MODULE 4
FEEDING

REPUBLIC OF GHANA
MINISTRY OF HEALTH

GHANA HEALTH SERVICE
Your Health • Our Concern

Training Course on Inpatient Management of Severe Acute Malnutrition

(Adapted from the 2002 WHO *Training course on inpatient management of severe acute malnutrition*)

Children 6–59 Months with SAM and Medical Complications

March 2012

This modified version of the 2002 World Health Organisation's *Training Course on Inpatient Management of Severe Acute Malnutrition (SAM)* is the practical application of the 2010 MOH/GHS *Interim National Guidelines for Community-Based Management of Severe Acute Malnutrition in Ghana*. The training course was modified by the MOH/GHS SAM Support Unit in collaboration with the MOH/GHS Regional SAM Support Teams. USAID/Ghana, FANTA-2 Bridge project, UNICEF/Ghana and WHO/Ghana provided technical and financial support to review and modify the training course. This revised training course is made possible by the generous support of the American people through the support of USAID/Ghana and the Office of Health, Infectious Diseases, and Nutrition, Bureau for Global Health, United States Agency for International Development (USAID), under terms of Cooperative Agreement No. AID-OAA-A-11-00014, through the FANTA-2 Bridge, managed by FHI 360.

Illustrations for modules: Susan Kress

Contents

Acronyms and Abbreviations

AFASS	Affordable, Feasible, Appropriate, Sustainable, and Safe
CCP	Critical Care Pathway
cm	Centimetre(s)
CMV	Combined Mineral and Vitamin Mix
CWC	Child Welfare Clinic
F-75	Formula 75 Therapeutic Milk
F-100	Formula 100 Therapeutic Milk
g	Gram(s)
IM	Intramuscular
IMNCI	Integrated Management of Neonatal and Childhood Illness
IU	International Unit(s)
IV	Intravenous
IYCF	Infant and Young Child Feeding
kcal	Kilocalorie(s)
kg	Kilogram(s)
L	Litre(s)
mg	Milligram(s)
ml	Millilitre(s)
mmol	Millimole(s)
mOsmol	Milliosmol(s)
MUAC	Mid-Upper Arm Circumference
NG	Nasogastric
NGT	Nasogastric Tube
ReSoMal	Rehydration Solution for Malnutrition
RUTF	Ready-to-Use Therapeutic Food
SAM	Severe Acute Malnutrition
SFP	Supplementary Feeding Programme
%	Percent

Introduction

Feeding is obviously a critical part of managing severe acute malnutrition (SAM). However, as explained in **Module 2, Principles of Care**, feeding must be started cautiously, in frequent, small amounts. If feeding begins too aggressively or if feeds contain too much protein or sodium, a child's systems may be overwhelmed and the child may die.

To prevent death, feeding should begin as soon as possible with F-75, the 'starter' formula used until the child is stabilised. F-75 is specially made to meet a child's needs without overwhelming the body's systems at this early stage of treatment. F-75 contains 75 kcal and 0.9 g protein per 100 ml. F-75 is low in protein and sodium and high in carbohydrates, which is more easily handled by the child and provides much-needed glucose.

When the child is stabilised (usually after 2–7 days), the 'catch-up' formula F-100 or ready-to-use therapeutic food (RUTF) are used to rebuild wasted tissues. RUTF and F-100 contain more calories and protein: 100 kcal and 2.9 g protein per 100 ml.

The contents of F-75, RUTF, and F-100 and the need for these contents were discussed in **Module 2, Principles of Care**. This module focuses on preparing feeds, planning feeding, and giving the feeds according to the plan.

Learning Objectives

This module describes how and allows you to practice the following skills:

- Preparing F-75 and F-100 and learning about RUTF
- Planning feeding and recording the intake and output for a 24-hour period for a child who is:
    - Feeding on F-75 during stabilisation
    - Adjusting to RUTF or F-100 during transition, including conducting the appetite test with RUTF
    - Feeding on RUTF or freely with F-100 during rehabilitation
- Measuring and giving feeds to children
- Recording intake and output
- Planning feeding for Inpatient Care

This module also contains materials on managing acute malnutrition in infants under 6 months of age (this category also includes infants over 6 months who weigh less than 4 kg).

In addition, the module allows you to discuss ideas for training staff at your hospital to do feeding-related tasks.

1. Prepare F-75 and F-100 Feeds and Learn about RUTF

Recipes for F-75 and F-100 and the contents of RUTF were given in **Module 2, Principles of Care**. The recipes for F-75 and F-100 are repeated in the table on the next page.

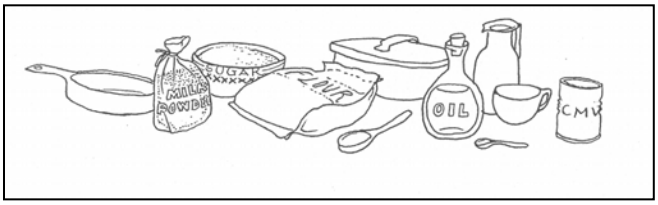
1.1. Prepare F-75 and F-100

In **Exercise A** you will prepare F-75 and F-100 using one of the recipes in the table on the next page or a similar recipe that is used in the Inpatient Care site (SAM ward) that you will visit during this course.

The first three recipes for F-75 include cereal flour and require cooking. Cooking directions for these recipes are given on page 6.

The last three recipes for F-75 can be used if there is no cereal flour or cooking facility. However, the recipes with no cereal flour have a high osmolarity (415 mOsmol/L) and may not be tolerated well by some children with diarrhoea. Cooking directions for these recipes are given on page 7.

Note: *F-75 and F-100 can also be obtained commercially. In that case, follow the preparation instructions on the package.*



Recipes for F-75 and F-100

If you have cereal flour and cooking facilities, use one of the top three recipes for F-75.

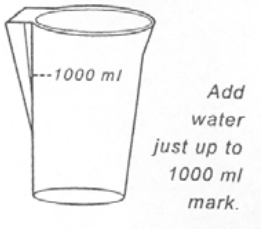
Alternatives	Ingredients	Amount for F-75
If you have dried skimmed milk	Dried skimmed milk Sugar Cereal flour Vegetable oil Combined mineral and vitamin mix (CMV)* *Water to make 1,000 ml*	25 g 70 g 35 g 30 g ½ level scoop *1,000 ml***
If you have dried whole milk	Dried whole milk Sugar Cereal flour Vegetable oil CMV* *Water to make 1,000 ml*	35 g 70 g 35 g 20 g ½ level scoop *1,000 ml***
If you have fresh cow's milk or full-cream (whole) long-life milk	Fresh cow's milk or full-cream (whole) long-life milk Sugar Cereal flour Vegetable oil CMV* *Water to make 1,000 ml*	300 ml 70 g 35 g 20 g ½ level scoop *1,000 ml***

If you do not have cereal flour or there are no cooking facilities, use one of the following recipes for F-75. | No cooking is required for F-100.

Alternatives	Ingredients	Amount for F-75	Amount for F-100
If you have dried skimmed milk	Dried skimmed milk Sugar Vegetable oil CMV* *Water to make 1,000 ml*	25 g 100 g 30 g ½ level scoop *1,000 ml***	80 g 50 g 60 g ½ level scoop *1,000 ml***
If you have dried whole milk	Dried whole milk Sugar Vegetable oil CMV* *Water to make 1,000 ml*	35 g 100 g 20 g ½ level scoop *1,000 ml***	110 g 50 g 30 g ½ level scoop *1,000 ml***
If you have fresh cow's milk or full-cream (whole) long-life milk	Fresh cow's milk or full-cream (whole) long-life milk Sugar Vegetable oil CMV* *Water to make 1,000 ml*	300 ml 100 g 20 g ½ level scoop *1,000 ml***	880 ml 75 g 20 g ½ level scoop *1,000 ml***

* The contents of CMV are listed in **Annex D** of **Module 2, Principles of Care**.

** ***Important note about adding water:*** *Add just the amount of water needed to make 1,000 ml of formula. (This amount will vary from recipe to recipe, depending on the other ingredients.) Do not simply add 1,000 ml of water, as this will make the formula too dilute. A mark for 1,000 ml should be made on the mixing container for the formula so that water can be added to the other ingredients up to this mark.*



Tips for Correct Preparation of F-75 and F-100 Recipes

- If possible, use a dietary scale that is accurate to at least 5 g. A scale made with its own bowl is convenient. If yours has only a flat platform, choose a suitable container for weighing the ingredients. Weigh the empty container first and account for this when weighing the ingredients.

  Small plastic bags can be used as containers for dry ingredients. They are so light that their weight can be ignored.

  To measure oil, choose a small container to reduce the surface to which the oil can stick. Let the oil drain out well from the container when transferring it to the blender or jug. Then rinse the container with a little boiled water and add the mixture of boiled water and rinsed oil to the blender or jug.

- Be sure that the scale is set to zero before weighing.

- Wash hands before measuring ingredients.

- If using scoops for measurement, level the ingredients with a knife to ensure consistent measurement. Be aware that equal weights of milk powder and sugar do not occupy the same volume; milk powder has a larger volume. Therefore, one must either weigh these ingredients or know the corresponding volume for each.

- Mix the oil well so that it does not separate out from the rest of the mixture. Oil is a vital source of energy; if it floats to the top of the mixture, there is a risk that some children will get too much and others too little. If possible, use an electric blender to thoroughly mix the oil into the mixture. Otherwise, use a strong rotary whisk or balloon whisk. Use a long whisk so that your hands do not dip into the formula while whisking.

- If there is a change in the type of milk supplied, change to a recipe appropriate for the type of milk available.

- If using combined mineral and vitamin mix (CMV), read the label carefully to ensure that you use the correct amount for your recipe. For example, if the scoop provided with the CMV is for making 2 L of mixture, use half a scoop to make 1 L. Carefully measure to determine the exact amount in half-scoops.

- Be careful to add the correct amount of water to make 1,000 ml of formula. If 1,000 ml of water is mistakenly added, the resulting formula will be about 15% too dilute.

- **Adding cooled boiled water when using commercial F-75 and F-100:** Follow the preparation instructions on the package.

Directions for Making Cooked F-75 with Cereal Flour (First Three Recipes)

You will need a 1-L electric blender or a hand whisk (rotary whisk or balloon whisk), a 1-L measuring jug, a cooking pot, and a stove or hot plate. Amounts of ingredients are listed in the table on page 4. Cereal flour may be maize meal, rice flour, or whatever is the staple cereal in the area. CMV is not cooked with the mixture, but added at the end.

It is important to use cooled boiled water, even for recipes that involve cooking. Cooking the cereal mixture requires only 4 minutes of gentle boiling, and this may not be enough to kill all pathogens in the water. Make sure to cool the water before adding it to the powdered ingredients; adding boiling water may create lumps.

If using an electric blender:

1. Put about 200 ml of the cooled boiled water into the blender. (If you are using liquid milk instead of milk powder, omit this step.)

2. Add the flour, milk or milk powder, sugar, and oil. Blend.

3. Add cooled boiled water to the 1,000 ml mark and blend at a high speed.

4. Transfer the mixture to a cooking pot and boil gently for 4 minutes, stirring continuously.

5. Some water will evaporate while cooking, so transfer the mixture back to the blender after cooking and add enough cooled boiled water to make 1,000 ml. **Add the CMV** and blend again.

If using a hand whisk:

1. Mix the flour, milk or milk powder, sugar, and oil in a 1-L measuring jug. (If using milk powder, this will be a paste.)

2. Slowly add cooled boiled water up to 1,000 ml.

3. Transfer the mixture to a cooking pot and whisk vigorously.

4. Boil gently for 4 minutes, stirring continuously.

5. Some water will evaporate while cooking, so transfer the mixture back to the measuring jug after cooking and add enough boiled water to make 1,000 ml. **Add the CMV** and whisk again.

Directions for No-Cooking Recipes (Last Three Recipes)

If using an electric blender:

1. Put about 200 ml of the cooled boiled water into the blender. (If you are using liquid milk instead of milk powder, omit this step.)

2. Add the required amounts of milk or milk powder, sugar, oil, and CMV.

3. Add cooled boiled water to the 1,000 ml mark and then blend at high speed.

If using a hand whisk:

1. Mix the required amounts of milk powder and sugar in a 1-L measuring jug.

2. Add the oil and stir well to make a paste. (If you use liquid milk, mix the sugar and oil and then add the milk.)

3. Add the CMV, and slowly add cooled boiled water up to 1,000 ml, stirring continuously.

4. Whisk vigorously.

Important Note: *Whether using a blender or a whisk, it is important to measure up to the 1,000 ml mark* ***before*** *blending/whisking. Otherwise, the mixture becomes too frothy to judge where the liquid line is.*

Prepare F-75 and F-100 using Commercial Products

- Add cooled boiled water when using commercial F-75 and F-100. Follow the preparation instructions on the package.

- The contents of the package are usually added to 2,000 ml of water.

- To make small quantities of F-75, add 20 ml of water to 1 scoop of the commercial F-75 product.

- To make small quantities of F-100, add 18 ml of water to 1 scoop of the commercial F-100 product.

1.2. Ready-to Use-Therapeutic Food

RUTF is an energy-dense, mineral- and vitamin-enriched food that is equivalent to F-100, except that RUTF has iron added to it. RUTF is used for the dietetic management of SAM in Inpatient Care during transition and in Outpatient Care during rehabilitation. RUTF is an integral part of Outpatient Care, as it allows children to be treated at home rather than at centre-based Inpatient Care treatment facilities.

There are currently two forms and several commercial types of RUTF: a lipid-based spread, such as Plumpy'nut®, and a biscuit bar, such as BP 100®. Several countries are producing their own lipid-based RUTF. Their products have similar nutrition quality as F-100 and have been shown to be physiologically similar to commercial forms of F-100 and RUTF.

Plumpy'Nut® is a ready-to-eat therapeutic spread presented in individual packets. It is a paste composed of vegetable fat, groundnut/peanut butter, skimmed milk powder, lactoserum, maltodextrin, sugar, and mineral and vitamin complex.

Instructions for Use

Clean drinking water must be made available to children while they consume ready-to-eat therapeutic spread.

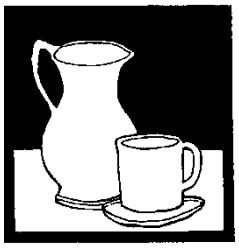
Recommendations for Use

The product is recommended for use for the dietetic management of SAM in the transition and rehabilitation phases.

Storage and Packaging

Plumpy'nut® has a shelf life of 24 months from the manufacturing date and should be stored in a cool and dry place. It often comes in a 92 g packet that contains 500 kcal. A carton (around 15.1 kg) contains 150 packets.

To learn more, **see Annex D** of **Module 2, Principles of Care.**



Exercise A

In this exercise, your group will prepare F-75 and F-100 according to the recipes used in the hospital that you will visit during this course. Your facilitator will give you a copy of the recipes to be used.

Notice the differences in the recipes for F-75 and F-100. You will have a chance to taste each formula.

While preparing the recipes, think about the following issues in relation to your own hospital and be prepared to discuss them with the group.

- What aspects of preparing these recipes would be difficult in my hospital?
- How can I make sure that the recipes are prepared correctly?
- Are the necessary ingredients available?
- Do any new supplies need to be purchased, such as correctly sized scoops?

When you have finished preparing F-75 and F-100,
your facilitator will distribute packets of RUTF and discuss
with you the contents of the RUTF and how it is used.

2. Feed the Child with F-75 during Stabilisation

2.1. Determine the Frequency of Feeds

On the first day, feed the child small amounts of F-75 every 2 hours (12 feeds in 24 hours, including through the night). If the child is hypoglycaemic, give ¼ of the 2-hourly amount every half-hour for the first 2 hours or until the child's blood glucose is at least 3 mmol/L.

Night feeds are extremely important. Many children die from hypoglycaemia as a result of missed feeds at night. Children must be awakened for these feeds.

