At the end of this session participants will be able to: 1. Identify which milks are used for the nutritional treatment of infants 1-6 in an ITFC, 2. Know how to prepare the different types of milk, 3. Know how and when to administer the milk according to weight and stage of treatment.

Contents Breastfeeding and supplementary milks used of the nutritional treatment of infants 0-6m in a nutrition programme. How to prepare the different types of milk. How to administer the milk according to weight and stage of treatment.

Methodology Overview: This is a 55 (+ 15 min optional) minute session where the participants will have the opportunity to learn about the nutritional treatment for infants 1-6m.

1. Introduction with a lead-in question.
2. The facilitator explains the nutritional treatment for infants 0-6m with a PPT.
3. Participants practice applying the nutritional treatment for infants with case studies.
4. The facilitator provides feedback and does a wrap up with the key messages.
5. Optional activity: Role play milk preparation.

Time	Activities	Description of Learning Activities	Method	Materials
5'	Activity 1: Introduction	Explanation of the learning objectives and introduction to the session with a lead-in question	Whole Group & pairs	Ppt: NP_M6_S21_NutritionalTreatmentBrestfeedingAndNon (objectives and lead in question part).
20'	Activity 2: Nut/Treatment content	Facilitator explains the nutritional treatment for infants 1-6m with the ppt	Whole group	Ppt: NP_M6_S21_NutritionalTreatmentBrestfeedingAndNon (theoretic content part) Infant formula tin and material
20'	Activity 3: Practice	Participants works in pairs with two case studies Facilitator provides answers/feedback	In pairs	NP_M6_S21_CaseStudies Takeaways are used to do the case studies (below)
10'	Activity 4: Wrap up / take away	Facilitator does a final wrap up with the keymessages. The takeaways will be delivered	Whole group	NP_M6_S21_Takeaway_FeedingTables_Breastfeeding NP_M6_S21_Takeaway_FeedingTables_NONBreastfeeding NP_M6_S21_Takeaway_PreparingFormula NP_M6_S21_Takeaway_TreatmentStagesBreastfeeding NP_M6_S21_Takeaway_TreatmentStagesNONBreastfeeding
Optional 15'	Optional activity	Milk preparation practice	In pairs	Material to prepare the infant formula.



Materials

- Flip chart and pens.
- Computer and projector (if available).
- Ppt: NP_M6_S21_NutritionalTreatmentBrestfeedingAndNon.
- **To print:** Case studies: NP_M6_S21_CaseStudies (1 set per pair)
- Takeaways:
 - NP_M6_S21_Takeaway_FeedingTables_Breastfeeding
 - NP_M6_S21_Takeaway_FeedingTables_NONBreastfeeding
 - NP_M6_S21_Takeaway_PreparingFormula
 - NP_M6_S21_Takeaway_TreatmentStagesBreastfeeding
 - NP_M6_S21_Takeaway_TreatmentStagesNONBreastfeeding
 - NP_M6_S21_Takeaway_KeyMessages
- **(Optional) Materials to prepare the infant formula:** Infant formula powder, clean and boiled water, pot with lid, Cup (250 ml), cup cut to measure 30 ml volume, teaspoon, thermos, soap, clean towels or disposable towels.
 - **To print** NP_M6_S21_Takeaway_PreparingFormula



Description of activities

Activity 1: Introduction

(Whole group/pairs, 5 minutes)

- (Whole group, 2 minutes) Set Up
 - The facilitator will introduce the objectives of the module.
 - After the facilitator ask a lead-in question using the ppt: NP_M6_S21_NutritionalTreatmentBrestfeedingAndNon
 - **In a nutrition programme, what is the order of preference of the following milks for the correct nutritional treatment of infants? BMS (i.e. infant formula), F-100 diluted, Breastmilk, F-75**
- (In pairs, 2 minutes)
 - The participants work together to answer the question.
- (Whole group, 1 minute)
 - The facilitator writes down the different answers in the flipchart. He/she will give the correct answer during the explanation in Activity 2.

Activity 2: Nutritional treatment content

(Whole group, 20 minutes)

- The facilitator will explain the theoretic content of the session, with the support of the PPT: NP_M6_S21_NutritionalTreatmentBrestfeedingAndNon
- Remember to refer to the question of Activity 1 during the content explanation
- Explain that the practical aspects of the expression of breastmilk, cup feeding, and supplementary suckling technique will be explained in another session of the module.

REMEMBER! Important to remind participants that infants 0-6 months can be treated in the ATFC, but in hospital infants 0-1 month should be in a neonatal ward (using *MSF Neonatal Care Guidelines*) and infants 1-6 months in the ITFC (using ITFC protocol)

A. ITFC and ATFC considerations and follow up

ITFC

The physical set up of a unit/ward for treating these infants and their mothers/caretakers will be constrained by the physical environment, socio-cultural constraints and HR resources.

