TRAINING COURSE ON THE MANAGEMENT OF SEVERE ACUTE MALNUTRITION

PARTICIPANT MODULE

Federal democratic Republic of Ethiopia, Ministry of Health

Second Edition, 2013
Addis Ababa, Ethiopia

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Acknowledgement (First Edition)

The first National Protocol on the Management of Severe Acute Malnutrition (SAM) was developed in 2004 and the 2nd and updated version was made available as of March 2007. However, there was no standardized and comprehensive training course material on the management of SAM using adult learning methodology and which encompasses adequate clinical practice sessions.

Thus, this package of standardized modular training course material was developed using the WHO "*Training Course on the Management of SAM, 2002*" as template but taking most of the contents from the "National Protocol for the Management of SAM, 2007". The package consists of two sets of training materials: a set of modules for a 6 days' integrated course material (*Training Course on the Management of SAM, 2011*) which combines both the inpatient and outpatient care, and a separate set of modules for a 2 days' course on the outpatient care (*Training Course on the Outpatient Treatment Program of SAM, 2011*).

The first edition of this training material was developed and printed through the technical and financial assistance of WHO/Ethiopia and with the support and valuable input of key partners especially UNICEF, Concern/Ethiopia, Save the Children USA and many experts in the field. It is our strong belief that this training package will contribute significantly to the efforts being made to improve the quality of care provided for malnourished children both at outpatient and inpatient care services.

In this regard, the FMOH would like to appreciate the effort of WHO country office to coordinate and lead this task and the support of UNICEF, Concern, Save the Children USA and the Medical faculty of Addis Ababa University for their valuable contribution in the development of this training material.

We would like to sincerely acknowledge the remarkable contribution of **Dr Damte Shimelis** (Pediatrician, Addis Ababa University, Medical Faculty) and **Dr Habtamu Fekadu** (Pediatrician & Nutritionist) who served as consultants in the adaptation of the generic WHO modules.

The FMOH gratefully acknowledge the contribution of all who participated in this work especially the following professionals for their technical input in the development of this national training course material on the management of SAM.

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Dr Solomon Emyu	-	WHO/Ethiopia
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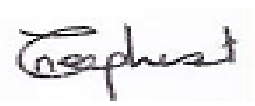
Dr Abdulaziz Ali	-	FANTA Project/FMOH

Special thanks go to Mrs Genet Kassa of WHO/Ethiopia for her assistance in formatting of the final material.

Finally, the Ministry of Health would like to recognize all the program managers and technical staff in the FMOH who contributed to the finalization of the document.



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Acknowledgement (Second Edition)

The FMOH gratefully acknowledge the contribution of all who participated in the revision and preparation of the second edition of these training materials, especially the following professionals for their technical input in the development of this national training course material on the management of SAM.

Dr Sirak Hailu	-	WHO/Ethiopia
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Mr Getahun Teka	-	WHO/Ethiopia
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Dr Habtamu Fekadu	-	Save the Children
Dr Damte Shimelis	-	AAU
Mr Mesfin Gose	-	FMOH
Dr Menbeu	-	Adama Hospital

MODULE CONTENT

ACRONYMS

F75	Therapeutic milk used only in Phase 1 of treatment for SAM
F100	Therapeutic milk used in Transition Phase and Phase 2 of treatment
IU	International Units
MUAC	Mid Upper Arm Circumference
NCHS	National Centre for Health Statistics of USA
NGT	Naso-Gastric Tube
NRU	Nutrition Rehabilitation Unit (same as TFU)
OPD	Out Patient Department (of health facility)
ORS	Oral Rehydration Salt
OTP	Out-patient Therapeutic Programme (treatment of SAM at home)
RDA	Recommended Dietary Allowances
ReSoMal	Oral Rehydration Solution for severely malnourished patients
RUTF	Ready-to-Use Therapeutic Food
RWG	Rate of Weight Gain
SAM	Severe Acute Malnutrition (wasting and/or nutritional edema)
SFP	Supplementary Feeding Programme
TFU	Therapeutic Feeding Unit (in hospital, health centre or other facility)
TFP	Therapeutic Feeding Programme
WFH	Weight for Height
WFL	Weight for Length
HB	Hemoglobin

SESSION 1: INTRODUCTION

S-1 Introduction

1.1. Importance of severe malnutrition as a health problem

Severe malnutrition is one of the most common causes of morbidity and mortality among children under the age of 5 years worldwide. Many children with Severe Acute Malnutrition (SAM) die at home without care, but even when hospital care is provided, mortality rates may be high.

Children with severe acute malnutrition often die because doctors unknowingly use practices that are suitable for most children, but highly dangerous for severely malnourished children. With appropriate case management in hospitals and follow-up care, the lives of many children can be saved, and Therapeutic Feeding Unit or severe malnutrition wards can dramatically lower case fatality rates. In certain hospitals that have used these case management methods, the mortality rate has been reduced from over 30% to less than 5%.

The World Health Organization (WHO) has developed a manual that describes current case management practices for children with SAM and the Federal Ministry of Health (FMOH) has also developed national protocol for management of severe acute malnutrition. This training course has adopted the WHO training manual to the Ethiopian context in line with the National protocol for the management of SAM for children less than 5 years. It builds on the experience of Ethiopia in the management of severe acute malnutrition in in-patient and out-patient programs. This course will teach how to implement many of the guidelines in the FMOH protocol and WHO manual.

1.2. Overview of the Management of Acute Malnutrition

Until 2000, the management of Acute Malnutrition has been restricted to facility-based approaches, greatly limiting coverage and impact. In response, the Community-Based Therapeutic Care (CTC) approach to the management of acute malnutrition was developed in 2001. The approach aims to reach the maximum number of children with acute malnutrition and to ensure access and coverage by providing treatment at many decentralized sites instead of a few centrally located inpatient facilities.

The comprehensive management of acute malnutrition, which is also called Community-Based Management of Acute Malnutrition (CMAM), consists of four main components:

1. **Community outreach/mobilization:** Health Extension workers and Community health workers (CHWs) conduct community screening for early case finding; give basic nutritional advice to mothers; and provide patient follow up for defaulters and encourage return to the program. Community mobilization also includes sensitization of the population to promote understanding of program objectives and methods. Session 7 of the module deals with the OTP care.

2. **Inpatient Treatment/ care:** Children who are acutely malnourished with associated medical complications and/or poor appetite; and infants less than 6 months with SAM need to be treated in inpatient care facility until they are well enough to continue nutritional rehabilitation in OTP.

3. **Outpatient Treatment Program (OTP):** Outpatient care is intended for children presenting SAM without medical complications and for children that have recovered in inpatient care after they have recovered appetite. They receive ready-to-use therapeutic food (RUTF) and routine medicines, which are taken at home, and the child attends the outpatient care site every week. Most children with SAM have no medical complications and can be treated in outpatient care. Session 7 of the module deals with the OTP care.

   This module deals with the inpatient and OTP care and partly community mobilization.

4. **Targeted supplementary feeding program (TSF):** Individuals with moderate acute malnutrition and no medical complications are supported and provided with dry take-home rations (or in some cases on-site feeding) and simple medicines. Because this is not therapeutic care, it will not be discussed further in this module.

1.3. Purpose of this training course

This course is designed for senior nurses, health officers, nutritionists, and doctors in health centers and hospitals that have or plan to have units or wards for children less than 5 years with SAM. The course will teach skills and knowledge specifically needed for management of children with SAM as in-patient and outpatient at the health centers and hospitals. The course will not teach basic medical techniques that are taught in schools of medicine and nursing (such as how to insert an IV or take a blood sample).

It is expected that participants will return to their health facilities and begin to implement the in-patient and OTP case management practices described in this course. In order to implement these practices, the health facilities therapeutic feeding unit/ severe malnutrition ward or OTP will need certain basic supplies and equipment listed in Annex A of the module.

1.4. Course methods and materials

This course uses a variety of methods of instruction, including reading, written exercises, discussions, role plays, video, and demonstrations and practice in a real Therapeutics feeding Units or severe malnutrition ward. Practice, whether in written exercises or on the ward, is considered a critical element of instruction.

Small groups of participants are led and assisted by “facilitators” as they work through the course modules (booklets that contain units of instruction). The facilitators are not lecturers, as in a traditional classroom. Their role is to answer questions, provide individual feedback on exercises, lead discussions, structure role plays, etc.

To a great extent, participants work at their own pace through the modules, although in some activities, such as role plays and discussions, the small group will work together.

The module is organized into nine Sessions. Session 2 to 6 discuss the in-patient care for SAM; Session 7 discusses the out-patient treatment of SAM; Session 8 describes the monitoring and reporting of TFP; and Session 9 explains how to involve Mothers in SAM care.

Session 1: Introduction
Session 2: Principles of Care
Session 3: Management of Medical Complications
Session 4: Feeding
Session 5: Daily Care
Session 6: Monitoring and Problem Solving of In-patient Care
Session 7: Outpatient Treatment Program
Session 8: Monitoring and Reporting of TFP
Session 9: Involving Mothers in Care

In addition to the module, you should have the following course materials:

- Chart booklet
- Photographs booklet
- 5 laminated reference cards:
    - Weight-for-height reference card
    - F-75 reference card for phase 1
    - F-100 and RUTF reference card for transition and Phase 2
    - SAM classification wall chart

All other course materials, such as the video and blank recording forms, will be provided in your classroom as needed.

Optional reference materials:

- FMOH. Protocol for the management of severe acute malnutrition. March 2007
- WHO 2003: Guidelines for the inpatient management of severely malnourished children
- WHO 1999. Management of severe malnutrition: a manual for physicians and other senior health workers.

1.5. Learning objectives of the module

Each session in this course will provide information and examples and allow you to practice skills necessary for managing severely malnourished children. The skills and information presented in each session are briefly outlined below:

- Identify a child with SAM and understand the essential components of care.
- Identify and manage a child with SAM with medical complications.
- Be able to manage children with SAM as in-patient like Phase 1, Transition and Phase 2.
- Prepare pre-packaged F75 and F100 or F75 and F100 from locally available ingredients and discuss how to train other staffs in feeding related tasks.
- Provide daily care and handle children with SAM appropriately.
- Be able to manage children with SAM as Out-patient
- Identify problems by monitoring individual child progress and investigating causes of problems.
- Be able to give complete discharge instructions.
- Be able to record and report the management of SAM
- Be able to record and report the performance of TFP (both in-patient and OTP).
- Encourage involvement of mothers in care and prepare them to continue good care at home.
- Evaluate the performance of individual in-patient care (TFU) and OTP

1.6. Objectives for clinical practice sessions

Each clinical session has specific objectives for observation and practice. The course schedule is designed so that participants learn about skills in the Sessions before practicing those skills in a clinical session.

Day 1: Tour of ward(s) and Clinical Signs

- Observe the admissions area
- Observe the emergency treatment area
- Observe how the severe malnutrition in-patient care ward or area is organized
- Observe kitchen area
- Observe any special areas for play, health education, etc.
- Look for clinical signs of severe acute malnutrition
- Weigh, and measure height and MUAC of children
- Look up weight-for-height percentage of median
- Identify children who are severely malnourished

Day 2: Management of Medical Complications

- Observe initial management of severely malnourished children
- Identify clinical signs of severe malnutrition, hypoglycemia, hypothermia, shock, and dehydration
- Practice filling a multi-chart during initial management
- Assist in doing initial management, if feasible, such as:
    - Taking rectal temperature
    - Measure and give ReSoMal
    - Monitor a child on ReSoMal
    - Giving bolus of glucose for hypoglycemia
    - Warming child
    - Giving first feed
- Determine antibiotics and dosages

Day 3: Feeding

- Observe nurses measuring and giving feeds
- Practice measuring, giving, and recording feeds
- Review 24-Hour Food Intake in the multi-charts and plan feeds for next day
- Determine if child is ready for transition phase and phase 2

Day 4: Daily Care and Feeding

- Assist with feeding (continued practice)
- Keep multi-charts on children observed and cared for
- Participate in daily care tasks, as feasible:
    - Measure respiratory rate, pulse rate and temperature
    - Administrer eye drops, antibiotics, multivitamins; change eye bandages, etc.
    - Weigh child and record (on the anthropometric chart section of the multi- chart)
- Provide feedback on the recording and reporting formats of the facility

Day 5: Outpatient Treatment Program (OTP)

- Observe the organization of OTP
- Assess and Admit a Child to Outpatient Care
    - Assess children for bilateral pitting edema
    - Measure MUAC, weight, height
    - Classify nutritional status
    - Test appetite (wash hands before handling the RUTF)
    - Decide: referral to inpatient care or admission to outpatient care
- Treat a child with SAM
    - Calculate doses and give routine medicines to child
    - Explain medical treatment to mother/caregiver
    - Calculate amount of RUTF for child, record it and give to the mother
    - Discuss key messages with mothers/caregivers
- Record on outpatient care treatment cards and registration book
- Review registration book and the Previous Monthly and Discuss With Staff How to Use and Interpret Data
- Assess and Treat a Child During an Outpatient Care Follow-On Session

Additional Objectives for In-Patient clinical Practice

- Observe teaching session with mothers
- Observe play session

SESSION 2: PRINCIPLE OF CARE

S-2 Principles of Care

Introduction

This Session will describe how to recognize a child with severe acute malnutrition and will outline the essential components of care. The severely malnourished child is likely to have many serious health problems in addition to malnutrition. In many cases these problems may not be clinically apparent. In some cases the usual treatment for a problem may be harmful or even fatal for a severely malnourished child. This session will describe how the physiology of the severely malnourished child is different, and how these differences affect care.

Learning objectives

This session will describe and allow you to practice the following skills needed to identify children with severe malnutrition:

- Recognizing signs of severe acute malnutrition
- Weighing and measuring children (in clinical session)
- Determining a Weight-for-Height or Length percentage of median based on the child's weight and length.
- Admission procedure for severely malnourished children

In addition the session will describe:

- How the physiology of severe malnutrition affects care of the child.
- Important things NOT to do and why.
- Recommended admission criteria for in-patient care.
- Principles of Phase 1, transition phase and phase2 treatment of SAM.

1.0 Recognize signs of severe acute malnutrition

You may be familiar with the following conditions that are related to SAM. Some of the signs help to determine whether or not a child has SAM, and whether to admit for in-patient or out-patient care. The other signs are used in determining treatments needed..

Severe wasting

A child with severe wasting has lost fat and muscle and has a "skin and bones" appearance. Another term used for this condition is marasmus. Severe wasting in infants of under 6 months is marked by visible severe wasting. Whereas for children >6 month severe wasting is assessed objectively using anthropometric measurements (WFL/H, MUAC).

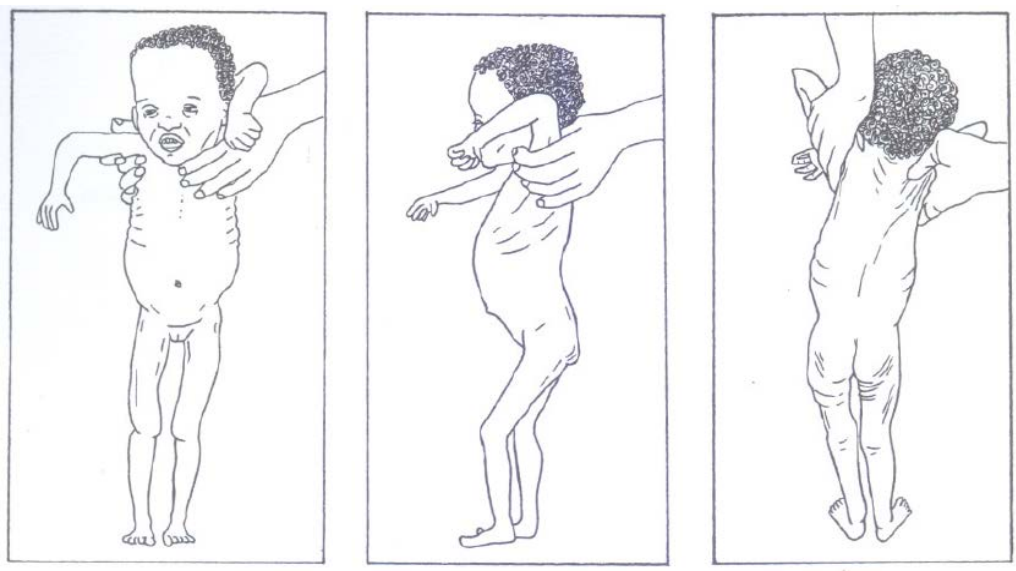
Visible severe wasting is an important sign of SAM for infants under 6 months of age. It is used as a criteria to classify as SAM only for infants below 6 months age. To look for severe wasting, remove the child's clothes. Look at the front view of the child:

- Is the outline of the child's ribs easily seen?
- Does the skin of the upper arms look loose?
- Does the skin of the thighs look loose?

Look at the back view of the child:

- Are the ribs and shoulder bones easily seen?
- Is flesh missing from the buttocks?

When wasting is extreme, there are folds of skin on the buttocks and thighs. It looks as if the child is wearing "baggy pants".
Because a wasted child has lost fat and muscle, this child will weigh less than other children of the same height/length and will have a low weight-for-height/Length.



Illus. 1: Child with visible severe wasting

Edema

Edema is swelling from excess fluid in the tissues. Edema is usually seen in the feet and lower legs and arms. In severe cases it may also be seen in the upper limbs and face.

To check for edema, grasp both feet so that they rest in your hand with your thumbs on top of the feet. Press your thumbs gently for three seconds or count 101,102,103. The child has edema if a pit (dent) remains in both feet when you lift your thumbs (see Fig. 1).

To be considered a sign of severe malnutrition, edema must appear in both feet. If the swelling is only in one foot, it may just be a sore or infected foot. The extent of edema is commonly rated in the following way:

Grades of bilateral pitting oedema	Definition
Absent	Absent
Grade +	Mild: Both feet/ankles
Grade ++	Moderate: Both feet, plus lower legs, hands or lower arms
Grade +++	Severe: Generalised bilateral pitting oedema, including both feet, legs, arms and face

Note: Edema is a characteristic of kwashiorkor, which is a form of severe malnutrition. The term kwashiorkor will not be used in this course. This course will simply refer to the sign edema.

Fig. 1: Foot with pitting edema

Dermatosis

Dermatosis is a skin condition. In severe malnutrition, it is more common in children who have edema than in wasted children. A child with dermatosis may have patches of skin that is abnormally light or dark in color, shedding of skin in scales or sheets, and ulceration of the skin of the perineum, groin, limbs, behind the ears, and in the armpits. There may be weeping lesions. There may be severe rash in the nappy area. Any break in the skin can let dangerous bacteria get into the body. When the skin is raw and weeping, this risk is very high.

The extent of dermatosis can be described in the following way:

+ mild: discoloration or a few rough patches of skin
+ + moderate: multiple patches on arms and/or legs
+ + + severe: flaking skin, raw skin, fissures (openings in the skin)

Treatment of dermatosis will be discussed in Daily Care Session.

Eye signs

Children with severe malnutrition may have signs of eye infection and/or vitamin A deficiency.

- **Bitot's spots** – superficial foamy white spots on the conjunctiva (white part of the eye). These are associated with vitamin A deficiency.

- **Pus and inflammation** (redness) are signs of eye infection.

- **Corneal clouding** is seen as an opaque appearance of the cornea (the transparent layer that covers the pupil and iris). It is a sign of vitamin A deficiency.

- **Corneal ulceration** is a break in the surface of the cornea. It is a severe sign of vitamin A deficiency. If not treated, the lens of the eye may push out and cause blindness. Corneal ulceration is urgent and requires immediate treatment with vitamin A and atropine (to relax the eye).

Treatment of all eye signs will be discussed in Management of medical Complications and in Daily Care Sessions.

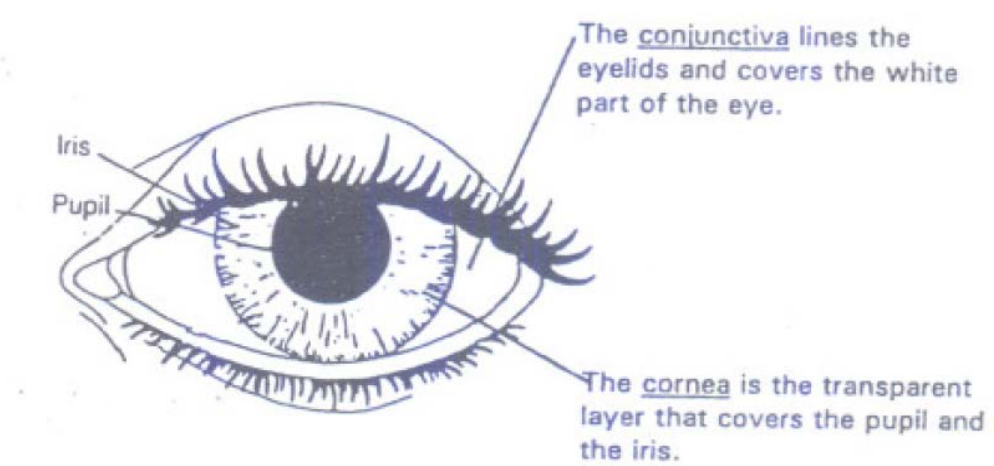


Fig 2.: Normal Eye

EXERCISE A

In this exercise you will look at photographs of children and identify signs related to SAM.

Open your photo booklet. Each photo is numbered. For each photo listed below in this exercise, write down all of the following signs you see:

- severe wasting
- edema
- dermatosis,
- eye signs (Bitot's spots, pus, inflammation, corneal clouding, corneal ulceration)

If the child has dermatosis or edema, try to estimate the degree of severity (+, ++, or +++). If you see none of the signs, write NONE. When everyone in the group has finished, there will be a discussion of the photographs. Photo 1 is described below as an example.

Photo 1: Moderate (++) edema, seen in feet and lower legs Severe wasting of upper arms -- Ribs and collar bones clearly show.

Photo 2:

Photos 3 and 4 (front and back view of same child):

Photo 5:

Photo 6:

Photo 7:

Photo 8:

Photo 9:

Photo 10:

Photo 11:

Photo 12:

Photo 13:

Photo 14:

Photo 15:

When you have completed this exercise, tell a facilitator that you are ready for the group discussion.

2.0 Weigh and measure the child

In addition to looking for visible signs of severe malnutrition, it is important to weigh and measure the child. Then the child's weight-for-height can be compared to averages.

2.1 Measure length/height

Carefully measure the child's length or height once on the first day. For children less than 85 cm in length, or children too weak to stand, measure the child's length while supine (lying down).

For children 85 cm or more, measure standing height. Note: Length is usually greater than standing height by 0.5 cm. This difference has been accounted for in the weight-for-height table in the chart booklet and on your Weight-for-Height Reference Card. If the child is 85 cm or more but cannot be measured standing, subtract 0.5 cm from the supine length.

Whether measuring length or height, the mother should be nearby to help soothe and comfort the child.

To measure length:
Use a measuring board with a headboard and sliding foot piece.

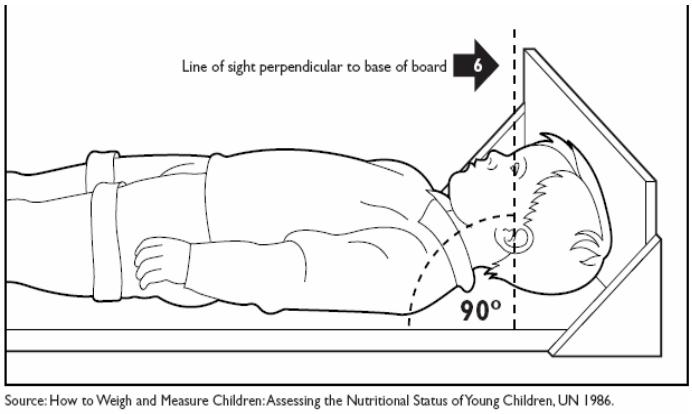
Lay the measuring board flat, preferably on a stable, level table. Cover the board with a thin cloth or soft paper to avoid causing discomfort and the baby sticking to the board.

Measurement will be most accurate if the child is naked; diapers make it difficult to hold the infant's legs together and straighten them. However, if the child is upset or hypothermic, keep the clothes on, but ensure they do not get in the way of measurement. Always remove shoes and socks. Undo braids and remove hair ornaments if they interfere with positioning the head. After measuring, re-dress or cover the child quickly so that he does not get cold.

Work with a partner. One person should stand or kneel behind the head board and:

- Position the child lying on his back on the measuring board, supporting the head and placing it against the headboard.
- Position the crown of the head against the headboard, compressing the hair

.



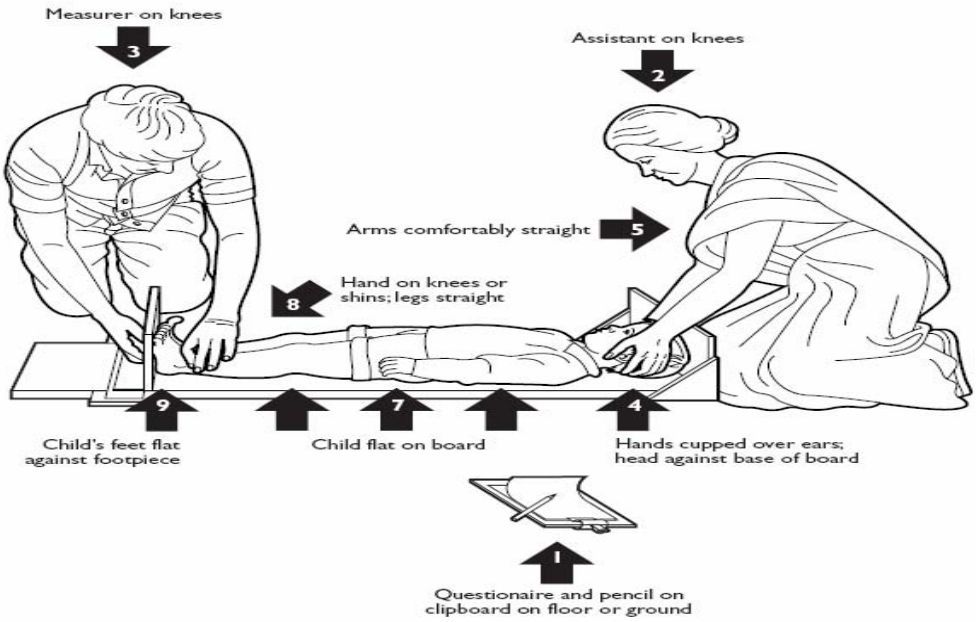
Source: How to Weigh and Measure Children: Assessing the Nutritional Status of Young Children, UN 1986.

Illus. 2 , head looking Straight up

- Hold the head with two hands and tilt upwards until the eyes look straight up, and the line of sight is perpendicular to the measuring board.
- Check that the child lies straight along the centre line of the measuring board and does not change position.

The other person should stand alongside the measuring board and:

- Support the child's trunk as the child is positioned on the board.
- Place one hand on the shins or knees and press gently but firmly.
- Straighten the knees as much as possible without harming the child.
- With the other hand, place the foot piece firmly against the feet. The soles of the feet should be flat on the foot piece, toes pointing up. If the child bends the toes and prevents the foot piece touching the soles, scratch the soles slightly and slide in the foot piece when the child straightens the toes.
- Measure length to the last completed 0.1 cm and record immediately on the Multi-chart.



Illus.3, child being measured lying down

To measure standing height:

A stadiometer is any device used to measure standing height. Use a stadiometer with a vertical back board, a fixed base board, and a movable head board. The stadiometer should be placed on a level floor.

Remove the child's socks and shoes for accurate measurement. Also remove hair ornaments and undo braids if they interfere with measurement.

Work with a partner. One person should kneel or crouch near the child's feet and:

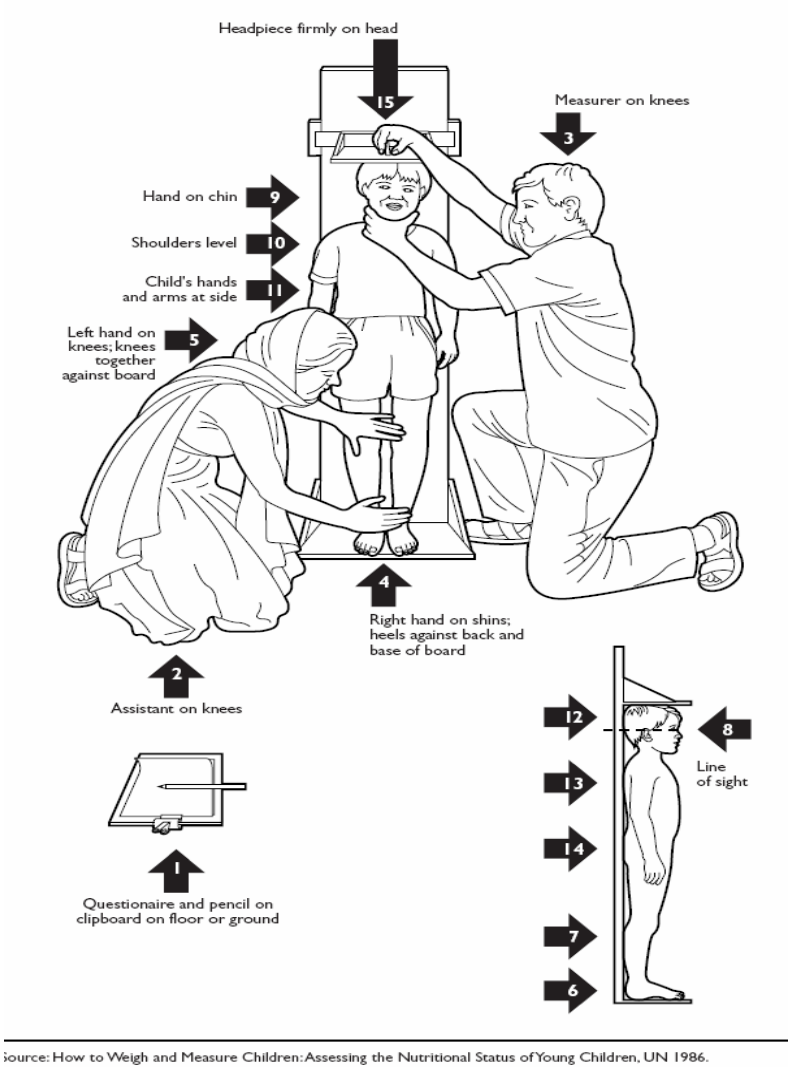
- Help the child stand with back of the head, shoulder blades, buttocks, calves and heels touching the vertical board.

- Hold the child's knees and ankles to keep the legs straight and feet flat. Prevent children from standing on their toes.

- Young children may have difficulty standing to full height. If necessary, gently push on the tummy to help the child stand to full height.

The other person should bend to level of the child's face and:

- Position the head so that the child is looking straight ahead (line of sight is parallel to the base of the board).
- Place thumb and forefinger over the child's chin to help keep the head in an upright position
- With the other hand, pull down the head board to rest firmly on top of the head and compress hair.
- Measure the height to the last completed 0.1 cm and record it immediately on the Multi chart.



Illus. 4: Child on Stadiometer

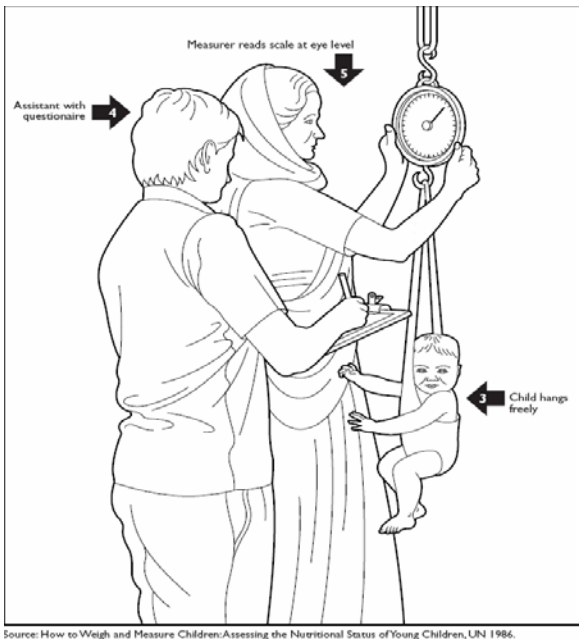
Note: *Although the terms "length" and "height" are often used interchangeably in the text of this training manual, it should be understood that length is measured for children less than 2 years or less than 85 cm, and standing height is measured for children older than 2 years or 85 cm or more.*[3]

2.2 Weigh the child

Weigh the child as soon as possible after he arrives. If the child is admitted, weigh the child once daily, preferably at about the same time each day. The weighing time should be about one hour before or after a feed.

To weigh the child:

- Remove the child's clothes, but keep the child warm with a blanket or cloth while carrying to the scale.
- Put a cloth in the scale pan to prevent chilling the child.
- Adjust the scale to zero with the cloth in the pan. (If using a scale with a sling or pants or basin, adjust the scale to zero with that in place.)
- Place the naked child gently in the pan (or in the sling or pants).
- Wait for the child to settle and the weight to stabilize.
- Measure weight to the nearest 100gm or as precisely as possible. Record immediately on multi-chart.
- Wrap the child immediately to re-warm.



Source: How to Weigh and Measure Children: Assessing the Nutritional Status of Young Children, UN 1986.

Illus. 5: Measuring by Salter scale using pants **Illus. 6: Measuring by Salter scale using basin**

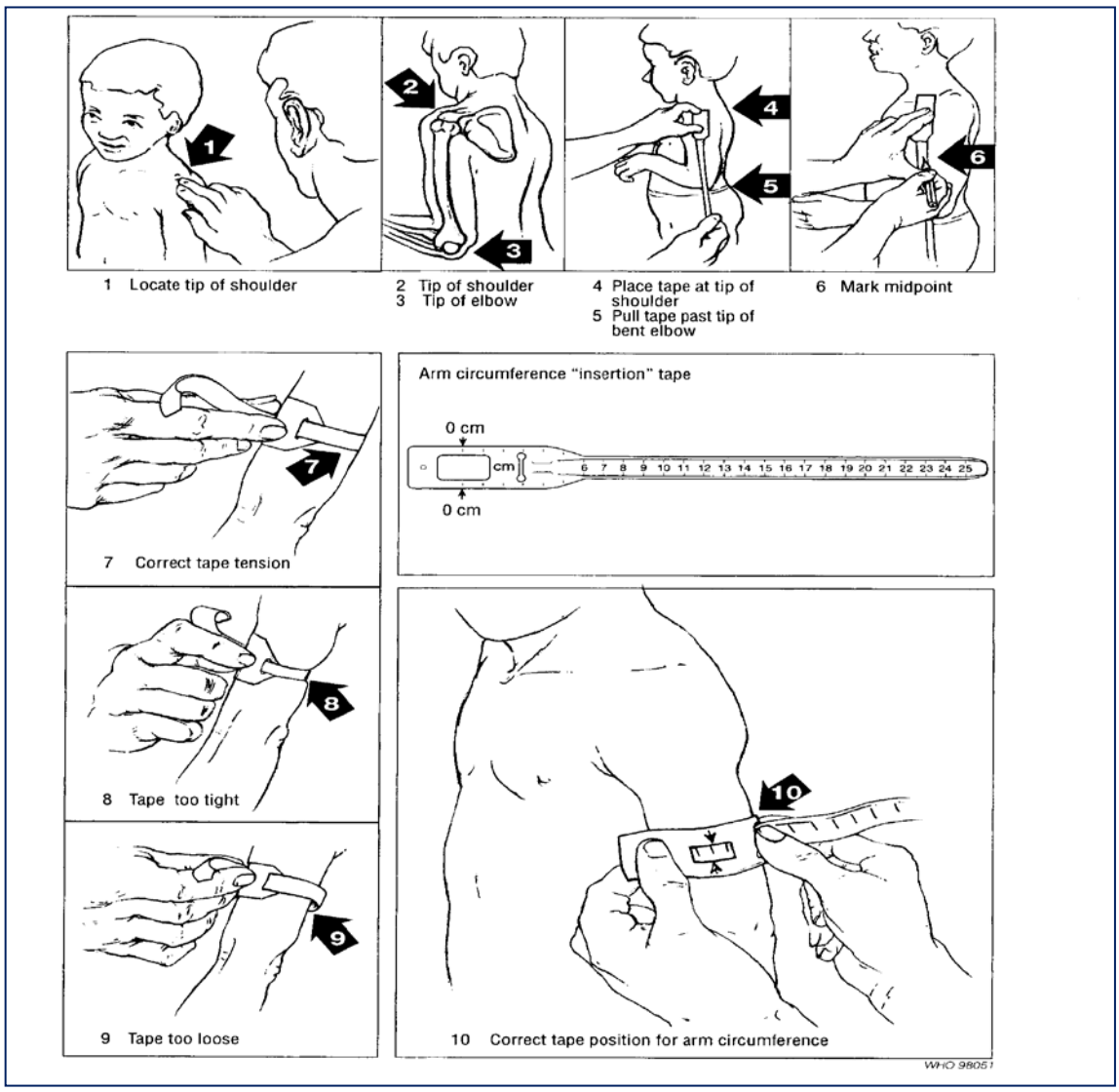
2.3 Standardize scales

Standardize scales daily or whenever they are moved:

- Set the scale to zero.
- Weigh one object of known weight and record the measured weight. (A container filled with stone or IV fluids etc. if the weight is accurately known.)
- Repeat the weighing of these objects and record the weights again.
- If there is a difference of 0.01 kg or more between duplicate weighing, or if a measured weight differs by 0.01 kg or more from the known standard, check the scales and adjust or replace them if necessary.