After the first day, increase the volume per feed gradually so that the child's system is not overwhelmed. The child will gradually be able to take larger, less frequent feeds (every 3 or 4 hours). Criteria for increasing the volume and decreasing the frequency of feeds are presented in **Section 2.6**.

2.2. Determine the Amount of F-75 Needed per Feed

Given the child's starting weight and the frequency of feeding, use a table to look up the amount of F-75 needed per feed. You have been given **F-75 Reference Tables** as job aids; copies of these tables are also found in **Annex A** of this module.

> Look at the F-75 Reference Tables in **Annex A** or the job aid. The first table is for children with SAM with no oedema or with mild (+) or moderate (++) oedema. The second table is only for children admitted with severe (+++) oedema.

On the F-75 Reference Tables, the required daily amount has been divided by the number of feeds to show the amount needed per feed.

If the child is severely wasted, notice that the amounts per feed ensure that the child will be offered a total of 130 ml/kg/day of F-75. This amount of F-75 will give the child 100 kcal/kg/day and 1.0–1.5 g of protein/kg/day. This amount is appropriate until the child is stabilised.

If the child has severe (+++) oedema, his or her weight will not be a true weight; the child's weight may be as much as 30% higher due to excess fluid. To compensate, a child with severe oedema should be given only 100 ml/kg/day of F-75. Amounts per feed for the child with severe oedema are shown in the F-75 Reference Tables.

Tips for using the F-75 Reference Tables

- Be sure that you use the correct reference table. One table is for most children, including those with mild (+) or moderate (++) oedema. The other table is used only if the child is admitted with severe (+++) oedema.

- Note that children's weights listed on the F-75 Reference Tables are all in even digits (2.0 kg, 2.2 kg, 2.4 kg, etc.). If a child's weight is between these (for example, if the weight is 2.1 kg or 2.3 kg), use the amount of F-75 given for the next lower weight (in this case use 2.0 kg if the child weighs 2.1 kg and 2.2 kg if the child weighs 2.3 kg).

- While the child is on F-75, keep using the starting weight to determine feeding amounts, even if the child's weight changes. (The weight is not expected to increase on F-75.)

- If the child starts with severe oedema, continue using the F-75 Reference Tables for severe oedema for the entire time that the child is on F-75. Also continue using the child's starting weight to determine the amount of F-75, even when the oedema (and weight) decreases. The volume per feed on the chart is already based on the child's estimated true weight.

SHORT ANSWER EXERCISE

For each child listed below, use your F-75 Reference Tables to determine the amount of F-75 to give per feed. The starting weight and oedema classification is given for each child, as well as the current frequency of feeds for the child.

Child 1: 6.8 kg, no oedema, 3-hourly feeds
Give _____ ml F-75 per feed.

Child 2: 8.5 kg, mild (+) oedema, 2-hourly feeds
Give _____ ml F-75 per feed.

Child 3: 5.2 kg, severe (+++) oedema, 2-hourly feeds
Give _____ ml F-75 per feed.

Child 4: 7.0 kg, severe (+++) oedema, hypoglycaemia, half-hourly feeds
Give _____ ml F-75 per feed.

Child 5: 9.6 kg, moderate (++) oedema, 4-hourly feeds
Give _____ ml F-75 per feed.

Compare your answers to this exercise to the answers on page 84.

Tell your facilitator when you have reached this point in the module. When everyone is ready, there will be a group oral drill on determining amounts of F-75 to give.

2.3. Record the Child's 24-Hour Feeding Plan

Each child's feeding plan should be recorded on a 24-Hour Food Intake Chart. (See **Annex E** for a blank copy of a 24-Hour Food Intake Chart.)

At the top of the 24-Hour Food Intake Chart, record the date, the type of feed to be given, the number of feeds per day, the amount to give per feed, and the total to give for the day. The details of each feed will be recorded on this form throughout the day. A sample completed 24-Hour Intake Chart is provided on page 17.

Information about feeding is also recorded on the Critical Care Pathway (CCP). On the Daily Care page of the CCP, record the type of feed to be given (F-75 or F-100) and the number of feeds to be given daily. For example, if the child is on a 2-hourly feeding schedule, record that 12 feeds will be given. At the end of the day, record the total amount taken that day. The CCP will provide a brief summary of feeds, as opposed to the detailed record of the 24-Hour Food Intake Chart.

Example of CCP Excerpt: Daily Care

DAILY CARE

	Week 1							Week 2	
DAYS IN HOSPITAL	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Date	*4/6*	*5/6*	*6/6*						
Daily weight (kg)	*4.4*	*4.2*	*4.0*						
Weight gain (g/kg)	*Calculate when on RUTF or F-100*								
Bilateral pitting oedema 0 + ++ +++	+	+	*0*						
Diarrhoea (D) or Vomit (V)	*D*	*D*	*0*						
FEED PLAN: Type of feed	*F-75*	*F-75*	*F-75*						
# daily feeds	*12*	*8*	*6*						
Volume to give per feed	*50*	*70*	*95+*						
Total volume taken (ml)	*570*	*560*	*560*						
NGT ***Y*** ***N***	*N*	*N*	*N*						
Breastfeeding ***Y*** ***N***	*Y*	*Y*	*Y*						
Appetite test with RUTF ***F failed*** ***P passed***	*F*	*F*	*F*						

2.4. Feed the Child F-75 Orally or by Nasogastric Tube, if Necessary

Oral Feeding

It is best to feed a child with a cup and saucer (and spoon, if needed). Encourage the child to finish the feed. It may be necessary to feed a very weak child with a dropper. Do not use a feeding bottle.

It takes skill to feed a very weak child, so nursing staff should do this task at first, if possible. Mothers[1] may help with feeding after the child becomes stronger and more willing to eat.

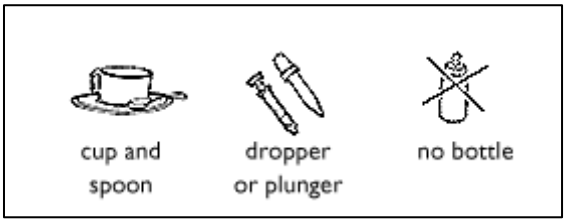
[1] The term 'mother' is used throughout this module. However, it is understood that the person who is responsible for the care of the child might not always be that child's mother, but rather some other caregiver. However, for the sake of readability, throughout this module 'mother' means 'mother/caregiver', 'she' means 'he or she', and 'her' means 'his or her'.

Never leave a child alone to feed. Spend time with the child, hold the child, and encourage him or her to eat. Catch dribbles by holding a saucer under the cup, as shown below. The saucer will allow feeding more quickly without worrying about spilling. At the end of the feed, give the child whatever amount was caught in the saucer.

Feeding orally with cup and saucer

Encourage breastfeeding on demand before and between F-75 feeds. Ensure that the child still gets the required feeds of F-75 even if breastfeeding.

Feed orally with:



Feeding Children who have Diarrhoea and Vomiting

If a child has continuing watery diarrhoea after he or she has been rehydrated, offer Rehydration Solution for Malnutrition (ReSoMal) between feeds to replace losses from stools. As a guide, children under 2 years of age should be given 50–100 ml of ReSoMal after each loose stool, while older children (2 years or older) should be given 100–200 ml. The amount given in this range should be based on the child's willingness to drink and the amount of ongoing losses in the stool.

If the child vomits during or after a feed, estimate the amount vomited, wait for about 30 minutes, and offer that amount of feed again within the 2 hour feeding period. If the child keeps vomiting, offer half the amount of feed twice as often. For example, if the child is supposed to take 40 ml of F-75 every 2 hours, offer half that amount (20 ml) every hour until vomiting stops.

Nasogastric Feeding

It may be necessary to use a nasogastric tube (NGT) if a child is very weak, has mouth ulcers that prevent drinking, or cannot take enough F-75 by mouth. The minimum acceptable amount for the child to take is 80% of the amount offered. At each feed, offer the F-75 orally first. Use an NGT if the child does not take 80% of the feed (i.e., leaves more than 20%) for two or three consecutive feeds.

Nasogastric (NG) feeding should be done by experienced staff. A child with an NGT is shown below. The NGT should be checked every time before the food is put down. Check placement by injecting air with a syringe and listening for gurgling sounds in the stomach. Change the tube if blocked. Do not plunge F-75 through the NGT; let it drip in or use gentle pressure.

Child with NGT

Abdominal distension can occur with oral or NG feeding, but it is more likely with NG feeding. If the child develops a hard distended abdomen with very little bowel sound, give 2 ml of a 50% solution of magnesium sulphate intramuscular (IM).

Remove the NGT when the child takes either:

- 80% of the day's amount orally
- Two consecutive feeds fully by mouth

Exception: If a child takes two consecutive feeds fully by mouth during the night, wait until morning to remove the NGT, just in case it is needed again in the night.

2.5. Record Intake and Output on a 24-Hour Food Intake Chart

A sample completed 24-Hour Food Intake Chart is on page 17.

Note: *In these modules, a 24-hour clock will be used, but participants may use a.m. and p.m. if they are more accustomed to that.*

Instructions for Completing the Chart

In the spaces above the chart, record the child's name, hospital ID number, admission weight and today's weight. If the child was rehydrated on the first day, list the rehydrated weight as the admission weight.

On the top row of the chart, record the date, the type of feed to be given, the number of feeds per day and the amount to give at each feed.

At Each Feed

In the left column labelled 'Time' record the time that the feed is given. Then complete the following steps and record information in the appropriate columns.

1. Record the amount of feed offered (column a).

2. After offering the feed orally, measure and record the amount left in cup (column b).

3. Subtract the amount left from the amount offered to determine the amount taken orally by the child (column c).

4. If necessary, give the rest of the feed by NGT and record this amount (column d).

5. Estimate and record any amount vomited (and not replaced by more feed) (column e).

6. Ask whether the child had watery diarrhoea (any loose stool) since last feed. If so, record 'yes' (column f).

At the End of 24 Hours

1. Total the amount of feed taken orally (column c).

2. Total the amount of feed taken by NGT, if any (column d).

3. Total the estimated amount lost through vomit (column e).

4. Add the totals taken orally and by NGT. Then subtract any loss from vomiting. The result is the total volume taken over 24 hours. Record this at the bottom of the 24-Hour Food Intake Chart and on the Daily Care page of the CCP.

Tell a facilitator when you have reached this point. When everyone is ready, there will be a demonstration of how to use the 24-Hour Food Intake Chart.

24-HOUR FOOD INTAKE CHART

Complete one chart for every 24-hour period.

Name: Matteu Hospital No: 406 Admission weight (kg): 4.2 Today's weight (kg): 4.2 Oedema: (0) + ++ +++

DATE: 4/06/01		**TYPE OF FEED** *(indicate if F-75, RUTF, F-100 or F-100-D)*: F-75 GIVE: 12 feeds of 45 ml/packets				
Time	**a.** Amount offered (ml)	**b.** Amount left in cup (ml)	**c.** Amount taken orally (a – b)	**d.** Amount taken by NGT, if needed (ml)	**e.** Estimated amount vomited (ml)	**f.** Watery diarrhoea (if present, yes)
8:00	45	0	45			
10:00	45	15	30			
12:00	45	15	30			
14:00	45	25	20		10	
16:00	45	35	10	35		
18:00	45	35	10	35		
20:00	45	30	15	30		
22:00	45	25	20	25	10	
24:00	45	20	25	20		
2:00	45	10	35	10		
4:00	45	5	40			
6:00	45	5	40			
		Column totals	**c.** 320	**d.** 155	**e.** 20	**Total yes:** 0
If child is ready for transition, conduct RUTF appetite test.					**Appetite test:** Failed Passed	
Total volume taken over 24 hours = amount taken orally **(c)** **+** amount taken by NGT **(d)** **–** total amount vomited **(e)** **=** 455 ml						

SHORT ANSWER EXERCISE

Answer the following questions about the 24-Hour Food Intake Chart for Matteu, which is given on the previous page.

1. At what times did Matteu's feeding day begin and end?

2. How many times was Matteu fed during the 24-hour period?

3. What amount of F-75 was Matteu offered at each feed?

4. At 10:00 did Matteu take enough (80%) of the F-75 orally?

5. At 12:00 did Matteu take enough of the F-75 offered?

6. What apparently happened at the 14:00 feed?

7. How was the feeding method changed at 16:00? Why do you think the staff changed the feeding method?

8. How was Matteu fed from 20:00 to 2:00?

9. At 4:00 and 6:00 did Matteu take enough F-75 orally?

10. What was the total volume of F-75 taken by Matteu over the 24-hour period? Include the amount taken orally and by NGT, and subtract the amount vomited.

11. Should Matteu's NGT be removed?

Compare your answers to this exercise to the answers beginning on page 84.

2.6. Adjust the Child's Feeding Plan for the Next Day

The total amount of F-75 given per day is based on the admission weight and does not change. (If the child is rehydrated on the first day, use the rehydrated weight.) As the child stabilises, the child can take more at each feed and feeds can be less frequent.

Each day, review the child's 24-Hour Intake Chart to determine if the child is ready for larger, less frequent feeds.

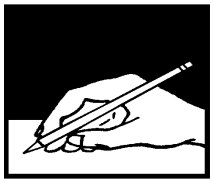
Criteria for Increasing Volume/Decreasing Frequency of Feeds

- If the child has vomiting, frequent diarrhoea, or poor appetite, continue 2-hourly feeds.

- If the child has little or no vomiting, has less frequent diarrhoea (for example, fewer than five watery stools per day), and is finishing most feeds, change to 3-hourly feeds.

- After a day on 3-hourly feeds, if the child has no vomiting, has less diarrhoea, and is finishing most feeds, change to 4-hourly feeds.

Compare the total amount of F-75 taken for the day to the 80% column on the F-75 Reference Tables to confirm that the child has taken enough. If not, NG feeding may be needed. Continue to offer each feed orally first. Then use an NGT to complete the feed if the child does not take at least 80% orally.



Exercise B

In this exercise, you will review 24-Hour Food Intake Charts and descriptions of children to determine their feeding plans for the next day.

Case 1 – Delroy

Delroy was admitted to Inpatient Care with diarrhoea. He had no oedema, was clinically well and alert, and had poor appetite and signs of dehydration. During the first two feeds of the day, Delroy was still being given ReSoMal. After he was rehydrated, he began 2-hourly feeds of F-75 at 12:00. His rehydrated weight was 4.6 kg, so he was given **10 feeds** of 50 ml each to finish the day's amount of 500 ml. He took all of his feeds very well, although his diarrhoea continued.

Delroy's completed 24-Hour Food Intake Chart for Day 1 is on page 22. Study the completed chart. Then answer the questions below about Delroy's feeding plan for Day 2.

1a. Since Delroy only had 10 feeds rather than 12, his total food intake cannot be compared to the 80% column on the F-75 Reference Tables. Instead, look at how much of each feed he took. Did Delroy take at least 80% of each feed?

1b. Although Delroy still has diarrhoea, it is only a small amount. According to the criteria in **Section 2.6** of this module, is Delroy ready to change to 3-hourly feeds?

1c. Enter instructions for Delroy's feeding plan for Day 2 on the following excerpt from the 24-Hour Food Intake Chart:

DATE:	**TYPE OF FEED:**	**GIVE: _____ feeds of ____ml**

1d. Starting with the first feed at 8:00, list the times at which Delroy will need to be fed on Day 2.

1e. On Day 2, Delroy took most of every feed for a total of 480 ml during the day. He had two diarrhoea stools and no vomiting. His weight has not changed, and there is still no oedema. Record information from Day 2 on the following excerpt from the Daily Care page of the CCP.

DAILY CARE

	Week 1							Week 2	
DAYS IN HOSPITAL	1	2	3	4	5	6	7	8	9
Date	4/12								
Daily weight (kg)	4.6								
Weight gain (g/kg)	*Calculate daily after on RUTF or F-100*								
Bilateral pitting oedema 0 + ++ +++	0								
Diarrhoea (D) or Vomit (V) O D V	D								
FEED PLAN: Type feed	F-75								
# daily feeds	10								
Volume to give per feed	50								
Total volume taken (ml)	480								
NG Tube Y N	N								
Breastfeeding Y N	Y								
Appetite test with RUTF ***F failed P passed***	F								

24-HOUR FOOD INTAKE CHART

Complete one chart for every 24-hour period.