Below are some guiding principles:

- Aim to ensure a separate room or space, away from older children, for care of infants 1-6m and their mothers/caretakers. The space should be calm, clean and with a stable room temperature of 23 to 26°C.
- These infants need to be carefully monitored by experienced clinical staff and so there should be good visibility on all patients – avoid a set-up where not all the infants are in view of the nurses’ station and ensure that the infants who are the most vulnerable/at risk of deterioration are closest to the nurses’ station.
- The infant’s weight should be checked daily with an electronic infant scale graduated to within 10g (or 20g)
- Every infant-mother pair needs careful and frequent evaluation including quantification of breastmilk production to provide appropriate management.
- Breastmilk production can be assessed (crudely) by weighing the child before and after feeding on an electronic scale plus expressing the leftover breastmilk after breastfeeding, or by expressing all breastmilk just before feeding to quantify the amount. Neither of these methods are particularly easy, but all attempts to quantify breastmilk as accurately as possible, greatly aid planning the nutritional treatment.
- **Breastmilk** quantities should be sufficient to cover at least 135 ml/kg/day for the infant (for instance for a 4kg infant 4 x 135/8 feeds = 67ml every 3 hours).

ATFC

- The management of infants is focused on **maternal counselling and support** (i.e. breastfeeding counselling and support, replacement feeding counselling and support) and checking the **clinical status** of the infants and their mothers/caretakers
- Ensure that all infants are **gaining weight appropriately**, especially the infants admitted underweight or nutritionally at-risk, while also remaining free of medical complications. Normal weight gain is approximately 125g/week or 10-20g/day.
- Always use an electronic infant scare graduated to within 10g (or 20g).
- Infants should be **followed-up weekly** or **more often if there is poor weight**

gain or any clinical concerns (to be decided by clinician examining the child).

- Ideally, **CHWs** should do a **home visit** between the visits in the ATFC. The reason for this is that this age group is very vulnerable, and follow-up once a week may not be frequent enough and the infant could deteriorate between visits.
- Whenever possible, the ATFC follow-up visits should be scheduled in correspondence with the **vaccination schedule**.
- **Maternal** physical and mental health as well as nutritional screening should be a key part of ATFC care and treatment or referral for any needs identified.
- **Length of stay in the nutrition programme** can vary widely, depending on the reason for admission, context, and possibility to provide outpatient follow-up. It may be very short for some infant-mother pairs, just the time to provide proper support and ensure that child is gaining weight appropriately. For other cases it may be longer, especially if there are serious physical or mental health issues for the mother/caretaker or infant.

B. Nutritional treatment:

General considerations

- Once an infant is admitted into the nutritional programme **it is essential to distinguish between those in whom breastfeeding is a possibility and the exceptional cases where it is not possible.**
- Every effort must be made **to maintain or promote the return to exclusive breastfeeding (EBF).**
- If the **mother is absent** (very ill, deceased), a **wet-nurse** is the best option.
- **Breastfeeding counselling** and support are a vital part of both inpatient and outpatient care (proper positioning and attachment, duration and frequency of feedings, effective suckling, etc) and must be delivered by experienced, empathetic and patient staff members
- In instances **where breastfeeding is not possible** (permanently or temporarily) **a supplementary milk supply will be necessary:**
 - **ITFC:** Provision of supplementary milk must be ensured
 - **ATFC:**
 - The decision on whether to provide a supply of a BMS (infant formula) to non-hospitalized patients, or patients being discharged from the hospital, needs to be made at **project-level**, based on the specific context, and in coordination with operations.
 - If BMS is provided for outpatient use, the caretaker must be trained on proper preparation, dilution and a clean water source must be ensured as well as the associated equipment needed to prepare and give the infant formula. In cases where this is not possible the provision of water filters is recommended.

Types of milk (listed in order of preference)

- **Breastmilk (from the breast and if not possible/sufficient then expressed)**

- **Breastmilk substitute or therapeutic milk:**
- The decision as to whether to use **infant formula** or **F-100 diluted** will vary according to different MSF sections.
- Check with your project which option you will need to follow.
- F-100 diluted can **only** be used in inpatient settings as it must be carefully prepared and diluted by experienced staff.
- **What is F-100 diluted?** F100 is diluted in 30% more water than usual. F-100 diluted provides adequate balance of nutrient intake with a similar calorie density to breast milk. F-100 diluted = 4 scoops of F100 + 100 ml water = 114 ml of normally reconstituted F-100 + 30 % of water (30 ml) = 100 ml F100-diluted (= 70 kcal).