2.4 Measure mid-upper arm circumference.

MUAC is measured on the upper left arm. To locate the correct point for measurement, the child's elbow is flexed to 90°, with the palm facing upwards. A measuring tape is used to find the midpoint between the end of the shoulder (acromion) and the tip of the elbow (olecranon); this point should be marked. The arm is then allowed to hang freely, palm towards the thigh, and the measuring tape is placed snugly around the arm at the midpoint mark. The tape should not be pulled too tight or too loose. Read the measurement to the nearest 0.1 cm. Further details of the procedure are illustrated below.



Illus 7: Measuring MUAC

3.0 Identifying a child with severe acute malnutrition

3.1 Determine Percent-of-median[1] based on child's weight and length/height[2]

What is Percent-of-median?

It is a way of comparing a measurement, in this case a child's weight-for-length, to an "average" (median). The median used in the national protocol and in this course are NCHS reference values for weight-for-height and weight-for-length. It is a ratio of a child's weight to the median weight of a child of the same height in the reference, expressed as percentage. As a concrete example if the median (or average) weight in the reference tables for a particular height was 10 kg and a child weighed 8 kg, she/he was 80% weight-for-height. A table in the chart booklet on page 29 (Annex I) shows the Percent-of-median for children of different weights and heights. It is also presented on the Weight-for-Height Reference Card.

Note:

1. *There is a new WHO child growth standards/ reference that uses z-score classification system, which is comparable across ages and heights, and among different indicators. The new WHO standard for SAM has not yet been included in the national protocol for SAM. That is why the percent of median and NCHS reference are used in this course.*

2. It is important to consider a child's weight-for-height rather than simply weight-for-age. The latter is affected by stunting. Stunting may cause low weight-for-age when a child is adequate weight-for-height. Feeding can correct wasting but cannot easily correct stunting.

How to calculate the weight/height percentage

Example: For a child of 80.5 cm and weighing 8.7 kg, Weight-for-Height Reference table give a median weight for a child of this height of 10.9 kg:
Weight-for-height = (8.7/10.9) x 100 = 80%

How to use the Weight-for-Height Reference table

To use the reference table in the chart booklet or on your Weight-for-Height Reference Card:

- First, find the child's length or height in the first column of the table.
- Then look in the right columns in the same row to find the weight that correspond to the weight of the child.
- Look at the top of the column to see what the child's percentage of median or degree of acute malnutrition is.

Note: *The child's weight may be between two percentage of median. If so, indicate that the weight is between these percentage of median by writing less than* (<). For example, if the weight is between 70 and 75%, write down as child's percentage of median is between 70 and 75%.

Examples

1. A child is 63 cm tall and weighs 6.5 kg

- On the Weight-for-Height reference table, look in the first column and look for the figure 63 (=height).
- Take a ruler or a piece of card place it under the figure 63 and the other figures on the same line.
- On this line, find the figure corresponding to the weight of the child, in this case 6.5.
- Look to see what column this figure is in the percentage of median. In this case it is in the **Weight Normal** column which is 100% of the median weight for height. In this example the child's weight is normal in relation to his height. He is therefore growing normally.

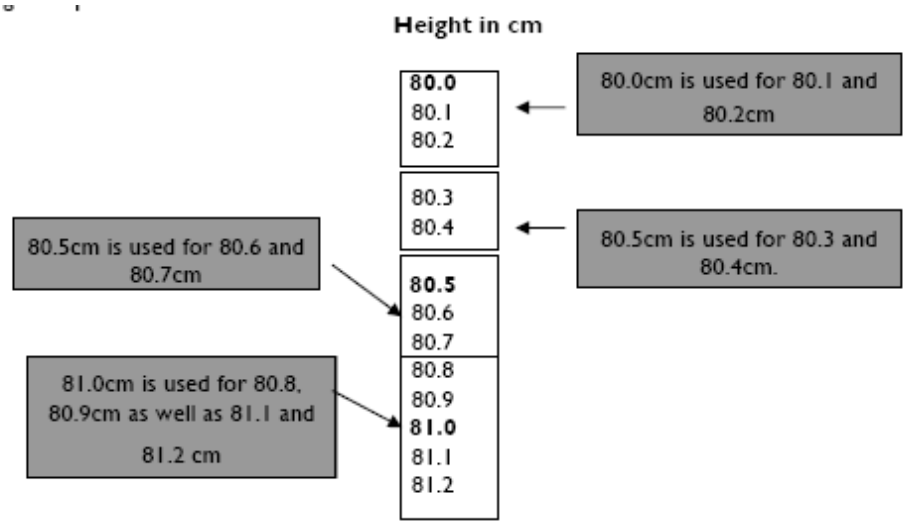
2. A child is 78 cm tall and weighs 8.3 kg

- This child is in the 80% of the median weight for height column. He is too thin in relation to his height. He has moderate acute malnutrition

Note: *It may be that the weight or the height is not a whole number.*

Example: height 80.4 cm and weight 7.9 kg. These two figures are not in the table.

For the height*: The height measurement has to be rounded to the nearest 0.5cm, as it is in the following example.*



For the weight: *Looking at the table, for a height of 80.5 cm the weight is 7.9 kg. This is between 7.6 and 8.1 kg. In order to express the fact that the child is between these two weights, write down this child's percentage is between 70 and 75%.*

EXERCISE B

Refer to weight for height or length reference table in your chart booklet or on your Weight-for-Height Reference Card). Indicate the percentage of median for each child listed below.

1. Shetaye, girl, length 63 cm, weight 5.0 kg

2. Robel, boy, height 101 cm, weight 10.8 kg

3. Tigist, girl, length 69.8 cm, weight 6.3 kg

4. Kumsa, boy, length 82 cm, weight 7.5 kg

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

3.2 Recommended criteria to diagnose severe Acute Malnutrition and for admission to TFP

3.2.1. Recommended criteria for SAM and Admission to TFP

All children who fulfill any of the following criteria have SAM and they should be admitted to a Therapeutic Feeding Program (In-patient care (TFU) or Out-Patient Treatment Program (OTP)):

1. **Infants less than six months or less than 3 Kg:**

   - Weight –for- Length (WFL) less than 70% or < -3Z score
     OR
   - Presence of pitting Edema of both feet
     OR
   - Visible Severe Wasting if it is difficult to determine WFL

2. **Children 6 months to 5 years:**

   - Weight –for- Length (WFL) / WFH less than 70 % or < -3Z score
     OR
   - Presence of pitting Edema of both feet
     OR
   - MUAC <11cm for child length greater than 65 cm

3.2.2. Medical Complications

If a child is 6 months to 5 years and has SAM according to the above criteria, check for the following serious medical complications that will determine the choice of treatment modalities (In-patient (TFU) or Out-patient (OTP)):

1. Unable to breast feed, drink or feed
2. Vomiting everything
3. Convulsions
4. Very Weak, Lethargic or unconscious
5. Hypothermia: axillary temp <35 ^{0}C or rectal < 35.5 ^{0}C
6. Fever ≥ 38.5 ^{0}C
7. Pneumonia/severe pneumonia
   - *Chest in-drawing*
   - *Fast breathing:*
   - *For child 6 month to 12 months: 50 breaths per minute and above*
   - *For a child 12 months up to 5 years: 40 breaths per minute and above*
8. Shock
9. Dehydration (*watery diarrhea with recent sunken eye balls*.)
10. Dysentery
11. Persistent diarrhoea
12. Hypoglycaemia
13. Severe anemia (*severe palmar pallor*)
14. Jaundice
15. Bleeding Tendencies
16. Dermatosis +++
17. Corneal clouding or ulceration
18. Measles (now or with eye/mouth complications)

3.2.3. Appetite Test

An appetite test is done to children ages 6 months to 5 years who have no medical complications in order to determine whether the child can eat the RUTF (Plumpy'Nut). The test shows whether the child has appetite, accepts the RUTF's taste and consistency and can swallow.

If a child fails the appetite test, it reflects a severe disturbance of the metabolism and this child needs to be treated as an in-patient. A poor appetite shows that the child has significant infection or a major metabolic abnormality such as liver dysfunction, electrolyte imbalance, etc. Such children with SAM are at immediate risk of death.

See the chart booklet (page 3) for the appetite test steps and interpretation. If a child passes the appetite test, he/she should be treated as out-patient if OTP service is available.

3.2.4. Recommended Admission Criteria and Admission Procedure

Children with SAM are treated as OTP or in-patient according to the severity of the child's condition. The age of a child, presence or absence of medical complications and result of the appetite test determine whether a child with SAM should be treated in OTP or in-patient care (TFU, or stabilization center or SAM ward). In-patient and OTP are different components of the same program. Use the *Assessment and Classification of a Child with Acute Malnutrition* table 1 on page 25 or on your chart booklet (pages 1 & 2) to determine which treatment is appropriate for a child with SAM.

- **Out-patient Treatment Program (OTP):** Children with SAM and has no medical complications, and who pass the appetite test are classified as uncomplicated SAM and they are treated in OTP with RUTF and routine medicines. These are taken at home, and the child attends the outpatient care site every one week. Read session 7of the module for detail management protocol of OTP.

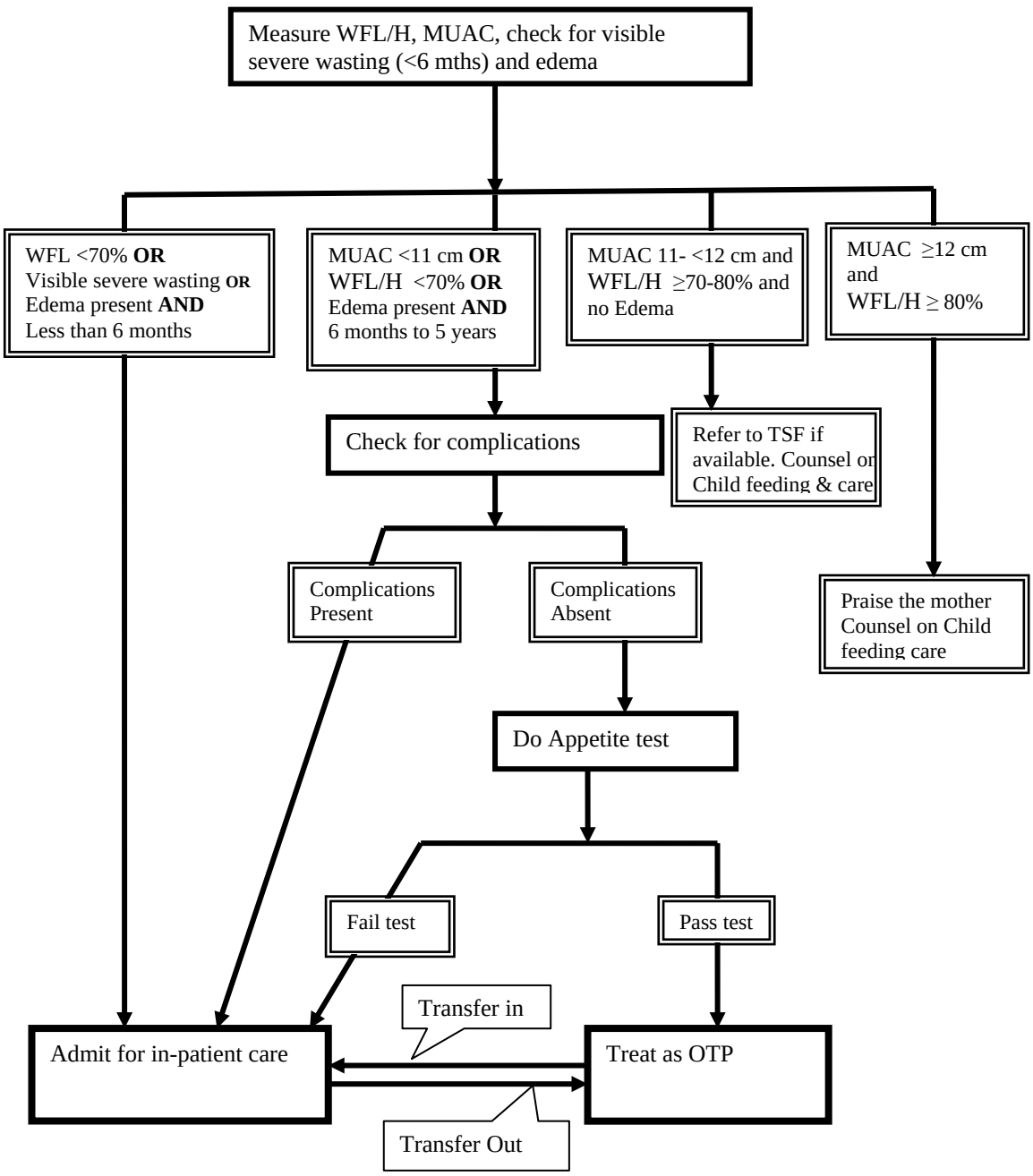
- **In-patient care (TFU):** All children with SAM need to be treated in an in-patient care facility until they are well enough to continue treatment in OTP if they fulfill any one of the following:

    1. Infants below six months of age with SAM
    OR
    2. Children 6 months to 5 years with SAM who have any one of the medical complications or failed appetite test
    OR
    3. Children with SAM and referred from OTP for in-patient care
    OR
    4. When OTP is not available in your working area or where the care taker lives or if the care taker's choice is inpatient care, all SAM children need to be admitted for in-patient care even if they do not fulfill the In-patient admission criteria.

A child who fulfills any of the first three criteria is classified as severe complicated acute malnutrition

Note: This training module describes the in-patient care for SAM and the OTP module will describe the Out-patient Treatment Program.

Note: *Children with severe acute malnutrition that need in-patient care are in danger of death from hypoglycemia, hypothermia, fluid overload, and undetected infections. They cannot be treated like other children. Their feeding and fluids must be carefully controlled, or they could die. To ensure the proper feeding and treatment routines, it is critical to keep these children in TFU/SC or separate rooms with in a ward. Other health problems and infections should be treated in these rooms.*



Admission Procedure Algorithm

Tab**le** 1: Assessment and Classification of Children for Acute Malnutrition

Children age 6 Months to 5 years		
Assess	**Classify**	**Action to take**
• WFL/H < 70% of median or < -3Z score OR MUAC <11cm OR Edema of both feet (+, ++), **PLUS** o Any one of the medical complications (see list below*), or o Failed Appetite test OR • +++ Edema, OR • Marasmic Kwashiorkor (WFL/H < 70% with edema, OR MUAC <11cm with edema)	**Complicated Severe Acute Malnutrition**	**Admit for in-patient management**
• WFL/H < 70% of median or < -3Z score OR MUAC <11cm OR • Edema of both feet (+, ++) AND • No medical complication AND pass appetite test	**Uncomplicated Severe Acute Malnutrition**	**Manage in OTP using the OTP protocol or manage as in-patient if OTP service is not available**
• WFL/H ≥ 70% to < 80% or ≥ -3Z to < -2Z score OR MUAC 11cm to <12cm AND • No edema of both feet	**Moderate Acute Malnutrition**	**Refer to supplementary feeding program if available,** **Counsel on infant and child feeding/care**
• If WFL/H ≥ 80% or ≥ -2Z score OR MUAC ≥ 12 cm AND • No edema of both feet	**No acute malnutrition**	**Congratulate and Counsel the mother on infa and child feeding/care**

***List of common medical complications:**

1. Unable to breast feed, drink or feed
2. Vomiting everything
3. Convulsions
4. Very Weak, Lethargic or unconscious
5. Hypothermia: axillary temp <35 ^{0}C or rectal < 35.5 ^{0}C
6. Fever ≥ 38.5 ^{0}C
7. Pneumonia/severe pneumonia
8. Shock
9. Dehydration (*watery diarrhea with recent sunken eye balls*.)
10. Dysentery
11. Persistent diarrhoea
12. Hypoglycaemia
13. Severe anemia (*severe palmar pallor*)
14. Jaundice
15. Bleeding Tendencies
16. Dermatosis +++
17. Corneal clouding or ulceration
18. Measles (now or with eye/mouth complication)

Edema grading: bilateral edema below ankles (+); below the knees & the elbows (++); generalized edema involving the upper arms & face (+++).
Dermatosis grading: few discolored or rough patches of skin (+); multiple patches on arms and/or legs (++); flaking skin, raw skin or fissures (openings in the skin) is grade +++ dermatosis.
Measles: If a child has generalized rash with one of the following: cough, runny nose or red eys
Measles with eye or mouth complications: If a child with measles has pus draining from the eye, clouding of cornea or mouth ulcers (deep or extensive ulcers)
Most of the treatment protocols and procedures indicated in this training module also apply to children over 5 years of age. However, some areas may need to be changed to fit the age range, particularly the MUAC cut-off point for admission.

EXERCISE C

In this exercise, you will look at photographs and consider information about a child in order to determine if the child should be admitted for In-patient care. Use the criteria and the Assessment and Classification of a Child with Acute Malnutrition table given on the previous page in this session. Refer to table 16 of the chart booklet or your Weight-for-Height Reference Card as needed.

Photo 18: This child is a girl, age 20 months. She is 70 cm in length. She weighs 6.5 kg and fails the appetite test. She has no medical complication. Should she be admitted to In-patient care? Why or why not?

Photo 19: This child is a girl, age 6 months. She is 60 cm in length and weighs 4.0 kg. Does she have Severe Acute Malnutrition? Why or why not?

Photo 20: This child is a boy, age 18 months. He is 65 cm in length and weighs 4.8 kg. He has no medical complication and passed appetite test. Should he be admitted to the in-patient care? Why or why not?

No Photo: This child is a girl, age 5 months. She is 65 cm in length and weighs 4.0 kg. Should she be admitted to the in-patient care? Why or why not?

No Photo: This child is a boy, age 7 months. His length is 60 cm. He weighs 3.5 kg and has edema of both feet. Should he be admitted to the in-patient care? Why or why not?

When you have completed this exercise, tell a facilitator that you are ready for the group discussion and drill.

Example of Therapeutic Treatment Multi-Chart

Page 34 shows the first and second part of a case record called **Therapeutic Treatment In-patient Multi-Chart.** Information has been entered about a child's presenting signs of SAM

The **Therapeutic Treatment Multi-Chart** is the primary tool used for in-patient treatment and follow up of a child with SAM. All staffs use the same multi-chart to record all the information needed to manage child with SAM. The **Multi-Chart** has sections titled Admission and Discharge registration, Anthropometric chart, Weight chart, Therapeutic diet, Surveillance chart, Routine and Special medicine, Test results, Observation, Immunization and Discharge education.

A complete, blank **Therapeutic Treatment Multi-Chart** is provided on Annex B on page 266. **The Multi-Chart** will be used in this course as both a job aid and a record of care. As the session continues, you will learn about the sections of the chart.

Until everyone is ready, in the meantime, you may study the example on the next page.

When everyone is ready, your facilitator will present a brief introduction on how to use the Therapeutic Treatment Multi-Chart.

S-2 Principles of Care

Registration No…464/01…..

Sheet No……1…….

Father's Name: Abebe.

First Name: Saron.

Address……..

Distance to House…….

Centre: TFU…….

Care hosp- ward/hosp-SNU/TFC

Day care/Day-care-non-res

Age (d/m/y) ……18 mos……

Birth date _____/_____/_____

Sex F …

Major Problems

1. SAM

2……...……..

3…….

Admission Date 14_/_2_/01

Time 10:00 am/pm

Readmission …… Y/N

From…….

Old Reg Nos……

Breastfeeding…..… Y/N

Complementary feeding..Y/N

Discharge Date _____/_____/_____

Cured **Defaulter** **Cause**

Dead **Time……am/pm** ……

Med Transfer **To……** ……

Nut referal **To……** …….

Non responder **To……**

Follow up by …….

Anthropometric Chart																						
	Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	Height (cm)	72																				
	Weight (Kg)	6.2																				
	Wt for Ht (%)	69																				
	MUAC (cm)																					
	Edema (0 to +++)	0																				

4.0 How does the physiology of severe malnutrition affect care of the child?

The child with severe malnutrition must be treated differently because his physiology is seriously abnormal due to **reductive adaptation.**

4.1 What is reductive adaptation?

The systems of the body begin to "shut down" with severe malnutrition. The systems slow down and do less in order to allow survival on limited calories. This slowing down is known as reductive adaptation. As the child is treated, the body's systems must gradually "learn" to function fully again. Rapid changes (such as rapid feeding or fluids) would overwhelm the systems, so feeding must be slowly and cautiously increased.

A simplified explanation of the implications reductive adaptation for care is provided below.

4.2 How does reductive adaptation affect care of the child?

Reductive adaptation affects treatment of the child in a number of ways. Three important implications for care are described in the next paragraphs.

Presume and treat infection

Nearly all children with severe malnutrition have bacterial infections. However, as a result of reductive adaptation, the usual signs of infection may not be apparent, because the body does not use its limited energy to respond in the usual ways, such as inflammation or fever.

Examples of common infections in the severely malnourished children are ear infection, urinary tract infection, and pneumonia. Assume that infection is present and treat all severe malnutrition admissions with broad spectrum antibiotics. If a specific infection is identified (such as Shigella), add specific appropriate antibiotics to those already being given.

Note: Choices of antibiotics will be discussed in the Management of medical Complications Session.

Do not give iron early in treatment

Due to reductive adaptation, the severely malnourished child makes less hemoglobin than usual. Iron that is not used for making hemoglobin is put into storage. Thus, there is "extra" iron stored in the body, even though the child may appear anemic. Giving iron early in treatment will not cure anemia, as the child already has a supply of stored iron.

Giving iron early in treatment can also lead to "free iron" in the body. Free iron can cause problems in three ways:

- Free iron is highly reactive and promotes the formation of free radicals, which may engage in uncontrolled chemical reactions with damaging effects.
- Free iron promotes bacterial growth and can make some infections worse.
- The body tries to protect itself from free iron by converting it to ferritin. This conversion requires energy and amino acids and diverts these from other critical activities.

Later, as the child recovers and begins to build new tissue and form more red blood cells, the iron in storage will be used and supplements will be needed.

Provide potassium and restrict sodium

Normally the body uses a lot of energy maintaining the appropriate balance of potassium inside the cells and sodium outside the cells. This balance is critical to maintaining the correct distribution of water inside the cells, around the cells and in the blood.

In reductive adaptation, the "pump" that usually controls the balance of potassium and sodium runs slower. As a result, the level of sodium in the cells rises and the potassium leaks out of the cells and is lost (for example, in urine or stools). Fluid may then accumulate outside of the cells (as in edema) instead of being properly distributed through the body.

All severely malnourished children should be given potassium to make up for what is lost. (They should also be given magnesium, which is essential for potassium to enter into the cells and be retained.). The commercially prepared F-75 and F-100 have enough potassium and magnesium and there is no need to supplement. However, if you use the F-75 and F-100 recipe that are prepared by the health facility/ locally, Combined Mineral Vitamin mixes (CMV) should be given to supplement potassium, Magnesium, and other important minerals and vitamins.

Malnourished children already have excess sodium in their cells, so sodium intake should be restricted. If a child has diarrhea, a special rehydration solution called ReSoMal should be used instead of regular WHO ORS. ReSoMal has less sodium and more potassium than regular WHO ORS.

SHORT ANSWER EXERCISE

Briefly answer these questions as a review of the previous section:

1 When a child is severely malnourished, why is it important to begin feeding slowly and cautiously?

2 Why should all severely malnourished children be given antibiotics?

3 Why is it dangerous to give iron early in treatment?

Tell the facilitator when you are ready to discuss these questions with the group.

5.0 Overview of the essential components of care

Overview of In-patient care

In-patient care has three important phases of treatment:

Phase 1 (Stabilization phase): children with complicated SAM are initially admitted to an in-patient facility for stabilization. These children are admitted to phase 1 room. During this phase:

- Life-threatening medical complications are treated (you will learn in session 3: Management of Medical Complications)
- Routine drugs are given to correct specific deficiencies (you will learn in session 5: Daily care)
- Feeding with F-75 milk (low caloric and sodium) is begun (you will learn in session 4: Feeding

The children in Phase 1 should be together in a separate room or section of the ward and not mixed with other patients

Transition phase: Once the child appetite recovers and the main medical complications are under control and edema start to reduce, a transition phase is started where F-100 or RUTF (Ready-to-Use Therapeutic Food) is introduced. This phase is important for slow transition as the introduction of large amounts of RUTF or F100 could lead to imbalance of body fluids and severe medical complications. In this phase:

- Routine drugs are continued
- Feeding with RUTF or F100 is started (you will learn in session 4: Feeding)

Phase 2 (Rehabilitation Phase): Children that progress through phase 1 and transition phase enter phase 2 (rehabilitation phase) when they have good appetite and no major medical complication. During phase 2:

- Routine drugs, deworming tablets and iron, are started (you will learn in session 5: Daily care
- Feeding with RUTF or F100 is increased in amount (you will learn in session 4: Feeding)
- Child starts gaining weight

Whenever possible, phase 2 is implemented as OTP with RUTF. Otherwise, it can be implemented in in-patient centers with RUTF or F100.

The criteria to move the child from one phase to another will be discussed in the feeding session.

All children will be monitored in each phase to assess their progress and the performance of the in-patient will also be monitored to follow the quality of care. You will learn how to monitor in the Daily care, and monitoring and problem solving sessions.

Overview of Outpatient Treatment Program (OTP)

Outpatient care is intended for children presenting SAM without medical complications, passed appetite test and for children that have transferred from inpatient care. Most children with SAM have no medical complications and can be treated in outpatient care.

The criteria to admit for OTP will have been discussed in assess and classify section of this session and it will be discussed further in OTP session.

During the OTP, the children with SAM receive:

- Ready-to-use therapeutic food (RUTF) which are taken at home
- Routine medicines which are taken at home,
- Follow up care at the outpatient care site every one week
- During follow up their progress in appetite and weight and presence or absence of complication will be assessed.

5.1 Feeding

F-75 and F-100 Formulas and RUTF

F-75 is the "starter" formula to use during phase 1, beginning as soon as possible and continuing for 2-7 days until the child is stabilized. Severely malnourished children cannot tolerate usual amounts of protein and sodium at this stage, or high amounts of fat. They may die if given too much protein or sodium. They also need glucose, so they must be given a diet that is low in protein and sodium and high in carbohydrate. F-75 is specially made to meet the child's needs without overwhelming the body's systems in the initial stage of treatment. **Use of F-75 prevents deaths. F-75 contains 75 kcal and 0.9 g protein per 100 ml.**

As soon as the child is stabilized on F-75, F-100 is used as a "catch-up" formula to rebuild wasted tissues during transition phase and phase 2. **F-100 contains more calories and protein: 100 kcal and 2.9 g protein per 100 ml.**

RUTF is high-energy, nutrient-dense food used for nutrition rehabilitation during phase 2 of In-patient care and in outpatient care (OTP).It does not need to be cooked or mixed with water, which prevents growth of bacteria and makes it good for out-patient or home management of SAM. It is similar in composition to F100 (except RUTF contains iron). The RUTF Plumpy'nut **has a caloric value of 500 kilocalories (kcal) and 12.5 gm of protein per one sachet of product (92 gms).** There are two types: soft lipid-based paste (Plumpy'nut®) or crushable nutrient bar (BP100).

The principle behind the recipes is to provide the energy and protein needed for stabilization and catch-up. You will learn more on these formulas/RUTF and feeding in the feeding session.

Mineral mix

Mineral mix is included in each recipe for F-75 and F-100. It is also used in making ReSoMal. The mix contains potassium, magnesium, and other essential minerals. It **is** included in F-75 and F-100 to correct electrolyte imbalance.
If you are preparing a locally made F 75, F 100 or Resomal, the mineral mix could be made in the pharmacy of the hospital (it will be explained in pages 51). Or a commercial product called Combined Mineral Vitamin Mix (CMV) may be used to provide the necessary minerals in the constitution of the preparations.

Vitamins

Vitamins are also needed in or with the feed. Vitamin mix cannot be made in the hospital pharmacy because amounts are so small. Thus, children are usually given multivitamin drops as well. The multivitamin preparation should **not** include iron.

If available, CMV may be used to provide the necessary vitamins. If CMV is used, separate multivitamin drops are not needed.

Whether using CMV or multivitamin drops, extra vitamin A and folic acid are needed. These additional requirements will be discussed in Management of medical Complications and Daily Care sessions.

Note: *The commercially manufactured F75 and F100 have all the necessary minerals and vitamins. Thus, there is no need to add mineral mix or vitamins or CMV in to these feeds.*

SHORT ANSWER EXERCISE

Briefly answer these questions as a review of the previous section:

1. Why is it important to have two different formulas (F-75, and F-100) for treating severe malnutrition?

2. Why is it important to have both F-100 and RUTF in treating SAM?

3. Mineral mix (or CMV) is included in F-75 and F-100 to correct electrolyte imbalance. What are two important minerals in this mix and why?

Tell the facilitator when you are ready to discuss these questions with the group

5.2 Process for successful management of children with SAM in In-patient care

The following process is essential for successful in-patient management of the severely malnourished child. You will learn how to do these important steps in Management of medical Complications, Feeding, and Daily Care.

1 – 2. Treat/prevent hypothermia and hypoglycemia (which are often related) by feeding, keeping warm, and treating infection.

3. Treat/prevent dehydration using Rehydration Solution for Malnutrition (ReSoMal).

4. Correct electrolyte imbalance (by giving feeds and ReSoMal).

5. Presume and treat infection with antibiotics.

6. Correct micronutrient deficiencies (by giving feeds and extra vitamins like vitamin A and folic acid as needed).

7. Start cautious feeding with F-75 to stabilize the child (usually 2-7 days).

8. Rebuild wasted tissues through higher protein/calorie feeds (F-100 or RUTF).

9. Provide stimulation, play, and loving care.

10. Prepare parents to continue proper feeding and stimulation after discharge.

5.3 Important things NOT to do and why

- **Do not give diuretics to treat edema.** The edema is partly due to potassium and magnesium deficiencies that may take about 2 weeks to correct. The edema will go away with proper feeding including a mineral mix containing potassium and magnesium. Giving a diuretic will worsen the child's electrolyte imbalance and may cause death.

- **Do not give iron during phase 1 and transition phase.** Add iron only when the child is in phase 2 (usually during week 2). As described earlier, giving iron early in treatment can have toxic effects and interfere with the body's ability to resist infection.

- **Do not give high protein formula** (over 1.5 g protein per kg body weight daily). Too much protein in the first days of treatment may be dangerous because the severely malnourished child is unable to deal with the extra metabolic stress involved. Too much protein could overload the liver, heart, and kidneys and may cause death.

- **Do not give IV fluids routinely.** IV fluids can easily cause fluid overload and heart failure in a severely malnourished child. Only give IV fluids to children with signs of shock. (Treatment will be described in Initial Treatment.)

Be sure that personnel in the emergency treatment area of the hospital know these important things NOT to do, as well as what to do.

SHORT ANSWER EXERCISE

Fill in the blanks based on your reading in the Session:

1. Two conditions that are related and must be treated immediately in a severely malnourished child are _____ and _____.

2. Cautious feeding with _____ is necessary at first to stabilize the child. Later, _____ is given to rebuild wasted tissues and gain weight.

3. If a severely malnourished child has diarrhea, a special rehydration solution called _____ should be given. This solution has less _____ and more _____ than regular ORS.

Indicate in the blank whether the statement is true or false:

4. _____ Giving IV fluids too quickly can cause heart failure in a severely malnourished child.

5. _____ Diuretics should be given to reduce edema.

Check your own answers to this exercise by comparing them to the answers given at the end of the session on page 268.

6.0 Discharge Criteria

The national protocol recommends that children with SAM should be discharged as cured from therapeutic feeding Program (TFP) if the child attains the following criteria:

Age 6 months to 5 years:

- A weight-for-length or height >=85% on more than one occasion (two days for in-patients, two weeks for out-patients)

and

- No edema for 10 days (in-patient) or 14 days (out-patient); or

- A target weight gain reached for two consecutive measurements or visits (see target weight table) if the child is admitted with MUAC.

Age less than 6 months or less than 3 kg being breast fed:

- if he/she is gaining weight on breast milk alone after the Supplemented Suckling technique has been used,

Age less than 6 months with no prospect of being breast-fed:

- When they reach ≥85% weight for length and switched to infant formula or other animal milk.

It usually requires about 2 – 6 weeks for a child to achieve the target weight if the principles of care for SAM are followed. If a child leaves the TFP before achieving 85 % weight-for-height/length, he/she is likely to get worse and have to return, or h/she may die at home.

If the caretaker decides to go home before fulfilling the discharge criteria and there is no OTP in the area, many preparations must be made to ensure that the caretakers can continue care at home. Follow-up visits are essential. There will be a discussion exercise about such situations in Involving Mothers in Care session.

The discharge criteria will be further discussed in session 5 (Daily Care)

Note: *Transfer from in-patient care to OTP is not considered as discharged cure.*

Tell a facilitator when you have reached this point in the session. There will be a brief video showing signs of severe malnutrition and the transformations that can occur when severely malnourished children are correctly managed. You will also discuss photos 21 – 29, which show children before and after treatment for severe malnutrition. Look at these photos while waiting for the video.

SESSION 3: MANAGEMENT OF MEDICAL COMPLICATIONS

S-3 Management of Medical Complications

Introduction

The focus of Management of Medical Complication session is to prevent death while stabilizing the child. The first step is to check the child for serious medical complications and provide emergency treatment as necessary. Any child presenting to the hospital or health center should be checked for serious medical complications as part of standard procedure.[1]

If serious medical complications are present, many procedures must be done very quickly, almost simultaneously. Practice and experience is needed to perform efficiently in an emergency room as a team. This course obviously cannot teach the entire process of emergency management, but it will focus on the steps that must be added or adjusted to treat the severely malnourished child.

Some of the Management of medical Complication procedures described in this session may be performed in the emergency room or triage area or OPD, before the child is admitted to TFU/SC or wards for children with SAM. It is very important that emergency room staff know to treat the severely malnourished child differently. They must be taught to recognize severely malnourished children and to understand that these children may be seriously ill even without showing signs of infection. A severely malnourished child should be seen as quickly as possible in the emergency room or triage area or OPD. Staff must understand that they should **not** put up a rapid IV but should follow procedures as outlined in the module, session 3.

When any necessary emergency treatment has been provided, the child should be moved immediately to the TFU or wards for children with SAM. For several days, it is critical to watch for and treat or prevent such life-threatening problems as hypoglycemia, hypothermia, shock, dehydration, and infection. Only later, after these problems are under control and the child is stabilized, is the child expected to gain weight. This session describes the life-saving tasks that are essential to management of medical complications of the severely malnourished child.

Learning Objectives

This session will describe and, to the extent feasible, allow you to observe and/or practice the following skills:

- Identifying and managing the severely malnourished child with:
    - Hypoglycemia
    - Hypothermia
    - Shock
    - Severe anemia
    - Corneal clouding and ulceration
    - Watery diarrhea and/or vomiting and dehydration
    - Heart failure
    - Infections
    - Abdominal distension

- Preparing ReSoMal
- Selecting appropriate antibiotics and calculating dosages
- Keeping a written record of initial findings and treatments

[1] Basic emergency treatment is taught in medical schools and will not be taught in this course. For additional information, you may refer to the National Protocol for Management of Severe Acute Malnutrition

1.0 Manage Hypoglycemia

1.1 What is Hypoglycemia?

Hypoglycemia is a low level of glucose in the blood. In severely malnourished children, the level considered low is less than <54 mg/dl (< 3 mmol/litre). The hypoglycemic child is usually hypothermic (low temperature) as well. Other signs of hypoglycemia include lethargy, limpness, and loss of consciousness. Another sign of hypoglycemia is eye-lid retraction due to overactive sympathetic nervous system, thus a child sleep with eyes slightly open. Sweating and pallor may not occur in malnourished children with hypoglycemia. Often the only sign before death is drowsiness.

The short-term cause of hypoglycemia is lack of food. Severely malnourished children are more at risk of hypoglycemia than other children and need to be fed more frequently, including during the night. Malnourished children may arrive at the hospital hypoglycemic if they have been vomiting, if they have been too sick to eat, or if they have had a long journey without food. Children may develop hypoglycemia in the hospital if they are kept waiting for admission, or if they are not fed regularly. Hypoglycemia and hypothermia are also signs that the child has a serious infection.

Hypoglycemia is extremely dangerous. The child may die if not given glucose (and then food) quickly, or if there is a long time between feeds.

1.2 Test blood glucose level

If blood was not taken during emergency procedures, take a sample on admission to the ward. The same sample can be used to determine blood glucose level, hemoglobin level and blood type, in case a transfusion is needed.

There may not be enough time to take and test a blood sample right away. If hypoglycemia is suspected, give treatment immediately without laboratory confirmation. If no testing strips are available, or if it is not possible to get enough blood to test, assume that the child has hypoglycemia.

Blood glucose level can be tested using treated paper strips such as Dextrostix, Glucostix, or other similar products.

1.3 Prevent Hypoglycemia / Begin F-75

If the child's blood glucose is not low, begin feeding the child with F-75 right away. Feed the child every 3 hours (8 feeds per day), even during the night especially in the first 24 hours. Appropriate amounts are given in your F-75 Reference Card or chart booklet in page 16. These frequent, small feeds will prevent hypoglycemia and provide nutrients for the child during the initial period of stabilization or phase 1.

> Look at F-75 reference table on page 16 of the chart booklet or your F-75 reference card now. Notice that the first column shows the weight of the child, and the next column shows the amount of F-75 to give

1.4 Treat Hypoglycemia

If blood glucose is low or hypoglycemia is suspected, immediately give the child a 50 ml bolus of 10% glucose or 10% sucrose orally or by NG tube. 50 ml is a very small amount, but it can make a big difference to the child.