Name: Delroy Hospital No: 107 Admission weight (kg): 4.6* Today's weight (kg): **same** Oedema: (0) + ++ +++

DATE: 4/12/01 (Day 1)		**TYPE OF FEED** *(indicate if F-75, RUTF, F-100 or F-100-D)*: F-75 GIVE: 10 feeds of 50 ml/packets				
Time	**a.** Amount offered (ml)	**b.** Amount left in cup (ml)	**c.** Amount taken orally (a – b)	**d.** Amount taken by NGT, if needed (ml)	**e.** Estimated amount vomited (ml)	**f.** Watery diarrhoea (if present, yes)
—						
—						
12:00	50	20	30			
14:00	50	0	50			
16:00	50	0	50			yes (small)
18:00	50	0	50			
20:00	50	0	50			
22:00	50	0	50			
24:00	50	0	50			yes (small)
2:00	50	0	50			
4:00	50	0	50			
6:00	50	0	50			yes (small)
		Column totals	**c.** 480	**d.** 0	**e.** 0	**Total yes:** 3
If child is ready for transition, conduct RUTF appetite test.					**Appetite test:** Failed Passed	
Total volume taken over 24 hours = amount taken orally **(c)** + amount taken by NGT **(d)** – total amount vomited **(e)** = 480 ml						

* rehydrated

Case 2 – Pedro

Pedro weighed 4.8 kg when he was admitted to Inpatient Care on Day 1. He had no oedema. He was given 12 feeds of 55 ml F-75 on Day 1. Pedro was a reluctant eater, but he finished most of his feeds and changed to 3-hourly feeds (8 feeds per day) on Day 2. On Day 2, Pedro was still reluctant to eat. At two feeds, he took less than 80% of the amount offered, but he took more at the next feeds, so an NGT was never used.

Pedro's completed 24-Hour Food Intake Chart for Day 2 is shown on the next page. Study the chart then answer the questions below.

2a. Did Pedro take at least 80% of the expected daily total? (Refer to the last column of the F-75 Reference Tables.)

2b. Should Pedro continue on 3-hourly feeds on Day 3 or should he change to 4-hourly larger feeds? Why?

2c. Enter instructions for Pedro's feeding plan for Day 3 on the following excerpt from the 24-Hour Food Intake Chart.

DATE:	**TYPE OF FEED:**	**GIVE: _____ feeds of ____ml**

24-HOUR FOOD INTAKE CHART

Complete one chart for every 24-hour period.

Name: Pedro Hospital No: 237 Admission weight (kg): 4.8 Today's weight (kg): **4.8** Oedema: (0) + ++ +++

DATE: 6/12/01 (Day 2)		**TYPE OF FEED** *(indicate if F-75, RUTF, F-100 or F-100-D)*: F-75 GIVE: 8 feeds of 80 ml/packets				
Time	**a.** Amount offered (ml)	**b.** Amount left in cup (ml)	**c.** Amount taken orally (a – b)	**d.** Amount taken by NGT, if needed (ml)	**e.** Estimated amount vomited (ml)	**f.** Watery diarrhoea (if present, yes)
8:00	80	10	70			
11:00	80	0	80			yes
14:00	80	0	80			
17:00	80	20	60			
20:00	80	10	70			
23:00	80	10	70			
2:00	80	20	60			
5:00	80	0	80		40	
		Column totals	**c.** 570	**d.** 0	**e.** 40	**Total yes:** 1
If child is ready for transition, conduct RUTF appetite test.					**Appetite test:** Failed Passed	
Total volume taken over 24 hours = amount taken orally **(c)** + amount taken by NGT **(d)** – total amount vomited **(e)** = 530 ml						

Case 3 – Rositha

When Rositha was admitted to Inpatient Care, she had severe (+++) oedema. She weighed 6.4 kg and has a MUAC of 10.8 cm. She refused to eat, so an NGT was inserted. On Days 1 and 2, she was given 55 ml of F-75 every 2 hours by NGT. On Day 3, her weight was down to 6.1 kg and her oedema was moderate (++).

Rositha's 24-Hour Feeding Chart for Day 3 is on the next page. Study the chart then answer the questions below.

3a. At what time did Rositha start taking feeds entirely by mouth?

3b. Rositha's NGT was left in during the night, although it was not needed. On Day 4, should the NGT be removed?

3c. Should Rositha continue on 2-hourly feeds on Day 4 or should she change to 3-hourly, larger feeds? Why?

3d. On Day 4, Rositha weighs 5.8 kg and her oedema is mild (+). Enter instructions for Rositha's feeding plan for Day 4 on the following excerpt from the 24-Hour Food Intake Chart.

DATE:	**TYPE OF FEED:**	**GIVE: _____ feeds of ____ml**

24-HOUR FOOD INTAKE CHART

Complete one chart for every 24-hour period.

Name: Rositha Hospital No: 453 Admission weight (kg): 6.4 Today's weight (kg): **6.1** Oedema: (0) + ++ +++

DATE: 08/02/01 (Day 3)		**TYPE OF FEED** *(indicate if F-75, RUTF, F-100 or F-100-D)*: F-75 GIVE: 12 feeds of 55 ml/packets				
Time	**a.** Amount offered (ml)	**b.** Amount left in cup (ml)	**c.** Amount taken orally (a – b)	**d.** Amount taken by NGT, if needed (ml)	**e.** Estimated amount vomited (ml)	**f.** Watery diarrhoea (if present, yes)
8:00	55	0	0	55		
10:00	55	30	25	30		yes (lots)
12:00	55	10	45	10		
14:00	55	10	45	10		
16:00	55	0	55			
18:00	55	0	55			yes (small)
20:00	55	0	55			
22:00	55	0	55			yes (small)
24:00	55	0	55			
2:00	55	0	55			
4:00	55	0	55			
6:00	55	0	55			
		Column totals	**c. 555**	**d. 105**	**e. 0**	**Total yes: 3**
If child is ready for transition, conduct RUTF appetite test.					**Appetite test:** Failed Passed	
Total volume taken over 24 hours = amount taken orally **(c)** **+** amount taken by NGT **(d)** **–** total amount vomited **(e)** **=** 660 ml						

Case 4 – Suraiya

When Suraiya was admitted to Inpatient Care, she weighed 5.7 kg and had mild oedema (+), mild dermatosis (+), and no appetite. Since she had only mild oedema, the physician used the first F-75 Reference Tables. Suraiya's weight of 5.7 kg was between the weights listed on the table, so she was given the next lower amount of F-75 (that is, 60 ml every 2 hours, the amount for a 5.6 kg child).

Suraiya had mouth sores and refused to eat, so an NGT was inserted for feeding. She began treatment for *Candida*. On Day 2, she began taking F-75 by mouth and had several good feeds orally. On the morning of Day 3, the NGT was removed.

Suraiya's 24-Hour Food Intake Chart for Day 3 is on the next page. Study the chart then answer the questions below.

4a. According to Suraiya's 24-Hour Food Intake Chart for Day 3, when did she begin to refuse most of her feeds?

4b. What should the night staff have done in response to Suraiya's refusal to feed? When should they have done this?

4c. What should be done for Suraiya on the morning of Day 4?

4d. Enter instructions for Suraiya's feeding plan for Day 4 on the following excerpt from the 24-Hour Food Intake Chart.

DATE:	**TYPE OF FEED:**	**GIVE: _____ feeds of ____ml**

When you have finished this exercise, please discuss your answers with a facilitator.

24-HOUR FOOD INTAKE CHART

Complete one chart for every 24-hour period.

Name: Suraiya Hospital No: 1103 Admission weight (kg): 5.7 Today's weight (kg): **5.6** Oedema: 0 (+) ++ +++

DATE: 14/03/01 (Day 3)		**TYPE OF FEED** *(indicate if F-75, RUTF, F-100 or F-100-D)*: F-75 GIVE: 12 feeds of 60 ml/packets				
Time	**a.** Amount offered (ml)	**b.** Amount left in cup (ml)	**c.** Amount taken orally (a – b)	**d.** Amount taken by NGT, if needed (ml)	**e.** Estimated amount vomited (ml)	**f.** Watery diarrhoea (if present, yes)
8:00	60	10	50			
10:00	60	10	50			
12:00	60	10	50			
14:00	60	10	50			
16:00	60	20	40			
18:00	60	10	50			
20:00	60	40	20			
22:00	60	30	30			
24:00	60	40	20			
2:00	60	60	0			
4:00	60	60	0			
6:00	60	60	0			
		Column totals	**c.** **360**	**d.** **0**	**e.** **0**	**Total yes:** **0**
If child is ready for transition, conduct RUTF appetite test.				**Appetite test:** Failed Passed		
Total volume taken over 24 hours = amount taken orally **(c)** + amount taken by NGT **(d)** – total amount vomited **(e)** = 360 ml						

3. Feed the Child during Transition

It takes about 2–7 days, or even longer, for the child to stabilise on F-75. When the child has stabilised and the appetite returns, do an **RUTF appetite test** while the child is still on F-75. Once the child starts eating RUTF, offer only RUTF.

The majority of children with SAM will be able to take the RUTF diet as soon as their appetite has returned after stabilisation. However, a small number of children with SAM will take longer to move from the milk diet to the RUTF diet. A child who initially refuses RUTF should continue to be offered RUTF at each feed (appetite test) until the child eats its full diet of RUTF and is ready for referral to Outpatient Care. For the small number of children who completely refuse or cannot tolerate RUTF, F-100 is used during transition and for rehabilitation.

RUTF and F-100 are the higher-calorie, higher-protein 'catch-up' therapeutic feeds intended to rebuild wasted tissues. After 1–3 days of feeding on RUTF during transition, a child will be referred to Outpatient Care to continue rehabilitation with RUTF. If the child cannot consume RUTF or there is no RUTF available, F-100 is used during transition, and the child will remain in Inpatient Care and receive F-100 freely until full recovery. However, it is extremely important to make the transition to RUTF or free feeding on F-100 gradually and to monitor the transition carefully. If the transition happens too rapidly, heart failure may occur, resulting in death.

3.1. Recognise Readiness for Transition

Look for the following signs of readiness, usually after 2–7 days on F-75:

- Return of appetite (easily finishes 4-hourly feeds of F-75)
- Reduced oedema or minimal oedema
- Resolving medical complication

The child may also smile at this stage.

Begin feeding RUTF gradually for most children

Begin feeding F-100 gradually for special cases

3.2. Transition Using RUTF (Introduce RUTF Slowly and Gradually)

The transition phase prepares the child for Outpatient Care and may last up to 3 days. During this phase, RUTF is gradually introduced when the child is still taking the F-75 feeds. The acceptability of RUTF is tested by offering the RUTF to the child at every feeding time. Feed the child with RUTF before offering the F-75 feeds. When the child eats at least 75% of the required amount of RUTF (150 kcal/kg/day), stop giving the F75 feeds and give the child the daily RUTF ration only.

During this time, feeding times are maintained as they were in the stabilisation phase. A full-day's amount of RUTF is given to the mother and the amount taken should be checked five times during the day. Breast milk should be offered on demand to breastfed children before feeding the child with RUTF. Children consuming RUTF should be offered plenty of potable drinking water during and after eating the RUTF.

Once the child's nutritional needs can be met on RUTF alone, appetite has been regained, and medical complications are resolving, he or she will be ready to be referred to outpatient care and continue treatment at home. Before referring the child to Outpatient Care, he or she should be observed for at least 24 hours eating RUTF after the transition phase to ensure he or she does not develop medical complications. The child should also start gaining weight. Even if a child's medical condition requires referral to another medical facility, he or she should continue nutritional treatment; therefore provide the child with a supply of RUTF to last at least one week.

Conduct the RUTF Appetite Test

- Conduct the appetite test in a quiet, separate area.

- Explain to the mother the purpose of the appetite test and outline the procedure that will be involved.

- Ask the mother to:
    - Wash her hands before giving the RUTF
    - Wash the child's hands and face before giving the RUTF
    - Sit with the child in her lap and gently offer the RUTF
    - Encourage the child to eat the RUTF without force-feeding
    - Offer potable water to drink from a cup while the child is eating the RUTF

- Observe the child eating the RUTF for about 30 minutes and determine if the child passes or fails the appetite test according to the following criteria.

Determine if Appetite Test is Passed or Failed

Pass Appetite Test	**Fail Appetite Test**
The child eats at least ⅓ of a packet of RUTF (92 g) within 30 minutes.	The child does not eat ⅓ of a packet of RUTF (92 g) within 30 minutes.

RUTF Feeding Procedures

- Provide the RUTF to the mother to feed the child and encourage the mother to give RUTF feeds at the same time as the F-75 feeds are provided during transition (6–8 feeds per day).

- Breastfed children should be offered breast milk on demand and before being fed RUTF.

- Ask the mother to offer potable water to drink from a cup while the child is taking the RUTF feeds

3.3. If RUTF Cannot be Given, Transition Using F-100 Slowly and Gradually

Transition takes 3 days. If RUTF cannot be given, give F-100 according to the following schedule.

- **First 48 hours (2 days):** Give F-100 every 4 hours in the same amount as you last gave F-75. Do not increase this amount for 2 days.

- **Then, on the third day:** Increase each feed by 10 ml as long as the child is finishing feeds. If the child does not finish a feed, offer the same amount at the next feed. If the feed is finished, increase the next feed by 10 ml. Continue increasing the amount until some food is left after most feeds (usually when amount reaches about 30 ml/kg per feed).

If the child is breastfeeding, encourage the mother to breastfeed between feeds of F-100.

Example of a Feeding Schedule during Transition

You may remember Delroy from **Exercise A**.

On Day 1, Delroy's rehydrated weight was 4.6 kg, and he started on 50 ml of F-75 every 2 hours. Delroy continued to feed well over the next 2 days. On Day 2, he took 3-hourly feeds of 75 ml F-75. On Day 3, he took 4-hourly feeds of 100 ml F-75. He also smiled at his mother and the nurses.

On Day 3, Delroy easily finished all of his 4-hourly feeds. Thus, on Day 4, Delroy is ready for transition.

Delroy's feeding schedule during transition would be as follows.

Day 4: RUTF appetite test is conducted before each feed. If Delroy fails the appetite test, offer 100 ml of F-100 every 4 hours (same amount and frequency as he previously took F-75).

Day 5: RUTF appetite test is conducted before each feed. If Delroy fails the appetite test, offer 100 ml of F-100 every 4 hours (same as Day 4).

Day 6: Delroy is offered RUTF before F-100 feeds. If Delroy again fails the appetite test, continue 4-hourly F-100 feeds, increasing amount by 10 ml each time (e.g., 110 ml then 120 ml then 130 ml). If Delroy does not finish a feed, give the same amount at the next feed. Continue increasing the amount until some food is left after most feeds.

3.4. Monitor the Child Carefully during Transition

Every 4 hours, check the child's respiratory and pulse rates. If RUTF or F-100 is introduced carefully and gradually, problems are unlikely. However, increasing respiratory or pulse rates may signal heart failure, so call a physician for help. (More information on danger signs and monitoring is given in **Module 5, Daily Care**, and in **Annex B, Danger Signs for the Management of Severe Acute Malnutrition in Children under 5 in Inpatient Care**)

3.5. Record Intake/Output and Plan the Child's Feeds for the Next 24 Hours

Record the amount of RUTF or F-100 offered at each feed and the child's intake and output (vomiting or diarrhoea) on the 24-Hour Food Intake Chart. Also enter the total amount taken during the day on the CCP.

Enter the feeding plan for the next day on a new 24-Hour Food Intake Chart. On the third day, when feeds should increase by 10 ml per feed (as long as the child is taking all that is offered), mark an arrow by the starting amount per feed, for example, 105 ml ↑ in F-100 intake.