Nutritional treatment for infants for whom breastfeeding is possible:

- Ensure proper **maternal support** (session 21), both physical, nutritional and psychosocial.
- When the **breast milk is sufficient, but the intake is insufficient** (due to maternal or infant causes, see below for examples):
 - The objective is to provide infants with adequate nutrition (**via breastfeeding PLUS feeding expressed breastmilk**) until the infant can obtain full requirements via exclusive breastfeeding.
 - If breastfeeding is still possible, infant should be put to the **breast prior to each feeding**.
 - Breastmilk should then be **expressed and fed to the infant by cup or spoon**, (or naso-gastric tube (NGT) if the infant is very ill or unable to take milk orally for some reason).
- It is often very difficult to know how much breastmilk the infant is receiving through breastfeeding. If a problem of insufficient intake has been diagnosed as the problem for the infant (rather than insufficient breastmilk), then it is unlikely that they are getting their full needs this way. Pay special attention to an infant crying, rooting, or sucking their fist when a breastfeeding session is 'ended' as this likely means they are still hungry.
- As such, at least for the first few days of admission, calculate the total quantity (ml) of feeds from the **expressed breastmilk alone** (and not trying to work out how much they got from actual breastfeeding)
- Start by providing infant with **135ml/kg/day of total feeding of expressed breast milk**, and gradually increase the quantity as the child's general condition improves and the child requests more (crying, rooting or sucking their fingers/fist).
- If the condition of the child has improved but they are not gaining weight, try to gradually increase quantities by **10-20 ml/kg/day**.
- When exclusive breastfeeding has been re/established, the infant and their mother should be observed for an additional **2-3 days** to make sure that weight gain is appropriate with exclusive breastfeeding (approximately **10-20 g/day**).
- If the amounts suggested above are not able to be initially expressed by the mother, complete to the total quantity needed with supplementary milk, e.g. if 90ml is needed and only 60ml is expressed, give this and then 30ml of F-100d or BMS straight after. Continue this way until all the needs can be met from the expressed breastmilk.
- If the infant does not gain weight after 2 weeks, despite no medical complications

(TB and HIV specifically have been ruled out), an alternate method of feeding should be explored. Options include a combination of breastfeeding with BMS, or BMS alone.

- **When the breast milk is insufficient¹**
 - **The overall aim of this approach is to supplement the breastmilk with a therapeutic milk or BMS so that the infant gets adequate nutrition and is able to grow and develop appropriately and then reducing the supplementary milk in a controlled way so that the breastmilk takes over as the main source of nutrition for the infant by the end of the process**
 - See table below for protocol – it is important to note that the focus here is on the correct kcal/kg/day to give and as this ends up being different quantities (ml) for F-100d/F-75 and BMS (due to their slightly different nutritional composition) we use the quick tables (see Takeaways) to calculate how much supplementary milk is needed for each infant. In addition, the composition of F-100d and F-75 is close enough that we use the same quantities (ml) otherwise it could get too confusing having so many different tables. REMINDER: F-75 or BMS is the preferred milk for infants with oedema.
 - Inadequate production is often due to insufficient stimulation by the infant. The use of the **supplementary suckling technique** with each feed allows the infant to stimulate the breast and to increase the mother’s milk production while giving a milk supplement to the infant
 - **Infant formula or F-100 diluted should then be provided in addition of breastfeeding.** If the child is unable to suckle, always express breastmilk and give it to the child via cup or spoon, before giving the milk supplement.
 - **In exceptional cases,** breastmilk production will remain insufficient despite optimal support.
 - Children less than 6 months **with oedema** should be started on **Infant Formula (BMS) or F75**. When the oedema has resolved, and they are suckling strongly they should be changed to F100-diluted or infant formula.

¹ On objective assessment by an experienced staff member

Note for the facilitator: Causes of insufficient milk intake

Causes of insufficient milk intake

Situations that subject an infant to insufficient milk intake lead to the infant becoming nutritionally at-risk/underweight (can also referred to as acute malnutrition). Insufficient milk intake can be caused by factors related to the mother and/or the infant. It is therefore essential to spend time with mother/caretaker and child, especially during feeding, to identify the source of the problem and provide appropriate advice and information.

Cultural beliefs, practices at home and practical considerations often influence infant feeding practices and breastfeeding is often replaced or mixed². These issues must be understood and considered when deciding how to best ensure sustained nutrition for an infant.

It is important to take time to understand and analyse the cause of the problem for every infant and mother/caretaker pair to be able to act accordingly.

Maternal causes of insufficient milk intake

Breastfeeding mechanics

- **New mothers**, who have never breastfed, might particularly have difficulties with effective breastfeeding techniques. Even mothers who have previously breastfed successfully, may then have difficulty with another infant as each infant is different and it is a different stage in the mother's physical and emotional life.
- **Lack of knowledge of correct positioning, proper attachment and milk transfer** which are all essential for efficient breastfeeding
- **Nipple abnormalities** such as inverted nipples can prevent the child from attaching properly. It is important not to assume that all apparently inverted or irregular nipples will interfere with breastfeeding. It should be confirmed based on observation.
- **Breast engorgement or painful breasts** (presence of infection or nipple fissures) may contribute to impaired breastfeeding.