Glucose is preferable because the body can use it more easily; sucrose must be broken down by the body before it can be used. However, give whichever is available most quickly. If only 50% glucose solution is available, dilute one part to four parts sterile or boiled water to make a 10% solution.

If the child can drink, give the 50 ml bolus orally. If the child is alert but not drinking, give the 50 ml by NG tube.

The table below shows how to reconstitute 50 ml of 10% glucose from available solutions..

Mixture of	Gives
12.5 ml of 40% dextrose + 37.5 ml of Distilled water	**50 ml of 10% Dextrose**
7.5 ml of 40% dextrose + 42.5 ml of 5% dextrose	
10 ml of 50% dextrose + 40 ml Distilled water	
6 ml of 50% dextrose + 44 ml of 5% dextrose	

If the child is lethargic, unconscious, or convulsing, give 5 ml/kg body weight of sterile 10% glucose by IV, followed by 50 ml of 10% glucose or sucrose by NG tube.* If the IV dose cannot be given immediately, give dose first through NG tube.

* If the child will be given IV fluids for shock, there is no need to follow the 10% IV glucose with an NG bolus, as the child will continue to receive glucose in the IV fluids.

Start feeding F-75 half an hour after giving glucose and give it every half-hour during the first 2 hours. For a hypoglycemic child, the amount to give every half-hour is ¼ of the 3-hourly amount shown on your F-75 Reference Card.

Take another blood sample after 2 hours and check the child's blood glucose again. If blood glucose is now 54 mg/dl (3mmol/l) or higher, change to 3-hourly feeds (8 feeds per day) of F-75. If still low, make sure antibiotics and F-75 have been given. Keep giving F-75 every half-hour **and Treat with second-line antibiotics**

Example

Araya weighs 7.4 kilograms. He has hypoglycemia and is given a 50 ml bolus of 10% glucose orally shortly after arrival at the hospital. One half-hour after taking the glucose, Arya should be given ¼ of the three-hourly (8 feeds) amount of F-75 for his weight. The three-hourly amount is 125 ml, so Araya should be given at least 30 ml every half-hour for two hours. Then, if his blood glucose is 54 mg/dl (3mmol/l) or higher, he should be given 125 ml of F-75 every three hours.

2.0 Manage Hypothermia

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2.1 What is Hypothermia?

Hypothermia is low body temperature. A severely malnourished child is hypothermic if the **rectal temperature is below 35.5 ^{0}C** or if the **axiliary temperature is below 35 ^{0}C.**

Severely malnourished children are at greater risk of hypothermia than other children and need to be kept warm. The hypothermic child has not had enough calories to warm the body. If the child is hypothermic, he is probably also hypoglycemic. Both hypothermia and hypoglycemia are signs that the child has a serious systemic infection.

2.2 Take temperature

Rectal temperatures are preferred because they more accurately reflect core body temperature. If axillary temperatures are taken, convert them to rectal by adding 0.5 ^{0}c.

If possible, use a low-reading thermometer (it is a type of thermometer that reads body temperature as low as 30^{0}C). If no low-reading thermometer is available, use a normal thermometer. With a normal thermometer, assume that the child has hypothermia if the mercury does not move.

2.3 Warm the child

Severely malnourished children have difficulty controlling their body temperature and so must be kept warm and fed frequently. Keeping them warm also conserves their energy.

Hypothermia is very dangerous. If the child is hypothermic, re-warming is necessary to raise temperature.

Maintain temperature (prevent hypothermia)

The following measures are important for all severely malnourished children:

- Cover the child, including his head.
- Stop draughts in the room. Move the child away from windows.
- Maintain room temperature of 28 and 32 ^{0}C (82.4-89.6 ^{0} F) if possible.
- Keep the child covered at night.
- Warm your hands before touching the child.
- Avoid leaving the child uncovered while being examined, weighed, etc.
- Promptly change wet clothes or bedding.
- Dry the child thoroughly after bathing.

If it is not possible to warm the room, let the child sleep with skin to skin contact to the mother or caretaker, and cover them with a blanket.

Actively re-warm the hypothermic child

In addition to keeping the child covered and keeping the room warm, use one of the following re-warming techniques if the child is hypothermic:

- Have the mother hold the child with his skin next to her skin when possible (kangaroo technique), and cover both h of them. Keep the child's head covered. Give warm Fluid to mother.

Illus 8: kangaroo technique

- Use a heater or incandescent lamp with caution. Use indirect heat (not too close). Monitor rectal temperature every 30 minutes to make sure the child does not get too hot. Stop re-warming when the child's temperature becomes normal.

- Do NOT use hot water bottles due to danger of burning fragile skin.

    - All hypothermic children should be treated for hypoglycemia and for infection as well.

THERAPEUTIC TREATMENT MULTICHART FOR SEVERE MALNUTRITION

Unique SAM # .....

Registration # 464/01

Sheet # ..... 01...

Child's full name: Saron Abebe

Address (kebele, woreda, region) Howolso, Shebedino, SNNPR

Referred from: Howolso HC

(TFU/OTP/Mobile clinic - circle the right source of referral)

Age (m or yr - specify) 18months

Sex... F

Breast feeding (Y/N)..... N

complemenrary feeding (Y/N) ... Y

Major Problems
1. SAM
2. Hypoglycemia

Date of admission(EC) 14/ 02/ 01

Time. 10:00 AM/PM

Readmission (Y/N)..... N

If yes, from .....

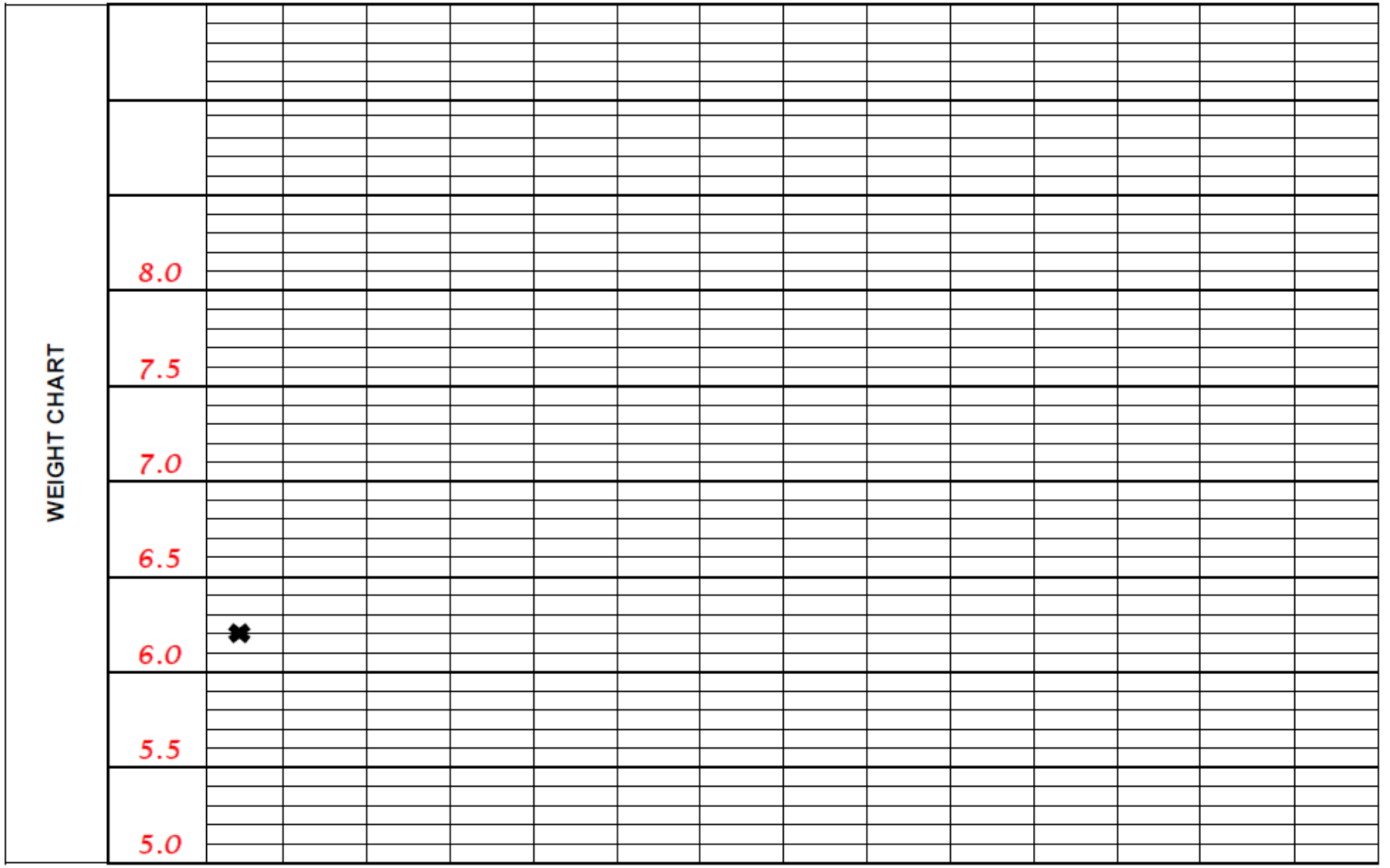
Old Reg Nos.....

ANTHROPOMETRIC CHART		1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Date	14/02/01													
	Height (cm)	72													
	Weight (kg)	6.2													
	W / H (%)	<70													
	MUAC (cm)	11.2													
	Edema (0 to +++)	++													

S-3 Management of Medical Complications

Target Weight
(85% WFL/H)

7.6 kg



S-3 Management of Medical Complications

THERAPEUTIC DIET

			1	2	3	4	5	6	7	8	9	10	11	12	13	14
Date			14/02/01													
Phase (I, TR, II)			I													
Diet Name			F-75													
Volume per feed (ml/feed)			110													
Number of Feeds/day			8													
Total feed per day (ml/day)			880													
Iron added (Y/N)			–													
A=Absent V= vomit R = refuse NG = NG tube IV = IV fluid Amount taken		6:00 am	1 X X / X X													
		9:00 am	2 X R / X X													
		12:00 pm	3 X X / X X													
		3:00 pm	4 X V / X V													
100%	X X / X X	6:00 pm	5 X X / X X													
75%	X X / X	9:00 pm	6 X X / X X													
		12:00am	7 R X / X X													
50%	X X	3:00 am	8 X X / X X													
25%	X		9													
			10													
		Porridge														
		Family mea														
		Other														

SURVEILLANCE CHART

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Date	14/02/01													
Diarrhea (Y/N)	N													
Vomit (Y/N)	N													
Dehydrated (Y/N)	N													
Cough (Y/N)	N													
Respiratory rate (breaths/min)	38													
Pulse rate (beats/min)	80													
Palmar pallor (Y/N)	N													
Temp. AM Ax/ Rec. (°C)	36													
Temp. PM Ax/ Rec (°C)														
Dermatosis (0 to +++)	0													
Liver size below costal margin (cm)	0													
Shock (Y/N)	N													
Failure to respond (Y/N)														

S-3 Management of Medical Complications

Enter name, dose and route of administration (oral-PO, intramuscular - IM, or intravenous-IV) for each drug. Enter your initial in the box when the drug is given.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
ROUTINE MEDICINES	Date	14/02/01													
	Vit A 100,000 IU	HT													
	Folic Acid 5 mg (PO)														
	Amoxicillin Time: 6:00 AM	HT													
	250 mg Po 6:00pm	HT													
	BID														
	Deworming in phase 2:														
SPECIAL MEDICINE	Antibiotic 1 Time:														
	Gentamycin IV/IM 6:00am	HT													
	30 mg once daily														
	Antibiotic 2														
	Time:														
	Resomal														
	IV fluid														
	Blood														
	NG tube														
	10% GLUCOSE ORAL 50ml	HT													
	Measles Vaccine 0.5ml	HT													

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Date	14/02/01													
	Hgb (gm/dl) / Hct (%)	9 g/dl													
	Malaria smear	-													
	Glucose (mg/dl)	44													
	TB test	-													

S-3 Management of Medical Complications

OBSERVATION:	Make sure that the admission history and examination is documented in a separate sheet.
14/02/01 10am:	
Saron has SAM (marasmickwashiorkor) and hypoglycemia. She is alert and has no other complications.	
Plan: Admit her in phase one and start with F75, oral amoxacilline and im Gentamycin. Give her Vit A and measles vaccine too. Treat hypoglycemia as follows;	
1.Give 50ml 10% glucose orally	
2.Give 37ml of F75 every 30 minutes for 2 hours	
3. Repeat blood glucose test after 2 hours	

3.0 Manage watery diarrhea and/or vomiting and Dehydration

3.1 Recognize Dehydration and the need for ReSoMal

Misdiagnosis and mistreatment for dehydration is the commonest cause of death in child with SAM under treatment.

It is difficult to determine hydration status in a severely malnourished child, as the usual signs of dehydration (such as lethargy, sunken eyes and skin pinch) may be present in these children all of the time, whether or not they are dehydrated.

Diagnosis of dehydration is mainly based on the history rather than on patient's examination alone. Ask the mother if the child has had watery diarrhea or vomiting, recent change in the child's appearance and recent sunkening of eyes.

Consider the diagnosis of dehydration in non-edematous child and give ReSoMal if there are:

- Definite history of significant recent fluid loss (diarrhea looking like water, not just 'loose' stools, appearing with sudden onset in the last hours or days)
- Clear history of a recent change in the child's appearance
- If the eyes are sunken then the mother must say that the eyes have changed to become sunken since the diarrhea or vomiting started

Edematous children are over-hydrated, but they are frequently hypovolemic due to dilation of blood vessels with low cardiac output. If the child with edema has definite watery diarrhea and is deteriorating clinically (excessive weight loss, more than 2% of the body weight per day) , the child is dehydrated.

The diagnosis of shock in SAM children is considered if a child has a weak or absent radial or femoral pulse, and cool or cold hands and feet or low or unrecordable blood pressure. If in addition if there is also loss of consciousness, it is severe shock. These children need IV fluids (See section 4.1 management of shock)

The treatment of shock in edematous child is the same as the treatment of septic shock (See section 4.1 management of shock). Monitor carefully fluid replacement in edematous children, as there is a high risk of heart failure. See the flow chart on the next page to decide on the management of Dehydration.

Note: The following signs of dehydration are important to detect improvements later not for initial diagnosis. (Also ask about blood in the stool, as this will affect choice of antibiotics.) Even though the signs may be misleading, if they go away after giving ReSoMal, you will know that the ReSoMal has had a good effect.

Signs of Dehydration to follow

Lethargic	A lethargic child is not awake and alert when he should be. He is drowsy and does not show interest in what is happening around him.
Restless, irritable	The child is restless and irritable all the time, or whenever he is touched or handled.
Sunken eyes	The eyes of a severely malnourished child may always appear sunken, regardless of the child's hydration status. Ask the mother if the child's eyes appear unusual. Photographs 6, 30, and 31 (in the Photographs booklet) show sunken eyes.
Thirsty	See if the child reaches out for the cup when you offer ReSoMal. When it is taken away, see if the child wants more.

3.2 What is ReSoMal?

ReSoMal is a rehydration solution for children with SAM. It is a modification of the standard Oral Rehydration Solution (ORS) recommended by WHO. ReSoMal contains less sodium, more sugar, and more potassium than standard ORS and is intended for severely malnourished children with diarrhea.

It should be given by mouth or by nasogastric tube. Do not give standard ORS to severely malnourished children.

ReSoMal is available commercially in some places, but it may also be prepared from standard ORS and some additional ingredients.

Contents of ReSoMal as prepared from standard ORS:

Water	2 liters
WHO-ORS	one 1 liter packet
sugar	50 g
mineral mix solution*	40 ml or one leveled scoop CMV

*The mineral mix solution is the same that is used in making F-75 and F-100. Composition of mineral mix is described below. It may be prepared by the hospital pharmacy. Alternatively, a commercial product, called Combined Mineral Mix (CMV), may be used. If CMV or mineral mix is not available, prepare with out the mixes

Recipe for Electrolyte/mineral solution (used in the preparation of ReSoMal and milk feeds)

Weigh the following ingredients and make up to 2500 ml. Add 20 ml of electrolyte/mineral solution to 1000 ml of milk feed.

	quantity g	molar content of 20 ml
Potassium Chloride: KCl	**224**	24 mmol
Tripotassium Citrate: $C_6H_5K_3O_7.H_2O$	**81**	2 mmol
Magnesium Chloride: $MgCl_2.6H_2O$	**76**	3 mmol
Zinc Acetate: $Zn(CH_3COO)_2.2H_20$	**8.2**	300 µmol
Copper Sulphate: $CuSO_4.5H_2O$	**1.4**	45 µmol
Water: make up to	**2500 ml**	

Note: add selenium if available (sodium selenate 0.028 g, $NaSeO_4$ $10H_20$) and iodine (potassium iodide 0.012g, KI) per 2500 ml.

Source: WHO 1999. Management of severe malnutrition: a manual for physicians and other senior health workers

3.3 Prepare ReSoMal

If using commercial ReSoMal, follow the package instructions. If preparing ReSoMal from standard ORS and mineral mix solution, prepare as follows:

- Wash hands.
- Empty one 1-litre standard ORS packet into container that holds more than 2 liters.
- Measure and add 50 grams of sugar. (It is best to weigh the sugar on a dietary scale that weighs to 5 g.)
- Measure 40 milliliters or one leveled scoop of CMV in a graduated medicine cup or syringe; add to other ingredients.
- Measure and add 2 liters cooled boiled water.
- Stir until dissolved.
- Use within 24 hours.

3.4 Calculate amount of ReSoMal to give

For a child who has dehydration but no sign of shock, give ReSoMal as follows, in amounts based on the child's weight:

How often to give ReSoMal	Amount to give
Every 30 minutes for first 2 hours	5 ml/kg body weight
Every hour for up to 10 hours	5 - 10 ml/kg*

* The amount offered in this range should be based on the child's willingness to drink and the amount of ongoing losses in the stool. Continue to give F-75 every 3 or 4 four hours.

If the child has already received IV fluids for shock and is switching to ReSoMal, omit the first 2-hour treatment and start with the amount for the next period of up to 10 hours.

Replace ongoing loss with 30 ml of ReSoMal per **watery stool** for edematous children and with 50-100 ml for non-edematous children under 2 years and 100 to 200 ml for non edematous children 2 years and above.

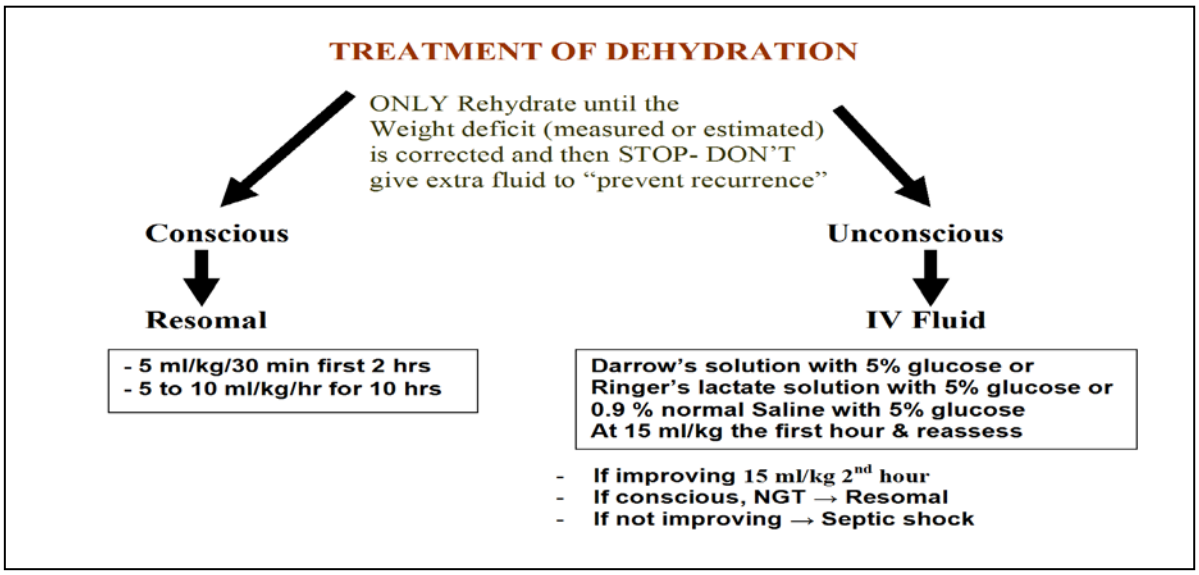


Fig 3: Algorithm for treatment of Dehydration in children with SAM

Fill in the blanks in the following case studies:

SHORT ANSWER EXERCISE

1. Rediet has watery diarrhea and is severely malnourished with no edema. He weighs 6.0 kilograms. He is dehydrated but has no shock. He should be given _____ ml ReSoMal every _____ minutes for ____ hours. Then he should be given ____ - ____ ml ReSoMal in _____ hours for up to ____ hours. In the other hours during this period, _____ should be given.

2. Yetayesh arrived at the hospital in shock and received IV fluids for two hours. She has improved and is now ready to switch to ReSoMal. Yetayesh weighs 8.0 kilograms. For up to _____ hours, she should be given ReSoMal. The amount of ReSoMal to offer is _____ millilitres per hour.

Answer the question below:

3. After the first two hours of ReSoMal, a child is offered 5 -10 ml/kg of ReSoMal. What two factors affect how much to offer in this range?

Check your own answers to this exercise by comparing them to the answers given on page 268 at the end of the module.

3.5 Give ReSoMal slowly

It is essential to give ReSoMal slowly, much more slowly than you would give ORS to a well-nourished child. Too much fluid, too quickly, can cause heart failure.

The best way to give ReSoMal is by cup, even with a very sick child. The child may need to be coaxed, or you may need to use a spoon or syringe. If the mother is able to give the ReSoMal, she should be taught to give it slowly.

A nasogastric (NG) tube can be used for giving ReSoMal at the same rate if the child is too weak to take enough fluid voluntarily. An NG tube should be used in weak or exhausted children, and in those who vomit, have fast breathing, or painful mouth sores.

IV fluids should not be used to treat dehydration (except in case of shock as discussed earlier). Since the degree of dehydration cannot be determined by clinical signs, and too much fluid could cause heart failure, it is very important that fluids not be forced on the child. When fluids are given orally, the child's thirst helps to regulate the amount given.

3.6 Monitor the child who is taking ReSoMal

Monitor the child's progress every half hour for the first two hours; then monitor hourly, i.e., every time the child takes F-75 or ReSoMal (see the monitoring algorithm (Fig 4) on next page.

Signs to check

- Respiratory rate - Count for a full minute.
- Pulse rate - Count for 30 seconds and multiply by 2.
- Weight
- Urine frequency – Ask: Has the child urinated since last checked?
- Liver size: mark before any infusion
- Stool or vomit frequency – Ask: Has the child had a stool or vomited since last checked?
- Signs of hydration - Is the child less lethargic or irritable?

Record the above information on the In-patient Multichart; then give ReSoMal and record the amount taken. Notice any changes when you check the signs above.

Signs of improving hydration status

- Fewer or less pronounced signs of dehydration, for example:
- less thirsty
- less lethargic

Note: Although these changes indicate that rehydration is proceeding, many severely malnourished children will not show these changes even when fully rehydrated.

- Slowing of rapid respiratory and pulse rates
- Passing urine
- Gaining weight with clinical improvement

If a child has three or more of the above signs of improving hydration status, stop giving ReSoMal. Instead, offer ReSoMal after each watery diarrhea, as described in section 6.7 below.

Signs of Overhydration

Stop ReSoMal if any of the following signs appear:

- Increased respiratory rate by 5 breaths and pulse rate by 25 beats per minute. (Both must increase to consider it a problem.)
- Jugular veins engorged. (Pulse wave can be seen in the neck.)
- Sudden increase in liver size and tenderness
- Increasing edema (e.g., puffy eyelids).
- Increasing weight with clinical deterioration

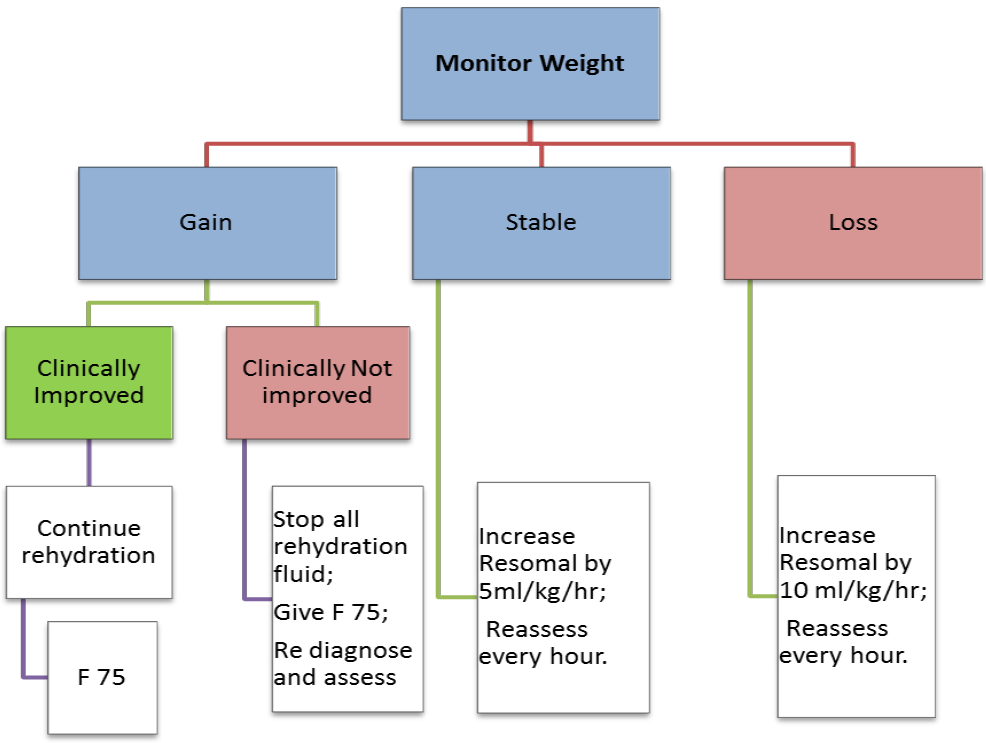


Figure 4. Monitoring a malnourished child on rehydration fluid

3.7 After rehydration, offer ReSoMal after each loose stool

When the child has three or more signs of improving hydration (see above), stop giving ReSoMal routinely in alternate hours. However, watery diarrhea may continue after the child is rehydrated. If diarrhea continues, give ReSoMal after each watery diarrhea to replace stool losses and prevent dehydration:

- Edematous Children: give 30 ml after each watery stool.
- Non-edematous children:
  - < 2 years: give 50-100 ml after each watery stool
  - 2 years and older: give 100 -200 ml after each watery stool.

Base the amount given in these ranges on the child's willingness to drink and the amount of stool loss.

EXERCISE A

In this exercise, the group will prepare and taste ReSoMal and will measure appropriate amounts to give to severely malnourished children.

A facilitator will lead this exercise. When the group has prepared and tasted the ReSoMal, each person should answer the following questions individually. Then a facilitator will ask each person to measure the amount of ReSoMal given in one of the answers.

1. Rafael has severe acute malnutrition with no edema. He has diarrhea and signs of dehydration but has no signs of shock. He is just starting ReSoMal. He weighs 7.3 kg.

.

a) How much ReSoMal should Rafael be given every 30 minutes for the next 2 hours?

b) After 2 hours, what is the amount of ReSoMal that Rafael should be offered every hour?

2. Selamawit has severe acute malnutrition with severe edema. She has vomiting and watery diarrhea. She weighs 11.6 kilograms.

a) How much ReSoMal should Selamawit be given?

Tell a facilitator when you have answered the above questions and are ready to measure the amounts of ReSoMal.

4.0 Manage a severely malnourished child with shock

4.1 What is shock?

Shock is a generalized hypo perfusion of tissues and a dangerous condition with severe weakness, lethargy, or unconsciousness, cold extremities, and fast, weak pulse. It is caused by diarrhea with severe dehydration, hemorrhage, burns, or sepsis. In severely malnourished children, some of the signs of shock may not appear all the time, so it is difficult to diagnose. Thus, IV fluids are given in severe malnutrition only if the child meets the following criteria:

The severely malnourished child is considered to have shock if he/she is **lethargic or unconscious** and has **cold hands plus either:**

- **slow capillary refill** (longer than 3 seconds), **or**
- **weak ,fast or absent radial or femoral pulses and**
- **absence of signs of heart failure in an edematous child**

To check capillary refill:

- Press the nail of the thumb or big toe for 2 seconds to produce blanching of the nail bed.
- Count the seconds from release until return of the pink color. If it takes longer than 3 seconds, capillary refill is slow.

For a child 2 months up to 12 months of age, a fast pulse is 160 beats or more per minute. For a child 12 months to 5 years of age, a fast pulse is 140 beats or more per minute.

4.2 Give oxygen, IV glucose, and IV fluids for shock

If the child is in shock (meets criteria in the box above):

- Give oxygen (for infants 0.5 to 1 lit per minutes, and for older children 1 to 2 lit per minute).
- Give sterile 10% glucose 5 ml/kg by IV (as described in section 1.4).
- Give IV fluids as described on the next page.
- Keep the child warm.

Giving IV fluids

Shock from dehydration and sepsis are likely to coexist in severely malnourished children. They are difficult to differentiate on clinical signs alone. Children with shock due to dehydration will respond to IV fluids. Those with septic shock and no dehydration will not respond. The amount of IV fluids given must be guided by the child's response. Overhydration can cause heart failure and death.

To give IV fluids:

- Check the starting respiratory and pulse rates and record them including the starting time on the Multi-chart and shock follow up chart below (which you can prepare in your health facility to follow up children with shock and dehydration).

- Infuse IV fluid at 15ml/kg over 1 hour. Use one of the following solutions, listed in order of preference:
  - Ringer's lactate solution with 5% glucose*
  - 0.9 % normal Saline with 5% glucose* (add 125 ml of 40 % or 100 ml of 50% glucose to 1 liter of 0.9% saline to make this fluid)
  - Half-strength Darrow's solution with 5% glucose (dextrose) +

  *If either of these is used, add sterile potassium chloride (20 mmol/l) if possible.
  + It is not available in our country. If you get Darrow's solution, it is the best choice.

- Observe the child and check respiratory and pulse rates every 10 minutes (see the shock follow up chart below). Follow the liver size, if the child is passing urine and weight gain.

- If the respiratory rate and pulse rate increase and child is gaining weight, stop the IV rehydration and assume septic or cardiogenic shock.

- If respiratory rate and pulse rate are slower after 1 hour, the child is improving. Repeat the same amount of IV fluids for another hour. Continue to check respiratory and pulse rates every 10 minutes.

- After 2 hours of IV fluids, switch to oral or nasogastric rehydration with ReSoMal (special rehydration solution for children with severe malnutrition). Give 5-10 ml/kg ReSoMal every hour and continue to give F-75 every 3-4 hours for up to 10 hours or until fully rehydrated.

4.3. If no improvement with IV fluids, give blood transfusion

If the child fails to improve after the first hour of IV fluids, then assume that the child has septic shock. Give maintenance IV fluids (4 ml/kg/hour) while waiting for blood. When blood is available, stop all oral intake and IV fluids, give a diuretic to make room for the blood, and then transfuse whole fresh blood at 10 ml/kg slowly over 3 hours. If there are signs of heart failure, give packed cells instead of whole blood as these have a smaller volume. (See steps below in section 5.2 for more details.)

Shock follow up chart

SIGNS OF SHOCK Lethargic/unconscious, Cold hand, Slow capillary refill(>3 seconds) , Weak/fast pulse												
	Start :	Monitor every 10 minutes					2nd hr:	Monitor every 10 minutes				
Time												
Resp. rate												
Pulse rate												
Liver Size (cm)												
Passed urine (Y/N)												
Weight												

5.0 Manage Severe Anemia

5.1 What is severe Anemia?

Anemia is a low concentration of hemoglobin in the blood. Severe anemia is a hemoglobin concentration of < 4 g/dl (or hematocrit <12%). If it is not possible to test hemoglobin, rely on clinical judgment. For example, you can judge the degree of anemia based on paleness of gums, lips, palm, and inner eyelids.

Severe anemia can cause heart failure and must be treated with a blood transfusion. As malnutrition is usually not the cause of severe anemia, it is important to investigate other possible causes such as malaria and intestinal parasites (for example, hookworm).

Mild or moderate anemia is very common in severely malnourished children and should be treated later with iron, after the child has stabilized. (Do NOT give iron during phase 1and transition phase as it can damage cell membranes and make infections worse.)

Symptoms of moderate and severe anemia may appear between day two and day 14 of treatment of malnutrition, due to the movement of fluids from tissues (edema and intracellular water) to vascular space. This temporary excess of fluids will produce dilutional anemia (i.e. pseudo-anemia) that should never be treated with transfusions (this risks aggravating the problem and inducing cardiac overload and death). Pseudo-anemia normally resolves spontaneously after 2 or 3 days when kidney function recovers and excess fluids can be eliminated. For these reasons, transfusion is not recommended between 48 hours and day 14 unless there is heart failure and the cause is other than dilutional anemia

5.2 Give blood transfusion

Give blood transfusion in the first 48 hours if:

- Hgb is < 4 g/dl, (Hct is < 12 %), or
- Hgb 4 to 6 gm/dl (Hct 12 to 18%) and respiratory distress

1. Stop all oral intake and IV fluids during the transfusion.
2. Look for signs of congestive heart failure such as fast breathing, respiratory distress, rapid pulse, engorgement of the jugular vein, cold hands and feet, cyanosis of the fingertips and under the tongue.
3. Give a diuretic[1] to make room for the blood. Furosemide (1 mg/kg, given by IV) is the most appropriate choice.
4. If there are no signs of congestive heart failure, transfuse whole fresh blood at 10 ml/kg slowly over 3 hours. If there are signs of heart failure, give 10 ml/kg packed cells over 3 hours instead of whole blood.

[1] Diuretics should never be used to reduce edema in children with severe malnutrition. The purpose of giving a diuretic before a blood transfusion is to prevent congestive heart failure from overloading the circulation with the transfusion.

EXERCISE B

In this exercise, you will be given some information and partially completed Multi-chart for several children. You will then answer questions about treatment needed. Use your module or reference cards as needed.

Case 1: Teblets

Teblets is an 18-month-old girl referred from a health centre. Her arms and shoulders appear very thin. She has moderate edema. She does not have diarrhea or vomiting, and her eyes are clear. She has (+)dermatosis. She has no other medical complication but she failed Appetite test. Additional information is provided in the excerpt from anthropometric, surveillance, and test results sections of the Multi-chart below.

		1	2	3	4	5
ANTHROPOMETRIC CHART	Date	16/03/02				
	Height (cm)	70				
	Weight (kg)	5.8				
	W / H (%)					
	MUAC (cm)	11.3				
	Edema (0 to +++)	++				

		1	2	3	4	5
SURVEILLANCE CHART	Date	16/03/02				
	Diarrhea (Y/N)	N				
	Vomit (Y/N)	N				
	Dehydrated (Y/N)	N				
	Cough (Y/N)	N				
	Respiratory rate (breaths/min)	34				
	Pulse rate (beats/min)	80				
	Palmar pallor (Y/N)	Y				
	Temp. AM Ax/ Rec (°C)	34.5				
	Temp. PM Ax/ Rec (°C)					
	Dermatosis (0 to +++)	1				
	Liver size below costal margin (c	0				
	Shock (Y/N)	N				
	Failure to respond (Y/N)					

		1	2	3	4	5
	Date	16/03/02				
Test Results	Hgb (gm/dl) / Hct (%)	9 g/dl				
	Malaria smear	-				
	Glucose (mg/dl)	60				
	TB test	-				

a. What is Teblets's weight-for-height percent of median?

b. Should Teblets be admitted for in-patient care? Why or why not?

c. Is Teblets hypothermic?

d. Is Teblets hypoglycemic?

e. Does Teblets have severe anemia?

f. What two things should be done for Teblets immediately based on the above findings?

.

When you have finished this case, discuss your answers with a facilitator

Case 2 – Kedija

Kedija is a 3-year-old girl. She is very pale when she is brought to the hospital, but she is alert and can drink. She has no signs of shock, no diarrhea, no vomiting, and no eye problems. She passed the Appetite test. Additional findings are described in her MULTI-CHART sections below.

		1	2	3	4
ANTHROPOMETRIC CHART	Date	08/01/01			
	Height (cm)	80			
	Weight (kg)	7.4			
	W / H (%)	<70			
	MUAC (cm)	10.5			
	Edema (0 to +++)	0			

		1	2	3	4
SURVEILLANCE CHART	Date	08/01/01			
	Diarrhea (Y/N)	N			
	Vomit (Y/N)	N			
	Dehydrated (Y/N)	N			
	Cough (Y/N)	N			
	Respiratory rate (breaths/min)	35			
	Pulse rate (beats/min)	100			
	Palmar pallor (Y/N)	Y			
	Temp. AM (Ax/ Rec (°C)	36			
	Temp. PM (Ax/ Rec (°C)	36			
	Dermatosis (0 to +++)	0			
	Liver size below costal margin (cm)	0			
	Shock (Y/N)	N			
	Failure to respond (Y/N)				

		1	2	3	4
	Date	08/01/01			
Test Results	Hgb (gm/dl) / Hct (%)	3.9			
	Malaria smear	-			
	Glucose (mg/dl)	40			
	TB test	-			

a. What should Kedija be given immediately to treat her hypoglycemia?