A Child on F-100

DATE: 9/12/01	**TYPE OF FEED:** F-100	**GIVE:** 6 **feeds of** 105↑ **ml**

A Child on RUTF

DATE: 9/12/01	**TYPE OF FEED:** RUTF	**GIVE:** 6 **feeds, daily feed = 1.5 packets**

3.6. Criteria to Move Back From Transition to Stabilisation Phase

The child should be moved back to the stabilisation phase if there is:

- Weight gain of more than 10 g/kg/day in association with an increase in respiratory rate, this is indicative of excess fluid retention
- Increasing or developing oedema
- Rapid increase in the size of the liver

- Any signs of fluid overload
- Tense abdominal distension
- Significant re-feeding diarrhoea leading to weight loss
- A complication that necessitates an IV infusion
- There is need for feeding by NGT

Note: *It is common for children to have some change in stool frequency when they change diet. This does not need to be treated unless the child loses weight. Having several loose stools without weight loss is* ***not*** *a criteria to move back to the stabilisation phase.*

Exercise C

Case 1 – Delroy

The CCP excerpt below summarises Delroy's progress through the first 2 days of transition (Days 4 and 5). Prior to feeding on F-100, RUTF appetite tests were conducted on Days 4, 5, and 6; Delroy failed the RUTF appetite tests. However, on Days 4 and 5 he took all of every feed of 100 ml F-100. The column for Day 6 shows what the nurse wrote on the CCP in the morning of Delroy's third day of transition.

DAILY CARE

	Week 1							Week 2	
DAYS IN HOSPITAL	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Date	4/12	5/12	6/12	7/12	8/12	9/12			
Daily weight (kg)	4.6	4.6	4.6	4.6	4.65	4.75			
Weight gain (g/kg)	*Calculate when on RUTF or F-100*				10.8*	21.5*			
Bilateral pitting oedema 0 + ++ +++	0	0	0	0	0	0			
Diarrhoea (D) or Vomit (V) O D V	D	D	0	0	0				
FEED PLAN: Type feed	F-75	F-75	F-75	F-100	F-100	F-100			
# daily feeds	10	8	6	6	6	6			
Volume to give per feed	50	75	100	100	100	110↑			
Total volume taken (ml)	480	600	600	600	600				
NG Tube Y N	N	N	N	N	N	N			
Breastfeeding Y N	Y	Y	Y	Y	Y	Y			
Appetite test with RUTF ***F failed P passed***	/	/	/	F	F	F			

* These figures show Delroy's weight gain in grams per kg body weight. You will learn how to calculate and interpret this gain later, in **Module 6, Monitoring, Problem Solving, and Reporting**.

On Day 6, Delroy was offered increasing amounts of F-100. His 24-Hour Food Intake Chart for Day 6, through the 24:00 feed, is shown on the next page. Study Delroy's chart and answer the questions below.

1a. How much F-100 should Delroy be offered at the 4:00 a.m. feed? Enter this amount in the 'Amount Offered' column of Delroy's chart.

1b. Delroy leaves 10 ml of the F-100 offered at 4:00 a.m. He has had no vomiting or diarrhoea since the last feed. Complete the rest of Delroy's 24-Hour Food Intake Chart for Day 6, including the totals.

1c. Complete the rest of the column for Day 6 on the excerpt of Delroy's CCP above.

24-HOUR FOOD INTAKE CHART

Complete one chart for every 24-hour period.

Name: Delroy Hospital No: 107 Admission weight (kg): 4.6 Today's weight (kg): **4.75** Oedema: (0) + ++ +++

DATE: 9/12/01 (Day 6) **TYPE OF FEED** *(indicate if F-75, RUTF, F-100 or F-100-D)*: F-100 GIVE: 6 feeds of 110† ml/packets

Time	**a.** Amount offered (ml)	**b**. Amount left in cup (ml)	**c.** Amount taken orally (a – b)	**d.** Amount taken by NGT, if needed (ml)	**e.** Estimated amount vomited (ml)	**f.** Watery diarrhoea (if present, yes)
8:00	110	0	110			
12:00	120	10	110			
16:00	120	0	120			
20:00	130	10	120			
24:00	130	0	130			
4:00						
		Column totals	**c.**	**d.**	**e.**	**Total yes:**

If child is ready for transition, conduct RUTF appetite test. **Appetite test:** (Failed) Passed

Total volume taken over 24 hours = amount taken orally **(c)** **+** amount taken by NGT **(d)** **–** total amount vomited **(e)** **=** ___ ml

Case 2 – Pedro

You may remember that Pedro was a reluctant eater on Days 1 and 2. On Day 3 his appetite increased and he took eight 3-hourly feeds of 80 ml F-75. He took all of the F-75 offered at each feed. On Day 4, Pedro took six 4-hourly feeds of 110 ml F-75. He ate greedily and still wanted more at the end of each feed.

On Day 5 Pedro began transition. The nurse conducted the RUTF appetite test, but Pedro failed it (each time RUTF was offered, Pedro refused to eat it). When he was offered F-100, he eagerly took six 4-hourly feeds of 110 ml. Pedro's mother says that he wants more F-100 at each feed. She asks if she can give Pedro more.

2a. Should Pedro be given larger feeds of F-100 on Day 6?

2b. What should the nurse explain to Pedro's mother?

2c. On Day 7, what feed should the nurse offer Pedro?

Case 3 – Rositha

You may remember that Rositha was admitted with severe oedema (+++) and had to be fed by NGT for several days because she refused to eat. Rosita was referred from a district where Outpatient Care for the management of SAM without medical complications has not yet been introduced. In agreement with Rosita's mother, the hospital management decided to manage the child in Inpatient Care until full recovery.

By Day 6, Rositha was feeding much better and she had lost most of her oedema. Her weight had decreased from 6.4 kg to 5.4 kg because of loss of oedema fluid. Since Rositha's starting amount of F-75 was taken from the F-75 Reference Tables for severely oedematous children, the staff continues to use that chart and her starting weight to determine the amount of F-75 to give. On Day 6, Rositha was given six 4-hourly feeds of 105 ml. She eagerly took all of the F-75 offered.

On Day 7, Rositha's oedema appears to be gone and she weighs 5.2 kg.

3a. Is Rositha ready for transition? Why or why not?

3b. Enter instructions for Rositha's feeding plan for Day 7 on the following excerpt from the 24-Hour Food Intake Chart.

DATE: *12/02/01 (Day 7)* **TYPE OF FEED:** ____ **GIVE**: ___ **feeds, daily feed =** ____

3c. Rositha takes her feeds on Day 7 well and shows no danger signs. Enter instructions for Rositha's feeding plan for Day 8.

DATE: *13/02/01 (Day 8)* **TYPE OF FEED:** ____ **GIVE**: ___ **feeds, daily feed =** ____

3d. Rositha takes her feeds on Day 8 well and shows no danger signs. Enter instructions for Rositha's feeding plan for Day 9.

DATE: *14/02/01 (Day 9)* **TYPE OF FEED:** ____ **GIVE**: ___ **feeds, daily feed =** ____

When you have finished this exercise,
please discuss your answers with a facilitator.

4. Feeding on RUTF or Freely with F-100 during Rehabilitation

Transition takes about 3 days. After transition, the child is in the rehabilitation phase and can eat enough amounts of RUTF or F-100 freely to an upper limit of 220 kcal/kg/day. (This is equal to 220 ml/kg/day.) Most children will consume at least 150 kcal/kg/day; any amount less than this indicates that the child is not being fed freely or is unwell.

The **F-100 Reference Tables** show that 150–220 kcal/kg/day of intake is suitable for children of different weights up to 10 kg. A copy of the F-100 Reference Table is in **Annex A**. The **RUTF Reference Table** available in **Annex C** shows the 150–200 kcal/kg/day range of intake suitable for children of different weights up to 12 kg.

4.1. Feeding during Rehabilitation on RUTF

Children progressing to the rehabilitation phase who are on RUTF should be referred from Inpatient Care to Outpatient Care. The children should be monitored weekly or every 2 weeks in the Outpatient Care site close to his or her community or in the Outpatient Department of the same health facility that houses the Inpatient Care site.

Note: *Rehabilitation using RUTF in Outpatient Care is covered in a separate training. Health care providers managing children with SAM in Outpatient Care will need to undergo a separate training course.*

4.2. Feed Freely with F-100 during Rehabilitation

A few special cases of children 6–59 months of age will complete full treatment in Inpatient Care. These include:

- Children who are completely unable to tolerate RUTF even after conducting the appetite test on several occasions during the transition phase
- When the mother refuses Outpatient Care despite being adequately counselled
- When there are no Outpatient Care services available close to the patient's community/district and the mother is able and willing to complete treatment in the Inpatient Care

4.3. Encourage the Child to Eat Freely at Each Feed

During the rehabilitation phase, encourage the child to eat as much as he or she wants at each feed, within the range shown on the F-100 Reference Table. Continue to feed every 4 hours within this range. Sit with the child and actively encourage eating. Never leave the child alone to feed. If the child's weight is between two weights given on the F-100 Reference Table, use the range for the next lower weight (e.g. if the child's weight is 8.1 kg, use the range for 8.0 kg).

If you need to calculate the acceptable range yourself (for example, if the child weighs more than 10 kg), multiply the child's weight by 150 ml (minimum) and 220 ml (maximum). Then divide each result by 6 (for 6 feeds per day). This will tell you how many ml to give per feed. An easier method may be to add together the feed volumes for an appropriate combination of children's weights from the card. For example, if a child weighs 13.2 kg, add the volumes shown for a 10.0 kg child and a 3.2 kg child.

Examples

- Maria weighs 6.2 kg. According to the F-100 Reference Table, her feeds of F-100 may be in the range of 155–230 ml.

- Kwame weighs 4.5 kg. Using the range for the next lower weight, 4.4 kg, Kwame's feeds should be in the range of 110–160 ml.

- Delia weighs 12.0 kg. Calculate the acceptable range of volumes of F-100 for her as follows:

  Minimum: 12.0 kg × 150 = 1,800
  1,800 ÷ 6 = 300 ml per feed

  Maximum: 12.0 kg × 220 = 2,640
  2,640 ÷ 6 = 440 ml per feed

  Alternative method for Delia: Add volumes for a 10.0 kg child and a 2.0 kg child:

  Minimum: 250 ml + 50 ml = 300 ml per feed

  Maximum: 365 ml + 75 ml = 440 ml per feed

  Due to rounding of the figures on the F-100 Reference Table, the volumes may be slightly different using the alternative method.

4.4. Record Intake/Output; Determine if Intake of F-100 is Acceptable

Record each feed on the 24-Hour Food Intake Chart. To determine if daily intake is acceptable, compare the volume taken to the range given on the F-100 Reference Table. If the child is not taking the minimum amount, there may be a problem, such as an infection, or the child may need more encouragement to eat. In general, if the child is gaining weight rapidly, he or she is doing well. If the child has diarrhoea but is still gaining weight, there is no need for concern and no change is needed in the diet.

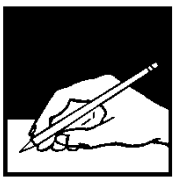
By Week 3 or 4, if the child is doing well there is no need to continue using the 24-Hour Food Intake Chart. If the child is gaining weight rapidly you may assume that he or she is doing well. Monitoring for danger signs is no longer needed.

4.5. Adjust the Feeding Plan for F-100 as Necessary

During rehabilitation, a child is expected to gain weight rapidly, and the amount of F-100 given should be increased as the child's weight increases. The more energy that is packed in, the faster the child will grow. To plan feeds for the next day:

- Use the child's **current** weight to determine the appropriate range of F-100 each day.
- Choose a starting amount within the range. Base the starting amount on the amount taken in feeds during the previous day. If the child finished most feeds, offer a bit more. If the child did not finish most feeds, offer the same amount as the day before.
- Do not exceed the maximum in the range for the child's current weight.

If the amount of F-100 offered may be increased during the day, write a note to this effect on the 24-Hour Food Intake Chart. For example, write '*Increase by 10 ml until some left – not to exceed 175 ml*'. Or use an arrow to show that an increase is permitted, for example, '*155 ↑, not to exceed 175*'. If the child is starting the day with the maximum amount allowed, write on the chart '*Do not increase*'.



Exercise D

Case 1 – Delroy

You may remember that Delroy began transition on Day 4. After failing the appetite test, on Days 4 and 5 he was given 90 ml F-100 per feed. On Day 6 he increased to 135 ml by the last feed of the day. On Day 7 Delroy began free feeding on F-100. Delroy's 24-Hour Food Intake Chart for Day 7 is on the next page.

1a. What volume of F-100 was Delroy offered at his last feed on Day 7?

1b. On Day 8, Delroy's weight is 5.0 kg. What is the range of volumes of F-100 that is appropriate for Delroy for each 4-hourly feed?

1c. What should be the starting amount of F-100 given on Day 8?

1d. What instructions should be written on the 24-Hour Food Intake Chart concerning the amount of F-100 to offer at subsequent feeds on Day 8?

1e. On Day 8, Delroy reached the maximum volume per feed and still wanted more. The nurse gave him no more than the maximum allowed. On Day 9 Delroy's weight is up to 5.2 kg. What should be the starting amount of F-100 on Day 9? Should this amount be increased during the day?

24-HOUR FOOD INTAKE CHART

Complete one chart for every 24-hour period.

Name: Delroy Hospital No: 107 Admission weight (kg): 4.6 Today's weight (kg): **4.9** Oedema: (0) + ++ +++

DATE: 10/12/01 (Day 7)		**TYPE OF FEED** *(indicate if F-75, RUTF, F-100 or F-100-D)*: F-100 GIVE: 6 feeds of 140↑ ml/packets (Do not exceed 175 ml per feed)				
Time	**a.** Amount offered (ml)	**b.** Amount left in cup (ml)	**c.** Amount taken orally (a – b)	**d.** Amount taken by NGT, if needed (ml)	**e.** Estimated amount vomited (ml)	**f.** Watery diarrhoea (if present, yes)
8:00	140	10	130			
12:00	140	0	140			
16:00	150	0	150			
20:00	160	10	150			
24:00	160	0	160			
4:00	170	0	170			
		Column totals	**c.** 750	**d.**	**e.**	**Total yes:**
If child is ready for transition, conduct RUTF appetite test.					**Appetite test:** (Failed) Passed	
Total volume taken over 24 hours = amount taken orally **(c)** + amount taken by NGT **(d)** – total amount vomited **(e)** = 900 ml						

Case 2 – Pedro

Day 7 was Pedro's third day of transition. The nurse had consistently conducted the RUTF appetite test on Days 5, 6 and 7, and Pedro refused to take the RUTF but eagerly took the F-100. On Day 7, Pedro started leaving food at 130 ml of F-100. On Day 8, he began feeding on 130 ml and gradually increased to 160 ml, when he started leaving food again. On Day 9, his weight was 5.05 kg. His 24-Hour Food Intake Chart for Day 9 is on the next page.

2a. What is an appropriate range of daily volumes of F-100 for Pedro on Day 9?
_____ – _____ ml

Did Pedro take a total volume of F-100 in this range?

Following is an excerpt from Pedro's CCP. On the fourth row Pedro's weight gain per day is shown in g per kg of his body weight. A weight gain of 10 or more g/kg/day is considered good. A gain of 5 up to 10 g/kg/day is considered moderate. Less than 5 g/kg/day is poor. You will learn to calculate daily weight gain and to keep a graph of weights in later modules.