Multiples (twins, triplets)

Women normally have enough breastmilk to successfully breastfeed twins or triplets, as the production of milk depends on the infant demand. It is important to acknowledge, however, that breastfeeding more than one infant can be challenging. The biggest issue with multiples is learning how to properly 'juggle' feeding more than one infant – ensuring that each infant gets adequate time at the breast.

Psychological or environmental factors

When there is a question of inadequate milk supply, it is important to determine if the problem is truly due to insufficient milk production, or other factors. Women under stress may have trouble breastfeeding. Psychological stress itself does not always directly affect a woman's ability to produce milk. However, it may prevent mothers from putting their infant to the breast often enough or in a correct position. Insufficient suckling may then affect milk production. With proper support and time, nearly all women under stress can successfully breastfeed.

² Continuing to breastfeed at times, while offering replacement feeds at other times

Maternal nutritional status or illness

Acute malnutrition is rarely a cause of insufficient milk production in women unless it is very severe. Infants with mothers who have acute malnutrition can continue to get adequate nutrition but must feed more frequently (every 2-3 hours) than those with a healthy mother. Mothers with severe acute malnutrition (SAM) may see their milk production decrease by 20-30% compared to well-nourished mothers, but many of these women continue to produce at least 500 ml of breast milk daily if the infant continues to suckle³. Bearing this in mind however, a mother with acute malnutrition must be provided with nutritional treatment, medical treatment and psychosocial support (see *MSF Nutritional Protocol for Pregnant and Lactating Women*) and a thorough assessment made on a case by case basis of her capacity to breastfeed her infant.

Maternal illness, acute or chronic, may contribute significantly to her ability to feed her infant. Whether there is a temporary or permanent lack of sufficient breastmilk, a bridging solution must be established to ensure proper nutrition for the nutritionally at-risk/underweight infant (who has reached this state due to the lack of breastmilk) until, in most cases, breastfeeding can be fully re-established.

Inappropriate use of BMS'

Infants who are not breastfed rely on another source of nutrition, most often a BMS. Inadequate supply of BMS, improper preparation and preparation with unclean water can all contribute to poor nutritional status in a non-breast-fed infant. Home-modified animal milk is not recommended for infants less than six months of age⁴ due to significant nutritional inadequacy **and should only be used as a last-resort, stop-gap measure.**

Maternal knowledge attitudes and beliefs

A mother might not always want to, or be willing to, breastfeed due to beliefs, ideas, concerns or fears about breastfeeding related to herself or her infant. These beliefs, concerns, etc, may have their origin from the women herself or have arisen in her due to other influences in her socio-cultural or religious environment and way of life. It is important to try to understand the reasons behind their beliefs and decision to not breastfeed in a non-judgemental and constructive way. It is also equally as important to carefully explain the benefits of breastfeeding and the potential risks of not breastfeeding in their specific context. This kind of dialogue will help in finding a context-adapted solution for ensuring the healthy growth and development of the infant and indeed the health of their mother. Temporary or bridging solutions with BMS may be necessary, the ultimate goal should still be to get the mother back to breastfeeding when at all possible.

Infant-related causes

Acute or chronic illness, prematurity

Illness and prematurity may cause an infant to be too weak to suckle and swallow

³ Brown KH, Dewey KG. Relationships between maternal nutritional status and milk energy output of women in developing countries. In: *Mechanisms Regulating Lactation and Infant Nutrient Utilization* (Picciano MF and Lonnerdal B, eds.), pp. 77-95. Wiley-Liss: New York, 1992.

⁴ Alternative milks may be used as a BMS in children aged six months and older, such as pasteurised or boiled full-cream animal milk (cow, goat, buffalo, sheep, camel), ultra-high temperature (UHT) milk, reconstituted evaporated (but not condensed) milk, fermented milk or yogurt. *Infant Feeding in Emergencies: Operational Guidance for Emergency Relief Staff and Programme Managers*, Ed.2017. IFE Core Group.

properly. This can become a vicious cycle – as breastmilk production is directly dependent on demand and stimulation by the infant, those infants who have difficulties in breastfeeding will stimulate the breasts less and consequent milk production will decrease. The lack of nutrition causes the infant to become increasingly weaker and unable to feed properly – and the cycle continues.

Congenital malformations

Congenital abnormalities in the infant that may contribute to poor attachment include ankyloglossia (tongue tie), cleft palate, micrognathia (undersized jaw), and macroglossia (unusually large tongue).

Neurological complications

Immaturity of the central nervous system (premature infants), peri-natal brain ischemia, or other causes of neurological deficits may lead to absent or abnormal sucking and swallowing reflexes.

Medical conditions

Neonatal tetanus, respiratory distress, and congenital heart disease can lead to difficult or impossible nursing. Oral lesions (i.e. oral thrush) may render feeding painful and difficult for an infant.