How should it be given?

b. When should Kedija begin taking F-75? How often?

How much should she be fed?

c. Does Kedija have very severe anemia? If yes, what should be done? Kedija has no signs of congestive heart failure

Case 3 Yohannes

Yohannes is a 15-month-old boy who has been unwell since the rains fell 5 weeks ago. For the last 3 days he has had no food but has been given home fluids for diarrhea. Yohannes is lethargic and limp on arrival at the hospital, and the doctor assumes his blood glucose is low without taking time for a blood sample and Dextrostix test. Yohannes's temperature does not record on a standard thermometer. His gums, lips, and inner eyelids appear normal in color (not pale). Additional information is given below:

		1	2	3	4
ANTHROPOMETRIC CHART	Date	08/01/01			
	Height (cm)	70			
	Weight (kg)	5.8			
	WFH (%)	<70			
	MUAC (cm)	9.9			
	Edema (0 to +++)	0			

		1	2	3	4
SURVEILLANCE CHART	Date	08/01/01			
	Diarrhea (Y/N)	Y			
	Vomit (Y/N)	N			
	Dehydrated (Y/N)	Y			
	Cough (Y/N)	N			
	Respiratory rate (breaths/min)	38			
	Pulse rate (beats/min)	98			
	Palmar pallor (Y/N)	N			
	Temp. AM Ax Rec (°C)	<35.5			
	Temp. PM Ax/ Rec (°C)				
	Dermatosis (0 to +++)	+			
	Liver size below costal margin (cm)	0			
	Shock (Y/N)	Y			
	Failure to respond (Y/N)				

		1	2	3	4
	Date	08/01/01			
Test Results	Hgb (gm/dl) / Hct (%)	9.5 g/dl			
	Malaria smear	-			
	Glucose (mg/dl)	Assumed <54			
	TB test	-			

SIGNS OF SHOCK None ***Lethargic***/unconscious ***Cold* hands** ***Slow capillary refill***(>3 seconds)
Weak/fast pulse

	Start:	Monitor every 10 minutes					2nd hr:	Monitor every 10 minutes				
Time												
Resp. rate												
Pulse rate												
Passed urine (Y/N)												
Liver Size (cm)												
Weight												

a. What are four treatments that Yohannes needs immediately?

-
-
-
-

b. What amount of sterile 10% glucose should be given by IV?

c. What amount of IV fluids should be given over the first hour?

Yohannes is given IV fluids starting at 9:45 a.m. His respiratory rate at that time is 60 breaths per minute, and his pulse rate is 130. Yohannes is monitored every 10 minutes over the next hour, and both his respiratory and pulse rates slow down during this time. At 10:45 a.m. his respiratory rate is 40 and his pulse rate is 105.

d. What should be done for the next hour?

After two hours of IV fluids, Yohannes is alert enough to drink, although he still appears unwell. His blood glucose has been tested and is now up to 90 mg/dl. His hemoglobin is 8.2 g/dl. He is weighed again, and his new weight is 6.0 kg.

e. What should Yohannes be given in over the next period of up to 10 hours?

f. How much F-75 should be given at each feed? (Hint: Use Yohannes's new weight to determine amount.)

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

6.0 Give emergency eye care for corneal clouding and ulceration

6.1 What are corneal clouding and ulceration?

Corneal clouding is haziness of the surface of the cornea (eye surface), whereas corneal ulceration is a break in the surface of the cornea. In the later case the eye may be extremely red or bleeding, or the child may keep the eye closed. In corneal ulceration, if there is an opening in the cornea the lens of the eye may extrude (push out) and cause blindness. Photo 12 in the photo booklet shows corneal ulceration.

Corneal clouding and ulceration are dangerous conditions that may lead to loss of vision if not treated urgently,

6.2 Examine the eyes

Wash your hands. Touch the eyes extremely gently and as little as possible. The child's eyes may be sensitive to light and may be closed. If the eyes are closed, wait until the child opens his eyes to check them or gently pull down the lower eyelids to check. Wash your hands again after examining the eyes.

6.3 Give vitamin A and atropine eye drops immediately for corneal ulceration

If the child has corneal clouding and ulceration, give vitamin A immediately.

Child's age	Vitamin A Oral Dose
< 6 months	50 000 IU
6 - 12 months	100 000 IU
>12 months	200 000 IU

You should instill one drop atropine (1%) into the affected eye(s) to relax the eye and prevent the lens from pushing out. Tetracycline eye drops and bandaging are also needed but may wait until later in the day. Daily Care session describes other treatments of corneal ulceration.

All severely malnourished children with eye signs need vitamin A on Day 1, and many need additional eye care which can wait until later in the day. Daily Care Session describes treatment of various eye signs.

7.0 Managing Heart failure

7.1 Diagnosis

Physical deterioration with weight gain, sudden increase in liver size, tenderness of the liver, increased respiratory rate, 'grunting' breathing, crepitations in lungs, prominent superficial and neck veins, engorgement of the neck veins when the abdomen is pressed, increased edema or reappearance of edema, among other clinical signs and symptoms. It progresses to marked respiratory distress with rapid pulse, cold hands and feet, edema and cyanosis and sudden death from cardiac shock.

Heart failure and pneumonia may be difficult to tell apart as they can be clinically similar. When weight gain precedes or is associated with signs of respiratory distress, heart failure should be the first diagnosis. If there is loss of weight, consider pneumonia instead.

Note: *Children with edema do not necessarily present weight gain during heart failure if the expanded circulation is due to mobilization of edema fluid from the tissues to vascular space.*

7.2 Treatment

- Stop all intakes of oral or IV fluids. No fluid or food should be given until heart failure has improved (even if this takes 24 to 48 hours). Small amounts of sugar-water can be given orally to prevent hypoglycemia.
- Give Furosemide (1 mg/kg) single dose, repeat if necessary.
- If it is due to severe anemia, manage as in section 5.2.

EXERCISE C

In this exercise, you will be given information and a partially completed In-patient Multi-chart or a blank Multi-chart for several children. You will then answer questions about treatment needed or complete the Multi-chart.

Case 1: Mola

Mola is an 11-month-old boy. Additional information is given on the multi charts below. Mola is awake, has no signs of shock, and has no diarrhea or vomiting. He has left eye corneal ulceration and recent attack of Measles. His dextrostix shows blood sugar in the range of 27 mg/dl.

		1	2	3	4
ANTHROPOMETRIC CHART	Date	08/01/01			
	Height (cm)	72			
	Weight (kg)	6.2			
	WFH (%)	<70			
	MUAC (cm)	10.5			
	Edema (0 to +++)	0			

		1	2	3	4
SURVEILLANCE CHART	Date	08/01/01			
	Diarrhea (Y/N)	N			
	Vomit (Y/N)	N			
	Dehydrated (Y/N)	Y			
	Cough (Y/N)	N			
	Respiratory rate (breaths/min)	42			
	Pulse rate (beats/min)	96			
	Palmar pallor (Y/N)	N			
	Temp. AM Ax/ Rec (^{0}C)	35			
	Temp. PM Ax/ Rec (^{0}C)				
	Dermatosis (0 to +++)	0			
	Liver size below costal margin (cm)	0			
	Shock (Y/N)	N			
	Failure to respond (Y/N)				

		1	2	3	4
	Date	08/01/01			
Test Results	Hgb (gm/dl) / Hct (%)	9 g/dl			
	Malaria smear	-			
	Glucose (mg/dl)	27			
	TB test	-			

a. What are three things that should be done immediately for Mola?

-
-

b. In a half-hour, what should be given to Mola? How much should be given?

Case 2 – Radiel (For this case, use a blank multi-chart available in your classroom and Shock follow up chart (you can make yourself))

Radiel is a 9-month-old boy. He has not been feeding well in the last 3 weeks. He has had watery diarrhea and vomiting in the last 3 days. There has been no blood in the stool. Radiel is severely wasted and has some mild dermatosis. He has no edema. His weight is 4.4 kg and length is 64 cm. His mother reported Radiel has recent sunkening of his eyes

Radiel's axillary temperature is 38°C, and his blood glucose is 90 mg/dl. His hemoglobin is 12.0 g/dl. His eyes appear clear, and he has not had measles. Radiel drinks eagerly. He has no signs of shock.

a. Using the above information about Radiel, complete as many parts of the multi-chart as you can.

Note: You will not complete the section of the IN-PATIENT MULTI-CHART for Antibiotics in this exercise. Although it is important to give antibiotics quickly, you will learn about these later. Do not complete the therapeutic diet (Feeding) section yet.

Since Radiel has diarrhea but no signs of shock, he needs ReSoMal. Radiel is first given ReSoMal at 9:00 a.m. His respiratory rate is 28 and his pulse rate is 105. He eagerly takes the full amount. At 9:30 his respiratory rate is still 28 and his pulse rate is 105. Radiel has not passed urine. He has had one episode of diarrhea but no vomiting. There has been no change in hydration signs. Again Radiel takes the full amount of ReSoMal.

The columns below show Radiel's progress during the next hour. He continues to take the full amount of ReSoMal.

Time	**10:00**	**10:30**
Resp. rate	28	25
Pulse rate	105	100
Liver Size (cm)	0	0
Passed urine (Y/N)	N	Y
Weight	4.4	Not taken

b. At 11:00, Radiel is ready to begin the next period of treatment, during which ReSoMal and F-75 are given. How much ReSoMal should Radiel be given? Enter this information on the observation section of the multi-chart.

c. What signs of overhydration should be watched for during this period?

At 11:00 Radiel's respiratory rate remains at 25 and his pulse rate at 100. He has passed no urine, but he has had one watery diarrhea in the past hour. He has not vomited. Radiel takes the maximum amount of ReSoMal in his range, but he no longer seems thirsty and eager to drink.

d. Complete Radiel's observation section of the multi-chart for 11:00.

At 12:00 Radiel's respiratory rate remains at 25 and his pulse rate at 100. He has passed urine or stools in the past hour, and he has not vomited. Radiel is weighed again. He now weighs 4.5 kg. Radiel continues to be willing to drink within the recommended range, although he does not drink eagerly.

e. What signs of improving hydration does Radiel show?

f. What should be given to Radiel in the next hour (starting at 12:00)? How much should be given?

Radiel should continue taking F-75 every 3 hours, even during the night. He must also be kept warm. Radiel should also be given antibiotics, which you will learn about in the next section of this Session.

g. If Radiel's diarrhea continues, what should he be given after each diarrhea? How much should he be given?

Case 3 – Etaferaw (For this case use the first page of a blank multi-chart available in your classroom and Shock follow up chart (you can make yourself)). This case will be done as a group.

Etaferaw is a 25-month-old girl. She arrives at the hospital at 10:00 a.m. on March 3rd. She has had diarrhea and vomiting for 10 days. She is severely wasted. She has no edema and no dermatosis. She weighs 6.1 kg and is 74 cm in length.

Etaferaw has an axillary temperature of 36°C and a blood glucose level of 72 mg/dl. Her hemoglobin has not been tested. Her left eye appears normal, but her right eye has some pus draining from it. She has not had measles.

Etaferaw has cold hands and is lethargic. When the doctor presses her thumbnail, it takes longer than 3 seconds for the pink color to return to the nail bed. Her pulse is fast (140 per minute).

There has been no blood in the stool. She seems to have sunken eyes, but her mother says they are always that way.

Using the information about Etaferaw, complete as many parts of the multi-chart and shock follow up chart as you can.

> *Note: You will not complete the section for Antibiotics in this exercise.*
> *Although it is important to give antibiotics quickly, you will learn about these later. In the Diarrhea section, complete only the top part at this point*
> *(through dehydration signs). Do not complete the Feeding section yet.*

a. Is Etaferaw hypoglycemic?

Is she hypothermic?

b. Does Etaferaw need vitamin A? Does she need it immediately?

c. What signs of shock does Etaferaw have?

What amount and type of IV fluids should Etaferaw be given in the first hour? Enter the amount on the multi-chart in the special medicine section and on the shock follow up chart.

Etaferaw's IV is started at 10:30 a.m. Her respiratory rate is 40 breaths per minute and her pulse rate is 140 per minute. The nurses monitor Etaferaw every 10 minutes. The results of monitoring are as follows.

Time	Respiratory rate	Pulse rate	Passed urine (Y/N)	weight	Liver size (BCM)	Remark
10:40	38	130	N		0	
10:50	36	120	N		0	
11:00	35	100	N		0	Etaferaw sits up, seems alert
11:10	33	90	Y		0	
11:20	32	85	N		0	
11:30	30	80	N	6.16	0	

d. Enter Etaferaw's starting time and rates on her the shock follow up chart. What should be done next for Etaferaw?

Etaferaw is given IV fluids for another hour. During the second hour her respiratory rate remains steady at 30 and her pulse rate at 80. After receiving IV fluids, Etaferaw weighs 6.2 kg

e. What should be given to Etaferaw at 12:30? How much should be given? Enter the amount on the observation section of multi-chart.

At 12:30, Etaferaw's respiratory rate is still 30 and her pulse rate is still 80. She has not passed urine. She has had one diarrhea stool but no vomiting. She is alert and her eyes are still sunken.

f. The nurse offers Etaferaw the maximum amount of ReSoMal in her range, and Etaferaw eagerly takes it all. Write this amount in the space for "Resomal" in the special medicine section.

Twelve hours after her arrival at the hospital, Etaferaw is much better. Since she responded so well to IV fluids and ReSoMal, it is clear that she was dehydrated. She needs to continue 3-hourly feeds of F-75, but she no longer needs ReSoMal routinely. She needs antibiotics, which you will learn about in the next section of the Session.

g. Etaferaw's diarrhea continues after she is rehydrated. What does she need after each watery diarrhea? How much does she need?

When you have finished these cases, discuss your answers with a facilitator

8.0 Treat Infections

Give all severely malnourished children antibiotics for presumed infection even if they do not have clinical sign of systemic infections. Give the first dose of antibiotics while other initial treatments are going on, as soon as possible.

8.1 Select antibiotics and prescribe regimen

Selection of antibiotics depends on the presence or absence of complications. Complications include septic shock, hypoglycemia, hypothermia, skin infections or dermatosis (+++ with raw skin/fissures), respiratory or urinary tract infections, or lethargic/sickly appearance.

As shown on the summary chart on the next page:

- **If no medical complications or only failed appetite test**, give first line antibiotics:
    - Oral Amoxicillin (preferred) or Cotrimoxazole if Amoxicillin is not available.

- **If complications present**, give second line antibiotics:

    - **If the child has the following complications (** Unable to feed , Vomiting everything shock, Convulsions, lethargic/very weak, pneumonia/severe pneumonia, hypoglycaemia, hypothermia, dermatosis with raw skin/fissures, jaundice, bleeding tendencecies, complicated measles,)

        - **Give,** Gentamicin, plus IV Ampicillin for 2 days followed by oral Amoxicillin. But i*f child is not seriously sick looking and can take oral medication, avoid IV Ampicillin and start with oral Amoxicillin and IM Gentamycin.*

    - **If the child has complications other than mentioned above like (**dehydration, dysentery, persistent diarrhea**,** fever other than malaria, measles without complication)**,**
        - **Give** oral Amoxicillin and I.M. Gentamycin. *If child is seriously sick looking, instead of oral Amoxicillin & IM Gentamycin start with IV Ampicillin and IV Gentamycin,*

- **If the child fails to improve within 48 hours,** add chloramphenicol or Ceftriaxone)

- Almost all children improve on Gentamicin plus amoxicillin, and it is rare that chloramphenicol is needed.

- **If specific infections are identified which require a specific antibiotic not already being given**, give an additional antibiotic to address that infection.

  For example, dysentery may require additional antibiotics. Certain skin infections such as Candidiasis require specific antibiotics. Antimalarial treatment should be given according to the national protocol.

Different formulations of drugs are available (e.g., tablets or syrups of varying strengths). The formulation of the drug will affect the amount to measure for a dose. Some common formulations are given in the dosage tables on the Antibiotics Reference Card, which is also found in the chart booklet on page 17 &18 (Tables 8, 9, 10).

For each formulation of a drug, the dosage tables have rounded practical doses to use for children of different weights. ***Note****: Never base the dose on age*

Note: You can use Amoxicillin-Calvulanic Acid (Augmentin), and Ceftriaxone as additional second or third option drugs according to you clinical judgment.

Table 2: Summary: Antibiotics for Severely Malnourished Children

IF:	GIVE:
No Medical Complications	Oral Amoxicillin as indicated in Table 7. If Amoxicillin is not available, give Cotrimoxazole for 5 days
Failed Appetite Test	
Medical Complications (Unable to feed , Vomiting everything shock, Convulsions, lethargic/very weak, pneumonia/severe pneumonia, hypoglycaemia, hypothermia, dermatosis with raw skin/fissures, jaundice, bleeding tendencecies, complicated measles,)	**Gentamycin** IV or IM once daily for 7 days, **plus:** **Ampicillin** IV every 6 hours for 2 days followed by oral **Amoxicillin** for 5 days *If child is not seriously sick looking and can take oral medication, avoid IV Ampicillin and start with oral Amoxicillin and IM Gentamycin.*
If the child has medical complications other than mentioned above, (dehydration, dysentery, persistent diarrhea**,** fever other than malaria, measles without complication)	**Oral Amoxicillin** and **IM Gentamicin** for 7 days. *If child is seriously sick looking, instead of oral Amoxicillin & IM Gentamycin start with IV Ampicillin and IV Gentamycin*
If child fails to improve within 48 hours, ADD:	**Chloramphenicol** IV or IM every 8 hours for 5 days. (Give IV every 6 hours if suspect meningitis.) or ceftriaxone 100 mg/kg divided into 2 doses IV or IM + Gentamicin once daily for a total of 10 days.
If a specific infection requires an additional antibiotic, ALSO GIVE:	**Specific antibiotic** as indicated.

[1]*If the child is not passing urine, Gentamicin may accumulate in the body and cause renal failure and deafness. Do not give the second dose until the child is passing urine.*

[2]*If amoxicillin is not available, give Ampicillin, 50 mg/kg orally every 6 hours for 5 days.*

Example of determining a dose:

Khalid is 82 cm in height and weighs 7.8 kg. He has severe acute malnutrition with a percentage of median of less than 70%. he failed appetite test. His rectal temperature is 36°C and his blood glucose is about 72 mg/dl. He is alert and irritable. He has no dermatosis. He has no signs of shock. He has had some loose stools but no blood in the stools. There is no evidence of respiratory or urinary tract infections.

a.	Khalid has no complications, so he should be given Amoxicillin. It should be given orally every 12 hours for 5 days.
b.	Khalid's body weight is 7.8 kg.
c.	The hospital has Amoxicillin syrup containing 250 mg per 5 ml.
e.	The doctor looks up the dose for this strength Amoxicillin syrup and Khalid's weight. The dose is 5 ml. He prescribes 5 ml Amoxicillin syrup to be taken orally every 12 hours for 5 days.

8.2 Choose and use the best route of administration

Wherever possible antibiotics should be given orally or by NG tube. Infusions containing antibiotics should not be used unless indicated because of the danger of inducing heart failure and introducing infections.

Indwelling cannula should rarely be used. The disadvantages of indwelling cannula are:

- They give access to the circulation for antibiotic-resistant bacteria in these immuno-compromised patients; the dressing quickly becomes dirty.
- They require fluid or anticoagulants to keep the vein open – but these children have impaired liver function (bleeding tendency) and are very sensitive to fluid overload
- They require skilled health persons to insert and maintain the cannula.
- The administration of IV drugs takes more time, from higher grades of staff, than giving oral drugs.
- IV preparations are much more expensive than oral preparations and the cannula itself is expensive
- Insertion of the cannula is painful and distressing for the child and they frequently need to be re-inserted.
- The cannula restricts the movements of the child and impairs feeding, washing, play and care.
- Extravasation into the tissue or misplacement of the cannula in an artery can cause skin necrosis and other complications

Sometimes there is a need for parenteral antibiotics and choice of whether to give a drug intravenously (IV) or by intramuscular (IM) injection. IM injections are very painful for a severely malnourished child. If an IV line is in and being used for giving fluid, use it for the antibiotic as well.

If there is no IV line in, and only one IM injection is needed, give the IM injection, but take special care to avoid bruising tender skin. The child will not have much muscle, so look for the sites with the most muscle and rotate sites (e.g., buttocks, thighs). If more than 2 ml is to be injected, divide the dose between two sites.

If frequent injections would be needed, it is preferable to use a 21 or 23-gauge butterfly needle to keep a vein open for injecting antibiotics. Use the IV dose. This option allows the staff to give conveniently the antibiotic intravenously without leaving an IV bag up, and it is less painful for the child.

Heparinised cannulas can also be used to keep a vein open for giving antibiotics.

EXERCISE D

In this exercise, you will select antibiotics and determine dosages for several children. Refer to the Antibiotics Reference Card or the chart booklet page 17 & 18 as needed. When there are different drug formulations listed, choose the drug formulation that is most likely to be available in your hospital

Case 1 – Debebe

Debebe is 77 cm long and weighs 7.0 kg. He has edema of both feet. He has no hypoglycemia, no hypothermia, no signs of shock, and no other complications.

a. What antibiotic does Debebe need? By what route should it be given?

b. Summarize the prescription for Debebe in the table below:

Drug	Route	Dose	Frequency	Duration

Case 2: Hana

Hana weighs 6 kg. She is severely malnourished and has hypoglycemia, hypothermia, and mild dermatosis. She does not have shock and will not be given IV fluids.

a. What two antibiotics should Hana be given now?

b. Assuming that all of the necessary supplies are available, what route should be chosen?

c. Given Hana's body weight, summarize the prescription for each antibiotic below:

Drug	Route	Dose	Frequency	Duration

Hana improves within 48 hours. Her temperature rises and stays above 35.5°C, and her blood glucose level rises above 54 mg/dl. She has not gained weight, but she is alert and is taking F-75 well.

d. After two days, how should Hana's drug regimen change?

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

9.0 MANAGEMENT OF ABDOMINAL DISTENSION WITH ABSENT BOWEL SOUNDS, GASTRIC DILATATION AND INTESTINAL SPLASH

The following measures should be taken:

- Give **Gentamicin** IV once daily plus **Ampicillin** IV every 6 hours
- Consider adding Chloramphenicol or Ceftriaxone IV
- Stop all other drugs that may be causing toxicity (such as metronidazole)
- Give a single IM injection of magnesium sulphate (2ml of 50% solution).
- Pass an NG-tube and aspirate the contents of the stomach, then "irrigate" the stomach with isotonic clear fluid (5% dextrose or 10% sucrose –the solution does not need to be sterile). Do this by introducing 50ml of solution into the stomach and then gently aspirating all the fluid back again. This should be repeated until the fluid that returns from the stomach is clear.
- Put 5 ml/kg of sugar-water (10% sucrose solution) into the stomach and leave it there for one hour. Then aspirate the stomach and measure the volume that is retrieved. If the volume is less than the amount that was introduced then either a further dose of sugar-water should be given or the fluid returned to the stomach.
- There is frequently gastric and oesophageal candidiasis: give oral nystatin suspension or fluconazole.
- Keep the child warm.

If the child's level of consciousness is poor give intravenous glucose

- Do not put up a drip at this stage. Monitor the child carefully for 6 hours, without giving any other treatment
- Improvement is measured first by a change in intestinal function --decrease in the distension of the abdomen, visible peristalsis seen through the abdominal wall, return of bowel sounds, decreasing size of gastric aspirates – and second by improvement in the general condition of the child.

If there is intestinal improvement then start to give small amounts of F75 by NG tube (half the quantities given in the feeding table – subsequently adjust by the volumes of gastric aspirated).

If there is no improvement after 6 hours then:

- Consider putting up an IV drip. It is very important that the fluid given contains adequate amounts of potassium. Sterile Potassium Chloride (20mmol/l) should be added to all solutions that do not contain potassium. Use Ringer-Lactate in 5% dextrose or half-strength saline in 5% dextrose. The drip should be run VERY SLOWLY – the amount of fluid that is given should be NO MORE THAN 2 to 4 ml/kg/h.
- When the gastric aspirates decrease so that one half of the fluid given to the stomach is absorbed, discontinue the IV treatment and continue with oral treatment only.

9.0 Record initial findings and treatments and communicate to staff

In all cases, but especially if a child is being transferred from an emergency room, it is important to communicate in writing and orally to key staff:

- the child's symptoms
- treatments already given
- what needs to be done to continue care and feeding
- whether or not the child has complications that require being near the nurses' station for careful, constant observation

The in-patient Multi Chart is an example of a tool to help communicate what has been done and what needs to be done for the child.

When everyone is ready, the group will view a video segment about treatment of medical complication. This video will show many of the steps described so far in this session.

SESSION 4: FEEDING

Introduction

Feeding is obviously a critical part of managing severe malnutrition; however, as explained in 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, the 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 stabilized. F-75 is specially made to meet the 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 carbohydrate, which is more easily handled by the child and provides much-needed glucose.

When the child is stabilized (usually after 2 to 7 days), the "catch-up" formula F-100 is used to rebuild wasted tissues. F-100 contains more calories and protein: 100 kcal and 2.9 g protein per 100 ml.

This session will describe the three phases of in-patient care for children 6 moths- 5 years and under 6 months separately. It also describes the contents of F-75 and F-100, need for these contents, how to prepare the feeds, plan feeding, and give the feeds according to plan.

Learning Objectives

This will describe and allow you to practice the following skills:

- Preparing F-75 and F-100
- Planning feeding for a 24-hour period for a child who is in Phase 1, Transition Phase and Phase 2: -taking F-75; or -adjusting to F-100 during transition; or -feeding freely on F-100.
- Measuring and giving feeds to children
- Recording intake and output
- Planning feeding for a ward

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

1.0 Prepare F-75 and F-100

There are two types of F-75 and F-100:

1. Pre-packaged F-75 and F-100: these are commercially manufactured-and pre-packed as large and small packet.

   Add either one large packet of F-75 or F100 to 2 liters of water or one small packet to 500 ml of water. Where very few children are being treated, smaller volumes can be mixed using the red scoop (20 ml water per red scoop of F-75 powder, or 18 ml of water per red scoop of F100).

   You will practice the preparation in exercise A and during the feeding clinical session at the hospital.

2. Locally prepared F-75 and F-100 recipe that are prepared by the health facilities or locally:

   If you cannot get the pre-packaged F-75 and F-100, you can prepare several recipes for F-75 and F-100 as described on the next page. The choice of recipe may depend on the availability of ingredients, particularly the type of milk, and the availability of cooking facilities. In the next exercise, you will prepare F-75 and F-100 using one of these recipes, or a similar recipe used in the severe malnutrition ward that you will visit during this course.

   The top three recipes given for F-75 include cereal flour and require cooking. The bottom three recipes for F-75 can be used if there is no cereal flour or no cooking facilities. However, the recipes with no cereal flour have a high osmolarity (415 mOsmol/l) and may not be tolerated well by some children with diarrhea.

   Cooking directions are given in Annex C. The F-100 recipes do not require cooking as they do not contain cereal flour.

   It is hoped that one or more of the recipes can be made in your hospital.

Table 3: 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	Ingredient	Amount for F-75	
If you have dried skimmed milk	Dried skimmed milk Sugar Cereal flour Vegetable oil Mineral mix* Water to make 1000 ml	25 g 70 g 35 g 30 g 20 ml 1000 ml**	
If you have dried whole milk	Dried whole milk Sugar Cereal flour Vegetable oil Mineral mix* Water to make 1000 ml	35 g 70 g 35 g 20 g 20 ml 1000 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 Mineral mix* Water to make 1000 ml	300 ml 70 g 35 g 20 g 20 ml 1000 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	Ingredient	Amount for F-75	Amount for F-100
If you have dried skimmed milk	Dried skimmed milk Sugar Vegetable oil Mineral mix* Water to make 1000 ml	25 g 100 g 30 g 20 ml 1000 ml**	80 g 50 g 60 g 20 ml 1000 ml**
If you have dried whole milk	Dried whole milk Sugar Vegetable oil Mineral mix* Water to make 1000 ml	35 g 100 g 20 g 20 ml 1000 ml**	110 g 50 g 30 g 20 ml 1000 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 Mineral mix* Water to make 1000 ml	300 ml 100 g 20 g 20 ml 1000 ml**	880 ml 75 g 20 g 20 ml 1000 ml**

**Contents of mineral mix are given on Page 51 of Management of medical Complications Session. Alternatively, a commercial product called Combined Mineral Vitamin Mix (CMV) may be used.*

****Important note about adding water**: Add just the amount of water needed to make 1000 ml of formula. (This amount will vary from recipe to recipe, depending on the other ingredients.) Do not simply add 1000 ml of water, as this will make the formula too dilute. A mark for 1000 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.*

EXERCISE A

In this exercise, your group will prepare F-75 and F-100 in small and large volume. Your facilitator will demonstrate F-75 and F-100 milk powder, materials that will be used for preparation, and how to prepare.

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

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

- What aspects of preparation would be difficult in my hospital?
- How can I make sure that the milks are prepared correctly?
- Do any new supplies need to be purchased, such as correctly sized scoops?

I. Children 6 months to 5 years

2.0 Phase I Feeding

2.1 Feed the child with F-75 and Determine frequency of feeds

On the first day, feed the child a small amount of F-75 every 3 hours (8 feeds in 24 hours, including through the night). If the child is hypoglycemic, give ¼ of the 3-hourly amount every half-hour for the first 2 hours or until the child's blood glucose is at least 54 mg/dl (3 mmol/l).

Night feeds are extremely important. Many children die from hypoglycemia due to missed feeds at night. Children must be awakened for these feeds.

After the second 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 4 hours).

Six feeds per day are given where there are few staffs at night. Give eight feeds per day where there are sufficient staffs to prepare and distribute the feeds at night.

Criteria for increasing the volume and decreasing the frequency of feeds will be presented in section 2.6.

2.2 Determine 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 needed per feed. You have been given a table that describes *the amount of F-75 to give during phase1 called F-75 reference card*. A copy of it is in page 16 (table 6) of the chart booklet.

Look at your F-75 reference card or chart booklet now, the required daily amount has been divided by the number of feeds to show the amount needed per feed.

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 - 1.5 g protein/kg/day. This amount is appropriate until the child is stabilized.

Tips for using the F-75 Reference Card

- Be sure that you use the correct table. Use the table for *the amount of F-75 to give during phase 1*.

- While the child is on F-75, keep using the starting weight to determine feeding amounts even if the child's weight increases because the weight is not expected to increase on F-75. For an edematous child, use the daily measured weight as their weight decreases when the edema reduces.

SHORT ANSWER EXERCISE

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

Child 1:	6.8 kg, no edema, 3-hourly feeds Give _____ml F-75 per feed.
Child 2:	8.5 kg, mild (+) edema, 4-hourly feeds Give _____ml F-75 per feed.
Child 3:	5.2 kg, severe (+++) edema, 3-hourly feeds Give _____ml F-75 per feed.
Child 4:	7.0 kg, severe (+++) edema, hypoglycemia, ½-hourly feeds Give _____ml F-75 per feed.
Child 5:	9.6 kg, moderate (++) edema, 6- feeds per day, Give _____ml F-75 per feed.

Check your own answers to this exercise by comparing them to the answers given on page 269 at the end of the Session.

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 the Multi-chart in the therapeutic diet box: record the phase, diet name (type of feed) to be given (F-75 or F-100), ml per feed, the number of feeds to be given daily, and ml per day. For example, if the child is on a 3-hourly feeding schedule, record that 8 feeds will be given.

Record the time the feed is given and mark with × in one of the four small boxes for each 25% of F-75 the child take.

Example of Therapeutic Diet part of the Multi-Chart

			1	2	3
THERAPEUTIC DIET	Date		**12/05/04**		
	Phase (I, TR, II)		**I**		
	Diet Name		**F-75**		
	Volume per feed (ml/feed)		**140**		
	Number of Feeds/day		**8**		
	Total feed per day (ml/day)		**1,120**		
	Iron added		—		
	A=Absent V= vomit R = refuse NG = NG tube IV = IV fluid Amount taken 100% X X / X X 75% X X / X 50% X X / ( ) 25% X / ( )	6:00 am 1 9:00 am 2 12:00 pm 3 3:00 pm 4 6:00 pm 5 9:00 pm 6 12:00 am 7 3:00 am 8 9 10	**X X** **V R** **X X** **X X**		
	Porridge				
	Family meal				
	Other				

2.4 Feed the child F-75 orally, or by NG tube if necessary

Oral feeding

It is best to feed the child with a cup (and spoon, if needed). Encourage the child to finish the feed. It may be necessary to feed a very weak child with a dropper or syringe. 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 may help with feeding after the child becomes stronger and more willing to eat. **Never leave the child alone to feed**. Spend time with the child, hold the child, and encourage him to eat. Catch dribbles by holding a saucer under the cup, as shown in photograph 33 of the Photographs booklet or figure below. The saucer will allow feeding more quickly without worrying about spilling. At the end of the feed, give the child the amount caught in the saucer.

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

Feeding children who have diarrhea and vomiting

If the child has continuing watery diarrhea after he has been rehydrated, offer ReSoMal between feeds to replace losses from stools. As a guide, non edematous children under 2 years should be given 50 to 100 ml of ReSoMal after each loose stool, while older children should be given 100 to 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 and offer that amount of feed again. 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 3 hours, offer half that amount (20 ml) every one and half hour until vomiting stops.

Nasogastric (NG) feeding

It may be necessary to use a nasogastric (NG) tube if the child is very weak, has mouth ulcers that prevent drinking, has pneumonia with rapid respiration or if the child cannot take enough F-75 by mouth. The minimum acceptable amount for the child to take is 75 % of the amount offered. At each feed, offer the F-75 orally first. Use an NG tube if the child does not take 75% of the feed (i.e., leaves more than 25%) for 2 or 3 consecutive feeds.

A child with an NG tube is shown in photograph 6. The NG tube should be checked every time 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 NG tube; let it drip in, or use gentle pressure.

The use of the NGT should not normally exceed 3 days and should only be used in Phase 1

Abdominal distension can occur with oral or NGT 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 IM.

Remove the NG tube when the child takes:

.

- 75 % of the day's amount orally; or
- 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 NG tube, just in case it is needed again in the night.

2.5. Record intake and output on the second part of the therapeutic diet section of the multi-Chart

There is an example of a completed 24-Hour Food Intake of a Multi- Chart on the next page.
Instructions for completing chart:
On the top part of the therapeutic diet section , record the date, phase, the type of feed to be given (diet name), ml per feed, the number of feeds per day, and the amount to give at each feed (ml/day).

At each feed: On the second or lower part of the therapeutic diet section, in the second column, record the time that the feed is given. Then record in each column of the days as follows:

- Record the amount taken by the child orally as follows: mark with X the four boxes if the child takes 100%, three boxes if ¾, two boxes if ½ and one box if ¼ of the feed offered and write R if the child take less than ¼ of the feed .

- If the feed is given by NG tube, mark the small box with NG and mark with 'X' for each quarter he/she has taken orally.

  Mark with V in the small boxes if the feed has vomited and estimate the proportion of the feed vomited and record the amount (and not replaced by more feed).

- Ask whether the child had watery diarrhea (any loose stool) since last feed. If so, tally the number of diarrhea in the surveillance chart or section of the multi-chart (which you will see in the monitoring Session).

S-4 Feeding

At the end of 24 hours: decide if the child is taking at least 75% of the daily feed or if there is more loss through vomiting or diarrhea as compared to the intake.

Therapeutic Diet part of the Multi-Chart to fill 24-HOUR FOOD INTAKE

Name: **Mattios Samson** Admission weight (kg): **3.2 kg** Today's weight (kg): **3.2 kg**

THERAPEUTIC DIET

			1	2	3
Date			**11/01/02**		
Phase (I, TR, II)			**I**		
Diet Name			**F-75**		
Volume per feed (ml/feed)			**75**		
Number of Feeds/day			**6**		
Total feed per day (ml/day)			**450**		
Iron added			**—**		
A=Absent V= vomit R = refuse NG = NG tube IV = IV fluid Amount taken		6:00 am 1	**X** **X**		
			X **X**		
		10:00 am 2	**X** **X**		
			X **R**		
		2:00pm 3	**X** **X**		
			R **R**		
		6:00 pm 4	**X** **V**		
100%	X X / X X		**V** **V**		
		10:00 pm 5	**NG** **NG**		
			V **X**		
75%	X X / X	2:00 am 6	**NG** **NG**		
			X **X**		
		7			
50%	X X /	8			
		9			
25%	X /				
		10			
Porridge					
Family meal					
Other					

Tell a facilitator when you have reached this point. When everyone is ready, there will be a demonstration of how to fill the second part of the therapeutic diet section of the multi-Chart.

SHORT ANSWER EXERCISE

Answer the following questions about the 24-Hour Food Intake for Mattios on the previous page:

1. How many times was Mattios fed during the 24-hour period?

2. What amount of F-75 was Mattios offered at each feed?

3. At 10:00 am did Mattios take enough (75 %) of the F-75 orally?

4. What apparently happened at the 6:00 pm feed?

5. How was the feeding method changed at 10:00 pm? Why do you think the staff changed the feeding method?

6. How was Mattios fed from 10 pm to 2 am?

Check your own answers to this exercise by comparing them to the answers given on page 269 at the end of the Session

2.6 Adjust the ward's feeding plan for the week

The amount of F100 and F75 to be given to each child depends on his/her weight that is taken daily in phase 1 and transition and every other day in phase 2. Readjust the amount of milk to be prepared for each child every morning after taking the weight of the children in the ward.