DAILY CARE

	Week 1						Week 2			
DAYS IN HOSPITAL	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Date	*5/12*	*6/12*	*7/12*	*8/12*	*9/12*	*10/12*	*11/12*	*12/12*	*13/12*	*14/12*
Daily weight (kg)	*4.8*	*4.75*	*4.75*	*4.8*	*4.8*	*4.85*	*4.9*	*5.0*	*5.05*	*5.15*
Weight gain (g/kg)	*Calculate when on RUTF or F-100*				*0*	*10.4*	*10.3*	*20.4*	*10*	*9.9*
Bilateral pitting oedema 0 + ++ +++	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
Diarrhoea (D) or Vomit (V) O D V	*0*	*D V*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
FEED PLAN: Type feed	*F-75*	*F-75*	*F-75*	*F-75*	**F-100*	**F-100*	**F-100*	**F-100*	*F-100*	*F-100*
# daily feeds	*12*	*8*	*8*	*6*	*6*	*6*	*6*	*6*	*6*	*6*
Volume to give per feed	*55*	*80*	*80*	*105*	*105*	*105*	*120*	*120*	*150*	
Total volume taken (ml)	*600*	*560*	*640*	*630*	*630*	*630*	*720*	*840*	*900*	
NG Tube Y N	*N*	*N*	*N*	*N*	*N*	*N*	*N*	*N*	*N*	
Breastfeeding Y N	*y*	*y*	*Y*	*y*	*y*	*y*	*y*	*y*	*y*	
Appetite test with RUTF ***F failed P passed***	*/*	*/*	*/*	*F*	*F*	*F*	*F*	*F*	*F*	

** RUTF appetite test conducted before each feed*

2b. Look at Pedro's 24-Hour Food Intake Chart on the next page. Notice that Pedro ate the same amount per feed on Day 9 without increasing. Is there any apparent reason for concern? Why or why not?

2c. Enter instructions for Pedro's feeding plan for Day 10 on the following excerpt from the 24-Hour Food Intake Chart.

DATE:	**TYPE OF FEED:**	**GIVE: _____ feeds of ____ml**

24-HOUR FOOD INTAKE CHART

Complete one chart for every 24-hour period.

Name: Pedro Hospital No: 236 Admission weight (kg): 4.8 Today's weight (kg): **5.05** Oedema: (0) + ++ +++

DATE: 13/12/01 (Day 9)		**TYPE OF FEED** *(indicate if F-75, RUTF, F-100 or F-100-D)*: F-100 GIVE: 6 feeds of 160↑ ml/packets (Do not exceed 185 ml)				
Time	**a.** Amount offered (ml)	**b.** Amount left in cup (ml)	**c.** Amount taken orally (a – b)	**d.** Amount taken by NGT, if needed (ml)	**e.** Estimated amount vomited (ml)	**f.** Watery diarrhoea (if present, yes)
8:00	160	10	150			
12:00	160	10	150			
16:00	160	10	150			
20:00	160	10	150			
24:00	160	10	150			
4:00	160	10	150			
		Column totals	**c.** 900	**d.** 0	**e.** 0	**Total yes:** 0
If child is ready for transition, conduct RUTF appetite test.					**Appetite test:** (Failed) Passed	
Total volume taken over 24 hours = amount taken orally **(c)** + amount taken by NGT **(d)** – total amount vomited **(e)** = 900 ml						

Case 3 – Rositha

Day 9 was Rositha's third day of transition on F-100. On Day 9 she started at 115 ml feeds of F-100. She took all of her feeds well and progressed to 145 ml by the 4:00 feed.

On Day 10 Rositha weighed 5.2 kg and began feeding freely on F-100. Her 24-Hour Food Intake Chart for Day 10 is on the next page. Calculate the column totals and the total volume taken over 24 hours.

3a. What was the total volume of F-100 taken by Rositha over 24 hours on Day 10?

3b. What is the appropriate daily range of volumes for Rositha's weight? Was the amount taken within the appropriate range?

3c. Looking back at Rositha's Monitoring Record for Day 9, the head nurse noticed that Rositha's temperature had increased just before the 16:00 feed. What does this suggest about the cause of Rositha's eating less?

3d. Which of the following should the head nurse do? (Check the appropriate answer.)

____ Alert the physician that Rositha has a problem and needs to be checked carefully
____ Plan feeding for Day 11 to start at 145 ml F-100 again
____ Both of the above

When you have finished this exercise,
please discuss your answers with a facilitator.

24-HOUR FOOD INTAKE CHART

Complete one chart for every 24-hour period.

Name: Rositha Hospital No: 453 Admission weight (kg): 6.4 Today's weight (kg): **5.2** Oedema: (0) + ++ +++

DATE: 15/02/01 (Day 10)		**TYPE OF FEED** *(indicate if F-75, RUTF, F-100 or F-100-D)*: F-100 GIVE: 6 feeds of 145↑ ml/packets (Do not exceed 190 ml)				
Time	**a.** Amount offered (ml)	**b**. Amount left in cup (ml)	**c.** Amount taken orally (a – b)	**d.** Amount taken by NGT, if needed (ml)	**e.** Estimated amount vomited (ml)	**f.** Watery diarrhoea (if present, yes)
8:00	145	10	135			
12:00	145	45	100			
16:00	145	50	95			
20:00	145	60	85			
24:00	145	70	75			
4:00	145	65	80			
		Column totals	**c.**	**d.**	**e.**	**Total yes:**
If child is ready for transition, conduct RUTF appetite test.				**Appetite test:**	Failed Passed	
Total volume taken over 24 hours = amount taken orally **(c)** **+** amount taken by NGT **(d)** **–** total amount vomited **(e)** **=** ____ ml						

5. Plan Feeding for Inpatient Care

Up to now, this module has focused on planning feeding for individual children. It is also important to plan feeding for Inpatient Care as a whole so that staff know how much food to prepare, how much food to put in cups at each feed, etc. Food is prepared for every feed session; food is not kept for next meals unless there is a reliable refrigerator.

5.1. Determine a Schedule for Feeding and Related Activities in Inpatient Care

The ward schedule should include times for the following activities:

- Preparing feeds (as often as necessary to ensure freshness)
- Reviewing patient charts and planning feeding for the day
- Feeding according to 2-hourly, 3-hourly, and 4-hourly plans
- Weighing
- Bathing
- Shift changes

Once these activities are scheduled, you will see where time for organised play and educational activities can most conveniently fit in.

In general, monitoring activities (such as measuring temperature, pulse, and respiration) should take place every 4 hours on an individual basis, before a child feeds. There is no need to include these activities on the written schedule for the ward. Individual treatments and drugs are also to be given on an individual basis.

🕘 Time for Preparing Food

Based on storage capabilities, the length of time food will stay fresh, and the availability of kitchen staff, decide whether food should be prepared every 12 or 24 hours. Twelve hours is most common. If refrigeration is poor or there are very many children, it may be necessary to make food more frequently, even for every feed. If well-refrigerated, food will stay fresh for 24 hours. Food must be discarded after 24 hours.

RUTF does not require any preparation. Therefore, children on RUTF are given their full ration for the day in the morning and instructions on how to feed the child are provided to mothers.

🕘 Time for Review and Planning

Select a time of day to review each child's past 24-Hour Food Intake Chart, plan feeding for each child (if this has not already been done during physician rounds), and compile feeding plans for each child onto a feeding chart for the entire ward. An example of a completed Ward Schedule is shown on the next page, and a blank Ward Schedule is provided in **Annex E**. This chart is used in the kitchen so that staff know how much F-75 and F-100 to prepare and, in the case of RUTF, how much to give for the day.

🕘 Feeding Times

Select a time of day that each 'feeding day (24 hours)' will start. This is usually in the morning after totals have been done from the previous day and a Ward Schedule has been prepared for the new day. The time selected should be after staff have arrived and had time to prepare the food.

Plan times for 2-hourly, 3-hourly, and 4-hourly feeds. At almost every hour, some children will have feeds. Ensure that no feeds occur at times of shift changes. For example, if shift changes are on the hour, plan for feeds to occur on the half-hour.

Keep in mind that a few children, such as those with hypoglycaemia or continued vomiting, may be on a special half-hourly or hourly feeding schedule. Those children will need special attention to ensure that the more frequent feeds are provided outside the normal schedule.

🕘 Weighing and Bathing

Daily weighing will need to occur at about the same time each day, preferably 1 hour before or after a feed.

Since the children are undressed for weighing, this is also a good time for bathing. Generally children on 2-hourly feeding schedules are new to the ward and are likely to be too ill to be bathed. Children on 3-hourly and 4-hourly schedules may be bathed when they are weighed if this is convenient.

🕘 Shift Changes

Shift changes may already be fixed for your hospital, and you may need to work around them in planning your schedule. Often there are three shifts per day, with the night shift being the longest. Keep in mind that no feeding should be scheduled during a shift change. It is best for shifts to overlap slightly so that instructions may be communicated from one shift to the next.

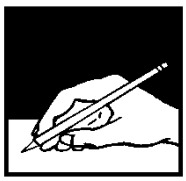
Example Ward Schedule

City Hospital has good refrigeration. There are usually 10–15 children in Inpatient Care. There is adequate staff to prepare feeds twice daily, so it is decided to prepare feeds every 12 hours.

There are three nursing shifts per day. Each shift overlaps with the previous one by 30 minutes, so there is time to communicate instructions. The 'feeding day' starts at 10:00 a.m., after the senior nurse has had time to review charts from the day before and plan for the day. Beginning with the morning shift change, the schedule for the ward is as follows.

Example of a Ward Schedule

TIME	Activities by Feeding Schedule			Other Ward Activities/Comments
	2-hourly	3-hourly	4-hourly	
Shift change 6:30 – 7:00; instructions given				
7:00	Weigh	Feed	Weigh, bathe	
8:00	Feed	Weigh, bathe		Senior Nurse reviews each child's past 24-Hour Food Intake Chart and weight; plans feeding for the day; completes Daily Inpatient Care Feed Chart
9:00				Prepare feeds for next 12 hours
10:00	Feed	Feed	Feed	Start of new 'feeding day'
11:00				Organised play, parent education
12:00	Feed			
13:00		Feed		
Shift change 13:30 – 14:00; instructions given				
14:00	Feed		Feed	
15:00				Organised play, parent education
16:00	Feed	Feed		
17:00				Organised play, parent education
18:00	Feed		Feed	
19:00		Feed		
20:00	Feed			
Shift change 20:30 – 21:00; instructions given to night staff				
21:00				Prepare feeds for next 12 hours
22:00	Feed	Feed	Feed	
23:00				
24:00	Feed			
1:00		Feed		
2:00	Feed		Feed	
3:00				
4:00	Feed	Feed		
5:00				
6:00	Feed		Feed	



Exercise E

In this exercise you will draft a schedule for your own Inpatient Care setting, using your own information on shift changes, frequency of making food, etc.

If there are other staff members from your hospital attending this training course, you should work together on this exercise.

Draft your ideas on a blank piece of paper first. Then use the blank schedule on the next page (or develop your own format). Be sure to include times for:

- Preparing food (as often as necessary)
- Reviewing charts and planning feeding for the day
- Feeding
- Weighing
- Bathing
- Shift changes

Consider the following questions and be prepared to discuss them.

- Is there a need to adjust shifts, kitchen hours, or other aspects of your hospital's schedule to accommodate feeds?
- When are there times in the schedule to include opportunities for play or educating parents about feeding their children?

Sample Schedule Format

TIME	Activities by Feeding Schedule			Other Ward Activities/Comments
	2-hourly	3-hourly	4-hourly	

When you have finished making a schedule for your Inpatient Care site, tell a facilitator that you are ready for a group discussion.

5.2. Prepare a Daily Inpatient Care Feed Chart

An example of a Daily Inpatient Care Feed Chart is on the next page. Take the following steps to prepare one.

1. Enter the name of each child in Inpatient Care in the first column.

2. Note that children on F-75 will have information recorded in the left-hand section of the chart, children on F-100 in the right-hand section, and children on RUTF at the bottom of the page. Looking at each child's individual 24-Hour Food Intake Chart for the coming day, transfer:

    - The number of feeds planned for the child for the day

    - The amount of F-75 or F-100 needed per feed and the amount of RUTF needed per day (***Note:*** *If a child may be increasing the size of F-100 feeds during the day, enter the amount of the largest feed that you expect him or her to take; to ensure that there is enough food, it is better to estimate high*)

3. Determine the total amount of F-75 and F-100 needed for each child by multiplying the number of feeds by the amount per feed.

4. Add the individual totals to determine the total amount of F-75, F-100, and RUTF needed for the day for the ward.

5. Divide the day's totals by the number of times that food is prepared in a day. For example, if food is prepared every 12 hours, or twice daily, divide the day's totals by 2. If food is prepared every 8 hours, divide by 3, etc. The result is the amount needed until the next time that food is prepared.

6. Round up the amount needed to the nearest L (since food is prepared in L batches).

7. Plan to prepare some extra food. The extra amount will be used for new admissions and other times extra food might be needed. Enter the amount to prepare in the appropriate space on the chart.

8. Determine the amount of RUTF required for the day based on the number of children and their daily weight in reference to the RUTF Reference Table in **Annex C**.

Example Daily Inpatient Care Feed Chart

Date: *14/03/01*

Ward: *Severe Acute Malnutrition*

Name of Child	F-75			F-100		
	Number feeds	Amount/feed (ml)	Total (ml)	Number feeds	Amount/feed (ml)	Total (ml)
Kwame	*12*	*55*	*660*			
Ama				*6*	*250*	*1500*
Flora				*6*	*300*	*1800*
Adjoua				*6*	*180*	*1080*
Manuel	*8*	*115*	*920*			
Jose				*6*	*200*	*1200*
Gabriela	*8*	*100*	*800*			
Gariba	*6*	*200*	*1200*			
Marina				*6*	*280*	*1680*
Cristina	*12*	*90*	*1080*			
Mensah				*6*	*160*	*960*
Jemilatu				*6*	*200*	*1200*
Amina				*6*	*150*	*900*
F-75 (total ml) needed for 24 hours			*4660*	**F-100 (total ml) needed for 24 hours**		*10320*
Amount needed for ____*12*___ hours*			*2330*	Amount needed for ___*12*___ hours*		*5160*
Amount to prepare (round up to whole L)			*3 L*	**Amount to prepare (round up to whole L)**		*6 L*

Name of Child	RUTF					
	Number feeds			Packets per day**		
Kofi			*6*	*3*		
Efua			*6*	*3***		
Carla			*6*	*2*		
Juliana			*6*	*2***		
	RUTF total (packets) for 24 hours			*10 Packets of RUTF*		

* Divide daily amount by the number of times the feed is prepared each day. For example, if feeds are prepared every 12 hours, divide the daily amount by 2.

** If the days ration is 2½, 1½, etc, round off to the nearest whole number; counsel the mother on how to store the leftover ½ packets for the following day.

Exercise F

In this exercise you will finish completing a Daily Inpatient Care Feed Chart and determine how much F-75 and F-100 to prepare for the ward and how much RUTF to give to the mothers for each day. Use the partially completed Daily Inpatient Care Feed Chart on the next page for this exercise.

1. Kwesi is the tenth child in the ward. It is his fourth day in the ward and he is still on F-75. His feeding plan for the day is below. Add Kwesi feeding plan to the Daily Inpatient Care Feed Chart on the next page.

DATE: *17/5/01*	**TYPE OF FEED:** *F-75*	**GIVE:** *6* **feeds of** *130* **ml**

2. Vera is the eleventh child in the ward. She is starting her second day of transition, so her planned amount of F-100 should not be increased during the day. Vera's feeding plan for the day is below. Add her feeding plan to the Daily Inpatient Care Feed Chart on the next page.

DATE: *17/5/01*	**TYPE OF FEED:** *F-100*	**GIVE**: *6* **feeds of** *160* **ml**

3. Sami is the last child in the ward, his weight is 5.2 kg. Sami's feeding plan is below. Sami is on RUTF; he had good appetite and ate eagerly yesterday. Add Sami's feeding plan to the Daily Inpatient Care Feed Chart on the next page.