D. Nutritional treatment for infants without the possibility of breast-feeding:

- For cases in which breastfeeding is not possible the ITFC approach is also **divided into 3 stages, in order to progressively increase the quantities of BMS or F-100 diluted the infant consumes whilst they are medically and nutritionally stabilised. The goal is to get them up to the recommended amounts for non-malnourished infants.**
- See table below for protocol – AGAIN it is important to note that the focus here is on the correct kcal/kg/day to give and as this ends up being different quantities (ml) for F-100d/F-75 and BMS (due to their slightly different nutritional composition) we use the quick tables (see Takeaways) to calculate how much supplementary milk is needed for each infant. In addition, the composition of F-100d and F-75 is close enough that we use the same quantities (ml) otherwise it could get too confusing having so many different tables. REMINDER: F-75 or BMS is the preferred milk for infants with oedema.
- Non-breast-fed infants run a **higher risk of acute respiratory infections, diarrhoea and severe dehydration.**
- Wet-nurse:
 - ⇒ When faced with an **infant whose mother has died or is too ill to breastfeed**, it is generally preferable **to try to find a woman who can serve as a wet-nurse** for the infant.
 - ⇒ However, counselling, testing, and treatment for HIV are necessary for potential wet-nurses, especially in regions with a HIV prevalence >1% in pregnant women.

REFER PARTICIPANTS TO MSF BF BOOKLET FOR MORE INFORMATION

Table 2 ITFC Stages of Nutritional treatment for infants with no possibility of breastfeeding (see feeding volume tables in takeaway)

STAGE	NUTRITIONAL TREATMENT BMS/F-100 DILUTED/(F-75)	DURATION
1	100 kcal/kg/day of BMS/F-100d in 8 to 12 feeds/day* (Infant with oedema: F-75 or BMS) USE QUICK TABLES FOR QUANTITIES (ml)	5-7 days (can be less if infant gaining appropriate weight and progressing well, infants with oedema which takes more than approximately 4 to reduce may need a little longer in this stage)
2	110-130 kcal/kg/day of BMS/F-100d in 8 to 12 feeds/day* (Infant with oedema: F-75 or BMS) USE QUICK TABLES FOR QUANTITIES (ml)	2-3 days
3	150 kcal/kg/day of BMS/F-100d in 8 to 12 feeds/day* (Infant with oedema: F-75 or BMS) USE QUICK TABLES FOR QUANTITIES (ml)	2-3 days

Key considerations:

- **Stage 3:** The recommended volume of milk may be difficult for a young infant to take in. The full amount should nevertheless be offered, and any amount remaining should be measured and recorded before being thrown away. The aim of the 3rd stage is to put on weight. If the infant is gaining weight (approximately 10-20g/day) there is no need to worry about the amount taken. On the other hand, if the infant is not able to take the full amount and is not putting on weight, their medical condition should be reassessed.
- **Discharge:** In addition to improved clinical status, the **infant should show weight gain of 10-20g/day for 2-3 days** prior to discharge.

During the infant formula explanation, the material to prepare the milk will be shown:

Infant formula

- BMS **does not possess all the healthy and protective qualities of breast milk**. BMS is unable to provide the immune protection and adapted nutrient

composition (to an infant's needs) that is found in breast milk. Neither does it contain the specific binding proteins that facilitate the absorption of trace elements such as iron, zinc and others. **It poses risks of infection**, especially if unclean water is used for preparation.

- **Prior to discharge, the caretaker should be educated and trained on the correct preparation of the BMS** applying proper hygiene measures. Moreover, the **caretaker should be able to assure that all the equipment and source of infant formula** will be available without interruption for the infant until they are 6 months old (when they can start to be weaned)

How to prepare infant formula (BMS)

- These instructions are for how to **prepare the infant formula in the ITFC** and for the rare number of infants without the possibility of breastfeeding, who are being transitioned from **stage 3 nutritional rehabilitation to giving infant formula at home**.
- In order to ensure the correct preparation at home, the necessary **material should be given to the caretakers**: cooking pot, cup, spoon and a water filter at discharge and infant formula on a monthly basis until 6 months old (this may vary from project to project).
- There are different presentations and formulations of infant formula
 - **Presentation:**
 - Powdered infant formula that must be reconstituted with clean water.
 - Ready-to-use infant formula (RUIF) that comes as 100 ml single use units.
 - **Formulation**
 - 0-6 months formulation ("1st stage") – designed as the sole source of nutrition for the infant – can also be used for infants older than 6 months and is the only one available in the MSF catalogue
- **Preparation**
 - Tins of powdered infant formula come with a **measuring spoon** that accurately measures 4.5 g of powder.
 - **One level measure of infant formula powder (4.5 g) is mixed with 30 ml of clean and boiled water**, 2 measures for 60 ml of water, 3 measures for 90 ml of water, etc.