For phase 1 and transition, it is preferable to give therapeutic milk as a small and frequent diet. Children in these phases will tolerate better small and frequent feeding. They will consume the amount per feed more easily and reduce the likelihood of re-feeding diarrhea

There are two feeding plans for use in therapeutic feeding units

- Three-hourly feeding, eight times a day
- Four-hourly feeding, six times a day

Decide whether to give three-hourly feeding or four-hourly feeding depending on availability of sufficient staff to prepare and distribute the feeds at night. If your health facility has critical staff gap during the night, you can give five feeds a day. Instead of trying to evenly divide 24 hours into five feeds, use the four hourly feeding plan and omit one feeding schedule after mid night. Refer to the right table on the chart booklet or laminated reference chart to make sure that the child completes the 24 hours feed using five feeds per day.

Example of feeding schedule

Feeds	1	2	3	4	5	6	7	8
Eight	6:00 AM	9:00 AM	12:00 PM	3:00 PM	6:00 PM	9:00 PM	12:00 AM	3:00 AM
Six	6:00 AM	10:00 AM	2:00 PM	6:00 PM	10:00 PM	2:00 AM		
Five	6:00 AM	10:00 AM	2:00 PM	6:00 PM	10:00 PM			

EXERCISE B

In this exercise, you will review 24-Hour Food Intake using the therapeutic diet section of the Multi -charts and descriptions of children in order to determine their feeding plans for the next day.

Case 1 – Dendir

Dendir was admitted with diarrhea. He had no edema. At the first two feeds of the day, Dendir was still being given ReSoMal. After he was rehydrated, he began 4-hourly feeds of F-75 at 6:00 am. His rehydrated weight was 3.8 kg, so he was given 6 feeds of 80 ml each to finish the day. He took all of his feeds very well, although he continued to have small watery diarrhea.

Dendir's completed 24-Hour Food Intake Chart for Day 1 is given on the next page. Study the completed chart. Then answer the following questions about Dendir's feeding plan for Day 2.

1a. Did Dendir take at least 75 % of his 24 hour feeds?

1b. Although Dendir still has diarrhea, it is only a small amount. Enter instructions for Dendir's feeding plan for Day 2 on the following excerpt from the multi-chart and in Dendir's Multi-chart:

Date:_____ Type of feed _____ Give_____ feeds ___ ml

S-4 Feeding

Name: Dendir **Admission Weight:3.8 Kg** **Current Weight: Same**

				1	2	3
THERAPEUTIC DIET	Date			**4/12/01**		
	Phase (I, TR, II)			**I**		
	Diet Name			**F-75**		
	Volume per feed (ml/feed)			**80**		
	Number of Feeds/day			**6**		
	Total feed per day (ml/day)			**480**		
	Iron added			**–**		
	A=Absent V= vomit R = refuse NG = NG tube IV = IV fluid Amount taken		6:00 am 1	**X** **X**		
				X **X**		
			10:00 2	**X** **X**		
				X **X**		
			2:00pm 3	**X** **X**		
				X **X**		
			6:00 pm 4	**X** **X**		
	100%	X X X X		**X** **X**		
			10:00 5	**X** **X**		
				X **X**		
	75%	X X X	2:00 am 6	**X** **X**		
				X **X**		
			7			
	50%	X X 				
			8			
	25%	X 	9			
			10			
	Porridge					
	Family meal					
	Other					

Case 2 – Petros

Petros weighed 4.8 kilograms when he was admitted to the ward on Day 1. He had no edema. He was given 6 feeds of 95 ml F-75 on Day 1. Petros was a reluctant eater, but he finished most of his feeds and continued 4-hourly feeds (6 feeds per day) on Day 2. On Day 2, Petros was still reluctant to eat. At two feeds he took less than 75% of the amount offered, but he took more at the next feeds, so an NG tube was never used.

Petros's completed 24-Hour Food Intake Chart for Day 2 is on the next page.

2a. Did Petros take at least 75% of the expected daily total?

2b. Enter instructions for Petros's feeding plan for Day 3:

DATE: _____ TYPE OF FEED: _____ GIVE: ____feeds of_____ ml

2c. Starting with the first feed at 6:00 a.m., list the times at which Petros will need to be fed on Day 3:

S-4 Feeding

Name: Petros **Admission weight: 4.8 Kg** **Current weight: 4.8Kg**

				1		2		3	
THERAPEUTIC DIET	Date			**5/12/01**		**6/12/01**			
	Phase (I, TR, II)			**I**		**I**			
	Diet Name			**F-75**		**F-75**			
	Volume per feed (ml/feed)			**80**		**80**			
	Number of Feeds/day			**6**		**6**			
	Total feed per day (ml/day)			**480**		**480**			
	Iron added			—		—			
	A=Absent V= vomit R = refuse NG = NG tube IV = IV fluid Amount taken		6:00 am	1			**X**	**X**		
							X	**X**		
			10:00	2	**X**	**X**	**X**	**X**		
					X	**X**	**X**	**X**		
			2:00pm	3	**X**	**X**	**X**	**X**		
					X	**X**	**X**	**X**		
			6:00	4	**X**	**X**	**R**	**R**		
	100%	X X			**X**	**R**	**V**	**V**		
		X X	10:00	5	**X**	**X**	**X**	**X**		
					X	**X**	**X**	**X**		
	75%	X X	2:00 am	6	**X**	**X**	**X**	**X**		
		X			**V**	**R**	**X**	**V**		
				7						
	50%	X X								
				8						
	25%	X		9						
				10						
	Porridge									
	Family meal									
	Other									

Case 3 – Rosa

When Rosa was admitted, she had severe (+++) edema. She weighed 6.4 kg and was 66 cm long. She refused to eat, so an NG tube was inserted. On Days 1 and 2 she was given 140 ml of F-75 every 4 hours by NG tube. On Day 3 her weight was down to 6.1 kg and her edema was moderate (++). Rosa's 24-Hour Feeding Chart for Day 3 is shown below.

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

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

3c. On Day 4 Rosa weighs 5.8 kg and her edema is mild (+). Enter instructions for Rosa's feeding plan for Day 4 on her multi-chart.

Name: Rosa Admission weight (kg): 6.4 kg today's weight (kg): 6.1 kg

				1		2		3		4	
	Date			**6/02/01**		**7/02/01**		**8/02/01**		**9/02/01**	
	Phase (I, TR, II)			**I**		**I**		**I**			
	Diet Name			**F-75**		**F-75**		**F-75**			
	Volume per feed (ml/feed)			**140**		**140**		**140**			
	Number of Feeds/day			**6**		**6**		**6**			
	Total feed per day (ml/day)			**840**		**840**		**840**			
	Iron added			**—**		**—**		**—**			
THERAPEUTIC DIET	A=Absent V= vomit R = refuse NG = NG tube IV = IV fluid Amount taken		6:00 am	1		**X**	**X**	**X**	**X**		
						NG	**NG**	**NG**	**NG**		
			10:00am	2	**R**	**R**	**X**	**X**	**X**	**X**		
					R	**R**	**NG**	**NG**	**X**	**NG**		
			2:00pm	3	**NG**	**NG**	**X**	**NG**	**X**	**X**		
					NG	**NG**	**NG**	**X**	**X**	**X**		
			6:00pm	4	**NG**	**NG**	**X**	**X**	**X**	**X**		
	100%	X X X X			**NG**	**NG**	**NG**	**NG**	**X**	**X**		
			10:00pm	5	**NG**	**NG**	**X**	**X**	**X**	**X**		
					NG	**NG**	**NG**	**NG**	**X**	**X**		
	75%	X X X	2:00 am	6	**NG**	**NG**	**X**	**X**	**X**	**X**		
					NG	**NG**	**NG**	**NG**	**X**	**X**		
				7								
	50%	X X |									
				8								
	25%	X |	9								
				10								
	Porridge										
	Family meal										
	Other										

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

3.0 Transition Phase (Feeding the child in transition)

It may take 2-7 days for the child to stabilize on F-75. When the child has stabilized, transfer into transition phase and offer F-100, the higher calorie, higher protein "catch-up" feed intended to rebuild wasted tissues. In terms of feeding, it is the same as phase I except F-100 or RUTF is given rather than F-75. Eventually the child will be offered F-100 freely. However, it is extremely important to make the transition to free feeding on F-100 or RUTF gradually and monitor carefully. If transition is too rapid, heart failure may occur. Usually a child stays in transition phase for 2-3 days.

3.1 Recognize readiness for transition phase

Look for the following signs of readiness to progress from Phase 1 to transition phase:

- Return of appetite (easily finishes the F-75 feeds) and
- Reduced edema or minimal edema (++ or less) and
- No IV line, No NGT

The child may also smile at this stage.

Note; children with +++ edema should wait in phase I at least until their edema has reduced to ++ edema. These children are particularly vulnerable to fluid overload and heart failure.

3.2 Begin giving F-100 or RUTF

Transition takes 3 days, during which F-100 or RUTF should be given according to the following schedule:

First 48 hours (2 days):

A. Give RUTF (Plumpy'Nut rather than F100) if the child is going to continue treatment as out-patients (OTP) with take-home treatment. Use your RUTF reference card for Transition Phase or the RUTF reference table on page 20 (Table 11) of the chart booklet to determine the total amount of RUTF (Plumpy'Nut) that should be taken during the day.

   The full day's amount of RUTF should be given to the mother and the amount taken checked five times during the day. Children that are not taking sufficient RUTF should be given F100 to make up any deficit in intake. No other food should be given to the patient during this period. They should be offered as much water to drink as they will take during and after they have taken some of the RUTF.

   When the children are taking this amount they should be discharged to continue their treatment at home as OTP.

B. Give F-100 every 4 hours in the same amount as you last gave F-75 if children can't take RUTF or are not going to continue treatment in OTP. Give F-100 based on your F-100 reference card for Transition Phase or the F-100 reference table on page 21 (Table 12) of the chart booklet. Do not increase this amount for 2 days.

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

3.3 Monitor the child carefully during transition

Every 6 hours check the child's respiratory and pulse rate. If F-100 is introduced carefully and gradually, problems are unlikely; however, increasing respiratory rate and pulse rate may signal heart failure. Call a physician for help. (More information on danger signs and monitoring is given in Daily Care.)

3.4 Record intake/output; plan child's feeds for next 24 hours

Record the amount of F-100 or RUTF offered at each feed, and the child's intake and output (vomiting or diarrhea) on the therapeutic diet and surveillance charts of the multi -Chart. Enter the feeding plan for the next day on a therapeutic diet chart.

3.5. Criteria to move back from transition phase to phase1

Move the child back to Phase 1:

- If the patient gains weight more rapidly than 10g/kg/d (this indicates excess fluid retention)
- If there is increasing edema
- If a child who does not have edema develops edema
- If there is a rapid increase in the size of the liver
- If any other signs of fluid overload develop.
- If tense abdominal distension develops
- If the patient gets significant re-feeding diarrhea so that there is weight loss.
- If patient develops medical complication
- If Naso-Gastric Tube is needed
- If patient takes less than 75% of the feeds in Transition Phase even after interchange between RUTF and F100

EXERCISE C

Case 1 – Dendir

You may remember Dendir. he has finished his daily F-75 but he refused RUTF on day 4. The following Multi-chart excerpt summarizes Dendir's progress through the first three days of phase 1.

Study Dendir's chart and answer the following questions.

a. Is Dendir ready for transition phase?

b. What should he be offered at 6:00 am of day 4? What should be the amount per feed and total amount per day? Record on the multi- chart

Name: Dendir **Admission weight: 3.8 Kg** **Today's weight: 3.82 Kg**

		1	2	3	4	5	6
Anthropometric Chart	Date	4/12/01	5/12/01	6/12/01	7/12/01	8/12/01	9/12/01
	Height (cm)	**62**					
	Weight (Kg)	**3.8**	**3.8**	**3.8**	**3.82**		
	Wt for Ht (%)	**< 70**					
	MUAC (cm)						
	Edema (0 to +++)	**0**	**0**	**0**	**0**	**0**	
Therapeutic Diet Chart	Date	4/12/01	5/12/01	6/12/01	7/12/01	8/12/01	9/12/01
	Phase	**I**	**I**	**I**			
	Diet Name	**F-75**	**F-75**	**F-75**			
	Ml/feed	**80**	**80**	**80**			
	# meals/day	**6**	**6**	**6**			
	ml/day	**480**	**480**	**480**			
	Iron added						

Case 2: Petros

You may remember that Petros was a reluctant eater on Days 1 and 2. On Day 3 his appetite increased, and he took six feeds of 95 ml F-75. He ate greedily and still wanted more at the end of each feed.

On Day 4 Petros began transition and OTP service is available in the area.

a. What Should Petros be given on Day 4? What amount should be feed?

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

Case 3 – Rosa

You may remember that Rosa was admitted with severe edema and had to be fed by NG tube for several days because she refused to eat.

By Day 4 Rosa was feeding much better, and she had lost most of her edema.

Her weight had decreased from 6.4 kg to 5.4 kg because of loss of edema fluid. On Day 4 Rosa was given six feeds of 110 ml. She eagerly took all of the F-75 offered.

On Day 5 Rosa's edema appears to be gone and she weighs 5.2 kg.

a. Is Rosa ready for transition? Why or why not?

b. Rosa refused Plumpy'Nut. Enter instructions for Rosa's feeding plan for Day 5 on the following:

DATE: 10/02/01 (Day 5) **TYPE OF FEED:** **GIVE:_____ feeds of_____ ml**

c. Rosa takes her feeds on Day 5 well and shows no danger signs. Enter instructions for Rosa's feeding plan for Day 6:

DATE:11/02/01 (Day 6) **TYPE OF FEED:_____** **GIVE:____ feeds of_____ ml**

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

4.0 Phase 2 (Feed freely with F-100 or RUTF)

4.1. Criteria to move from transition phase to phase 2 feeding

Transition takes 2-3 days. After transition, the child is in the phase 2 ("rehabilitation" phase). A child is ready for phase 2:

- If he/she has good appetite. This means taking at least 90% of the RUTF or F100 prescribed for Transition Phase.

- Edematous patients should remain in Transition Phase until there is a definite and steady reduction in edema (now at + level):

    - For those who are going to remain as inpatients they should normally remain in Transition Phase until they have lost their edema entirely.

    - For those who are going to continue as OTP they can go when their appetite is good and they have reduced their edema to ++ or +.

4.2. Feed with F-100 or RUTF and determine amount to Give

During phase 2, a child can feed freely F-100 to an upper limit of 220 kcal/kg/day (This is equal to 220 ml/kg/day.) or RUTF. 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. There is F-100 or RUTF reference table that shows the amount to give for children of different weights up to 40 - 60 Kg. A copy of this table is in page 24-25 of the chart booklet (Table 14 & 15).

There are two options for Phase 2:

A. Transfer to OTP: If there is OTP in the area the child is living, transfer the child to Out patient Treatment (OTP) to be treated at home with RUTF. The detailed management for OTP is described in the OTP module.

The child should be transferred with sufficient RUTF to last until the next day operation of the OTP site closest to the child's home. Provide at least one week supply of RUTF.

Explain to the caretaker how to give the RUTF at home:

- RUTF is a food and a medicine for malnourished children only. It should not be shared with the other family members even if the child does not consume all the diet offered. Opened packets of RUTF can be kept safely and eaten at a later time – the other family members should not eat any that is left over at a particular meal.

- Wash with soap child's hand and face before feeding. Keep food clean and covered.

- Tell the mother how much her child should eat each day (this is given in the Amounts of RUTF to give per day and per week table on your RUTF reference card for phase 2 or the RUTF reference table on page 24 of the chart booklet, Table 14).

- These children often only have moderate appetites and eat slowly. Give small regular meals of RUTF and encourage the child to eat as often as possible (every 3 to 4 hours).

The child can keep the RUTF with him/her and eat is steadily throughout the day – it is not necessary to have set meal times if the food is with the child all the time.

- RUTF is the only food the child needs to recover during his time in the program. It is not necessary to give other foods; a lot of other foods will delay the recovery of your child. If other foods are given, always give RUTF before other foods.

B. Continue Phase 2 as in-patient: Treat with F-100 or RUTF in an in- patient care if there is no OTP service in the area where the child lives or for other medical reason the child should stay as in-patient or caretaker preference is Phase 2 in patient care.

If the child has been on RUTF during transition, continue RUTF as in (A) above.

If the child has been on F-100 during transition:

- Preferably use RUTF as above or

- Continue with F-100: On the first day of Phase II, you can increase F-100 at each feed by 10 ml as long as the child is finishing feeds and demanding for more. If the child does not finish a feed, offer the same amount at the next feed; then if the feed is finished, increase by 10 ml.

During the phase 2, encourage the child to eat as much as he wants at each feed. Continue to feed every 4 hours within this range. Sit with the child and actively encourage eating. Never leave the child alone to feed.

Breast-fed children should always get breast-milk before they are given F100 or RUTF and also on demand.

4.3 Record intake/output; determine if intake is acceptable

Record each feed on the therapeutic diet part of the Multi-Chart. To determine if daily intake is acceptable, compare if the child is finishing 75% of the feed. 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 is doing well.

If the child has diarrhea but is still gaining weight, there is no need for concern, and no change is needed in the diet.

If significant “re-feeding diarrhea” occurs so that the child looses weight, he/she is put back to Phase 1.

If a major illness occurs during Phase 2, particularly during the first week, the patient should be put back to Phase 1 and given F75 as in Phase 1.

By week 3 or 4, if the child is doing well and gaining weight rapidly, you may assume that he is doing well. Monitoring for danger signs is no longer needed.

4.4 Adjust feeding plan as necessary

During Phase II, the child is expected to gain weight rapidly, and the amount of F-100 or RUTF given should be increased as the child gains. 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 amount of F-100 or RUTF 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 he 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.

4.5. Criteria to move back from phase 2 to phase 1

A child who has any one of the following should be returned to Phase 1:

- develops any signs of a complication
- Increase/development of edema
- Development of refeeding diarrhea sufficient to lead to weight loss.
- Weight loss for 2 consecutive weighing
- Static weight for 3 consecutive weighing
- Fulfilling any of the criteria of "failure to respond to treatment"

EXERCISE D

Case 1 – Dendir

You may remember that Dendir began transition on Day 4. On Day 5 he was given 80 ml F-100 per feed. On Day 6 Dendir was transferred to phase 2 and he continued to refuse RUTF. However, he began free feeding on F-100 and his weight is 4.1 Kg.

a. What amount of F-100 should he be offered on Day 6?

b. Write the instruction on the multi- Chart concerning the frequency and amount of F-100 to offer on Day 7?

Case 2 – Petros

Day 6 was Petros's second day of transition. He finished more than 90 % of the Plumpy'Nut on day 5 and 6. On Day 7, his weight is 4.9 kg.

a. What action do you take?

b. What is an appropriate amount of Plumpy'Nut per feed and the total daily intake? How many sachets you should give to Petros until he is enrolled in OTP?

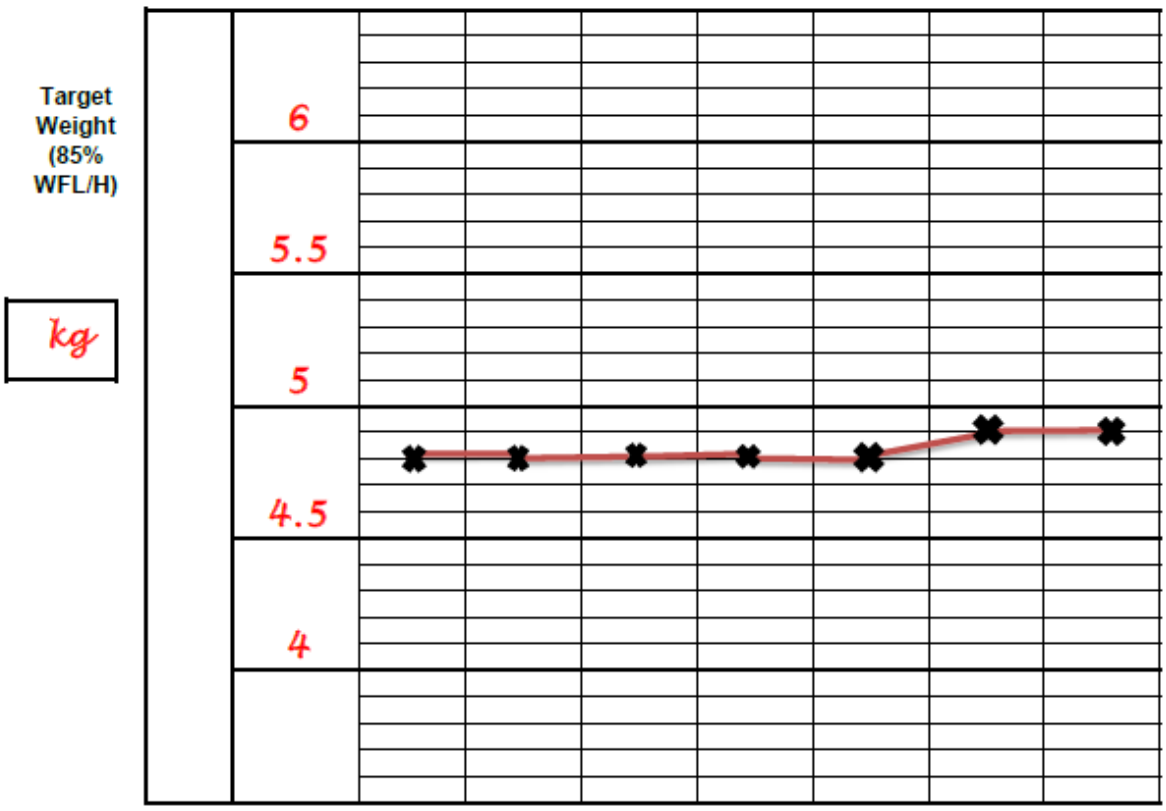
On the next page there is an excerpt from Petros's Multi-Chart. The Weight Chart section shows Petros's weight gain pattern.

c. When do you think Petros started to gain weight? Is that expected?

S-4 Feeding

Name: Petros **Admission weight: 4.8 Kg** **Current weight (Day 7): 4.9 Kg**

ANTHROPOMETRIC CHART		1	2	3	4	5	6	7
	Date	08/01/05	09/01/05	10/01/05	11/01/05	12/01/05	13/1/2005	14/1/2005
	Height (cm)							
	Weight (kg)	4.8	4.8	4.8	4.8	4.8	4.9	4.9
	W / H (%)							
	MUAC (cm)							
	Edema (0 to +++)	0	0	0	0	0	0	0



THERAPEUTIC DIET		1	2	3	4	5	6	7
	Date	08/01/05	09/01/05	10/01/05	11/01/05	12/01/05	13/1/2005	
	Phase (I, TR, II)	I	I	I	I	TR	TR	
	Diet Name	F-75	F-75	F-75	F-75	RUTF	RUTF	
	Volume per feed (ml/feed)	95	95	95	95			
	Number of Feeds/day	6	6	6	6			
	Total feed per day (ml/day)	570	570	570	570	1.5 sac	1.5 sac	
	Iron added (Y/N)	-	-	-	-	-	-	

Case 3 – Rosa

Day 6 was Rosa's second day of transition. On Day 6 she weighed 5.2 kg and started at 110 ml feeds of F-100. She took over 75% of her feeds well. On Day 7 Rosa weighed 5.3 kg and began feeding freely on F-100. Her 24-Hour Food Intake excerpt from the multi-chart for Day 7 is on the next page.

3a. What should be the amount per feed and the total volume of F-100 should be taken by Rosa over 24 hours on Day 7? Fill the instruction on the multi chart on next page.

3b. Looking back at Rosa's Monitoring Record for Day 7, the head nurse noticed that Rosa's temperature has increased to 38.5^0C axillary just before the 2:00 a.m. feed. What does this suggest about the cause of Rosa's eating less?

3c. Which of the following should the head nurse do? (Tick)

____ Alert the doctor that Rosa has a problem and needs to be checked carefully

____ Plan feeding for Day 8 to start at 180 ml F-100 again

____ Both of the above

S-4 Feeding

Name: Rosa Admission Weight: 6.4 Kg Today's' weight (day 9): 5.3 Kg

THERAPEUTIC DIET				6		7		8	
	Date			12/02/01		13/02/01			
	Phase (I, TR, II)			TR		II			
	Diet Name			F-100		F-100			
	Volume per feed (ml/feed)			110		180			
	Number of Feeds/day			6		6			
	Total feed per day (ml/day)			660		1080			
	Iron added (Y/N)			_		Y			
	A=Absent V= vomit R = refuse NG = NG tube IV = IV fluid Amount taken		6:00 am 1	X	X	X	X		
				X	X	X	X		
			10:00am 2	X	X	X	X		
				X	X	X	X		
			2:00pm 3	X	X	X	R		
				X	X	X	X		
			6:00 pm 4	R	R	X	X		
	100%	X X X X		X	X	X	X		
			10:00pm 5	X	X	X	R		
				X	X	X	X		
	75%	X X X	2:00 am 6	X	X	X	R		
				X	X	R	R		
			7						
	50%	X X 							
			8						
	25%	X 							
			9						
			10						
	Porridge								
	Family meal								
	Other								

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

II. Feeding Infants less than 6 months

Malnourished infants should always be treated in inpatient facilities. The management of complication is the same as children 6 moths to 5 years as explained in the treatment of complication section. The feeding of infants is different from older children and it is also different for infants on breast feeding or with a caretaker willing to breast feed and for infants who can not be breast-fed. RUTF is not suitable for them, as the reflex of swallowing is not present yet.

5.1. Infants below six months (with a female caretaker)

Infants who are malnourished are weak and do not suckle strongly enough to stimulate adequate production of breast milk. The mother often thinks that she has insufficient milk and is apprehensive about her ability to adequately feed her child. The objective of treatment of these children is to return them to full exclusive breastfeeding.

Phase 1 – Transition – Phase 2

The objective is to supplement the child while stimulating production of breast milk. This is achieved through the Supplementary Suckling (SS) technique:

- Breastfeed every three hours for at least 20 minutes (more if the child cries or demands more)
- Between one and a half hours after a normal breastfeed give maintenance amounts of F100-diluted using the SS technique.
- Diluted F100 is given at 130 ml/kg/day, distributed in 8 meals .To determine the amount use table 4 on the next page or table 2 on page 5 of the chart booklet.
- If the infant has no edema, there are not separate phases in the treatment of infants with the SS technique. There is no need to start with F75 and then switch to F100diluted unless the infant has edema.
- If the infant presents with edema, start treatment with F75 (See F75 reference table on page 16 of chart booklet) instead of F100 diluted. After resolution of edema, change to F100 diluted.

***Note**: F100 undiluted is never used for small infants (less than 3kg)*

Preparation of F 100 diluted

One packet of F100 is diluted in 2.7 liters of water, instead of 2 liters.

- To make small quantities of F100 diluted,

- Use 100ml of F100 already prepared and add 35ml of water, then you will get 135ml of F100diluted. Discard any excess waste. Don’t make smaller quantities.
- If you need more than 135ml, use 200ml of F100 and add 70ml of water, to make 270ml of F100 diluted and discard any excess waste.

Supplementary suckling technique

The mother holds a cup with the F100 diluted. The end of a NG tube (size nº8) is put in the cup, and the tip of the tube on the breast, at the nipple. The infant is offered the breast in the normal way. The cup is placed 5 – 10 cm below the level of the nipple for easy suckling. When the child suckles more strongly it can lowered to up to 30 cm (see Fig. below)

Follow up

The child is weighed every day. When the child is gaining weight at 20 g/day (absolute weigh gain) the quantity of F100 diluted in the cup is reduced by half so that the child gets more breast milk. If after this, weight gain is maintained by 10gm/day, then stop the supplement suckling completely. When it is certain that the child is gaining weight on breast milk alone he/she should be discharged, whatever his weight or weight-for-length. If the child is not gaining weight then continue with the SS technique, but increase the quantity of F100 diluted in the cup to 5 mls for each feed.

Care for the mothers

Check nutritional status of the mother (MUAC and edema). Explain the treatment and discourage self-criticism for the lack of milk. She should drink at least 2 liters of water per day, and eat about 2500 kcal/day. She should also receive Vitamin A (200 000 IU unless there is a risk of pregnancy). Micronutrient supplementation must also be given to the mother.

The mother should be counseled strongly on exclusive breast feeding.

Table 4: Amount of F-100 diluted to give for infants during Supplementary Suckling

Weight (Kg)	Diluted F100 in ml per feed in Phase 2, (8 feeds/day)
< 1.3	25 ml per feed
1.3 - 1.5	30
1.6 - 1.7	35
1.8 - 2.1	40
2.2 - 2.4	45
2.5 - 2.7	50
2.8 - 2.9	55
3.0 - 3.4	60
3.5 - 3.9	65
4.0 - 4.4	70

Note: The quantity is NOT increased as the infant starts to gain weight

5.2. Infants below six months who can not be breast-fed

The following only applies to malnourished infants for whom there is no prospect of being breast-fed (e.g. no mother, no wet-nurse) and are less than 6 months of age or less than 3 kg, with weight-for-length < 70 % or bilateral edema.

Feeding

Standard protocols are followed except that F100 is given diluted in the phase 1 (stabilization phase) (instead of F75) for children without edema. Refer table 5 below or table 3 on page 6 of the chart booklet to determine the amount).

Children with edema are fed with F75. In transition and phase 2 use Diluted F100 (RUTF is not suitable for these children) at inpatient facility.

- During Transition Phase, the amount of diluted F100 in phase 1 is increased by one third.
- During phase 2, give diluted F 100 using table 6 below or table 4 on page 7 of the chart booklet.

Table 5: Amounts of F100 diluted to give for infants not breast-fed in Phase 1

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Weight (Kg)	Diluted F100 in ml per feed in Phase 1, (8 feeds/day)
< 1.6	30 ml per feed
1.6 - 1.8	35 ml
1.9 - 2.1	40 ml
2.2 - 2.4	45 ml
2.5 - 2.7	50 ml
2.8 - 2.9	55 ml
3.0 - 3.4	60 ml
3.5 - 3.9	65 ml
4.0 - 4.4	70 ml

Table 6: Amounts of F100 diluted to give for infants not breast-fed in Phase 2

Weight (Kg)	Diluted F100 in ml per feed in Phase 2, (8 feeds/day)
< 1.6	60 ml per feed
1.6 - 1.8	70 ml
1.9 - 2.1	80 ml
2.2 - 2.4	90 ml
2.5 - 2.7	100 ml
2.8 - 2.9	110 ml
3.0 - 3.4	120 ml
3.5 - 3.9	130 ml
4.0 - 4.4	140 ml

III. Management of SAM in HIV infected children

Recovery from malnutrition is possible in children with HIV and AIDS, but it may take longer and treatment failures are more common. The treatment of severe malnutrition in children with HIV/AIDS should be the same as for HIV-negative children. Exactly the same protocol is used in HIV positive and negative children as explained in this training manual and the national protocol.

The drugs that are used for TB and HIV are quite toxic to the liver and pancreas. These organs are particularly affected by SAM. If treatment with anti-TB drugs or ARVs is started in the severely malnourished patient they are likely to develop very severe side effects from the drugs. This leads to withdrawal from the treatment program. Neither TB nor HIV are rapidly fatal illnesses. Thus, it is better to treat first severe malnutrition in all patients and to delay introduction of ARVs or Anti-TB drugs for one or two weeks until the liver, pancreas and intestine have recovered sufficiently to metabolize the drugs safely.

TB, HIV and SAM are linked and frequently appear in the same patient. Thus, children with SAM should be particularly screened for TB at the time of HIV testing.

EXERCISE E

Case 1: Almaz.

You are in charge of 10 babies below 6 months in Zewditu Hospital. On August 1st, Almaz was admitted to a TFU. She is 5 months old, weighs 2.9kg and her length is 55cm. She is being breastfed. Her mother says that her pregnancy lasted 9 months but Almaz was small when she was born. Her mother is 22 years old, she has had 4 pregnancies but has only 2 children alive. The father is absent.

Answer the following questions based on the previous and the additional information given below:

1. She was admitted to in-patient because her Weight for length is < 70%? True/False

2. What feed should be given to Almaz daily using the SS technique?

   TYPE OF FEED: _____ GIVE: _____ feeds of _____ml

3. When she gains weight at 20 g/d the volume of F100 diluted should be halved? true/false

4. After satisfactory weight gain her SS diet is halved, it should now be stopped if she gains at least 10g per day? true/false

5. The SS technique has been successful and she is gaining weight at 30gm/d on breast milk alone. She will complete treatment and can be discharged when she has reached 85% weight for height for two successive weights? true/false

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

6.0. Plan feeding for the ward

Until this point, this session has focused on planning feeding for the individual child. It is also important to plan feeding for the ward as a whole, so that the staffs know how much food to prepare, how much food to put in cups at each feed, etc.

6.1 Determine a schedule for feeding and related activities in the ward

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 4-hourly plans in special cases 3 hourly
- Weighing
- Bathing
- Shift changes

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

In general, monitoring activities (such as measuring temperature and pulse and respirations) will take place every four 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 will also be given on an individual basis.

Time for preparing feeds

It is recommended to prepare for each feed and storage is not recommended especially in our situation where refrigeration is poor and storage facilities are not good.

Time for review and planning

Select a time of day to review each child's past 24-Hour Food Intake on the multi- 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. This chart is used in the kitchen so that staff knows how much F-75 and F-100 to prepare.

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 Daily Ward Feed Chart 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 4-hourly 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.

Weighing and bathing

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

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

6.2 Prepare a Daily Ward Feed Chart to use in preparing feeds

An example of a Daily Ward Feed Chart is on the next page. To prepare a Daily Ward Feed Chart:

- Enter the name of each child in the ward in the first column.
- Looking at each child's individual 24-Hour Food Intake on the multi-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. (Note: if a child may be increasing the size of feeds during the day, enter the amount of the largest feed that you expect him to take. To ensure that there is enough food, it is better to estimate high.)
- 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.
- Add the individual totals to determine the total amount of F-75, and F-100 to be prepared during each feeding.
- Plan to prepare some extra feed. The extra amount will be used for new admissions, etc. Enter the amount to prepare in the appropriate space on the chart.

S-4 Feeding

Example

DAILY WARD FEED CHART

DATE: 14/03/01 **WARD: TFU**

Name of Child	F-75		F-100 Transition		F-100 Phase 2	
	Number feeds	Amount/ feed (ml)	Number feeds	Amount/ feed (ml)	Number feeds	Amount/ feed (ml)
Muleta	6	90				
Elisabeth			6	250		
Feven					6	300
Leila					6	180
Amanuel	6	110				
Yosef			6	200		
Genet	6	95				
Hailu	6	200				
Meriem					6	270
Kebre	6	95				
Kendu					6	150
Jemila					6	210
Jemberu					6	150
Total		**590**		**450**		**1,260**

EXERCISE F

In this exercise, you will finish completing a Daily Ward Feed Chart and determine how much F-75 and F-100 to prepare for the ward. Use the partially completed Daily Ward Feed Chart on the next page in this exercise.

1. Paulos 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 Paulos's feeding plan to the Daily Ward Feed Chart.

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

2. Fatuma 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. Fatuma's feeding plan for the day is below. Add her feeding plan to the Daily Ward Feed Chart.

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

3. Samuel is the last child in the ward. Samuel's feeding plan is below. Samuel ate eagerly yesterday, and he is likely to reach his maximum amount today. Add Samuel's feeding plan to the Daily Ward Feed Chart.

   DATE: 17/5/01 TYPE OF FEED: F-100 GIVE: 6 feeds of 170 ml

4. Feeds are prepared every 4 hours at this hospital. Complete the Daily Ward Feed Chart to determine how much to prepare every 4 hours.

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

S-4 Feeding

Use in Exercise F

DAILY WARD FEED CHART

DATE: 17/05/01 **WARD: Severe Malnutrition**

Name of Child	F-75		F-100 Transition		F-100 Phase 2	
	Number feeds	Amount/ feed (ml)	Number feeds	Amount/ feed (ml)	Number feeds	Amount/ feed (ml)
Meena					**6**	**240**
Tayib	**6**	**70**				
Abdul					**6**	**180**
Mamit			**6**	**200**		
Nishan	**6**	**65**				
Keflu					**6**	**210**
Hadgu					**6**	**210**
Beshir	**6**	**120**				
Lemesa			**6**	**250**		
Total						

6.3 Plan staff assignments related to feeding children

The major tasks involved in feeding are:

- preparing F-75, F-100, and ReSoMal
- measuring out feeds in amounts prescribed for each child
- feeding children
- recording feeds (and vomiting and diarrhea) on intake chart
- planning feeding schedule for an individual child for the next day
- preparing the Daily Ward Feed Chart

Each of these tasks is extremely important. Each task requires different skills. For example, preparing feeds 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.

6.4 Prepare staff to do assigned feeding tasks

If staffs 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, but may be done through staff meetings or on the job. Good training includes information, examples, and practice.

Example: Think about a time when you learned 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**); and
- then helped you **practice** 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. 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, F-100, and ReSoMal. The F-75 and F-100 Reference Cards used in this course are job-aids. Information may also be given orally, for example, in a staff meeting about how to complete patient records.

Example: Staff must be shown how to do the tasks. For example, they may watch a demonstration of preparing feeds or feeding a very weak child. They may look at a correctly completed 24-Hour Food Intake Chart.

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

Of course, training will not solve every problem in the ward. 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:

- do not know what to do; or
- do not know **how** to do a task.