DATE: *17/5/01*	**TYPE OF FEED:** *RUTF*	**GIVE**: *6* **feeds of** *2½ packets* *day*

4. Feeds are prepared every 12 hours at this hospital and RUTF's daily ration is provided to the mothers/caregivers once a day. Complete the bottom part of the Daily Inpatient Care Feed Chart on the next page to determine how much F-75 and F-100 to prepare for 12 hours and how much RUTF to give to the caregivers per day.

When you have finished this exercise,
please discuss your answers with a facilitator.

Daily Inpatient Care Feed Chart

Date: *17/05/01*

Ward: *Severe Acute Malnutrition*

Name of Child	F-75			F-100		
	Number feeds	Amount/feed (ml)	Total (ml)	Number feeds	Amount/feed (ml)	Total (ml)
Mina				*6*	*250*	*1500*
Tara	*12*	*50*	*600*			
Abdul				*6*	*180*	*1080*
Maya				*6*	*160*	*960*
Nisha	*12*	*65*	*780*			
Ben	*8*	*115*	*920*			
F-75 (total ml) needed for 24 hours				**F-100 (total ml) needed for 24 hours**		
Amount needed for _____ hours*				Amount needed for ____ hours*		
Amount to prepare (round up to whole L)				**Amount to prepare (round up to whole L)**		

Name of Child	RUTF					
	Number feeds			Packets per day**		
Kwame			*6*	*3***		
Kojo			*6*	*3*		
Aba			*6*	*3***		
	RUTF total (packets) for 24 hours					

* Divide daily amount by the number of times the feed is prepared each day. For example, if feeds are prepared every 12 hours, divide the daily amount by 2.

** If the days ration is 2½, 1½, etc, round off to the nearest whole number; counsel the mother on how to store the leftover ½ packets for the following day.

5.3. Plan Staff Assignments Related to Feeding Children

The major tasks involved in feeding are:

- Preparing F-75 and F-100
- Measuring out F-75 and F-100 feeds in amounts prescribed for each child; mothers with children on RUTF receive the daily amount of RUTF at once and are advised on the amount of RUTF the child should eat per feed
- Feeding children
- Recording feeds (and vomiting and diarrhoea) on intake chart
- Planning feeding schedule for an individual child for the next day
- Preparing the Daily Inpatient Care Feed Chart

Each of these tasks is extremely important. Each task requires different skills. For example, preparing food requires the ability to follow a recipe and measure carefully. Feeding children requires patience and the ability to encourage a child in a loving way.

Appropriate staff with the necessary skills or the ability to learn them must be assigned to each of these tasks.

5.4. Prepare Staff to Do Assigned Feeding Tasks

If staff do not know how to do the tasks that you plan to assign them, you will need to provide some training. Training need not be lengthy or formal; it may be done through staff meetings or on the job. Good training includes information, examples, and practice.

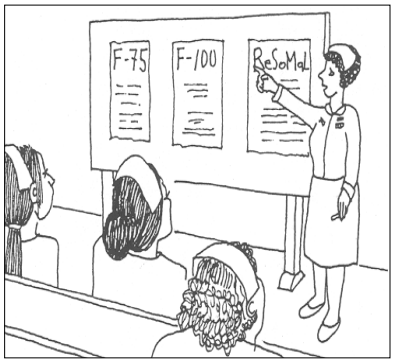
Example

Think about a time when you learnt a new skill, such as riding a bicycle, tying your shoe, or cooking rice. If you had a good teacher, that person probably:

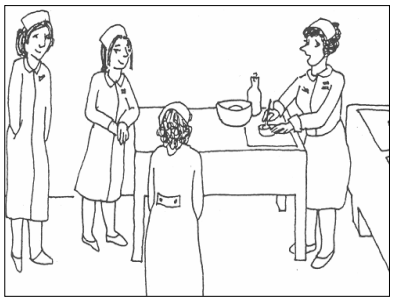
- First **told** you how (**information**)
- Then **showed** you how (**example**)
- Then helped you **practise** until you could do it yourself

These simple components of good teaching can be used in training staff to do feeding tasks or other tasks on the ward.

Information. Staff must be told (and preferably informed in a written job description) what tasks are expected of them. They must also be given instructions about how to do the tasks. Instructions may be in the form of a 'job aid', such as a poster on the wall with recipes for F-75 and F-100. The F-75, F-100, and RUTF Reference Tables and RUTF key messages used in this course are examples of job aids. Information may also be given orally, for example, in a staff meeting about how to complete patient records.



Examples. Staff must be shown how to do the tasks. For example, they might watch a demonstration on preparing food or feeding a very weak child. They might look at a correctly completed 24-Hour Food Intake Chart.



Practice. Practice is the most important element of training. To learn a task, staff must do the task themselves, receiving careful supervision and feedback as needed to improve performance. For example, staff must actually prepare food with supervision until they can do it correctly. They must also practise reading a Daily Inpatient Care Feed Chart and measuring appropriate amounts to feed children. Staff who will feed children need to practise holding them and encouraging them to eat.

Of course, training will not solve every problem in Inpatient Care. For example, staff may not want to do a task because it is unpleasant, or they may be unable to do a task because they lack the time or equipment. Training will not solve these problems, and other solutions will need to be considered.

Training is appropriate when staff either:

- Do not know **what** to do
- Do not know **how** to it

Exercise G

In this exercise, you will discuss various ways in which information, examples, and practice can be provided for feeding-related tasks.

First answer the questions below. Be prepared to discuss your answers with the group.

1. List one feeding-related task that staff in your hospital do not know how to do correctly.

2. Which staff members are (or will be) responsible for this task? Do they know they are responsible for it? If not, how can you inform them of their responsibility?

3. In training staff to do this task, how could you provide **information** cheaply, quickly, and realistically?

4. How could you provide **examples** cheaply, quickly, and realistically?

5. How could you provide **practice** cheaply, quickly, and realistically?

6. If you were to train staff to do this task, would there be any remaining problems interfering with doing the task? If so, what problems, and how could they be overcome?

Tell a facilitator when you are ready for the group discussion.

6. Management of SAM in Infants under 6 Months[2]

Breastfeeding support is an integral component of the management of SAM in infants. This support includes protection and support for early, exclusive, and continued breastfeeding, as well as reducing the risks of artificial feeding for non-breastfed infants. Infants who are not breastfed and who are particularly at risk also need to be ensured of protection and support.

Problems related to feeding that lead to SAM in infants include, among other factors:

- Lack of breastfeeding
- Partial breastfeeding
- Inadequate, unsafe artificial feeds
- Mother dead or absent
- Mother malnourished and/or traumatised, ill and/or unable to respond normally to infant's needs
- Disability that affects the infant's ability to suckle or swallow, e.g. cleft pallet, and/or a developmental problem affecting infant feeding

This section provides guidance on treatment of two categories of infants under 6 months:

1. Breastfed infants under 6 months with a (potential) lactating mother
2. Infants under 6 months without the prospect of breastfeeding

Infants over 6 months of age weighing less than 4 kg will also fall in these categories.

6.1. Breastfed Infants under 6 Months of Age with a (Potential) Lactating Mother

Admission Criteria

Admit breastfed infants under 6 months to Inpatient Care if the infant:

- Has bilateral pitting oedema
- Has visible wasting

[2] Based on promising practices and guidelines from various sources (e.g., C Prudhon. 2002. *Assessment and Treatment of Malnutrition in Emergency Situations*; M Golden and Y Grellety. 2006. *Guidelines on the management of the severely malnourished*).

- Is at high risk of SAM because of inadequate feeding of either the infant or the lactating mother

Infants under 6 months with acute malnutrition and their lactating mothers are both treated and taken care of. In food-insecure environments or emergency situations, they are at high risk of SAM, so it is important to consider the following:

- Infant is unable to suckle effectively (e.g., too weak)
- Infant is not satisfactorily gaining weight at home despite breastfeeding counselling
- Lactating mother has insufficient breast milk
- Lactating mother is malnourished
- Lactating mother is absent

Medical Treatment

Antibiotics

No presumptive antibiotic treatment is given to infants 0-6 months. Antibiotics or medicines are given if there are signs of infection that need treatment.

For infants 2–6 months (and weighing 2 kg or more):

- Refer to the Ghana Standard Treatment Guidelines (or Integrated Management of Neonatal and Childhood Illness [IMNCI] protocols) for the treatment of the specific infection.
  AND/OR
- Give first-line antibiotics as prescribed for children 6–59 months with SAM and medical complications: amoxicillin, 15–30 mg/kg, orally, 3 times per day for 5 days in association with gentamicin, 7.5 mg/kg, intravenous (IV) or IM, 1 time per day, for 5–10 days.
  OR
- Give ceftriaxone, 50 mg/kg/day, IM or IV, once per day.

For infants under 2 months (or weighing less than 2 kg):

- Refer to the Ghana Standard Treatment Guidelines (or IMNCI protocols) for the treatment of the specific infection.
  AND/OR
- Give ceftriaxone, 50 mg/kg/day, IM, 1 time per day.

Note: *Do not use chloramphenicol in young infants under 2 months, and use it with caution in infants 2–6 months.*

For guidance on the management of medical complications in the presence of SAM, see **Module 3, Initial Management**.

Vitamin A
Give 50,000 IU in a single dose upon admission only. If a child has bilateral pitting oedema, vitamin A should be provided after the oedema has resolved.

Folic Acid
Give 2.5 mg (½ a tablet crushed) in a single dose.

Ferrous Sulphate
Ferrous sulphate is added to F-100 (one crushed tablet of 200 mg of ferrous sulphate is added to 2 L of F-100) before diluting the F-100 to make F-100-Diluted. Alternatively provide doses of iron syrup orally. Iron should only be added in the feeds when the infant starts to gain weight.

Doses of Iron Syrup for a Common Formulation

Weight of child	**Dose of Iron Syrup**: Ferrous Fumarate, **100 mg per 5 ml** (20 mg elemental iron per ml)
3 up to 6 kg	0.5 ml
6 up to 10 kg	0.75 ml
10 up to 15 kg	1 ml

Note: *The amounts in the above doses are very small (less than ¼ teaspoons) and will need to be measured with a syringe.*

Dietary Treatment

- The main objective of managing SAM in infants under 6 months is to **restore exclusive breastfeeding**. Therefore, stimulate and support breastfeeding and supplement the infant's breastfeeding with therapeutic milk while stimulating production of breast milk.

- The infant should be breastfed as frequently as possible. Breastfeed every 3 hours for at least 20 minutes (more if the infant cries or demands more).

- Between a half-hour and an hour after a normal breastfeeding session, give maintenance amounts of therapeutic milk.

- Give **F-100-Diluted to infants under 6 months with severe wasting**. F-100-Diluted provides 75 kcal/100 ml but has a lower osmolarity than F-75 with a better carbohydrate-to-lipid ratio, and thus is better adapted to immature organ functions[3].

[3] F-100-Diluted has a lower osmolarity than some readily available infant formulas and thus has a lower risk of causing diarrhoea. Studies have shown that F-100-Diluted and some infant formulas give similar results in terms of mortality and weight gain.

- Give **F-75 to infants under 6 months with bilateral pitting oedema** and change to F-100-Diluted when the oedema is resolved.

Food Preparation

- For a large number of infants:
  - Add one packet of F-100 to 2.7 L of water instead of 2 L. This is referred to as F-100-Diluted, which provides about 75 kcal/100 ml.

- For a small number of infants:
  - Add 35 ml of water to 100 ml of F-100 already prepared, which will yield 135 ml of F-100-Diluted. Do not make smaller quantities.
  - If you need more than 135 ml, use 200 ml of F-100 and add 70 ml of water to make 270 ml of F-100-Diluted and discard any excess milk after use.
  - If F-100 is not readily available, these infants can be fed with the same quantities of commercial infant formula diluted according to the instructions on the tin. If there is a range of milk formulas to chose from, use a formula designed for **premature infants**. However, infant formula is not designed to promote rapid catch-up growth. Unmodified powdered whole milk should not be used.

Quantities of F-100-Diluted (or F-75) to Give

- Give F-100-Diluted at **130 ml/kg/day**, distributed across eight feeds per day, to provide **100 kcal/kg/day**.

- Use the reference table on the next page to determine the amounts of F-100-Diluted to give to infants using the supplementary suckling technique (for an explanation of the supplementary suckling technique, see ‘Feeding Technique’ on page 64).

- The quantity of F-100-Diluted should not be increased as the infant starts to gain weight.

Reference Table for Amounts of F-100-Diluted (Severe Wasting) or F-75 (Bilateral Pitting Oedema until the Oedema is Resolved) for Breastfed Infants

Infant's Weight (kg)	F-100-Diluted (or F-75 in case of oedema) (ml per feed if 12 feeds per day)	F-100-Diluted (or F-75 in case of oedema) (ml per feed if 8 feeds per day)
< 1.3	20	25
1.3–1.5	25	30
1.6–1.8	30	35
1.9–2.1	30	40
2.2–2.4	35	45
2.5–2.7	40	50
2.8–2.9	40	55
3.0–3.4	45	60
3.5–3.9	50	65
4.0–4.4	50	70

Regulation of Amount of F-100-Diluted (or F-75) Given

- Monitor the progress of the infant by the daily weight.

- If the infant loses weight or has a static weight for more than 3 consecutive days but continues to be hungry and is taking all the F-100-Diluted, add 5 ml extra to each feed.

- Give maintenance amounts of F-100-Diluted using the supplementary suckling technique.

- Weigh the infant with a scale graduated to within 10 g.

- In general, supplementation is not increased during the stay in the health facility.
    - If the volume of F-100-Diluted being taken results in weight loss, either the maintenance requirement is higher than calculated or there is significant malabsorption.
    - If the infant grows regularly with the same quantity of F-100-Diluted, it means the quantity of breast milk is increasing.
    - If, after some days, the infant does not finish all the supplemental feed, but continues to gain weight, it means the intake from breast milk is increasing and the infant is taking adequate quantities to meet his or her requirements.

- If the infant starts gaining weight, gradually **decrease** the amount of F-100-Diluted by one-third of the maintenance intake so that the infant is stimulated to take more breast milk.
    - If the **weight gain of 20 g per day is maintained for 2–3 days** (after gradual decrease of F-100-Diluted), **stop** F-100-Diluted completely.

  - If the weight gain is not maintained, **re-increase** the amount of F-100-Diluted given to 75% of the maintenance amount for 2–3 days then gradually decrease the amount again if the infant starts gaining weight.

- Once the infant is **gaining weight at 20 g per day on breastfeeding** and this rate of weight gain is maintained for 2–3 days, the infant is ready for discharge no matter what his or her current weight or weight-for-length is.

- If the mother is willing, it is advisable to keep the infant in the health facility for an additional 3–5 days on breast milk alone to make sure that he or she continues to gain weight. However, if the mother wishes to go home as soon as the infant is taking the breast milk with increased demand, the infant can be discharged and followed in the community or at the Child Welfare Clinic (CWC).

Feeding Procedures

- Ensure good breastfeeding through good attachment and effective suckling. Avoid distractions and let the infant suckle the breast at his or her own speed.

- Build the mother's confidence to help milk flow.

- Encourage more frequent and longer breastfeeding sessions to increase milk production and remove any interference that might disrupt breastfeeding.

- Use the supplementary suckling technique to provide maintenance amounts of F-100-Diluted, or feed by cup and saucer or NGT by drip (using gravity not pumping).

- Feed with an NGT **only** when the infant is not taking sufficient milk by mouth.

- The use of an NGT **should not exceed 3 days**.

- Discard any excess milk after use.