Preparation of infant formula

Material	Preparation
1. Infant formula powder	1. Properly wash the kitchen utensils (pot, spoon and cup)
2. clean and boiled water	2. Wash hands with water and soap.
3. Pot with lid	3. Boil water in the pot and let cool to room temperature/lukewarm – transfer immediately to thermos.
4. Cup (250 ml)	4. Place the necessary quantity of lukewarm water in a feeding cup of 150-250 ml volume.
5. Cup cut to measure 30 ml volume	5. Keep the rest of the hot water in the thermos for the following feeds.
6. Teaspoon	
7. Thermos	6. Add the corresponding amount of milk powder and ensure that

8. Soap	<p>the tin is correctly re-sealed.</p> <p>7. Stir (mix) with the spoon to dissolve the milk powder in the water.</p> <p>8. Verify temperature is suitable for drinking (use digital thermometer MSF catalogue code: PCOOTHF1C)</p> <p>9. Feed infant from cup.</p> <p>10. Discard any milk remaining in the cup more than one hour after preparation.</p>
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Volume of infant formula to prepare at home according to infant's weight

Note! These are different to the amounts used in the nutritional protocol, this is for non-sick infants who are considered no longer nutritionally at-risk/underweight

Weight of infant (kg)	Volume of water (ml)	Scoops of infant formula	Number of feeds per day	Number of tins BMS (400 g) per week*
2.5 – 3.0	60	2	6 - 8	1.0
3.1 – 3.5	90	3	6 - 8	2.0
3.6 – 4.0	120	4	6 - 8	2.5
4.1 – 4.5	150	5	6 - 8	3.0
4.6 – 5.0	180	6	4 - 6	3.5
5.1 – 6.0	210	7	4 - 6	4.0
> 6.0	240	8	4 - 6	5.0

Note: These are **suggested volumes** per feed and are approximations. Each day a healthy infant can eat less or more per feed, but on average these are the suggested volumes. The higher feed volumes are only typically reached at the end of these time periods i.e. a 1-month old baby will be drinking 120 ml per feed nearer to the 2-month mark than at 1 month after birth.

It may often not be possible for families to weigh their infants at home, so this table can also be used to help guide quantities by age. Again these are suggested volumes.

Age	Volume per feed (ml)	Volume per day (ml)
Newborn (< 1 month)	60-90	500-750
1 month	90-120	750-1000
2 months	120-150	1000-1200
3 months	150-180	1200-1400

4-5 months	180-210	1400 - 1700
6 months old	210-240	1700-1900



Activity 3: Practice Case Studies

(In pairs, 20 minutes)

- (In pairs, 12 minutes)
 - Participants are split into pairs. Participants receive 2 case studies with questions, and they must decide on the best management.
 - To do the case studies, the participants will use the takeaways:
 - NP_M6_S21_Takeaway_FeedingTables_Breastfeeding
 - NP_M6_S21_Takeaway_FeedingTables_NONBreastfeeding
 - NP_M6_S21_Takeaway_TreatmentStagesBreastfeeding
 - NP_M6_S21_Takeaway_TreatmentStagesNONBreastfeeding
 - For the milk calculation, they can use the Quick Tables
- (Whole group, 8 minutes)
 - Facilitator asks two pairs to present the cases on a flipchart (one case per each pair) and provides feedback of each case to the whole group.

Case 1 Breastfeeding infant in ITFC

A 3-month-old breastfed infant is admitted into the ITFC with a WAZ and WHZ < -3 (no oedema) with medical complications (fever and lethargic) and refusing the breast almost constantly for the last four days. The mother says she has never found breastfeeding easy since birth and that her baby often comes off the breast crying or feeds for a very long time but doesn't seem full.

A breastfeeding assessment is done and also a breastmilk expression assessment. Issues are identified with latch and positioning and indeed over the course of 6 hours, the mother expresses very little breastmilk (even after a good meal, plenty of water etc). Weight on admission: 3.0 Kg.

The mother is quite stressed about breastfeeding, but has no other risk factors for a mental health problem. Her MUAC is 238mm and she has no ongoing medical problems.

Question 1: Which type of milk would you give? How much milk would you give? How many ml per feeds for 8 feeds per day?

- Type of milk: Breastmilk and BMS or F-100 diluted (depending on which MSF section you work for!)
- Infant should be put to the breast on demand and mother given breastfeeding counselling focused particularly on latch and positioning as well as ensuring she understands all the hunger cues an infant can display

- The mother should then be helped to practice the supplementary suckling technique at each feeding with the supplementary milk
- If possible the mother should also be encouraged to express her milk as well to increase the demand for breastmilk and as such increase the supply, but this should only be done if the mother agrees and feels it will be useful on top of the breastfeeding on demand and the SST
- This project uses F-100d as the main supplementary milk for nutritional treatment of infants 1-6 months.