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

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

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

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

SESSION 5: DAILY CARE

Introduction

Attentive and consistent daily care will make the difference in a severely malnourished child's recovery. The routine of daily care in a severe malnutrition ward includes such tasks as feeding, bathing, weighing, giving antibiotics, and monitoring and recording each child's progress. Throughout a very busy day, and through the night, the staff must be patient and caring with both the children and their parents.

Feeding tasks were described in the Feeding Session. Weighing and measuring tasks were described in Principles of Care. This Session will describe other aspects of daily care. You will practice tasks related to daily care during ward visits. Written practice in the session will focus on completing and interpreting the sections relevant for daily Care and Weight Chart of the multi-chart and the Monitoring Record.

Learning Objectives

This Session and related clinical sessions will describe and allow you to practice the following skills:

- Handling a child with SAM appropriately
- Caring for the skin and bathing a child with SAM.
- Giving routine medicines and other prescribed antibiotics, medications and supplements
- Caring for the eyes
- Monitoring pulse, respirations, and temperature and watching for danger signs
- Completing and interpreting the sections of the multi-chart relevant for daily Care and Monitoring Record for severe malnutrition.
- Preparing and maintaining a weight chart (graph)

1.0 Handle the child gently

Children with SAM must be handled very gently, especially at the beginning of their care. The body of a child with SAM is fragile and bruises easily. The child needs all his energy to recover, so he must stay calm and not become upset. It is important to speak quietly and handle children as little as possible at first. Hold and touch children with loving care when feeding, bathing, weighing, and caring for them.

Through tone of voice, gentle manner, and caring attitude, nurses will set a good example for the mothers of providing tender, loving care. They will also win the trust of the mothers and make them more likely to stay with their children in the hospital for the necessary length of time. It is critical for mothers to stay with their children in the hospital. The number of other adults interacting with each child should be limited, and the most skilled staff available should perform medical procedures, preferably out of earshot and sight of the other children.
Nurses can set a good example by:

- Removing the child's clothes gently
- Bathing the child gently
- Talking softly to the child while giving treatments
- Holding the child close while feeding
- Encouraging a mother who is helping to provide care
- Comforting a child after a painful procedure

As the child recovers, stimulation of the child should increase. Play, physical activities, and mental and emotional stimulation become very important to the child’s complete recovery. There will be more information on these activities in Involving Mothers.

SHORT ANSWER EXERCISE

Tick all of the appropriate responses or actions in the situations described below.

1. A child is crying after having an intramuscular injection. The mother appears upset and uncertain what to do.

   ____ a. Leave the child alone until he calms down.

   ____ b. Hold and comfort the child.

   ____ c. Explain to the mother why the procedure was necessary and how it will help the child.

   ____ d. Show the mother how to hold the child gently without rubbing the site of the injection.

2. A mother pays little attention while her child is bathed by a nurse. The mother sits quietly, does not participate, and is hesitant to touch the child.

   ____ a. Look at the mother directly and explain the bathing procedure.

   ____ b. Reassure the mother that she will not hurt her child by bathing and holding her gently.

   ____ c. Show the mother how to bathe and hold the child gently.

   ____ d. Leave the mother alone with the child, assuming she will figure out how to finish the bath.

   _____e. Watch and help while having the mother dress and warm the child after the bath.

3. A mother falls asleep and does not finish feeding her child F-75 during the night.

   _____ a. Let the mother sleep while you feed the child yourself.

   _____ b. Gently wake the mother and ask, “Can you finish the feed?”

   ____ c. Wake the mother and tell her that the child could die if not fed every three hours.

   ____ d. Suggest that the mother take turns sleeping and giving feeds with another woman whose child is nearby.

Check your own answers by comparing them to the answers given on page 269 of the module.

Example of sections of Therapeutic-treatment multi-chart relevant for Daily care.

The next page shows an example of completed sections of multi-chart relevant for daily Care of severe malnutrition. When daily care tasks are performed, the nursing staff should record their initials on these pages.

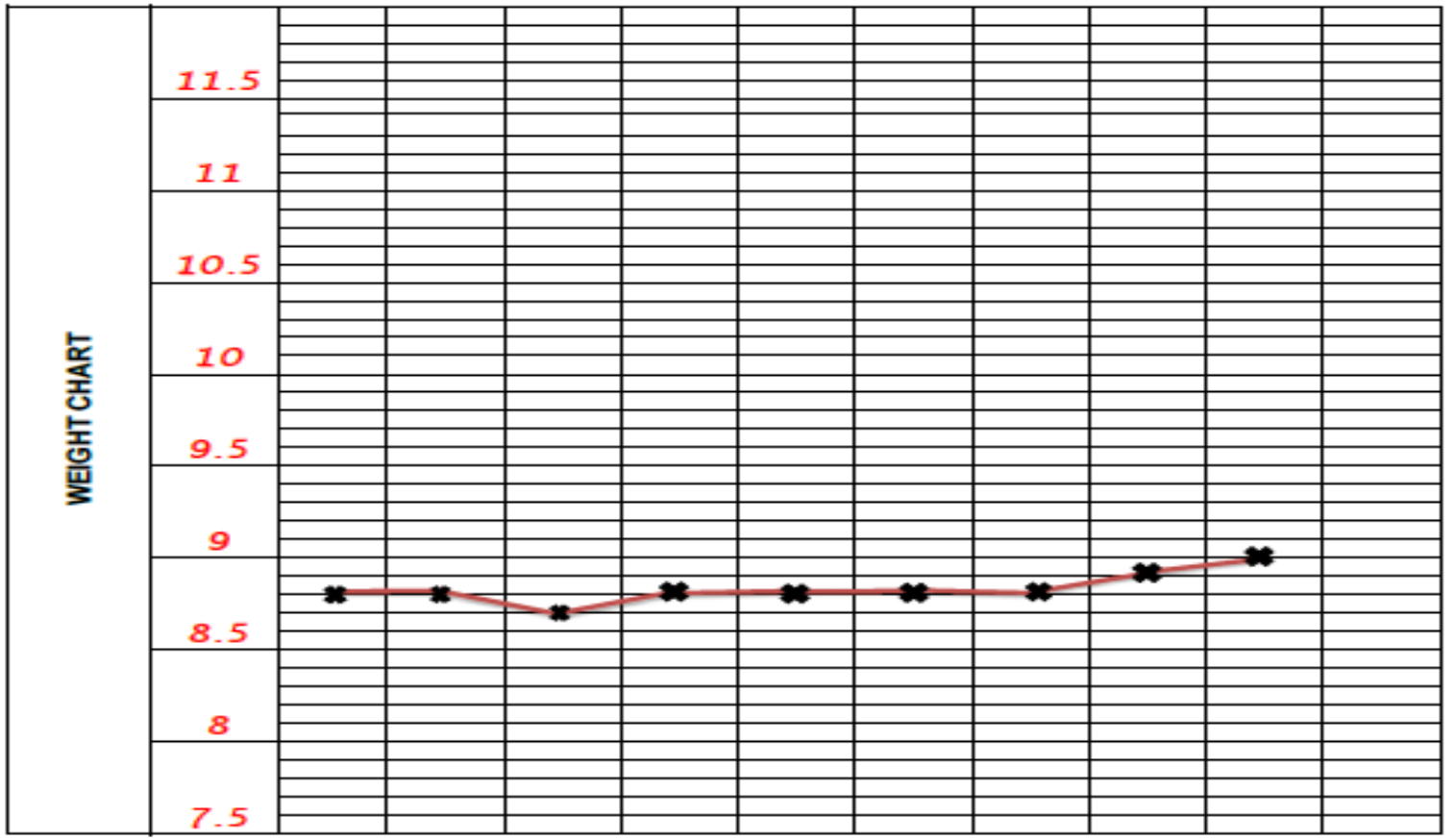
Tell a facilitator when you have reached this point of the session. When everyone is ready, your facilitator will present a brief demonstration on how to use the multi-chart for daily care. In the meantime, you may continue reading.

Birke Abera

ANTHROPOMETRIC CHART	Date	08/01/05	09/01/05	10/01/05	11/01/05	12/01/05	13/1/2005	14/1/2005	15/1/2005	16/1/2005	
	Height (cm)	89.5									
	Weight (kg)	8.8	8.8	8.7	8.8	8.8	8.8	8.8	8.9	9	
	W / H (%)	<70	<70	<70	<70	<70	<70	<70	<70	<70	
	MUAC (cm)	11.2							11.3		
	Edema (0 to +++)	0	0	0	0	0	0	0	0	0	

Target Weight (85% WFL/H)

11 kg



S-5 Daily Care

THERAPEUTIC DIET

	1	2	3	4	5	6	7	8	9	10
Date	08/01/05	09/01/05	10/01/05	11/01/05	12/01/05	13/1/2005	14/1/2005	15/1/2005	16/1/2005	
Phase (I, TR, II)	I	I	I	I	I	TR	TR	II	II	
Diet Name	F-75	F-75	F-75	F-75	F-75	F-100	F-100	F-100	F-100	
Volume per feed (ml/feed)	180	180	180	180	180	180	180	270	300	
Number of Feeds/day	6	6	6	6	6	6	6	6	6	
Total feed per day (ml/day)	1080	1080	1080	1080	1080	1080	1080	1620	1800	
Iron added (Y/N)	¬	¬	¬	¬	¬	¬	¬	Y	Y	

A=Absent
V= vomit
R = refuse
NG = NG tube
IV = IV fluid
Amount taken

100% [X X / X X]
75% [X X / X]
50% [X X]
25% [X]

		1	2	3	4	5	6	7	8	9	10
6:00 am	1	X	X	X	X	X	X	X	X	X	X	X	V	X	X	X	X	X	X
		R	R	X	X	X	X	X	X	X	X	X	V	X	X	X	X	X	R
10:00 am	2	X	X	X	X	X	X	X	X	X	X	X	X	X	R	X	V	X	X
		X	R	X	V	X	X	X	X	X	X	R	X	X	X	X	X	X	X
2:00 pm	3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	R	X	X
		X	X	X	R	X	V	X	V	X	X	X	X	X	X	X	X	X	X
6:00 pm	4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	V
		X	R	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10:00 pm	5	X	X	X	X	X	X	X	X	X	R	X	V	X	R	X	R	X	X
		X	X	X	R	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2:00 am	6	X	X	X	X	X	X	X	X	X	X	X	X	X	R	X	X	X	R
		X	R	X	X	X	X	X	R	X	X	X	R	X	X	X	R	X	X
	7																		
	8																		
	9																		
	10																		
Porridge																			
Family me																			
Other																			

SURVEILLANCE CHART

	1	2	3	4	5	6	7	8	9	10
Date	08/01/05	09/01/05	10/01/05	11/01/05	12/01/05	13/1/2005	14/1/2005	15/1/2005	16/1/2005	
Diarrhea (Y/N)	Y	Y	Y	N	N	N	N	N	N	
Vomit (Y/N)	N	Y	Y	Y	Y	Y	Y	N	Y	
Dehydrated (Y/N)	N	N	N	N	N	N	N	N	N	
Cough (Y/N)	N	N	N	N	N	N	N	N	N	
Respiratory rate (breaths/min)	35	36	35	35	34	34	36	37	37	
Pulse rate (beats/min)	90	90	90	92	105	103	100	105	100	
Palmar pallor (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Temp. AM Ax/Rec (°C)	35.5	36.3	36.8	37.3	36.9	37.2	36.8	36.7	36.6	
Temp. PM Ax/Rec (°C)	36	36.5	37	37.4	36.9	37.0	37.1	36.3	37.0	
Dermatosis (0 to +++)	+++	+++	+++	+++	++	++	+	0	0	
Liver size below costal margin (cm)	0	0	0	0	0	0	0	0	0	
Shock (Y/N)	N	N	N	N	N	N	N	N	N	
Failure to respond (Y/N)				N						

S-5 Daily Care

Enter name, dose and route of administration (oral-PO, intramuscular - IM, or intravenous-IV) for each drug. Enter your initial in the box when the drug is given.

			1	2	3	4	5	6	7	8	9	10
ROUTINE MEDICINES	Date		08/01/05	09/01/05	10/01/05	11/01/05	12/01/05	13/1/2005	14/1/2005	15/1/2005	16/1/2005	
	Vit A 200,000 IU		AS									
	Folic Acid 5 mg (PO)		AS									
	Amoxicillin	Time: 6:00 AM			BE	BE	BE	FH	FH			
	250 mg Po	: 2:00pm			BE	BE	BE	FH	FH			
	TID	: 10:00pm			AS	AS	AS	AS	AS			
	Deworming in phase 2:									BE		
SPECIAL MEDICINE	Antibiotic 1	Time: 6:00 AM	AS	AS								
	Ampicillin	: 12:00pm	AS	AS								
	440 mg IV	: 6:00pm	BE	BE								
	QID	: 12:00am	BE	BE								
	Antibiotic 2											
	Gentamycin IV/IM	Time: 6:00 AM	AS	AS	BE	BE	BE	FH	FH			
	40 mg once daily											
	Resomal											
	IV fluid											
	Blood											
	NG tube											
	TTC eye ointment three times daily											
	1% Potassium permanganate		AS	AS	BE	BE	BE	FH	FH			

2.0 Give Routine medicines and other medications

The nurse checks the multi-chart for severe malnutrition and gives the child any medication needed at that time. In addition, she may monitor respirations, pulse, and temperature; give eye drops, etc.

2.1 Give antibiotics as prescribed

Note: The prescription of appropriate antibiotics has already been covered in the Initial Management session. This section is about administering them.

When antibiotics are prescribed, enter the name, the dose and the route of administration in the routine medicine section under antibiotic I if it is the first line drug; and any additional antibiotics in the special medicine box under antibiotic II and III. The nurse should sign in the box when the antibiotic is given. If the prescription changes, be sure to update the multi-chart.

Look at the example of the routine and special medicines sections of the multi-chart for Birke on page 125. Notice how the Antibiotics section is set up and completed.

It is assumed that nursing staff knows how to measure and administer oral doses, so that will not be discussed here. However, giving antibiotics by IM injection may be difficult in a child with SAM and requires special care and attention.

Possible sites for IM injections are the buttocks or upper arm. Carefully select the site for an injection:

- Choose a site with enough muscle.
- Change the site when it becomes sore.

2.2 Give folic acid

Folic acid is a vitamin important for treating and preventing anemia and repairing the damaged gut. There is sufficient folic acid in commercially manufactured F75, F100 and RUTF to treat mild folate deficiency. CMV should be added in locally prepared F75 and F100.

On the day of admission, one single dose of folic acid (5 mg) can be given to children with clinical signs of anemia.

2.3 Give vitamin A

Severely malnourished children are at high risk of blindness due to vitamin A deficiency. Thus, vitamin A should be given orally to all children with SAM on the day of admission (on Day 1), except those with edema or those who received vitamin A in the past 6 months. However, for children with edema, it should be given once the edema subsides.

Children with measles and any clinical signs of vitamin A deficiency should be given vitamin A on admission even if edema is present.

Give a second dose on discharge if the child finishes the treatment in in-patient care. Don't give the discharge dose of vitamin A when transferred to OTP since it will be given at the OTP site on the fourth week.

Timing and oral dosages of vitamin A

Targets	Timing	Age	Dosage
All children*	Day 1	<6 months	50 000 IU
		6 – 12 months	100 000 IU
		> 12 months and >8 Kg **	200 000 IU
All children who are not transferred to OTP	Day 15 or day of discharge	Same age-specific dose	
All children who will be transferred to OTP	On the 4 th week of treatment	Same age-specific dose	
Children with eye signs or has measles or had measles in the past 3 months	Day 1,2 and 15	Same age-specific dose	

** Unless vitamin A is given in the last 6 months or if a child has edema*
*** If age >12 month and child weight is <8 kg, give 100,000 IU.*

Circle the "X" on day 1 of the therapeutic-treatment multi-chart when vitamin A is given at admission. Mark with X and circle on the day the discharge dose is given.

2.4. Give Measles Vaccine

All children from 9 months who are not vaccinated should be given measles vaccine both on admission and discharge after Phase 2. The first measles dose often does not give a protective antibody response. It is given because it ameliorates the severity of incubating measles and partially protects from nosocomial measles. The second dose is given to provoke protective antibodies.

SHORT ANSWER EXERCISE

1. Look again at the example of the multi chart for Birke (page 125). Birke is 2 years old and was admitted with some pus in her left eye. She has no vaccination cared. Should she be given a dose of vitamin A on Day 15? If yes, what is the dose? Should she be given Measles vaccine? If yes, when?

2. Another severely malnourished child with out edema, Neway, is admitted with no signs of vitamin A deficiency or eye infection. Neway is 5 months old and has never had measles. He has no record of previous doses of vitamin A. On what day(s) should Neway be given vitamin A? What is the dose? Should she be given Measles vaccine? Why and when?

3. Dasash (age 20 months) was referred from a health centre where she was given 200 000 IU vitamin A yesterday. She has no edema. She has corneal clouding. Should she be given another dose today, on Day 1 at the hospital?

   Should she be given a dose on Day 2? On Day 15?

Check your own answers to this exercise by comparing them to those given on page 269 at the end of the module.

2.5 Give Deworming tablets

Worms are common in older children who play outside, and they can be a problem in severely malnourished children. They can cause dysentery and anemia

Albendazole or Mebendazole is given at the start of phase 2 for children greater than 1 year that will remain as in-patient. For those transferred to outpatient Albendazole or Mebendazole is given at the second outpatient visit (after 7 days). Write the drug, dose (see table below) and "X" on the day the drug is given on routine medicines section of the multi-chart

Age	Give a single dose if child is ≥ 2 years and didn't get within the previous 6 months			
	Mebendazole		Albendazole	
2 - 5 years	500 mg tablet, or 5 tablets of 100 mg	Syrup, 100mg/5ml	400mg Tablet	Syrup, 100mg/5ml
	1 tablet (500mg)	5 tsp (25ml)	1 tablet	4 tsp (20ml)

2.6 Give Iron

Even if the child is anemic, he/she should not be given iron until he is recovering and he/she is in phase 2. If given earlier, iron can have toxic effects and reduce resistance to infection.

Provide iron to a child who is in phase 2. Add 1 crushed tablet of ferrous sulphate (200 mg) to each 2 to 2.4 liters of F100. For lesser volumes: 1000 to 1200 ml of F100, dilute one tab of ferrous suphate (200 mg) in 4 ml of the solution. For 500 ml to 600 ml of F100, add 1ml of the solution

Don't give iron to a child who is taking RUTF because it already has the required amount of iron.

3.0 Care for skin and bathe the child

Bathe children daily unless they are very sick. If a child is very sick, wait until the child is recovering to bathe him.

If the child does not have skin problems, or has only mild or moderate dermatosis, use regular soap for bathing.

If the child has severe (+++) dermatosis, bathe for 10-15 min/day in 1% potassium permanganate solution. To make a 1% solution, dissolve a crystal in enough water so that the color is slightly purple and still transparent. Sponge the solution onto affected areas while the child is sitting in a basin. This dries the lesions, helps to prevent loss of serum and inhibits infection. Initial on the special medicines section of the multi-chart when the bath is done. Write "1% permanganate" if it is used. (See example on page 125.)

If potassium permanganate solution is not available, affected areas may be dabbed with gentian violet.

If the child has severe dermatosis but is too sick to be bathed, dab 1% potassium permanganate solution on the bad spots, and dress oozing areas with gauze to keep them clean.

Apply barrier cream to raw areas. Useful ointments are zinc and castor oil ointment, petroleum jelly, or paraffin gauze dressing. These help to relieve pain and prevent infection. Use a different tube of ointment for each child to avoid spreading infection. If the diaper area becomes colonized with Candida, use nystatin ointment or cream after bathing. (Candidiasis is also treated with oral nystatin as described in the manual.)

Leave off diapers (nappies) so the affected area can dry. Be sure to dry the child well after a bath and wrap the child warmly.

4.0 Care for the eyes

Chloramphenicol or tetracycline eye drops are given for eye infection or possible eye infection. Atropine eye drops are used to relax the eye when there is corneal involvement (i.e., corneal clouding or ulceration). In some cases both types of eye drops may be needed.

Here is a summary of the eye drops needed for the eye signs discussed in this course:

If the child has:	**Then:**
Bitot's spots only (no other eye signs)	No eye drops needed
Pus or inflammation	Give chloramphenicol or tetracycline (1%) eye drops
Corneal clouding or Corneal ulceration	Give both: - Chloramphenicol or tetracycline (1%) eye drops and - atropine (1%) eye drops

Doses are as follows. Instill drops into the affected eye(s):

- Chloramphenicol or tetracycline (1%): 1 drop, 3-4 times daily for 7 to 10 days
- Atropine (1%): 1 drop, 3 times daily for 3 to 5 days.

If both types of drops are needed, they may be given at the same time for convenience. For example, give tetracycline 4 times daily, and at 3 of those times also give atropine. Continue drops for 7 to 10 days. If eye signs persist after 10 days, consult an eye specialist.

Use special care and tenderness in examining the eyes and instilling eye drops. To avoid spreading infection, use a separate dropper and bottle for each child. Also be sure to wash hands before and after treating each child.
Cover the affected eyes with saline soaked eye pads, and bandage the eyes. Open only for applying eye drop medications.

The affected eye(s) should also be cleaned with 0.9% saline solution until inflammation and irritation subside.

Some severely malnourished children sleep with their eyes open. Nurses should gently close the child's eyes while sleeping to prevent abrasion.

EXERCISE A

In this exercise you will decide on treatment for children with various eye signs. For some of the cases, you will refer to the Photographs booklet. For each child pictured or described, determine how many doses of vitamin A are needed and what kind of eye drops are needed.

1. Photo 8 – It was necessary to clean and open this child's eyes to examine them. Pus and inflammation were the eye signs found. The child has not had a dose of vitamin A in the last 6 months.

   On what days should this child receive vitamin A?

   What eye drops should be given, if any?

2. Photo 9 - This child has corneal clouding. He has not had a dose of vitamin A in the last 6 months.

   On what days should this child receive vitamin A?

   What eye drops should be given, if any?

3. Photo 10 - This child has a Bitot's spot and inflammation. He has not had a dose of vitamin A in the last 6 months.

   On what days should this child receive vitamin A?

   What eye drops should be given, if any?

4. Photo 12 - This child has corneal ulceration. He has not had a dose of vitamin A in the past 6 months.

   On what days should this child receive vitamin A?

   What eye drops should be given, if any?

5. Photo 15 – The child has +++ dermatosis.

   What treatment should this child get?

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

EXERCISE B

This exercise will be done as a group. Your facilitator will prompt you as you set up the multi-chart. Obtain a blank multi-chart to use in this exercise. (There should be a supply in your classroom.) When you have completed this exercise, save the filled multi-chart for later use in Exercise C.

Case – Lelissa

Lelissa is an 18-month-old girl with severe wasting and edema of both feet. She is acutely sick and has severe dermatosis, corneal clouding, and pus draining from her left ear. Lelissa does not seem to have worms. Her filled in-patient multi-chart is provided on the next page.

Nurses take the nursing trolley around the ward to give antibiotics, eye drops etc. at the following times:

6:00 a.m., 12:00 p.m., 6:00 p.m, 12:00 a.m., 6:00 a.m., 12:00 p.m.

Use the information on Lelissa's multi-chart, and the above information on nursing rounds, to set up Lelissa's multi-chart . Your facilitator will prompt you to include the necessary information.

When the group has completed this exercise, please discuss your answers with a facilitator

THERAPEUTIC TREATMENT MULTICHART FOR SEVERE MALNUTRITION

Unique SAM # .....

Registration # 1064

Sheet # .....01.....

Referred from: Leku HC

(TFU/OTP/Mobile clinic - circle the right source of referral)

Age (m or yr - specify) 18 m

Child's full name:

Lelissae Gemechu

Sex... F

Address (kebele, woreda, region)

Ramada, Shebedino, SNNPR

Breast feeding (Y/N)..... Y

complemenrary feeding (Y/N) ... Y

Major Problems
1. SAM
2. Dermatosis +++
3. Marasmic Kwash

Date of admission(EC) 14/ 02/ 01

Time. 7:30 AM/PM

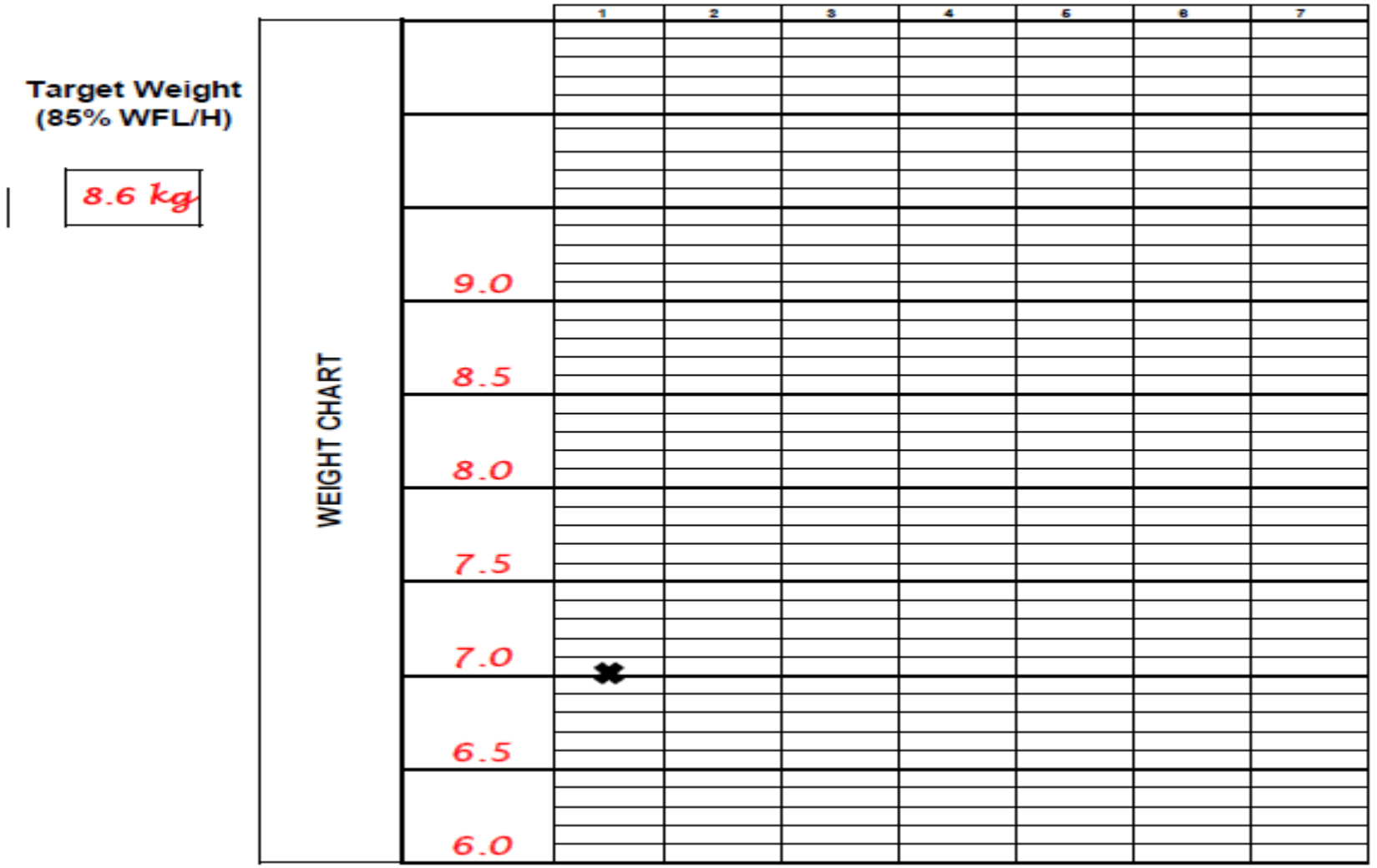
Readmission (Y/N)..... N

If yes, from .....

Old Reg Nos.....

ANTHROPOMETRIC CHART															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Date	14/02/2001													
	Height (cm)	77													
	Weight (kg)	7													
	W / H (%)	<70													
	MUAC (cm)	10.8													
	Edema (0 to +++)	+													

S-5 Daily Care



S-5 Daily Care

THERAPEUTIC DIET

		1	2	3	4	5	6	7	8	9
Date		14/02/2001								
Phase (I, TR, II)		I								
Diet Name		F-75								
Volume per feed (ml/feed)		125								
Number of Feeds/day		8								
Total feed per day (ml/day)		1000								
Iron added (Y/N)		-								
A=Absent V= vomit R = refuse NG = NG tube IV = IV fluid Amount taken 100% 75% 50% 25%	6:00 am 1									
	9:00 am 2	X X X R								
	12:00 pm 3									
	3:00 pm 4									
	6:00 pm 5									
	9:00 pm 6									
	12:00 am 7									
	3:00 am 8									
	9									
	10									
Porridge										
Family meal										
Other										

S-5 Daily Care

SPECIAL MEDICINE	Antibiotic 1	Time: 6:00 AM	BS													
	Ampicillin	: 12:00pm	TN													
	350 mg IV	: 6:00pm	SB													
	QID	: 12:00am	KL													
	Antibiotic 2															
	Gentamycin IV/IM	Time: 6:00 AM	BS													
	35 mg once daily															
	Resomal															
	IV fluid															
	Blood															
	NG tube															
	TTC eye ointment three times daily															
	1% Potassium permanganate		AS													
	Atropine (1%) eye drop three times daily		AS													

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Date	14/02/2001													
	Hgb (gm/dl) / Hct (%)	9 gr/dl													
	Malaria smear														
	Glucose (mg/dl)	72													
	TB test														

5.0 Monitor pulse, respirations, and temperature, and watch for danger signs

5.1 Measure Pulse and respiratory rate and take temperature

Measure pulse, count respirations and measure temperature every 6 hours, before feeding. This monitoring is very important because an increase in pulse rate or respiratory rate can signal a problem such as an infection, or heart failure from overhydration due to feeding or rehydrating too fast. An increase or decrease in temperature to above or below normal can indicate infection.

It is critical to monitor the child closely (every 6 hours) during phase 1 and during transition phase. After the child is stable and feeding freely on F-100 during phase 2, you may decrease monitoring of pulse, respirations, and temperature to once a day as long as the child is gaining weight. If there is no weight gain, or if the child loses weight, resume monitoring every six hours.

Record results of monitoring on the surveillance section of the multi-chart that allows you to record only two records of temperature and one reading of pulse and RR per day. However, a child with medical complications like, shock, dehydration, heart failure, hypoglycemia, hypothermia needs close follow up; thus prepare your own monitoring chart for pulse, respiration and temperature with 4 readings per day.

> Page 143 shows an example of a completed Monitoring Record. Tell a facilitator when you have reached this point in the module. When everyone is ready, your facilitator will present a brief demonstration of how to use the Monitoring Record. In the meantime, you may continue reading.

5.2 Recognize danger signs

Changes in pulse, respirations, temperature

The following increases in pulse and respiratory rate should be confirmed in order to determine if there is problem:

- If pulse increases by 25 or more beats per minute from the last measurement, confirm in 30 minutes*

- If respiratory rate increases by 5 or more breaths per minute from the last measurement, confirm in 30 minutes.*

** If on IV fluids, confirm in 10 minutes and watch closely.*

If the above increases in pulse AND respiratory rates are BOTH confirmed, they are a danger sign. Together, these increases suggest an infection, or heart failure from over hydration due to feeding or rehydrating too fast. Call a doctor for help. Stop feeds and ReSoMal, and slow fluids until a doctor has checked the child.

If just the respiratory rate increases, determine if the child has fast breathing, which may indicate pneumonia. If the child is from 2 up to 12 months old, a rate of 50 breaths per minute or more is considered fast. If the child is 12 months up to 5 years old, a rate of 40 breaths per minute or more is considered fast.

If just the pulse increases, there is no cause for concern, as the pulse may increase for many reasons, such as fear or crying.

If a child's axillary temperature drops below 35 ^{0}C, the child is hypothermic and needs re-warming. Have the mother hold the child next to her skin, or use a heater or lamp with caution. Be sure the room is warm (28 – 32 ^{0}C if possible) and the child is covered. Hypothermia may be a sign of infection. If the temperature drops suddenly, call a physician.

Increases in temperature can also indicate infections. Call a physician for help if there is a sudden increase or decrease in temperature. Changes in temperature can easily be seen on the temperature graph of on the monitoring record for pulse, RR, and temperature. Notice the changes in temperature on the example of the monitoring record of SAM on page 143.

Summary of Danger Signs Related to Pulse, Respirations, and Temperature		
	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 child 2 months up to 12 months old • 40 breaths/ minute or more in child 12 months up to 5 years	Pneumonia
Temperature	• Temperature <35 ^{0}C • Temperature ≥38.5 • Any sudden increase or decrease of axillary temp within the normal range.	Hypothermia (possibly due to infection, a missed feed, or child being uncovered) Infection

Other danger signs

Carefully watch any child with an infection such as pneumonia or sepsis, ear infection, or UTI. If possible, Keep children with infections near the nurses' station so that they can be easily watched. If a child has diarrhea or a rash, keep the child separate from the other children, if possible. For example, isolate the child behind a screen or in a separate area. Take special care with hand washing after handling these children.

In addition to watching for increasing pulse or respirations and changes in temperature, watch for the following danger signs and alert a physician if any of these danger signs appear.

- 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 distention
- new edema
- large weight changes
- increased vomiting
- petechiae (bruising)

6.0 Provide continuing care at night

Many deaths in severely malnourished children occur at night because a feed is omitted or the child becomes uncovered and cold. It is extremely important that enough staff are assigned to work at night, and that they are properly trained.
Night staff must:

- Keep each child covered to prevent hypothermia.

- Feed each child according to schedule during the night (at first this will be every 3 hours). This will involve gently waking the child to feed.

- Take 6-hourly measurements of pulse, respirations, and temperature.

- Watch carefully for danger signs and call a physician if necessary.

Monitoring Record for Respiratory rate, pulse rate and temperature (6 hourly)

Name: Birke

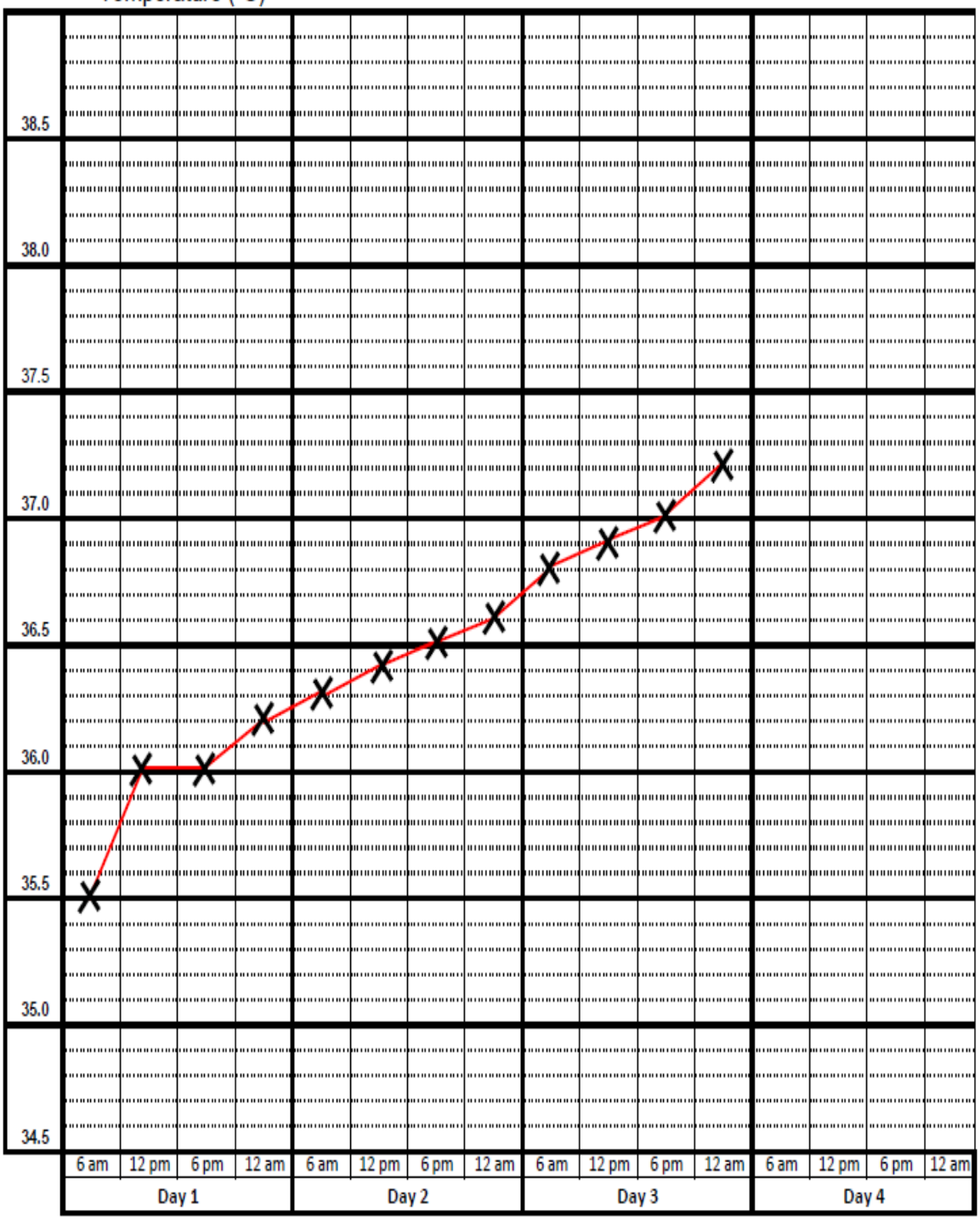
Respiratory Rate (breath/minute)

6 am	12 pm	6 pm	12 am	6 am	12 pm	6 pm	12 am	6 am	12 pm	6 pm	12 am	6 am	12 pm	6 pm	12 am
35	30	32	35	30	32	30	35	35	35	35	35				
Day 1				Day 2				Day 3				Day 4			

Pulse Rate (beats/ minute)

6 am	12 pm	6 pm	12 am	6 am	12 pm	6 pm	12 am	6 am	12 pm	6 pm	12 am	6 am	12 pm	6 pm	12 am
90	86	90	92	90	86	92	90	90	90	92	92				
Day 1				Day 2				Day 3				Day 4			

Temperature (^{0}C)



SHORT ANSWER EXERCISE

The following questions relate to the example of the monitoring Record of Birke on the previous page. The child monitored is 2 years old.