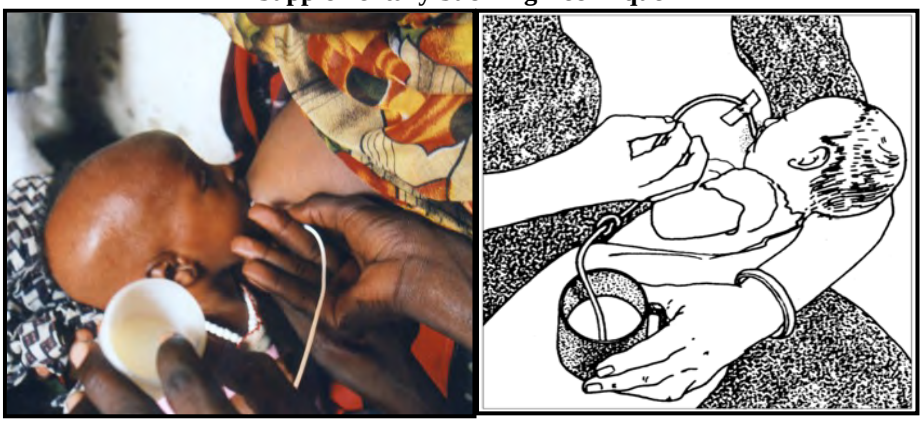
Feeding Technique

Use the supplementary suckling technique to re-establish or commence breastfeeding and also to provide maintenance amounts of F-100-Diluted to infants. This technique entails the infant suckling at the breast while also taking F-100-Diluted from a cup through a fine tube that runs alongside the nipple. The infant is nourished by the supplementary F-100-Diluted while suckling stimulates the breast to produce more milk (see the figure on the next page).

The steps required to use the supplementary suckling technique are simple. The mother holds a cup with the F-100-Diluted. The end of an NGT (size nº8 or size nº12) is put in the cup and the tip of the tube is placed on the breast, at the nipple. The infant is offered the breast with the right attachment. The cup is placed 5–10 cm below the level of the nipple for easy suckling. When the infant suckles more strongly, the cup can be lowered to up to 30 cm.

After feeding is completed, the tube is flushed through with clean water using a syringe. It is then spun (twirled) rapidly to remove the water in the lumen of the tube by centrifugal force. If convenient, the tube is then left exposed to direct sunlight.

Supplementary Suckling Technique



Individual Monitoring

The following parameters should be monitored **daily** and entered on the Inpatient Care CCP:

- Weight
- Degree of bilateral pitting oedema (0, +, ++, or +++)
- Body temperature, pulse, and respiration
- Standard clinical signs: stool, vomiting, dehydration, cough, respiration, liver size, eyes, ears, and skin condition
- Any other record, e.g., absent, vomits or refuses a feed, whether the infant is fed by NGT or given IV infusion or transfusion

As soon as the infant is 6 months of age and weighs greater than 4 kg, the infant falls into the management criteria for the age group 6–59 months. If the infant still has SAM (meets the admission criteria), introduce RUTF and refer the infant to Outpatient Care.

Supportive Care for Mothers

Supportive care for breastfeeding mothers should be provided, especially in very stressful situations. Focus needs to be directed at creating conditions that will facilitate and increase breastfeeding, such as establishing safe ‘breastfeeding corners’ for mothers and infants, one-to-one counselling, and mother-to-mother support. Traumatised and depressed women might have difficulty responding to their infants and might require mental and emotional support, which should also support an increase in breastfeeding. It is important to assess the nutritional status of the mother (using mid-upper arm circumference [MUAC] and evidence of bilateral pitting oedema).

Explain to the mother the different steps of treatment that her infant will go through. Efforts should be made to strengthen the mother's confidence and discourage self-criticism for perceived inability to provide adequate breast milk. Always alert the mother about the risk of pregnancy during breastfeeding amenorrhoea.

Adequate Nutrition and Supplementation for Breastfeeding Mothers

Breastfeeding women need about 450 kcal per day of extra energy. Essential micronutrients in breast milk are derived from the mother's food or micronutrient supplement. Therefore, it is important that the mother's nutrient and energy needs are met. The mother should consume at least 2,500 kcal per day. It is suggested that the health facility provide nutritious food for the mother. The mother should also receive vitamin A (200,000 IU, unless there is a risk of pregnancy) if the infant is under 2 months of age. Dehydration may interfere with breast milk production. It is therefore important to ensure that the mother drinks at least 2 L of water per day.

Psychosocial Care of the Mother

Psychosocial care is an essential component of the care of the mother and the infant with SAM, as the mother may have many problems of a physical or psychological origin. These problems could affect her care of her infant or lead to defaulting. The table below demonstrates some of the mother's potential difficulties.

The mother should receive a thorough explanation of her infant's problem and how to manage it. She should be guided through a breastfeeding session and the supplementary suckling technique. The mother should also be counselled on social problems and receive a medical check if necessary. Advice on hygiene and the correct way to breastfeed should be provided to the mother in a supportive, participatory way through individual counselling or group discussions to relieve her stress and fears.

Possible Difficulties Encountered by Lactating Mothers of Infants with SAM

Difficulties	Action Points
Nutrition and fluid intake	Provide enough fluid and balanced food; screen the mother for malnutrition
Physical and mental health	Provide medical advice whenever requested
Physical difficulties related to breastfeeding	Treat sore nipples, cracked nipples, and mastitis with breastfeeding counselling
Misinformation and misconceptions	Establish good communication with the mother

Discharge Criteria

Infants under 6 months being breastfed should be discharged when they:

- Successful re-lactate with effective suckling, translating to a minimum weight gain of 20 g per day on breast milk alone for 5 days

- Have no bilateral pitting oedema for 2 weeks (oedema cases)
- Are clinically well and alert with no other medical problem

Upon discharge, confirm that the mother has been adequately counselled and has received the required amounts of micronutrient supplements during the stay at the health facility and for use at home.

Note: *If a breastfed infant in treatment still has signs of SAM at the age of 6 months and has a weight greater than 4 kg, he or she moves to the 6–59 months age group and continues treatment accordingly (see the job aid Admission and Discharge Criteria for the Management of Severe Acute Malnutrition in Children under 5).*

Follow-Up after Discharge

Follow-up for discharged infants is very important; the children should be followed on a monthly basis at the CWC. In areas where services are available, the mother should be included in a supplementary feeding programme (SFP) and receive high-quality food with the right balance of nutrients to improve the quantity and quality of breast milk. It is also important to monitor the infant's progress and support breastfeeding and the introduction of complementary food at the appropriate age of 6 months.

6.2. Infants under 6 Months without the Prospect of Breastfeeding

The aim of the treatment of infants under 6 months with SAM **without** the prospect of being breastfed is to receive F-100-Diluted or infant formula until they are old enough to take semisolid complementary food.

Admission Criteria

Infants under 6 months without the prospect of breastfeeding (neither lactating mother nor wet nurse) should be admitted to Inpatient Care if the infant has:

- Bilateral pitting oedema
- Visible wasting

I. Stabilisation Phase

Medical Treatment

Antibiotics

No presumptive antibiotic treatment is given. Antibiotics or medicines are given if there are signs of infection that need treatment.

For infants 2–6 months (and weight of 2 kg or more):

- Refer to the existing Ghana Standard Treatment guidelines (or IMNCI protocols) for the treatment of the specific infection.
  AND/OR
- Give first-line antibiotics as prescribed for children 6–59 months with SAM and medical complications: amoxicillin, 15–30 mg/kg, orally, 3 times per day for 5 days in association with gentamicin, 7.5 mg/kg, IV or IM, 1 time per day for 5–10 days.
  OR
- Give ceftriaxone, 50 mg/kg/day, IM or IV once a day.

For infants under 2 months (or weight less than 2 kg):

- Refer to the Ghana Standard Treatment Guidelines (or IMNCI protocols) for the treatment of the specific infection
  AND/OR
- Give ceftriaxone, 50 mg/kg/day, IM or IV once a day.

Note: *Do not use chloramphenicol in young infants under 2 months, and use it with caution in infants 2–6 months.*

For guidance on the management of medical complications in the presence of SAM, see **Module 3, Initial Management**.

Vitamin A
Give 50,000 IU in a single dose upon admission only. If a child has bilateral pitting oedema, vitamin A should be provided after the oedema has resolved.

Folic Acid
Give 2.5 mg (½ tablet crushed) in a single dose.

Ferrous Sulphate
Give F-100-Diluted, as F-100 has already been enriched with ferrous sulphate, and it is easier and safer to use F-100-Diluted than to calculate and add ferrous sulphate to very small amounts of feeds. F-100 with one-third water makes the F-100-Diluted (see the section on food preparation on page 61).

Dietary Treatment

- Infants under 6 months without the prospect of breastfeeding with wasting should be given **F-100-Diluted** in the stabilisation phase with a cup and saucer. Never provide F-100 full strength (or RUTF).

- Infants under 6 months without the prospect of breastfeeding **with bilateral pitting oedema should always be given F-75** until the oedema has resolved. Then provide F-100-Diluted.

Quantities of F-100-Diluted (or F-75) to Give

- F-100-Diluted is given at **130 ml/kg/day**, distributed across eight feeds per day, providing **100 kcal/kg/day**.

- Use the table below to determine the amounts of F-100-Diluted or F-75 to give for non-breastfed infants under 6 months in the stabilisation phase.

- The quantity of F-100-Diluted is not increased as the infant starts to gain weight.

Stabilisation Phase Reference Table for Amounts of F-100-Diluted (Severe Wasting) or F-75 (Bilateral Pitting Oedema) for Infants (under 6 Months) with No Prospect of Being Breastfed

Infant's Weight (kg)	F-100-Diluted (or F-75 in case of oedema) (ml per feed if 12 feeds per day)	F-100-Diluted (or F-75 in case of oedema) (ml per feed if 8 feeds per day)
< 1.3	20	25
1.3–1.5	25	30
1.6–1.8	30	35
1.9–2.1	30	40
2.2–2.4	35	45
2.5–2.7	40	50
2.8–2.9	40	55
3.0–3.4	45	60
3.5–3.9	50	65
4.0–4.4	50	70

Food Preparation

- For a large number of infants:
  - Add one packet of F-100 to 2.7 L of water instead of 2 L. This is referred to as F-100-Diluted.

- For a small number of infants:
  - Add 35 ml of water to 100 ml of F-100 already prepared, which will yield 135 ml of F-100-Diluted. Do not make smaller quantities.
  - If you need more than 135 ml, use 200 ml of F-100 and add 70 ml of water to make 270 ml of F-100-Diluted and discard any excess milk after use.
  - If F-100 is not readily available, these infants can be fed with the same quantities of commercial infant formula diluted according to the instructions on the tin. If there is a range of milk formulas to chose from, use a formula designed for **premature infants**. However, infant formula is not designed to promote rapid catch-up growth. Unmodified powdered whole milk should not be used.

Feeding Procedures

- Feed by cup and saucer or NGT by drip (using gravity not pumping).
- Feed with an NGT **only** when the infant is not taking sufficient milk by mouth.
- The use of an NGT **should not exceed 3 days** and should be used **only** in the stabilisation phase.
- Discard any excess milk after use.

Feeding Technique

The feeding technique for non-breastfed infants under 6 months with SAM is the same as that of older children as described in this module. It is important to ensure the infant has adequate intake, which is recorded on the 24-Hour Food Intake Chart.

Individual Monitoring

The following parameters should be monitored **daily** and entered in the Inpatient Care CCP:

- Weight
- Degree of bilateral pitting oedema (0, +, ++, or +++)
- Body temperature, pulse, and respiration
- Standard clinical signs: stool, vomiting, dehydration, cough, respiration, liver size, eyes, ears, and skin condition
- Any other record, e.g., absent, vomits or refuses a feed, whether the infant is fed by NGT or given IV infusion or transfusion

Criteria to Progress from the Stabilisation Phase to the Transition Phase

The criteria to progress from the stabilisation phase to the transition phase are **both**:

- Return of appetite
- Oedema starts resolving, which is normally judged by an appropriate and proportionate weight loss as the oedema starts to subside

II. Transition Phase

Medical Treatment

See treatment as outlined in the stabilisation phase (page 67).

Dietary Treatment

- Only F-100-Diluted should be used.

- The volume of the F-100-Diluted feeds is **increased by one-third** over what was given in the stabilisation phase. F-100-Diluted is given at **150-170 ml/kg/day,** providing **110–130 kcal/kg/day**.

- Use the table below to determine the amounts of F-100-Diluted to give to non-breastfed infants in the transition phase.

Transition Phase Reference Table for Amounts of F-100-Diluted for Infants (under 6 Months) with No Prospects of Being Breastfed

Infant's Weight (kg)	F-100-Diluted (ml per feed if 8 feeds per day)
< 1.6	45
1.6–1.8	53
1.9–2.1	60
2.2–2.4	68
2.5–2.7	75
2.8–2.9	83
3.0–3.4	90
3.5–3.9	96
4.0–4.4	105

Individual Monitoring

Continue surveillance as outlined in the stabilisation phase (page 69).

Criteria to Progress from the Transition Phase to the Rehabilitation Phase

- A good appetite: taking at least 90% of the F-100-Diluted prescribed for the transition phase
  AND
- Complete loss of bilateral pitting oedema
  OR
- Minimum stay of 2 days in the transition phase for children with wasting
  AND
- No other medical problem

III. Rehabilitation Phase

Dietary Treatment

- Only F-100-Diluted should be used.
- The volume of the F-100-Diluted feeds is **twice** the volume given in the stabilisation phase.
- F-100-Diluted is given at **200 ml/kg/day,** providing **150 kcal/kg/day**.
- Use the table below to determine the amounts of F-100-Diluted to give to non-breastfed infants in the rehabilitation phase.

Rehabilitation Phase Reference Table for Amounts of F-100-Diluted for Infants (under 6 Months) with No Prospects of Being Breastfed

Infant's Weight (kg)	F-100-Diluted (ml per feed if 6–8 feeds per day)
< 1.6	60
1.6–1.8	70
1.9–2.1	80
2.2–2.4	90
2.5–2.7	100
2.8–2.9	110
3.0–3.4	120
3.5–3.9	130
4.0–4.4	140

Individual Monitoring

Continue surveillance as outlined in the stabilisation phase (page 69).

Discharge Criteria

Non-breastfed infants under 6 months should be discharged when they:

- Have 15% weight gain maintained (of admission weight or weight free of oedema) (for wasted cases)
- Have no bilateral pitting oedema for 2 consecutive weeks (oedema cases)
- Are clinically well and alert

Note: *If a non-breastfed infant in treatment still has signs of SAM at the age of 6 months and has a weight greater than 4 kg, he or she moves to the 6–59 months age group and continues treatment according to the Interim National Guidelines for CMAM in Ghana (see the job aid*

Admission and Discharge Criteria for the Management of Severe Acute Malnutrition in Children under 5).

Other Considerations at Discharge

- At discharge, the infant can be switched to infant formula or other breast milk substitutes per the Ghana infant and young child feeding (IYCF) recommendations.

- The mother has been adequately counselled.

Follow-Up after Discharge

Continuity of care after discharge is important. Follow-up of these infants is needed to supervise the quality of recovery and progress and to advise the mothers. It is also important to support introduction of complementary food at the appropriate age of 6 months.

6.3. Infant and Young Child Feeding Support

Annex B of **Module 7, Involving Mothers in Care** summarises health and nutrition education messages that can be used for individual and group counselling for improving and supporting IYCF practices. These messages are also available in the child health record book, which lists key behaviours to promote breastfeeding, summarises the importance of breastfeeding for infants and young children and recommends IYCF practices on breastfeeding and complementary feeding[4]. It also provides an example of Ghana adapted tool for recommended foods for infants and young children.

[4] IFE Core Group. 2009. *Integration of IYCF Support into CMAM*, Facilitator's Guide and Handouts. Oxford, UK: Emergency Nutrition Network.