Quantity F-100 diluted:

- As the infant is >1.5kg she can be started on a 3 hourly feed schedule (if the infant seems hungry between feeds, go to a 2 hourly schedule)
- Using the Quick Tables: 3.0 kg = **51 ml per meal** (406ml/day)

Question 2: On day 5, the infant is now clinically stable and does not refuse feeding. Breastfeeding technique is slowly improving with intensive counselling. How much milk would you give now? Would you change the stage of the infant? Weight evolution by day:

D1: 3.00

D2: 2.92

D 3: 2.94

D4: 2.92

D5: 2.92

- There is no weight gain. No change of the stage. Remain in stage 1
- Still on F-100d
- Try increasing the milk by 5ml for each feed
- Using Quick Tables 3.0kg = **51 ml per feed** (REMEMBER use admission weight for all calculations in stage 1)
- 51 ml+ 5ml = **56 ml per feed**

Question 3: It is now day 8. Breastfeeding is going well as is the SST at each feed. How much milk would you give now? Would you change the stage of the infant? Weight evolution by day:

D6: 2.94

D7: 2.98

D8: 3.06

- There is weight gain for 3 consecutive days. They can be changed to stage 2
- Still on F-100d
- 75% of Stage 1 quantity = 3.0kg was 51ml per feed, now 38ml per feed

Question 4: at day 11 you reassess. Would you change the stage of the infant? Weight evolution by day:

D9: 3.07

D10: 3.08

D11: 3.08

- Not yet.
- The infant is gaining weight but only just 10 g/day and has been stagnant for 1 day.

Question 5: It is now day 14. Would you change the stage of the infant? What type of milk would you give? Weight evolution by day:

D12: 3.11

D13: 3.13

D14: 3.15

- There is weight gain for 3 consecutive days of 20g/day. They can be changed to stage 50% of stage 1 quantity
- Still on F-100d
- 50% of Stage 1 quantity = 3.0kg was 51ml per feed, now **25ml per feed**

Question 6: It is now day 16. Would you change the stage of the infant? What type of milk would you give? Weight evolution by day:

D15: 3.18

D16: 3.21

- There is weight gain for 3 consecutive days of 20g/day. They can be changed to stage 25% of stage 1 quantity
- Still on F-100d
- 25% of Stage 1 quantity = 3.0kg was 51ml per feed, now **13ml per feed**

Question 7: It is now day 18. The mother says she wants to go home soon and that she feels breastfeeding is going well. Would you change the stage of the infant? What type of milk would you give? Weight evolution by day:

D17: 3.24

D18: 3.28

- There is weight gain for 2 consecutive days of 20g/day. They can be changed to stage 3 which is exclusive breastfeeding.
- Breastmilk
- The mother should be encouraged to feed on demand and make sure it is a minimum of every 3 hours including during the night.

Question 8: On day 21, the mother is very keen to go home. Would you refer the infant to the ATFC? Why? Weight evolution by day:

D19: 3.32

D20: 3.37

D21: 3.40

- Yes
- Because there is sufficient weight gain (at least 10-20g) on exclusive breastfeeding for 3 days

Case 2 Infant without the possibility to breastfeed in ITFC

A 2-month-old non-breastfeeding infant is admitted into the ITFC with a WAZ and WHZ < -3 with medical complications (pneumonia). The mother is absent (died two weeks ago) and the infant has been fed on some goats milk and some powdered milk since then, but hasn't been feeding well for the last 5 days. Weight on admission: 2.90 Kg.

Question 1:

What would you recommend to the caretaker as a first option for nutritional treatment?

- Try to find a woman who can serve as a wet-nurse for the infant.
- Counselling, testing, and HIV treatment are necessary for any potential wet-nurses

Question 2:

Which type of milk would you give? How much milk would you give? How many ml per feed for 8 feeds per day?

- Type of milk: BMS (the infant will be going home on this so no point to start with F-100d, might as well get them used to the infant formula)
- Quantity of infant formula:
 - 2.90 kg using Quick Tables = **55ml per feed (441ml per day)**

Question 3:

It is day 4 of admission. The infant is much better after receiving IV antibiotics for the pneumonia. She feeds well and seems hungry for more. Would you change the stage of the infant? What quantity of milk would you give?

Weight evolution by day:

- **D0: 2,90**
- **D1: 2.92**
- **D 2: 2.96**
- **D 3: 3.00**
- **D4: 3.10**
- There has been sufficient weight gain and child is stable so can change to stage 2.
- Quantity of infant formula:
 - $3.10 \text{ kg} \times 200 \text{ ml/kg/d} = 620 \text{ ml}$
 - $620 \text{ ml} / 8 \text{ feeds} = \mathbf{77 \text{ ml per feed}}$

Question 4:

On day 7, you reassess their nutritional treatment. Would you change the stage

of the infant? What quantity of milk would you give?