1. What were the child's temperature, respiratory rate, and pulse rate at 6 pm on Day 2?

   _____^{0}C _____ beats/minute _____ breaths/minute

2. What is the trend for the child's temperature over Days 1 through 3? (Tick one answer.)

   ____ a. There are sharp increases in temperature.
   ____ b. The temperature rises slowly and steadily.
   _____ c. The temperature stays below normal.

3. Has there been any significant change in the child's pulse rate? If so, when?

4. Has there been any significant change in the child's respiratory rate? If so, when?

5. On Day 4 at 12 am the nurse finds that the child has axillary temperature of 37.5 ^{0}C, a pulse rate of 100 beats per minute, and a respiratory rate of 45 breaths per minute (confirmed after 30 minutes). Enter this information on the Monitoring Record.

6. Is there a danger sign(s)? If so, what is the danger sign(s)? Should the nurse call a physician?

Check your own answers to this exercise by comparing them to the answers given on page 270 at the end of the module.

EXERCISE C

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In this exercise, you will make entries on a Daily Care part of the in-patient multi-chart and Monitoring Record for severe malnutrition. You will use the multi-chart that you set up for Lelissa in Exercise B. Obtain a blank Monitoring Record from the supply in your classroom.

Pretend that you are the nurse who cares for Lelissa on her first day in the ward. At the following times you give Lelissa her medications or monitor her progress. Make appropriate entries on the multi-chart and Monitoring Record; for example, enter your initials or record results of monitoring. *Additional information about feeding is provided in italics.*

Day 1

9:00 am *Lelissa is given her first feed of F-75. It is recorded on the therapeutic diet section of the multi-chart.* You check Lelissa's pulse, respiratory rate, and temperature. Her pulse rate is 100 beats per minute, her respiratory rate is 35 breaths per minute, and her axillary temperature is 38^0c.

- You give Lelissa 1.75 ml Ampicillin and 1.3 ml Gentamicin through her Heparinised IV cannula.
- You also give her 5 mg folic acid and 200 000 IU vitamin A.
- You put one drop of tetracycline and one drop of atropine in her left eye.
- Her ear is draining, and you gently wick it with a clean cloth.
- Since Lelissa is very ill, you do not bathe her, but you dab potassium permanganate solution on the worst patches of dermatosis, and you cover the raw areas with ointment and gauze.

12:00pm *Lelissa is given her second feed of F-75. It is recorded on the therapeutic diet section of the multi-chart.*

3:00 pm You check Lelissa's pulse, respiratory rate, and temperature. Her pulse rate is 105 beats per minute, her respiratory rate is 35 breaths per minute, and her rectal temperature is 38^0c. *Lelissa is given her third feed of F-75. It is recorded on the therapeutic diet section of the multi-chart*

- You give Lelissa 1.7 ml Ampicillin IV.
- You put one drop of tetracycline and one drop of atropine in her left eye.

6:00 pm The shift changes. Now pretend that you are the nurse on the next shift.

9:00 pm *Lelissa is given her fourth feed of F-75. It is recorded on the therapeutic diet section of the multi-chart.*

12:00 am *Lelissa is given her fifth feed of F-75. It is recorded on the therapeutic diet section of the multi-chart*

S-5 Daily Care

Answer the following questions:

1 At 12:00 am what else should be given to Lelissa?

2 When should Lelissa's respiratory rate, pulse rate, and temperature next be monitored?

3 What should be done for Lelissa at 3:00 a.m.?

When you have finished this exercise, there will be group discussion.

EXERCISE D

In this exercise, you will review several Monitoring Records and identify any danger signs.

Case 1 – Lelissa

You will remember that Lelissa was admitted with an ear infection and fever. You began Lelissa's Monitoring Record in the last exercise. Lelissa's continuing monitoring Record for the first two days is on the next page. Review her Monitoring Record; then answer the questions below.

1. What happens to Lelissa's temperature at 12:00 a.m. on Day 2?

2. Is this temperature change a danger sign? Why or why not?

3. What might be a cause of the temperature change?

4. Do Lelissa's pulse and respiratory rates indicate any danger signs?

5. What should be done for Lelissa at 12:00 a.m.?

Monitoring Record for Respiratory rate, pulse rate and temperature (6 hourly)

Name: Lelisa Abera

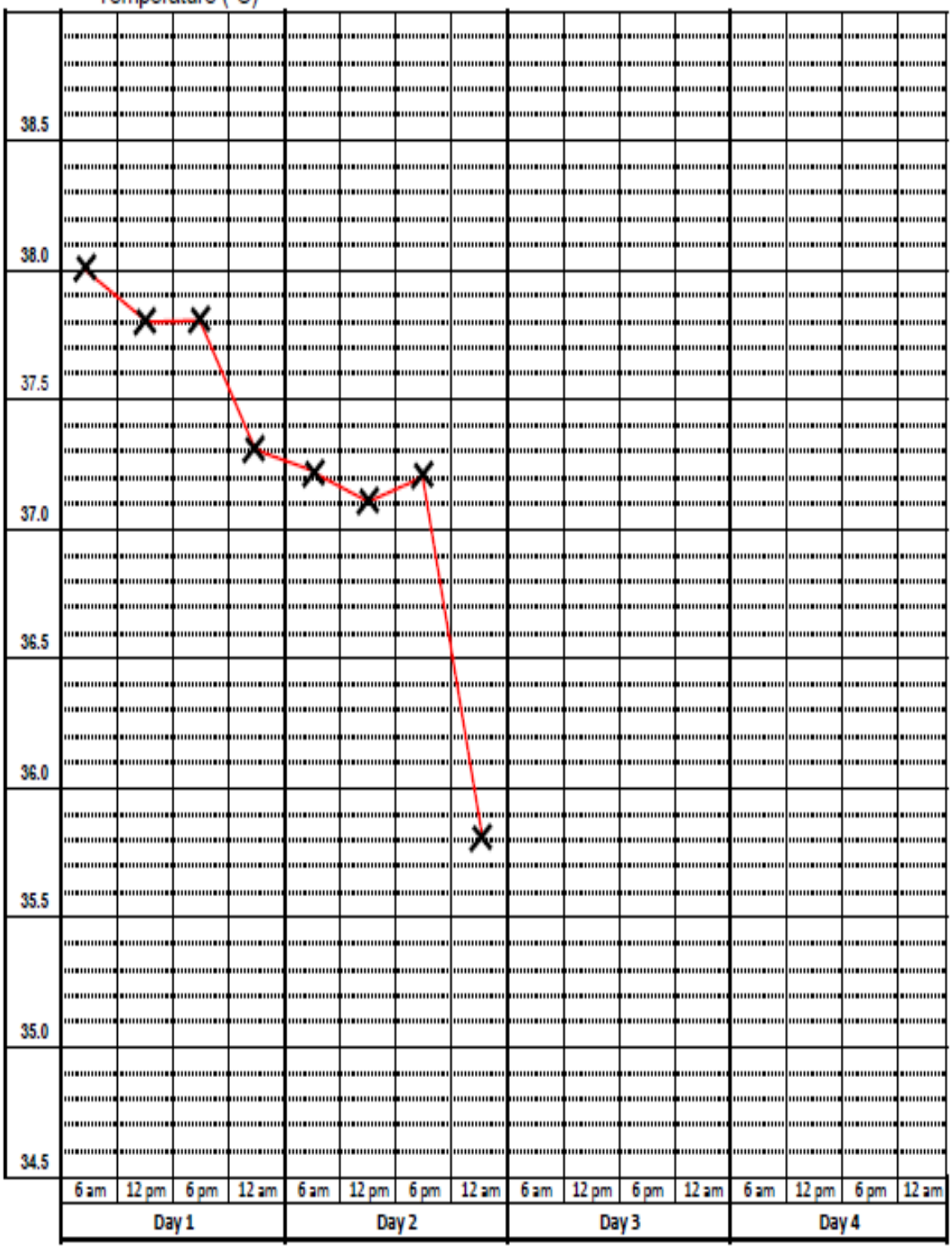
Respiratory Rate (breath/minute)

6 am	12 pm	6 pm	12 am	6 am	12 pm	6 pm	12 am	6 am	12 pm	6 pm	12 am	6 am	12 pm	6 pm	12 am
35	35	35	35	35	32	35	35								
Day 1				Day 2				Day 3				Day 4			

Pulse Rate (beats/ minute)

6 am	12 pm	6 pm	12 am	6 am	12 pm	6 pm	12 am	6 am	12 pm	6 pm	12 am	6 am	12 pm	6 pm	12 am
100	105	110	105	102	105	100	105								
Day 1				Day 2				Day 3				Day 4			

Temperature (^{0}C)



Case 2 – Chaltu

Chaltu is 2 years old and was admitted with diarrhea. She took ReSoMal orally for 2 hours. Then she began taking ReSoMal and F-75 in alternate hours. She did not take enough F-75 by mouth, so now she is being fed by NG tube. She still has some diarrhea and is given ReSoMal after each loose stool. Her temperature is steady and normal on day 1 and 2.

Review Chaltu's Monitoring Record without temperature below and answer the following questions.

1. Does Chaltu's pulse and respiratory rates indicate any potential danger sign? If yes, what is the danger sign?

2. What should be done in 30 minutes?

3. In 30 minutes Chaltu's pulse rate is 125 and her respiratory rate is 45. What should the nurse do?

4. What is a possible reason for the increase in Chaltu's pulse and respiratory rates?

Monitoring Record for Respiratory rate, pulse rate and temperature (6 hourly)

Name: **Chaltu**

Respiratory Rate (breath/minute)

30	**30**	**32**	**35**	**35**	**40**										

Pulse Rate (beats/ minute)

90	**90**	**95**	**100**	**100**	**125**										
6 am	12 pm	6 pm	12 am	6 am	12 pm	6 pm	12 am	6 am	12 pm	6 pm	12 am	6 am	12 pm	6 pm	12 am
Day 1				**Day 2**				**Day 3**				**Day 4**			

Case 3 – Bulto

Bulto is 2 years old. He is severely wasted but has no obvious complications or infections on admission. He is prescribed a routine course of Amoxicillin for 5 days.

Review Bulto's Monitoring Record and answer the questions below:

1. What happens to Bulto's temperature during the night of Day 2 and morning of Day 3? Does this indicate a danger sign?

2. Does the record of Bulto's pulse rates suggest any danger sign? Why or why not?

3. Does the record of Bulto's respiratory rates suggest any problem? Why or why not?

4. Should the physician be alerted?

5. The nurse notes that Bulto has chest indrawing. What could be the problem? What treatment should be given to Bulto?

.

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

Monitoring Record for Respiratory rate, pulse rate and temperature (6 hourly)

Name: Bulto

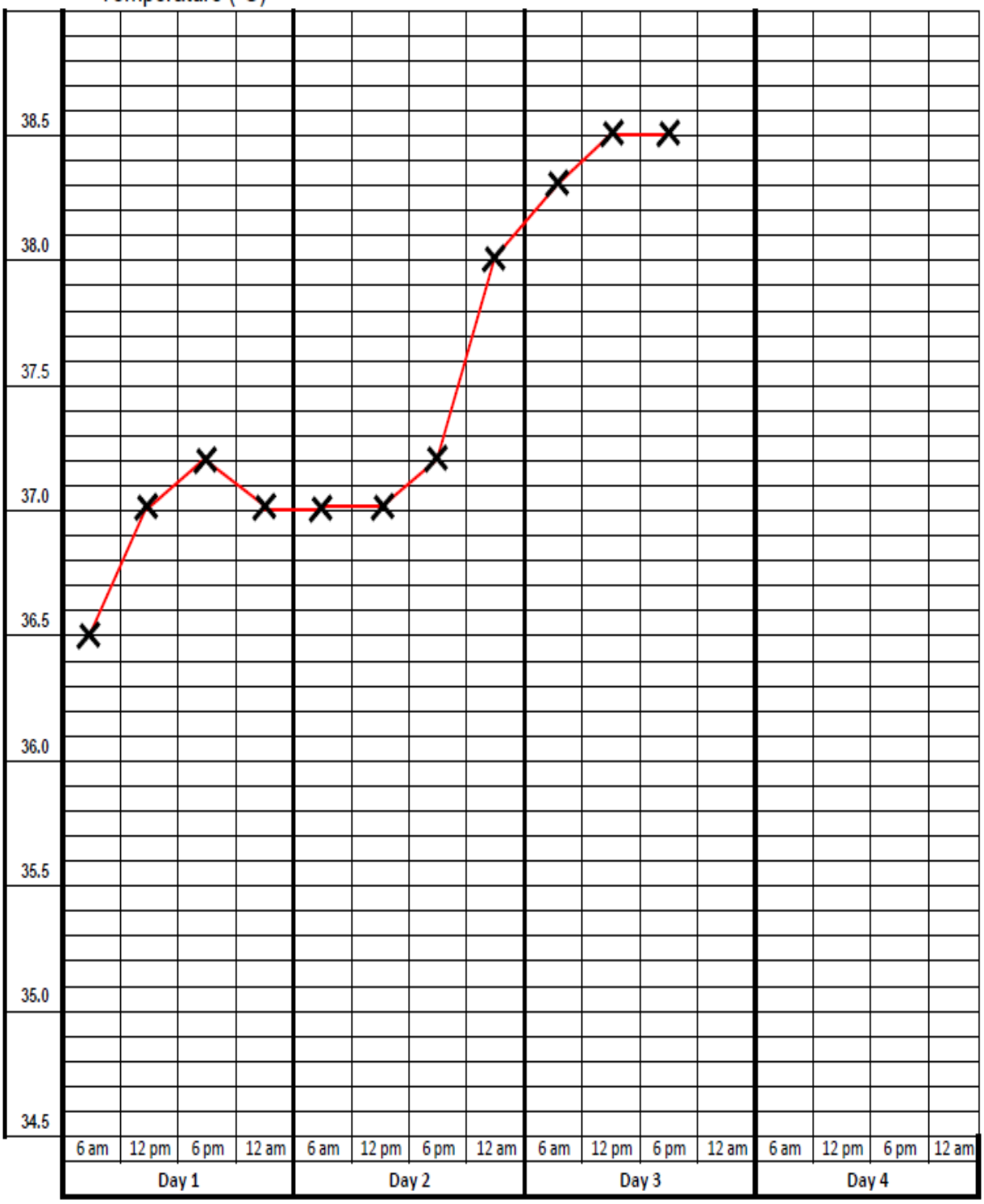
Respiratory Rate (breath/minute)

6 am	12 pm	6 pm	12 am	6 am	12 pm	6 pm	12 am	6 am	12 pm	6 pm	12 am	6 am	12 pm	6 pm	12 am
35	30	32	35	35	38	35	40	40	45	50					
Day 1				Day 2				Day 3				Day 4			

Pulse Rate (beats/ minute)

6 am	12 pm	6 pm	12 am	6 am	12 pm	6 pm	12 am	6 am	12 pm	6 pm	12 am	6 am	12 pm	6 pm	12 am
90	86	90	92	90	92	90	90	96	100	100					
Day 1				Day 2				Day 3				Day 4			

Temperature (^{0}C)



7.0 Weigh the child daily and maintain weight chart

How to weigh the child was described in Principles of Care. Remember to weigh the child at about the same time each day, about one hour before or after a feed.

After weighing the child each day, record the child's weight on the Anthropometric section of the Multi-chart. Then plot the child's weight on the Weight Chart included in the Multi-chart. The Weight Chart will visually show the child's progress towards discharge weight, any loss of weight due to edema, or failure to improve.

An example of a completed weight chart is shown on the next page. Study the example as you read the instructions below for preparing and maintaining a Weight Chart:

- Label the vertical axis of the graph with a range of weights that includes the child's starting weight and desired discharge weight, and allows for some weight loss as well as weight gain. Each horizontal line on the graph should represent a difference of 0.1 kg.

  - If the child has no edema, label the axis so that the starting weight will be near the bottom, but allow a little space (1 kg) below for possible weight loss.

  - If the child has edema, allow more space for weight loss (up to 30%) by placing the starting weight higher on the axis. As a general guideline, allow for up to:

    1 kg weight loss if mild (+) or moderate (++) edema
    2 kg weight loss if severe (+++) edema and child is $\leq$ 7 kg
    3 kg weight loss if severe (+++) edema and child is > 7 kg

- Use the weight for height reference card or table (Annex B) to determine the child's target or desired discharge weight (i.e., $\geq$85% weight for height). Record the desired or target weight in the big box below the weight to reach. Mark the desired discharge weight with a horizontal line across the chart.

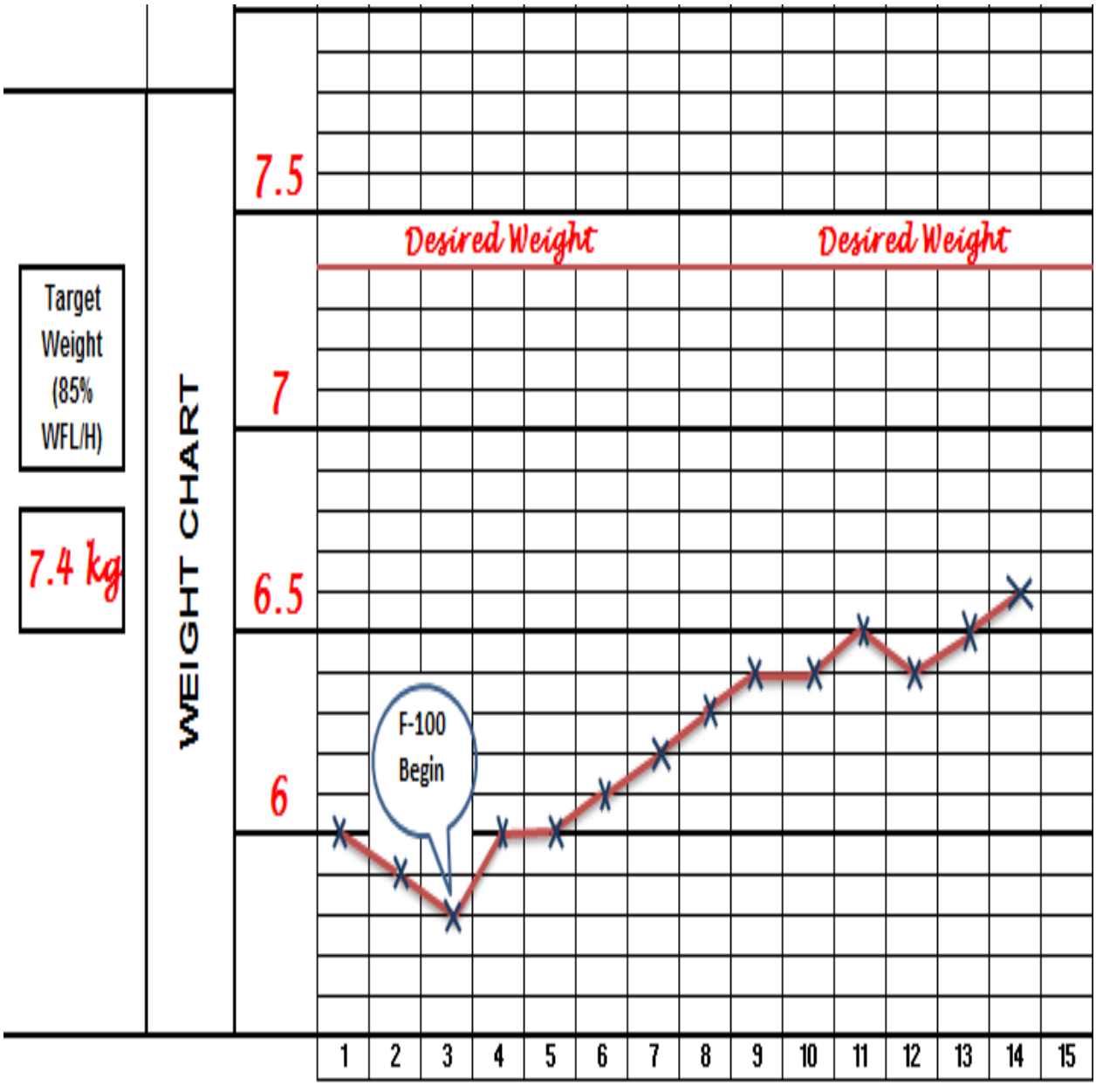
- Each day, plot the child's weight on the chart. Plot the starting weight on Day 1, the next day on Day 2, etc. Mark each point with an X or large dot so that it shows up clearly.

- Connect the points for the daily weights to see the child's progress.

- To highlight the day that F-100 is begun (the first day of transition), draw and label an arrow pointing to the weight for that day.

Example of weight chart for a boy with no edema

Starting weight: 6.0 kg Length: 71 cm Desired discharge weight (≥ 85% weight for height): 7.4 kg



The chart above shows a child who lost a little weight during the first few days on F-75 but then began to gain steadily after transition to F-100.

SHORT ANSWER EXERCISE

An example of a partially completed weight chart for a girl with mild (+) edema is on the next page. The child's starting weight is 5.3 kg. Since she has mild edema, space should be allowed for a 1 kg weight loss. To allow for this loss, the vertical axis is labeled so that 4.0 kg is at the bottom.

1. Look up the desired discharge weight for the child whose weight chart is shown on the next page. Enter the desired discharge weight above the chart, and mark it with a bold line on the chart.

2. Plot the weights for the next several days on the chart and connect them with a line:

   Day 11 weight: 5.1 kg
   Day 12 weight: 5.2 kg
   Day 13 weight: 5.3 kg

3. What was the child's lowest weight? On what day did this occur?

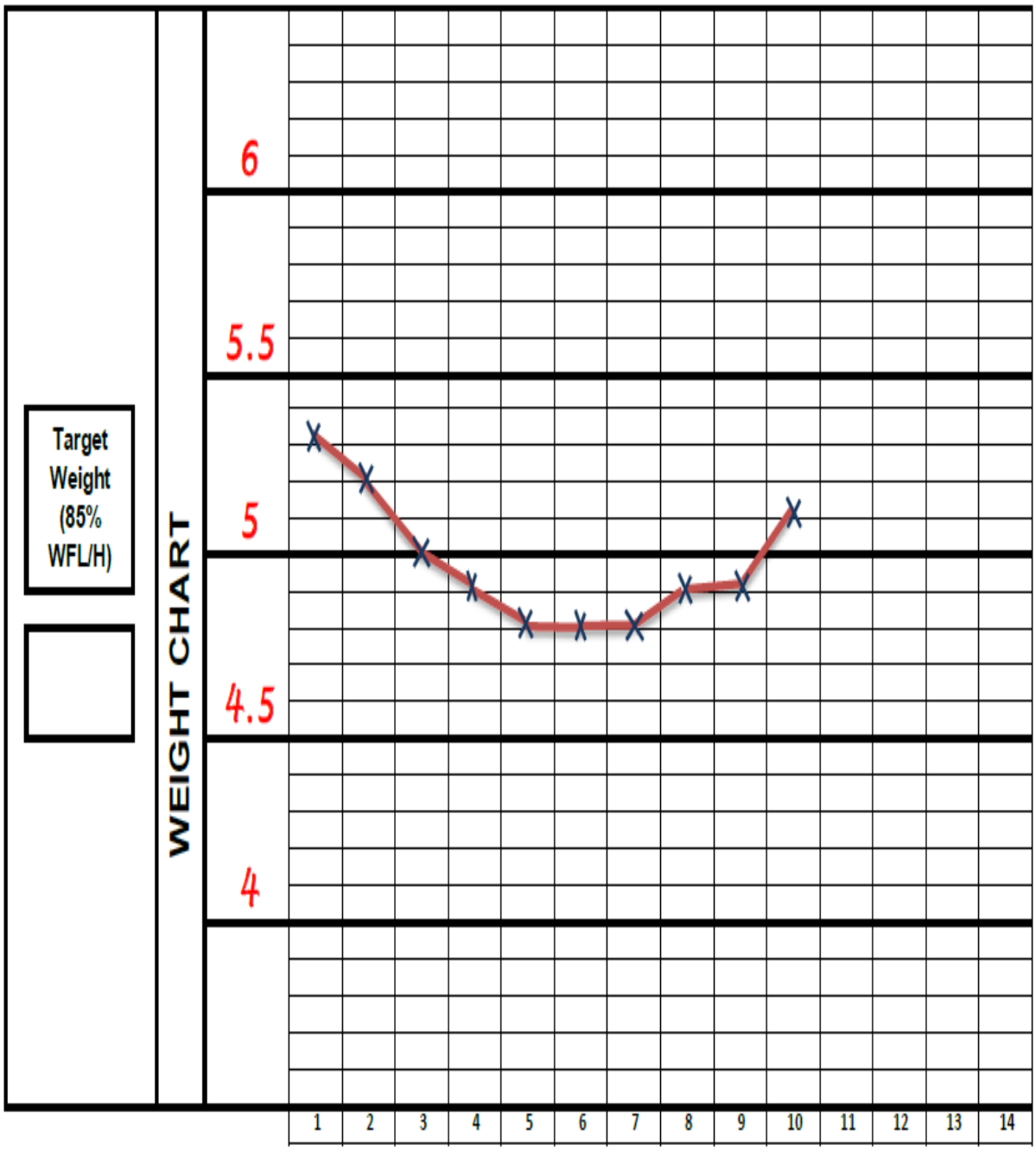
4. Why did the child lose weight?

5. Has the child made progress?

Check your answers of this exercise by comparing them to those given on page 270 of the module.

Example of weight chart for a girl with mild edema (+)

Starting weight: 5.3 kg Length: 67 cm Desired discharge weight (≥ 85% weight for height): _____ kg



8.0. Discharge Criteria

The discharge criteria differ for children age 6-59 months and less than 6 months.

i. Children age 6-59 months and who will complete their phase 2 treatments as inpatient should be discharged from in-patient care if they fulfill the following criteria:

Age	Discharge Criteria
Option 1	• weight-for-length or height ≥85% for 2 consecutive days **AND** no edema for 10 days (In-patient) or
Option 2	• Target weight gain achieved for 2 consecutive days if the child is admitted with MUAC

Note: Transfer from in-patient care to OTP is not considered as a discharge rather it is a transfer out to OTP

Option 1 is the preferred option. It is used where the facility has the capacity to measure the height of the children.

Option 2 is used particularly for children admitted on MUAC criteria and no equipment to measure height. See table 16 page 27 of the chart booklet for the target weight gain.

All the patients should be discharged to supplementary feeding program (SFP) for follow up where this is available.

ii. Children age less than 6 months should be discharged from in-patient care if they fulfill the following criteria:

Age	Discharge Criteria
<6 months on breastfeeding or with a caretaker willing to breast feed	• Infant gaining weight on breast milk alone • No medical problem • Mother is adequately supplemented with vitamins and minerals • There are no anthropometric criteria for discharge of the fully breast-fed infant who is gaining weight.

Age	Discharge Criteria
<6 months who can not be breast-fed	When they reach 85% weight for length and they can be switched to infant formula or animal milk.

If early discharge is necessary, many preparations must be made to ensure that the parents can continue care at home. Follow-up visits are essential.

SESSION 6: MONITORING AND PROBLEM SOLVING

Introduction

Many types of problems may occur in a severe malnutrition ward/ inpatient care. There may be problems with an individual patient's progress or care, such as failure to gain weight or treat an infection. There may also be problems that affect the entire ward, such as problems with staff performance, food preparation, or ward procedures or equipment. All of these problems require attention to prevent patient deaths.

This session teaches a process for identifying and solving problems that may occur on the ward. The process includes:

- Identifying problems through monitoring
- Investigating causes of problems
- Determining solutions
- Implementing solutions

This process can be used in solving problems with individual patients or problems that may affect the entire ward.

This session also describe the multi-chart relevant for monitoring and the monthly Reporting formats.

Learning Objectives

This session will describe and allow you to practice the following skills:

• Identifying problems by monitoring:

  -Individual patient progress, weight gain and care
  -Overall weight gain on the TFU or ward
  -Patient outcomes (such as cure, referral, death)
  -Case-fatality rate for the TFU or ward
  -Case management practices
  -Food preparation, ward procedures, and hygiene

- Investigating causes of problems

- Determining solutions appropriate for causes

- Conducting a problem-solving session with a group.

1.0 Use a process to identify and solve problems

1.1 Identify problems

Identify problems by monitoring. By monitoring individual patient progress, weight gain and care, you may identify problems such as the following:

- A patient's appetite has not returned
- A patient has failed to gain weight for several days while taking F-100
- A mother wants to take her child home before the child has reached the discharge weight
- A child seems to have an unrecognized infection

By monitoring overall weight gain on the ward, patient outcomes, and the case-fatality rate, you may identify problems such as the following:

- If the average weight gain is less than 8 gm /Kg/day or more than 20% of children in the TFU or ward have poor weight gain (<5 gm/Kg/day)
- 25% of mothers leave with their children before they reach the desired discharge weight
- The death rate in the ward was ≥ 10 % during the previous month.

By monitoring case management practices, food preparation, ward procedures, and hygiene, you may identify additional problems, which may in fact be causes of poor weight gain or adverse outcomes. For example, you may identify problems such as the following:

- IV fluids are given routinely by certain physicians
- Children are not fed every 3 hours through the night
- Staff do not consistently wash their hands with soap
- Preparation of milk is not correct.

When a problem is identified, describe it in as much detail as possible

Illus 9: Nurse with 5 questions

SHORT ANSWER EXERCISE

To describe the problem, state when, where, and with whom the problem is occurring. Also try to determine when the problem began. Knowing the details will help you find the cause, or causes, of the problem.

Read each pair of problem descriptions below. Tick the problem description that is more detailed and therefore more useful.

1. ____ a. There has been an increase in the number of deaths on the ward.

   ____ b. Four deaths have occurred at night in the past month.

2. ____ a. Tarekegne is not gaining weight.

   ____ b. After gaining 10 g/kg/day for four days, Tarekegne has stayed the same weight for the last three days.

3. ____ a. Dr Petros prescribes a diuretic for severe edema, but no other doctors do this.

   ____ b. Diuretics are sometimes prescribed for edema.

4. ____ a. Weight gain of some children on the ward is poor.

   ____ b. Weight gain is poor for most children who are taking adapted home foods instead of F-100.

Check your own answers to this exercise by comparing them to the answers given on page 270 at the end of the module.

1.2 Investigate causes of problems

It is critical to find the cause(s) of a problem before trying to solve it. Different causes require different solutions.

Investigation of causes may involve doing laboratory tests for a patient, observing and asking questions of staff, reviewing patient records, and/or monitoring food preparation and ward procedures.

1.3 Determine solutions

Solutions will depend on the causes of the problems. For example, if staff do not know how to do a new procedure, a solution may be training. On the other hand, if the cause is a lack of equipment or supplies, a different solution is needed. Solutions should:

- remove the cause of the problem (or reduce its effects)
- be feasible (affordable, practical, realistic); and
- not create another problem.

Illus 10: Nurse asking 4 questions

S-6 Monitoring and Problem Solving

Example of problem solving process

Problem: Weight gain in the inpatient care is not as good as it was several months ago. Instead of good weight gain for most children in phase 2 (that is, 10 g/kg/day or more), the typical weight gain is now less than 8 g/kg/day.

The senior nurse decides to investigate by monitoring ward procedures and food preparation. Following are some possible causes that she might find, along with an appropriate solution for each.

It is clear that buying new scoops will not solve the problem if the cause is really lack of an appropriate recipe. By investigating the cause of a problem, one can avoid wasting money and time on the wrong solutions.

Possible Cause:	**Possible Solution:**
The type of milk available for making feeds has changed, and the recipes have not been adjusted appropriately.	Adjust the feed recipes appropriately to use the milk that is available. Post the new recipes and teach them to staff.
Staff add too much water when making F-100. They add 1000 ml instead of just enough water to make 1000 ml of formula. OR Add less F-100 powder when making 1000 ml of F-100	Explain the recipe to staff. Be sure that 1000 ml is clearly marked on mixing containers. Demonstrate how to add water up to the mark.
Measuring scoops have been lost, and staffs are estimating amounts of ingredients for feeds.	Obtain new scoops.
There are more children on the ward, and staff numbers have not increased. Nurses cannot spend as much time feeding each child.	Invest time in teaching mothers to feed and care for the children.
Incorrect recording: - Inaccurate weighing scale or - Failure to complete the Multi-chart correctly	- Check the weighing scale according to the standard - randomly check the multi-chart

1.4 Implement solutions

Implementing a solution may be relatively simple (such as speaking with an individual staff member, or changing a child's feeding plan) or quite complex (such as changing staff assignments throughout the ward). Good communication with staff is important whenever any change is made.

To promote good communication when solving problems:

- Hold regular staff meetings, during which positive feedback is given and any problems, causes, and solutions are discussed.
- Provide staff with job descriptions, which list their assigned tasks.
- Provide clear instructions whenever any change is made.
- Provide "job-aids" such as checklists or posted instructions for any complex tasks (E.g. laminated F-75 and F-100 reference cards.)

Follow up to determine if a solution is implemented as intended. Then continue monitoring to determine whether the problem is solved. Give feedback to staff that includes praise for work done well, along with any instructions for improvement.

2.0 Monitor and solve problems with an individual patient

2.1 Monitor individual patient progress and care

Nursing staff should monitor certain signs (such as pulse rate, respiratory rate, and temperature) repeatedly during the day, especially during phase 1 or initial treatment (as discussed in daily care session). If there are danger signs (such as increasing pulse and respiratory rate, or a sudden drop in temperature), the staff should immediately respond as described in Initial Management and Daily Care. Otherwise, information is simply recorded on the Multi-chart, where it is reviewed by a clinician during rounds.

Clinicians should do a ward round at least once every day. During rounds, a clinician should:

- Observe the child and question the mother and nurse
  - -Is child more alert? smiling? sitting up? able to play?
  - -Has the child lost edema? -Is there less diarrhea?
  - -Has dermatosis improved?
  - -How is the child's appetite?

- Review the child's weight chart
  - -Is the child gaining weight according to the weight chart?
  - -If there is a loss, is it due to decreasing edema?

- Check for edema daily

- Review the multi-chart including the food intake
  - -Is the child getting the recommended feeds?
  - -Is prescribed care (such as antibiotics, folic acid) being given?
  - -Are there any danger signs recorded on the multi-chart:
    Increased pulse rate, respiratory rate, or temperature?

Daily, after a child is in phase 2, a clinician should calculate the child's weight gain in grams per kilogram body weight (g/kg/day) and judge whether weight gain is sufficient:

Good weight gain: 10 g/kg/day or more
Moderate weight gain: 5 up to10 g/kg/day
Poor weight gain: Less than 5 g/kg/day

To calculate daily weight gain

a. Subtract the child's weight yesterday (W1) from the child's weight today (W2). *Note: Do this even if the child has lost weight. If the child has lost weight, the result will be negative.* Express the difference as grams (kg x 1000). This is the total amount of weight gained during the day.

- W2 – W1 = __ kg
- __ kg x 1000 = ____ grams gained

b. Divide the grams gained (from step "a") by the child's weight yesterday. The result is the weight gain in g/kg/day.

Weight gain in grams ÷ W1 = ____ g/kg/day

If the child has lost weight during the past day, the "weight gain" for that day will be negative.

Note: This calculation is not useful until the child is on F-100, as the child is not expected to gain weight on F-75. In fact, weight may be lost on F-75 due to decreasing edema.

Remember that this calculation will be most useful if the child is weighed at about the same time each day.

Example

Ketema began taking F-100 on Day 4 in the in the TFU or ward. By Day 6 he began to gain weight. On Day 6 Ketema weighed 7.32 kg. On Day 7 he weighed 7.4 kg. His weight gain in g/kg/day can be calculated as follows:

- 7.4 kg – 7.32 kg = 0.08 kg 0.08 kg x 1000 = 80 grams gained
- 80 grams ÷ 7.32 = 10.9 g/kg/day

A gain of 10.9 g/kg/day is considered a good weight gain.

SHORT ANSWER EXERCISE

Calculate the daily weight gain for the children described below. Assume that the weights were taken at about the same time each day.

1. Mustefa weighed 7.25 kg on Day 10. He weighed 7.30 kg on Day 11. What was his weight gain in g/kg/day? What is your assessment of the weight gain?

2. Kebede weighed 6.22 kg on Day 8. She weighed 6.25 kg on Day 9. What was her weight gain in g/kg/day? What is your assessment of the weight gain?

3. Geremew weighed 7.6 kg on Day 9. He weighed 7.5 kg on Day 10. What was his weight gain in g/kg/day? (Note: Since Geremew lost weight, the answer will be negative.)

Check your own answers to this exercise by comparing them to the answers given on page 270 at the end of the module.