Summary of the Management of SAM in Infants under 6 Months of Age

Initial assessment and management	Weigh the infant, diagnose and treat complications such as hypothermia, hypoglycaemia, dehydration, infections, and septic shock.
Give the infant initial re-feeding	Feed the infant with F-100-Diluted or F-75 if the child has oedema for initial recovery and metabolic stabilisation.
Feed and care for the mother	If the mother is available, feed her and provide physical and psychological care to help restore her health, ability to produce milk, and ability to respond to her baby.
Keep mother and infant together	Keep the 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 baby 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 breast milk 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 or her to achieve rapid catch-up growth (nutritional 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 there is no prospect of breastfeeding	If breastfeeding is not possible, give F-100-Diluted if the child is wasted and F-75 if the child has oedema until the oedema resolves, then give F-100-Diluted. When the infant recovers, change to adequate artificial feeding in accordance with the IYCF recommendations and criteria for Ghana.
Discharge when gaining weight on breastfeeding alone **OR** **on a safe alternative and child has attained 15% target weigh**	Discharge the infant from Inpatient Care when he or she has gained weight (at least 20 g per day) for 5 days on breastfeeding alone (regardless of the original body weight). OR Discharge when the infant completely on adequate artificial feeding with formula and attained his or her 15% target weight.

Annex A. F-75 and F-100 Reference Tables

Volume of F-75 to Give to Children of Different Weights

See next page for adjusted amounts for children with severe (+++) oedema.

Weight of child (kg)	Volume of F-75 per feed (ml)[a]			Daily total (130 ml/kg)	80% of daily total[a] (minimum)
	Every 2 hours[b] (12 feeds)	Every 3 hours[c] (8 feeds)	Every 4 hours (6 feeds)		
2.0	20	30	45	260	210
2.2	25	35	50	286	230
2.4	25	40	55	312	250
2.6	30	45	55	338	265
2.8	30	45	60	364	290
3.0	35	50	65	390	310
3.2	35	55	70	416	335
3.4	35	55	75	442	355
3.6	40	60	80	468	375
3.8	40	60	85	494	395
4.0	45	65	90	520	415
4.2	45	70	90	546	435
4.4	50	70	95	572	460
4.6	50	75	100	598	480
4.8	55	80	105	624	500
5.0	55	80	110	650	520
5.2	55	85	115	676	540
5.4	60	90	120	702	560
5.6	60	90	125	728	580
5.8	65	95	130	754	605
6.0	65	100	130	780	625
6.2	70	100	135	806	645
6.4	70	105	140	832	665
6.6	75	110	145	858	685
6.8	75	110	150	884	705
7.0	75	115	155	910	730
7.2	80	120	160	936	750
7.4	80	120	160	962	770
7.6	85	125	165	988	790
7.8	85	130	170	1,014	810
8.0	90	130	175	1,040	830
8.2	90	135	180	1,066	855
8.4	90	140	185	1,092	875
8.6	95	140	190	1,118	895
8.8	95	145	195	1,144	915
9.0	100	145	200	1,170	935
9.2	100	150	200	1,196	960
9.4	105	155	205	1,222	980
9.6	105	155	210	1,248	1,000
9.8	110	160	215	1,274	1,020
10.0	110	160	220	1,300	1,040

[a] Volumes in these columns are rounded to the nearest 5 ml.

[b] Feed 2-hourly for at least the first day. Then, when the child has little or no vomiting and modest diarrhoea (< 5 watery stools per day) and is finishing most feeds, change to 3-hourly feeds.

[c] After a day on 3-hourly feeds, if the child is not vomiting, has less diarrhoea, and is finishing most feeds, change to 4-hourly feeds.

Volume of F-75 for Children with Severe (+++) Oedema

Weight with +++ oedema (kg)	Volume of F-75 per feed (ml)[a]			Daily total (100 ml/kg)	80% of daily total[a] (minimum)
	Every 2 hours[b] (12 feeds)	Every 3 hours[c] (8 feeds)	Every 4 hours (6 feeds)		
3.0	25	40	50	300	240
3.2	*25*	40	55	320	255
3.4	30	45	60	340	270
3.6	30	45	60	360	290
3.8	30	50	65	380	305
4.0	35	50	65	400	320
4.2	35	55	70	420	335
4.4	35	55	75	440	350
4.6	40	60	75	460	370
4.8	40	60	80	480	385
5.0	40	65	85	500	400
5.2	45	65	85	520	415
5.4	45	70	90	540	430
5.6	45	70	95	560	450
5.8	50	75	95	580	465
6.0	50	75	100	600	480
6.2	50	80	105	620	495
6.4	55	80	105	640	510
6.6	55	85	110	660	530
6.8	55	85	115	680	545
7.0	60	90	115	700	560
7.2	60	90	120	720	575
7.4	60	95	125	740	590
7.6	65	95	125	760	610
7.8	65	100	130	780	625
8.0	65	100	135	800	640
8.2	70	105	135	820	655
8.4	70	105	140	840	670
8.6	70	110	145	860	690
8.8	75	110	145	880	705
9.0	75	115	150	900	720
9.2	75	115	155	920	735
9.4	80	120	155	940	750
9.6	80	120	160	960	770
9.8	80	125	165	980	785
10.0	85	125	165	1,000	800
10.2	85	130	170	1,020	815
10.4	85	130	175	1,040	830
10.6	90	135	175	1,060	850
10.8	90	135	180	1,080	865
11.0	90	140	185	1,100	880
11.2	95	140	185	1,120	895
11.4	95	145	190	1,140	910
11.6	95	145	195	1,160	930
11.8	100	150	195	1,180	945
12.0	100	150	200	1,200	960

[a] Volumes in these columns are rounded to the nearest 5 ml.
[b] Feed 2-hourly for at least the first day. Then, when the child has little or no vomiting and modest diarrhoea (< 5 watery stools per day) and is finishing most feeds, change to 3-hourly feeds.
[c] After a day on 3-hourly feeds, if the child is not vomiting, has less diarrhoea, and is finishing most feeds, change to 4-hourly feeds.

F-100 Reference Table

Range of Volumes for Free-Feeding with F-100

Weight of child (kg)	Range of volumes per 4-hourly feed of F-100 (6 feeds per day)		Range of daily volumes of F-100	
	Minimum (ml)	Maximum (ml) [a]	Minimum (150 ml/kg/day)	Maximum (220 ml/kg/day)
2.0	50	75	300	440
2.2	55	80	330	484
2.4	60	90	360	528
2.6	65	95	390	572
2.8	70	105	420	616
3.0	75	110	450	660
3.2	80	115	480	704
3.4	85	125	510	748
3.6	90	130	540	792
3.8	95	140	570	836
4.0	100	145	600	880
4.2	105	155	630	924
4.4	110	160	660	968
4.6	115	170	690	1,012
4.8	120	175	720	1,056
5.0	125	185	750	1,100
5.2	130	190	780	1,144
5.4	135	200	810	1,188
5.6	140	205	840	1,232
5.8	145	215	870	1,276
6.0	150	220	900	1,320
6.2	155	230	930	1,364
6.4	160	235	960	1,408
6.6	165	240	990	1,452
6.8	170	250	1,020	1,496
7.0	175	255	1,050	1,540
7.2	180	265	1,080	1,588
7.4	185	270	1,110	1,628
7.6	190	280	1,140	1,672
7.8	195	285	1,170	1,716
8.0	200	295	1,200	1,760
8.2	205	300	1,230	1,804
8.4	210	310	1,260	1,848
8.6	215	315	1,290	1,892
8.8	220	325	1,320	1,936
9.0	225	330	1,350	1,980
9.2	230	335	1,380	2,024
9.4	235	345	1,410	2,068
9.6	240	350	1,440	2,112
9.8	245	360	1,470	2,156
10.0	250	365	1,500	2,200

[a] Volumes per feed are rounded to the nearest 5 ml.

Annex B. Danger Signs for the Management of SAM in Children under 5 in Inpatient Care

Danger Signs Related to Pulse, Respirations, and Temperature Alert a physician if these occur.		
	Danger sign:	**Suggests:**
Pulse and Respirations	Confirmed increase in pulse rate of 25 or more beats per minute **along with** Confirmed increase in respiratory rate of 5 or more breaths per minute	Infection or Heart failure (possibly from overhydration due to feeding or rehydrating too fast)
Respirations only	Fast breathing: • 50 breaths/minute or more in children 2–11 months* • 40 breaths/minute or more in children 1–5 years	Pneumonia
Temperature	Any sudden increase or decrease Rectal temperature below 35.5°C (95.9°F)	Infection Hypothermia (possibly due to infection, a missed feed, or child being uncovered)

* Infants under 12 months will normally breathe fast without having pneumonia. However, unless the infant's normal respiratory rate is known to be high, he/she should be assumed to have either overhydration or pneumonia. Careful evaluation, taking into account prior fluid administration, will help differentiate the two conditions and plan appropriate treatment.

In addition to watching for increasing pulse or respirations and changes in temperature, watch for other danger signs, such as:

- Anorexia (loss of appetite)
- Change in mental state (e.g., becomes lethargic)
- Jaundice (yellowish skin or eyes)
- Cyanosis (tongue/lips turning blue from lack of oxygen)
- Difficult breathing
- Difficulty feeding or waking (drowsy)
- Abdominal distension
- New oedema
- Large weight changes
- Increased vomiting
- Petechiae (bruising)

Normal Ranges of Pulse and Respiratory Rates

Age	**Normal ranges (per minute):**	
	Pulse	**Respirations**
2 to 11 months	80 up to 160	20 up to 60*

* Infants under 12 months will normally breathe fast without having pneumonia. However, unless the infant's normal respiratory rate is known to be high, he/she should be assumed to have either overhydration or pneumonia. Careful evaluation, taking into account prior fluid administration, will help differentiate the two conditions and plan appropriate treatment.

Annex C. RUTF Reference Table and Key Messages

Reference Table for Amounts of RUTF to Give to a Child per Day or Week Based on 92 g Packets Containing 500 kcal

Weight of the child (kg)	**Packets per day** (200 kcal/kg/day**)**	**75% of daily prescribed amount** (150 kcal/kg/day)
3.5–3.9	1½	1 ¼
4.0–4.9	2	1½
5.0–6.9	2½	2¼
7.0–8.4	3	2½
8.5–9.4	3½	2¾
9.5–10.4	4	3¼
10.5–11.9	4½	3½
≥ 12	5	4

RUTF Key Messages

- RUTF is a food and medicine for very thin children only. It should not be shared. Sick children often do not like to eat. Give small, regular meals of RUTF and encourage the child to eat often (if possible five to six meals per day). Your child should have ___ packets per day.
- RUTF is the only food sick/thin children need to recover during their time in Outpatient Care (however, breastfeeding should continue).
- For young children, continue to breastfeed regularly.
- Always offer the child plenty of clean water to drink or breast milk while he or she is eating RUTF.
- Wash the child's hands and face with soap before feeding if possible.
- Keep food clean and covered.
- Sick children get cold quickly. Always keep the child covered and warm.
- When a child has diarrhoea, never stop feeding. Continue to feed RUTF and (if applicable) breast milk.

Annex D. F-100-Diluted (and F-75) Reference Tables for Infants under 6 Months of Age

Breastfed Infants under 6 Months

Reference Table for Amounts of F-100-Diluted (Severe Wasting) or F-75 (Bilateral Pitting Oedema until the Oedema is Resolved)

Child's Weight (kg)	F-100-Diluted or F-75 in case of oedema (ml per feed if 12 feeds/day)	F-100-Diluted or F-75 in case of oedema (ml per feed if 8 feeds/day)
< 1.3	20	25
1.3–1.5	25	30
1.6–1.7	30	35
1.8–2.1	30	40
2.2–2.4	35	45
2.5–2.7	40	50
2.8–2.9	40	55
3.0–3.4	45	60
3.5–3.9	50	65
4.0–4.4	50	70

Infants under 6 Months with No Prospects of Being Breastfed

Stabilisation Phase Reference Table for Amounts of F-100-Diluted (Severe Wasting) or F-75 (Bilateral Pitting Oedema)

Child's Weight (kg)	F-100-Diluted or F-75 in case of oedema (ml per feed if 12 feeds/day)	F-100-Diluted or F-75 in case of oedema (ml per feed if 8 feeds/day)
< 1.6	25	30
1.6–1.8	30	35
1.9–2.1	30	40
2.2–2.4	35	45
2.5–2.7	40	50
2.8–2.9	40	55
3.0–3.4	45	60
3.5–3.9	50	65
4.0–4.4	50	70

Transition Phase Reference Table for Amounts of F-100-Diluted

Child's Weight (kg)	F-100-Diluted (ml per feed if 8 feeds/day)
< 1.6	45
1.6–1.8	53
1.9–2.1	60
2.2–2.4	68
2.5–2.7	75
2.8–2.9	83
3.0–3.4	90
3.5–3.9	96
4.0–4.4	105

Rehabilitation Phase Reference Table for Amounts of F-100-Diluted

Child's Weight (kg)	F-100-Diluted (ml per feed if 6-8 feeds/day)
< 1.6	60
1.6–1.8	70
1.9–2.1	80
2.2–2.4	90
2.5–2.7	100
2.8–2.9	110
3.0–3.4	120
3.5–3.9	130
4.0–4.4	140

Annex E. 24-Hour Food Intake Chart

24-HOUR FOOD INTAKE CHART

Complete one chart for every 24-hour period.

Name: Hospital No: Admission weight (kg): Today's weight (kg): Oedema: 0 + ++ +++

DATE:		**TYPE OF FEED** *(indicate if F-75, RUTF, F-100, or F-100-D)*:			GIVE: _____ feeds of _____ml/packets	
Time	**a.** Amount offered (ml)	**b**. Amount left in cup (ml)	**c.** Amount taken orally (a – b)	**d.** Amount taken by NGT, if needed (ml)	**e.** Estimated amount vomited (ml)	**f.** Watery diarrhoea (if present, yes)
		Column totals	**c.**	**d.**	**e.**	**Total yes:**
If child is ready for transition, conduct RUTF appetite test.					**Appetite test:** Failed Passed	
Total volume taken over 24 hours = amount taken orally **(c)** **+** amount taken by NGT **(d)** **–** total amount vomited **(e)** **=** _____ml						

Annex F. Daily Inpatient Care Feed Chart

Date: _____	Ward: _____

Name of Child	F-75			F-100		
	Number of feeds	Amount/ feed (ml)	Total (ml)	Number of feeds	Amount/ feed (ml)	Total (ml)
F-75 (total ml) needed for 24 hours				**F-100 (total ml) needed for 24 hours**		
Amount needed for _____ hours*				Amount needed for _____ hours*		
Amount to prepare (round up to whole L)				**Amount to prepare (round up to whole L)**		

	F-75 (total ml) needed for 24 hours		F-100 (total ml) needed for 24 hours	

Name of Child	RUTF	
	Number of feeds	Packets per day**
	RUTF total (packets) for 24 hours	

* Divide daily amount by the number of times the feed is prepared each day. For example, if feeds are prepared every 12 hours, divide the daily amount by 2.

** If the days ration is 2½, 1½, etc, round off to the nearest whole number; counsel the mother on how to store the leftover ½ packets for the following day.

Answers to Short Answer Exercises

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Child 1: 110 ml F-75

Child 2: 90 ml F-75 (When the weight is not on the reference table, use the next lower weight. Use the regular feeding table for a child with mild oedema.)

Child 3: 45 ml F-75 (Use the reference table for children with severe oedema.)

Child 4: 15 ml F-75 every half hour (Divide the 2-hourly amount for severely edematous child by 4.)

Child 5: 210 ml F-75 (Use the regular reference table since child has only moderate oedema.)

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1. Matteu's feeding day began at 8:00 a.m. and ended at 6:00 a.m. on the next morning.

2. 12 times

3. Matteu was offered 45 ml each time.

4. No, 30 ml is only about 66% of 45 ml.

5. No

6. He refused most of the feed and vomited the small amount that he took.

7. He was fed by NGT. The staff realised that he had not taken enough by mouth for 3 successive feeds. (***Note:*** *They could have started NG feeding after 2 poor feeds.*)

8. He was fed as much as he would take orally. Then he was given the rest by NGT.

9. Yes, he took about 88%.

10. 455 ml (300 ml taken orally + 175 ml taken by NG − 20 ml vomited)

11. No, the NGT should not be removed. Although he took almost all of the last two feeds by mouth, he is still leaving a little bit. When he takes two consecutive feeds completely by mouth, the tube should be removed.