Weight evolution by day:

- **D5: 3.20**
- **D6: 3.25**
- **D7: 3.34**

- The infant has been 3 days in Stage 2 and has gained weight, they can be moved to stage 3
- Quantity of infant formula:
 - $3.34 \text{ kg} \times 270 \text{ ml/kg/d} = 902 \text{ ml}$
 - $902 \text{ ml} / 8 \text{ feeds} = \mathbf{113 \text{ ml per feed}}$

Question 5:

It is day 21. The infant is clinically well, no longer on any treatment and the caretaker is confident in preparing the infant formula. Would you refer the infant to the ATFC? Why? Which is the weight gain (g/kg/d) of the last 3 days?

Weight evolution per day:

D8: 3:40
D11: 3.45
D15: 3.47
D18: 3.51
D19: 3.51
D20: 3.75
D21: 3.90

- Yes, because last 3 days weight gain has been $> 10\text{g/kg/day}$
- Weight gain calculation:
 - $3.90 - 3.51 = 0.39 \text{ kg} = 39 \text{ g}$
 - $3.51 \times 10\text{g/kg/d} = 35.1 \text{ g}$
 - 39g is greater than 35.1 g so they are reaching the minimum weight gain needed



Activity 4: Wrap Up

(Whole group, 10 minutes)

Facilitator does a wrap up asking to the participants what they have learned in the session and reviews the key messages below if they have not been mentioned:

- It is essential to **distinguish between those in whom breastfeeding is a possibility and the exceptional cases where it is not possible.**
- Every effort must be made **to maintain or promote the return to exclusive breastfeeding.**

- **Breastfeeding counselling and support are a vital part** of both inpatient and outpatient care.
- In instances where breastfeeding is not possible a supplementary breastmilk substitute will be necessary: **The caretaker must be trained to prepare it and, on the hygiene, measures needed for this**
- **types of milk are (listed on order of preference):**
 - **Breast milk** (for breastfed infants)
 - **Breast milk substitute (BMS):** infant formula or **F-100 diluted** (the choice of which milk is used will vary according to the MSF section you work for)

Inpatient Nutritional Treatment

- **ITFC Infants with the possibility of breast-feeding:**
 - **Objective:** infant is able to meet full nutritional requirements via exclusive breastfeeding (if possible)
 - When **the breast milk is sufficient, but the intake is insufficient:** provide **breastfeeding + feeding expressed breastmilk (cup, spoon or NGT).**
 - When **the breast milk is insufficient:** The **supplementary suckling technique** will be used to stimulate the breast and to increase mother's milk production while giving a **milk supplement (infant formula or F-100 diluted)**
 - The Nutritional treatment is delivered in **3 stages** where the milk supplementation is decreased whilst increasing exclusive breastmilk intake, as long as the child is gaining weight
- **ITFC Infants without possibility of breast-feeding:**
 - The nutritional treatment is also divided into **3 stages**, in order to progressively increase the quantities of infant formula
- At the **ATFC**, the management of infants will be based on **maternal counselling and support** (i.e. breastfeeding counselling and support, or replacement feeding counselling and support (if breastfeeding not possible))
- **Monitoring (ITFC and ATFC):**
 - The infant's weight should be checked daily in ITFC (or at each visit at the ATFC) with an electronic infant scale graduated to within 10g (or 20g).
 - For children admitted into ATFC, a CHW should do a home visit between the visits in the ATFC to check on the clinical status of the infant and the feeding practices at home.



Optional Activity: Milk Preparation Practice

(In pairs, then whole group, 20 min)

- (In group, 5 minutes) Set up
 - For this activity different kits of material to prepare the milk are needed (one kit per pair).
 - The facilitator provides the takeaway:
 - NP_M6_S21_Takeaway_PreparingFormula

- (In pairs, 10 minutes) Skills Practice
 - Each pair will go to a separate space of the room to prepare the milk. One person will prepare and the other will observe.
 - After they will swap roles.
 - The facilitator will move around observing and using the takeaway of infant formula milk preparation taking note of any mistakes observed.

- (Whole group, 5 minutes)
 - After everybody has practised the exercise, the facilitator will provide feedback and will mention any mistakes identified during the pairs' practice.
 - The facilitator will then demonstrate the process and as they observe and ask questions if they have doubts or if they identify any mistakes.



Takeaways

Facilitator gives "quick tips" for participants to take away:

- NP_M6_S21_Takeaway_FeedingTables_Breastfeeding
- NP_M6_S21_Takeaway_FeedingTables_NONBreastfeeding
- NP_M6_S21_Takeaway_PreparingFormula
- NP_M6_S21_Takeaway_TreatmentStagesBreastfeeding
- NP_M6_S21_Takeaway_TreatmentStagesNONBreastfeeding
- NP_M6_S21_Takeaway_KeyMessages



On the Job Training

The week after the session has been delivered, during the ITFC 1-6 months ward round, the facilitator will ask the medical staff why particular patients are receiving the quantity of milk using the information in the takeaway as a reference. During the preparation and administration of the infant formula, the facilitator will also check that it is performed correctly.