2.2 Identify the child who is failing to respond

A child is failing to respond if he or she:

- does not improve initially (primary failure); or
- Deteriorates/regress after having progressed satisfactorily to Phase 2 with a good appetite and weight gain in Transition Phase for in-patients and deteriorates after an initial response in out-patients (secondary failure).

Some criteria for failure to respond are listed below as a guide:

Failure to respond is a "diagnosis" in its own right. It should be recorded on the chart as such and the child then seen by more senior and experienced staff.

Criteria	Approximate time after admission
Child in Phase I (Primary Failure) • Failure to regain appetite • Failure to start to lose edema • Edema still present • Failure to enter Phase 2 and gain more than 5g/Kg/d	Day 4 Day 4 Day 10 Day 1**0**
Child in Phase 2 (Secondary Failure) • Failure to gain at least 5 g/kg/day for 3 successive days after feeding freely on F-100	During Phase 2

Note: the day of admission is counted as day 0

EXERCISE A

In this exercise you will review information about two cases to determine if they are making progress or if they are failing to respond.

Case 1 – Sara

Sara was admitted five days ago with moderate edema and wt for height of less than 70%. Parts of her Multi-chart and her feeding for Day 5 are provided on the next four pages. Sara's pulse rate has remained at about 90 over the five days, and her breathing rate has remained at about 35. She had measles in the last three months

Study the information about Sara and answer the questions below.

1a. Is Sara making progress? If so, describe her progress.

1b. Are there problems? If so, describe the problems.

THERAPEUTIC TREATMENT MULTICHART FOR SEVERE MALNUTRITION

Unique SAM # .....

Registration # 043

Sheet # .....01.....

Referred from: Kombolcha HC

(TFU/OTP/Mobile clinic - circle the right source of referral)

Age (m or yr - specify) 18 m

Child's full name:

Sara Teshome

Sex... F

Address (kebele, woreda, region)

01, Dessie Amhara

Breast feeding (Y/N)..... Y

complemenrary feeding (Y/N) ... Y

Major Problems
1. SAM
2. watery diarrhea
3. Marasmic Kuwash

Date of admission(EC) 7/ 04/ 03

Time. 2:45 AM/PM

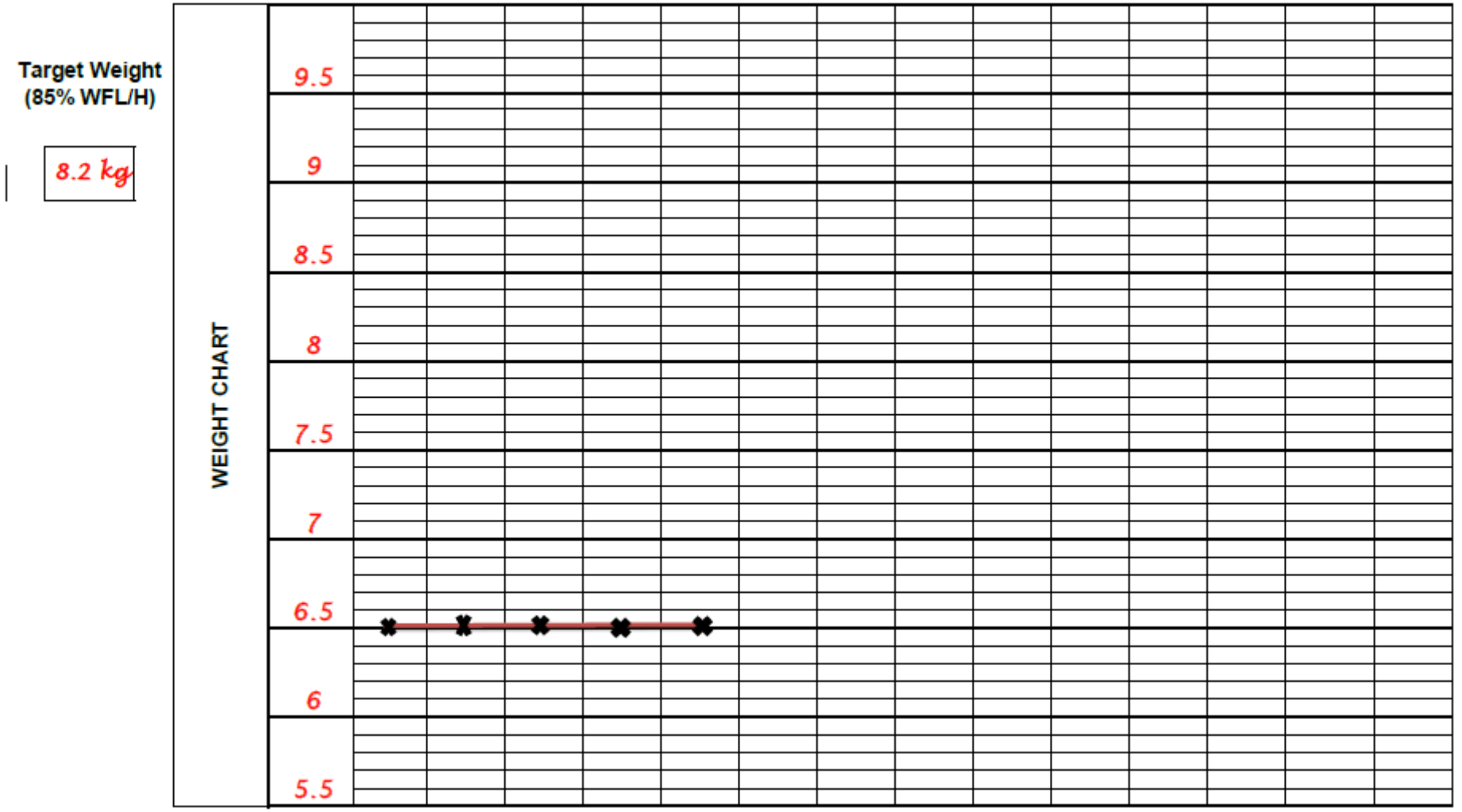
Readmission (Y/N)..... N

If yes, from .....

Old Reg Nos.....

ANTHROPOMETRIC CHART		1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Date	07/04/03	08/04/03	09/04/03	10/04/03	11/04/03									
	Height (cm)	75													
	Weight (kg)	6.6	6.5	6.5	6.5	6.5									
	W / H (%)	<70	<70	<70	<70	<70									
	MUAC (cm)	10.7													
	Edema (0 to +++)	++	++	++	++	++									

S-6 Monitoring and Problem Solving



S-6 Monitoring and Problem Solving

THERAPEUTIC DIET

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Date	07/04/03	08/04/03	09/04/03	10/04/03	11/04/03									
Phase (*I, TR, II*)	I	I	I	TR	TR									
Diet Name	F-75	F-75	F-75	F100	F-100									
Volume per feed (ml/feed)	140	140	140	140	140									
Number of Feeds/day	6	6	6	6	6									
Total feed per day (ml/day)	840	840	840	840	840									
Iron added (Y/N)	–	–	–	–	–									

A=Absent
V= vomit
R = refuse
NG = NG tube
IV = IV fluid
Amount taken

100%	X X	X X
75%	X X	X
50%	X X	
25%	X	

Feed	1	2	3	4	5	6	7	8	9	10	11	12	13	14
6:00 am 1		X X	X X	X X	X X									
		X R	X R	X X	X X									
10:00 am 2	X X	X X	X X	X X	X X									
	X R	X X	X X	X X	X X									
2:00 pm 3	X X	X X	X X	X X	X X									
	X X	X X	X R	X X	X X									
6:00 pm 4	X X	X X	X X	X X	X X									
	X R	X X	X X	X X	X X									
10:00 pm 5	X X	X X	X X	R R	R R									
	X R	X R	X X	X R	X X									
2:00 am 6	X X	R R	X X	X X	R R									
	X R	R R	X X	X R	X X									
7														
8														
9														
10														
Porridge														
Family me														
Other														

SURVEILLANCE CHART

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Date	07/04/03	08/04/03	09/04/03	10/04/03	11/04/03									
Diarrhea (Y/N)	Y	Y	N	N	N									
Vomit (Y/N)	N	N	N	N	N									
Dehydrated (Y/N)	Y	N	N	N	N									
Cough (Y/N)	N	N	N	N	N									
Respiratory rate (breaths/min)	35	36	35	37	34									
Pulse rate (beats/min)	90	93	90	92	105									
Palmar pallor (Y/N)	N	N	N	N	N									
Temp. AM Ax/ Rec (^{0}C)	35.5	36.3	36.8	37.3	36.9									
Temp. PM Ax/ Rec (^{0}C)	36	36.5	37	37.4	36.9									
Dermatosis (0 to +++)	+++	+++	++	++	+									
Liver size below costal margin (cm)	0	0	0	0	0									
Shock (Y/N)	N	N	N	N	N									
Failure to respond (Y/N)				N										

S-6 Monitoring and Problem Solving

Enter name, dose and route of administration (oral-PO, intramuscular - IM, or intravenous-IV) for each drug. Enter your initial in the box when the drug is given.

			1	2	3	4	5	6	7	8	9	10	11	12	13	14
ROUTINE MEDICINES	Date		07/04/03	08/04/03	09/04/03	10/04/03	11/04/03									
	Vit A 200,000 IU		FT													
	Folic Acid 5 mg (PO)		FT													
	Amoxicillin	Time: 9:00 AM	FT	FT	FT	FT	FT									
	250 mg Po	: 9:000pm	KS	KS	KS	KS	KS									
	BID															
	Deworming in phase 2:															
SPECIAL MEDICINE	Antibiotic 1	Time: 6:00 AM														
		: 12:00pm														
		: 6:00pm														
		: 12:00am														
	Antibiotic 2															
		Time: 6:00 AM														
	Resomal 30 ml per watery diarrea		FT													
	IV fluid															
	Blood															
	NG tube															
	TTC eye ointment three times daily															
	1% Potassium permanganate		FT	FT		FT										

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Date	07/04/03	08/04/03	09/04/03	10/04/03	11/04/03									
	Hgb (gm/dl) / Hct (%)	9	–	–	–	–									
	Malaria smear	-	–	–	–	–									
	Glucose (mg/dl)	72	–	–	–	–									
	TB test	-	–	–	–	–									

Exercise A, continued

Case 2 – Lemma

Lemma was admitted ten days ago with mild edema (both feet), dysentery, a fever, and wt/ht of less than 70%. Lemma was given Cotrimoxazole for his dysentery. After 5 days his dysentery was gone, but he was still sickly and had fever. He also had a deep, persistent cough and some difficulty of breathing. The physician suspected possible pneumonia and prescribed Ampicillin and Gentamicin, which has been given for 5 days.

Study parts of Lemma's MULTI-CHART, which are given on the next four pages. Then answer the questions below.

2a. What is Lemma's weight gain in g/kg/day from Day 10 to Day 11?

2b. Is Lemma making progress? If so, describe his progress.

2c. Are there problems? If so, describe the problems.

.

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

THERAPEUTIC TREATMENT MULTICHART FOR SEVERE MALNUTRITION

Unique SAM # .....

Registration # 561

Sheet # .....01.....

Referred from: Kombolcha HC

(TFU/OTP/Mobile clinic - circle the right source of referral)

Age (m or yr - specify) 18 m

Child's full name: Lema Shiferaw

Sex.. M

Address (kebele, woreda, region) Kersa Jimma Oromia

Breast feeding (Y/N)..... N

complemenrary feeding (Y/N) ... N

Major Problems
1. SAM
2. Dysentry
3. Fever

Date of admission(EC) 13/ 10/ 04

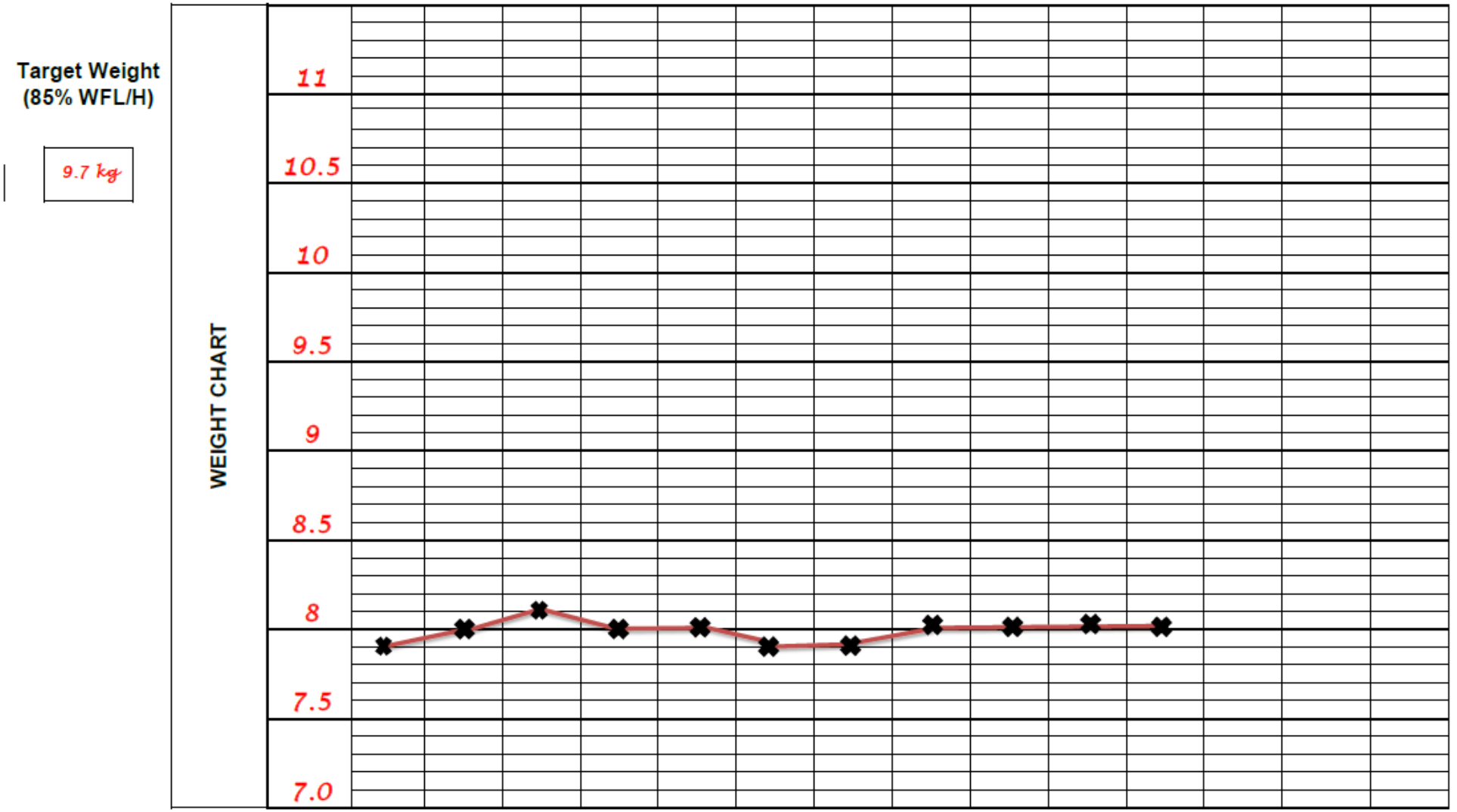
Time. 10:30 AM/PM

Readmission (Y/N)..... N

If yes, from .....

Old Reg Nos.....

ANTHROPOMETRIC CHART		1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Date	13/10/04	14/10/04	15/10/04	16/10/04	17/10/04	18/10/05	19/10/06	20/10/07	21/10/08	22/10/09	23/10/10			
	Height (cm)	83.5													
	Weight (kg)	7.9	8	8.1	8	8	7.9	7.9	8	8	8	8			
	W / H (%)	<70	<70	<70	<70	<70	<70	<70	70	70	70	70			
	MUAC (cm)	11.2							11.3						
	Edema (0 to +++)	+	+	+	+	0	0	0	0	0	0	0			


Target Weight
(85% WFL/H)
9.7 kg
WEIGHT CHART
11
10.5
10
9.5
9
8.5
8
7.5
7.0

S-6 Monitoring and Problem Solving

THERAPEUTIC DIET

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Date		13/10/04	14/10/04	15/10/04	16/10/04	17/10/04	18/10/05	19/10/06	20/10/07	21/10/08	22/10/09	23/10/10			
Phase (I, TR, II)		I	I	I	I	TR	TR	II	II	II	II	II			
Diet Name		F-75	F-75	F-75	F-75	F-100	F-100	F-100	F-100	F-100	F-100	F-100			
Volume per feed (ml/feed)		140	140	140	140	140	140	140	140	140	140	140			
Number of Feeds/day		6	6	6	6	6	6	6	6	6	6	6			
Total feed per day (ml/day)		840	840	840	840	840	840	840	840	840	840	840			
Iron added (Y/N)		¬	¬	¬	¬	¬	¬	y	y	y	y	y			
A=Absent V= vomit R = refuse NG = NG tube IV = IV fluid Amount taken 100% [X X / X X] 75% [X X / X] 50% [X X /] 25% [X /]	6:00 am	1	X X / X R	X X / X X	X X / X X	X X / X R	X X / X X	X X / X X	X X / X X	X X / R R	X X / X R	X X / X X			
	10:00 am	2	X X / X R	X X / X X	X X / X R	X X / X R	X X / X X	X X / X R	X X / X R	X X / X R	X X / X R	X X / R R			
	2:00 pm	3	X X / X R	X X / X R	X X / X R	X X / X X	X X / X X	X X / X X	X X / X X	R X / X R	X X / X R	X X / X R			
	6:00 pm	4	X X / X R	X X / X X	X X / X X	X X / X X	X X / X X	X X / R R	X X / X X	X X / X X	X X / R R	X X / R R			
	10:00 pm	5	X X / X X	X X / X R	X X / X R	X X / X X	X X / X X	X X / R R	X X / X R	R R / X X	X X / X X	X X / X X			
	2:00 am	6	X X / X X	X X / X X	X X / X X	X R / X X	X X / X X	X X / R R	R R / R X	X R / R R	X X / X X	X X / X X			
		7													
		8													
		9													
		10													
	Porridge														
	Family me														
	Other														

S-6 Monitoring and Problem Solving

SURVEILLANCE CHART

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Date	13/10/04	14/10/04	15/10/04	16/10/04	17/10/04	18/10/05	19/10/06	20/10/07	21/10/08	22/10/09	23/10/10			
Diarrhea (Y/N)	Y	Y	N	N	N	N	N	N	N	N	N			
Vomit (Y/N)	N	N	N	N	N	N	N	N	N	N	N			
Dehydrated (Y/N)	y	y	N	N	N	N	N	N	N	N	N			
Cough (Y/N)	y	y	y	N	N	N	N	N	N	N	N			
Respiratory rate (breaths/min)	35	36	35	37	34	38	40	36	33	35	35			
Pulse rate (beats/min)	90	93	90	92	105	90	93	90	100	104	95			
Palmar pallor (Y/N)	y	y	y	y	y	y	y	y	y	y	y			
Temp. AM Axil Rec (°C)	39	38.5	38.2	38	38	37.8	37.8	38.4	38.2	38	37.8			
Temp. PM Axil Rec (°C)	38.5	38	38.4	38.2	38.3	38.1	38	38.1	38.3	38	38.2			
Dermatosis (0 to +++)	+	+	+	+	+	+	+	+	+	0	0			
Liver size below costal margin (cm)	0	0	0	0	0	0	0	0	0	0	0			
Shock (Y/N)	N	N	N	N	N	N	N	N	N	N	N			
Failure to respond (Y/N)														

Enter name, dose and route of administration (oral-PO, intramuscular - IM, or intravenous-IV) for each drug. Enter your initial in the box when the drug is given.

ROUTINE MEDICINES

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Date		13/10/04	14/10/04	15/10/04	16/10/04	17/10/04	18/10/05	19/10/06	20/10/07	21/10/08	22/10/09	23/10/10			
Vit A 200,000 IU															
Folic Acid 5 mg (PO)		FT													
Amoxicillin	Time: 9:00 AM	FT	FT	FT	FT	FT									
250 mg Po BID	: 9:000pm	KS	KS	KS	KS	KS									
Deworming in phase 2:															

SPECIAL MEDICINE

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Antibiotic 1	Time: 6:00 AM						KS	KS	KS	KS	KS				
Ampicillin 500 mg IV, 1.75 ml QID	: 12:00pm						FT	FT	FT	FT	FT				
	: 6:00pm						FT	FT	FT	FT	FT				
	: 12:00am						KS	KS	KS	KS	KS				
Antibiotic 2															
Cotrimoxazole 240 mg Po, 4 ml BID	Time: 9:00 AM	FT	FT	FT	FT	FT									
	: 9:000pm	KS	KS	KS	KS	KS									
Resomal															
IV fluid															
Blood															
NG tube															
Gentamicin, 40mg IV, daily							FT	FT	FT	FT	FT				

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Date	13/10/04	14/10/04	15/10/04	16/10/04	17/10/04	18/10/05	19/10/06	20/10/07	21/10/08	22/10/09	23/10/10			
Hgb (gm/dl) / Hct (%)	8.8	–	–	–	–									
Malaria smear	–	–	–	–	–									
Glucose (mg/dl)	81	–	–	–	–									
TB test	–	–	–	–	–									

2.3 Determine cause(s) of failure to respond

When a child fails to respond then the common causes must be investigated and treated appropriately according to the standard protocol. The causes of a child's failure to respond may be related to procedures, staff, equipment, or the environment throughout the ward, or they may be related only to the individual child. If many children are failing to respond, look for causes that affect the entire ward, such as incorrect feeding practices or poor hygiene; these types of causes will be discussed in section 5.0. If your investigation is focused on one child, consider such possible causes as the following:

- Insufficient food given
  - -Has the feeding plan been adjusted as the child gains weight?
  - -Is the correct feed being given?
  - -Is the correct amount offered at the required times?
  - -Is the child being fed adequately at night?
  - -Is the child being held and encouraged to eat?
  - -Are leftovers recorded so the child's recorded intake is accurate?

- Vitamin or mineral deficiency
  - -Is mineral mix added to the child's food each day?
  - -Is an appropriate multivitamin given? (as in Feeding Session section 3.4)

- Insufficient attention given to child
  - -Do staff pay less attention to this child for some reason (for example, because they believe he is "beyond help")?
  - -Is the mother present to assist in feeding and care of the child?

- Rumination- The child regurgitates food from the stomach to the mouth, then vomits part of it and swallows the rest. This usually happens when the child is not observed.

  - -Is the child eating well but failing to gain weight?
  - -Does the child smell of vomit or have vomit-stained clothes or bedding?
  - -Does the child seem unusually alert and suspicious?
  - -Does the child make stereotyped chewing movements?

- Unrecognized infection – Infections most commonly overlooked include pneumonia, urinary tract infection, ear infection, and tuberculosis. Others include malaria, viral hepatitis B, and HIV infection.

- Serious underlying disease (such as congenital abnormalities, cancer, immunological diseases).

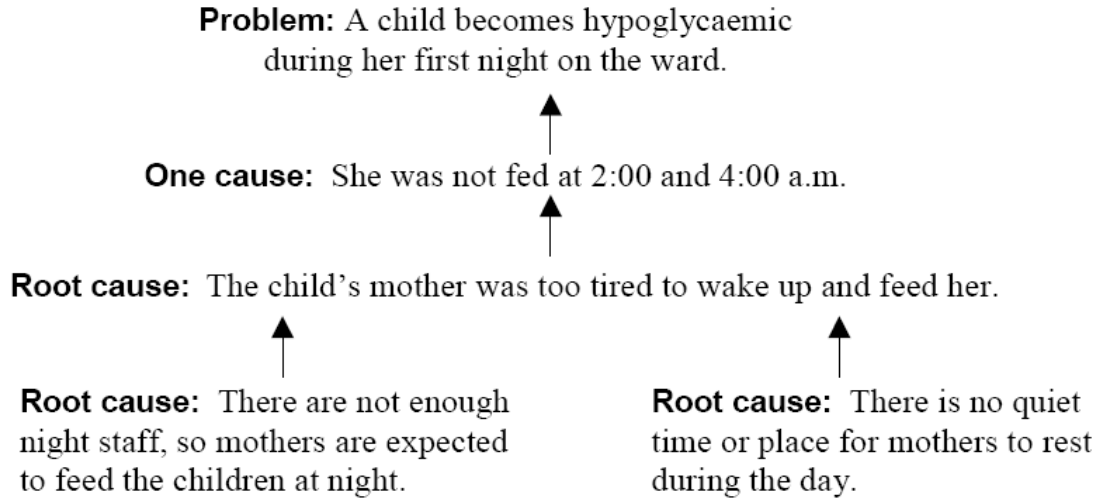
Remember that there may be multiple causes of failure to respond. For example, a child may have an infection plus a vitamin deficiency. Try to find all of the causes.

2.4 Identify and implement solutions for the individual child

In some cases, the cause of a problem may require a specific medical solution. If the child has an infection, a clinician will need to prescribe appropriate treatment as described in daily care session.

In many cases the solution to a problem may seem apparent through "common sense". For example, if the child is not being fed according to schedule, he must be fed according to schedule. However, there may be underlying causes that are also important. Continue to ask "Why?" until you reach the "root causes" of problems. The solutions to problems must address the root causes.

Example of a problem with root causes



Solutions: To solve this problem, it will be necessary to address all of the causes. Possible solutions include getting more night staff or finding a time and place for mothers to rest during the day. Night staff could also be asked to wake up the mothers and supervise night feeds, or help those mothers whose children require 3-hourly feeds.

EXERCISE B

In this exercise, you will discuss causes and solutions to problems affecting Sara and Lemma, two cases presented previously in Exercise A.

Case 1 – Sara

You remember that Sara was failing to respond on Day 5. She had not lost her edema and was not eating well. She had not progressed to transition phase. You may wish to review the information about Sara on pages 169.

Write answers to the following questions as preparation for a group discussion:

a. What are some possible causes of Sara's failure to respond? (List at least 3 possible causes.)

b. How could you find out the real cause(s)? List several possible ways to investigate.

c. While observing feeding in the ward, the senior nurse found that the staff paid very close attention to the children with IV drips and NG tubes. They paid much less attention to the children feeding orally. Sara did not appear as sick as many of the other children, and the nurses did not spend time with her encouraging her to eat.

   Based on the senior nurse's observations, what is a possible cause of Sara's failure to respond?

d. What is a possible solution appropriate for the cause identified in question 1c above?

Case 2 – Lemma

You remember that Lemma was failing to respond on Day 10. He had a deep, persistent cough and some difficulty breathing. The physician had been treating Lemma for pneumonia with Ampicillin and Gentamicin, which had been given for 5 days.

Since Lemma was not improving on Ampicillin and Gentamicin, the physician did a complete examination. He obtained a chest x-ray, which showed a shadow on the lungs. The physician also learned that a relative who lives in Lemma's household has tuberculosis.

a. Lemma's MULTICHART on page 174 shows no weight gain. Has Lemma been taking enough F-100?

b. What is a possible cause of Lemma's failure to respond?

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

3.0 Monitor overall weight gain in the inpatient Care/ward

Section 2.0 discussed problem-solving for individual patients. The remaining sections will discuss identifying and solving problems for the ward.

3.1 Compile data on weight gain in the inpatient care

Once a month, review records for the TFU or inpatient care ward for a given week (for example, the first week of the month) and compile data on a Average Weight Gain Tally Sheet for the Ward. Average Weight Gain is useful to show the quality of feeding

To complete the tally sheet:

- Identify the children who were on phase 2 for the entire week. (Only children in phase 2 are expected to gain weight.)
- Calculate the average daily weight gain for each of these children: (see the example below, how to calculate it)
  Eg. Chaltu has been admitted to ward, today is her 12th day in the ward. To calculate the average daily weight gain in the week, study the following tables and steps:

  Multi-Chart - Chaltu

					The last week, Day 0 to 7							
					0	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Date	1	2	3	4	5	6	7	8	9	10	11	12
Weight (Kg)	4.6	4.5	4.55	4.6	4.63	4.65	4.7	4.8	4.85	4.9	5.0	5.1

	Steps	**Chaltu'sCalculation**	**Interpretation**
a	Take the 7th day of the week weight	5.1 Kg	Last week Chaltu reached to 5.1 kg from 4.63 kg
b	Take Day 0 weight as baseline	4.63 Kg	
c	Subtract day 0 wt of the week from the 7th day weight, to get the total weight gain of the week in kg	5.1 – 4.63 = 0.47 kg	In the week (the 7 days) totally, Chaltu gained 0.47 kg or 470 gms in her weight.
d	Multiply the difference by 1000, to convert the total weight gain into gram	0.47 * 1000 = 470 gm	
e	Divide the 470gm by body weight on day zero in kilograms, to get the average daily weight gain(per Kg of body weight)	470gm/ 4.63kg = 101.512 gm/Kg	When the 470gm gainis divided for the initial weightequals 101.512 grams per each kilo of the initial weight.
f	Divide it by 7 days, to get the average daily weight gain	101.512gm/7 days = 14.5gm/kg/day	101.512gm/kg gain in a week means 14.5gm average gain per kilo of initial weight every day. This average daily weight gain is good (since it is >10gm/kg/day gain)

3.2 Determine if there is a problem with weight gain on the ward

If the weight gain of 20% or more of the children in phase 2 (on F-100) is poor, there is a problem that must be investigated. If there is a negative change as compared to previous months, there may also be a problem. For example, if the percentage of children in the "moderate" column increases and the percentage in the "excellent" column decrease, investigate the reasons for this change.

3.3 State the problem specifically

Describe the problem as completely and specifically as possible. Determine if the children who are not gaining weight adequately have certain things in common. For example:

- How long have they been on the TFU or ward?
- What are their ages?
- Are they located in a certain area of the ward?
- Are they cared for by certain staff?
- Are they receiving food or drinks that interfere with prescribed feeds?

You may think of other questions to ask to determine common factors. If there are no apparent common factors, then assume that the problem is throughout the TFU or ward.

After determining common factors, state the problem specifically, for example, "4 out of 5 children whose mothers are not staying in the TFU have poor weight gain". If the problem is occurring throughout the ward, say so, for example, "25% of children throughout the ward have poor weight gain".

Stating the problem specifically will help you look for the cause(s). Investigating causes by monitoring ward procedures, food preparation, etc. will be discussed in section 5.0.

EXERCISE C

In this exercise, you will review information on children who have been on F-100 for the past seven days. You will use a tally sheet to determine whether there is a problem with weight gain on the ward. There will then be a group discussion.

Information for the exercise

Twenty children on the ward have been in phase 2 for the past seven days. For seventeen of these children, the average daily weight gain for the past seven days has been calculated.

These children's names have already been entered on the tally sheet on the next page.

MULTl-CHART excerpts for the three children are given on page 186. Follow the instructions on page 182 - 183 to complete the tally sheet. Check your tally sheet with a facilitator if you wish. Then answer the questions on page 187.

S-6 Monitoring and Problem Solving

WEIGHT GAIN TALLY SHEET FOR WARD

Week of: **13/4/00**	Good weight gain: ≥ 10 g/kg/day	Moderate weight gain: 5 up to 10 g/kg/day	Poor weight gain: < 5 g/kg/day
Number of children in phase 2 for entire week: **20 children**	***Amir*** ***Wondwossen*** ***Sulayman*** ***Fate*** ***Keste*** ***Shimeles***	***Lukman*** ***Rahemeto*** ***Zenieba*** ***Taye*** ***Adem*** ***Alemayhew*** ***Edris*** ***Kibrom***	***Samson*** ***Marima*** ***Lulit***
Totals			
% of children in phase 2 in ward			

S-6 Monitoring and Problem Solving

Multi-Chart Excerpt 1- Aron

Anthropometric Chart	Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Height (cm)	64														
	Weight (Kg)	4.6	4.5	4.55	4.6	4.63	4.65	4.7	4.8	4.85	4.9	5.0	5.0			
	Wt for Ht (%)	<70														
	MUAC (cm)															
	Edema (0 to +++)															

Multi-Chart Excerpt 2 - Keflom

Anthropometric Chart	Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Height (cm)															
	Weight (Kg)	5.9	5.8	5.9	5.9	6.0	6.0	6.0	6.0	6.10	6.15	6.10	6.20	6.25	6.20	
	Wt for Ht (%)															
	MUAC (cm)															
	Edema (0 to +++)															

Multi-Chart Excerpt 3- Saba

Anthropometric Chart	Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Height (cm)															
	Weight (Kg)	7.7	7.7	7.7	7.8	7.8	8.0	8.1	8.15	8.22	8.2	8.3	8.3	8.35		
	Wt for Ht (%)															
	MUAC (cm)															
	Edema (0 to +++)															

S-6 Monitoring and Problem Solving

Questions to answer and discuss:

1. Does the tally sheet show that there is a problem with weight gain on the ward?

2. The senior nurse decided to look for common factors among the children who had poor weight gain. She found the following information:

   Samson – Arrived 21 days ago, age 2 years, orphan (no caregiver at the hospital), cared for by Nurse Rahel

   Marima – Arrived 18 days ago, age 19 months, no mother at hospital (aunt comes to visit), cared for by Nurse Aman

   Lulit– Arrived 12 days ago, age 22 months, was on IV at admission and then NG but now takes feeds orally, moved yesterday to Nurse Rahel's area, mother is present

   Keflom – Arrived 14 days ago, age 18 months, cared for by Nurse Aman, orphan (parents died and a neighbour left Keflom at hospital)

   What common factor(s), if any, are there among these children?

3. State the problem as specifically as possible using the information from the tally sheet and the information gathered by the senior nurse.

4. Do the common factors among the children with poor weight gain suggest a possible cause of the problem? If so, what is a possible cause? What further investigation may need to be done to investigate causes?

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

4.0 Monitor patient outcomes

4.1 Record each patient's outcome on the MULTI-CHART

On front page and at the right upper corner of the MULTI-CHART, there is discharge box for recording patient outcomes. Record the outcome for the patient whether it is successful or not. Record any relevant comments, such as circumstances and causes of adverse outcomes. Record the discharge outcomes in the outcome column and the reasons for any discharge outcomes, and with in how many hours the death occurs in remark column of the Registration book too.

Discharge Outcomes

1. Successful outcome:

Cured (Recovered): child that has reached the discharge criteria for in-patient care

Transfer Out to OTP: Child that is transferred from in-patient care to OTP.

2. Adverse outcomes:

Defaulter: Child that is absent for 2 consecutive days in in-patient care

Death: Patient that has died while s/he was in the in-patient care. Register after how many days the death happened (<24 hrs, 1-3 days, 4-7 days, and >7 days)

Non-responder: Patient that has not reached the discharge criteria after 40 days in the inpatient care

Medical Transfer: child is referred to higher health facilities for medical reasons and the referring health facility will not continue the nutritional treatment or transfer the child back to the program

Example from multi-chart

THERAPEUTIC TREATMENT MULTICHART FOR SEVERE MALNUTRITION

Unique SAM # .....

Registration # 561

Sheet # .....01.....

Referred from: Kombolcha HC

(TFU/OTP/Mobile clinic - circle the right source of referral)

Age (m or yr - specify) 18 m

Child's full name: Lema Shiferaw

Sex.. M

Address (kebele, woreda, region) Kersa Jimma Oromia

Breast feeding (Y/N)..... N

complemenrary feeding (Y/N) ... N

Major Problems

1. SAM
2. Dysentry
3. Fever

Date of admission(EC) 13/ 10/ 04

Time. 10:30 AM/PM

Readmission (Y/N)..... N

If yes, from .....

Old Reg Nos.....

ANTHROPOMETRIC CHART		1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Date	13/10/04	14/10/04	15/10/04	16/10/04	17/10/04	18/10/05	19/10/06	20/10/07	21/10/08	22/10/09	23/10/10			
	Height (cm)	83.5													
	Weight (kg)	7.9	8	8.1	8	8	7.9	7.9	8	8	8	8			
	W / H (%)	<70	<70	<70	<70	<70	<70	<70	70	70	70	70			
	MUAC (cm)	11.2							11.3						
	Edema (0 to +++)	+	+	+	+	0	0	0	0	0	0	0			

4.2 Tag adverse outcomes on the multi-chart

Use a colored tag or some other means to indicate records with adverse outcomes (that is, death, defaulter or referrals). The tag will make these records easy to find in the files when you are doing a review.

4.3 Review patient records for common factors in adverse outcomes

Periodically and whenever there is a death, review patient records. Note common factors that would suggest areas where case management practices or ward procedures may need to be carefully examined and improved.

For example, note whether recent deaths have occurred within the first 2 days after admission or later. Deaths that occur within the first 2 days are often due to hypoglycemia, overhydration, unrecognized or mismanaged septic shock, or other serious infection. Deaths that occur after 2 days are often due to heart failure; check to see if deaths are occurring during transition to F-100.

An increase in deaths occurring during the night or early morning, or on weekends, suggests that care of children at these times should be monitored and improved. For example, if there are many early morning deaths, it is possible that children are not being adequately covered and fed during the night.

If many mothers are choosing to take their children home after only a few days, look for common reasons. Are the mothers unable to leave other children at home? Is the ward uncomfortable for them? Are the staff unfriendly? Early departures also suggest a need to monitor and improve ward conditions and procedures.

Review of patient records for adverse outcomes can provide a basis for staff to discuss and solve problems.

EXERCISE D

In this exercise, you will review excerpts from the MULTI-CHARTs of three children who died. You will review the circumstances of the deaths and determine whether there are common factors.

Ketema had watery diarrhea, recent sunkening of eyes and he is lethargic .He was given normal saline IV at OPD due to low plasma sodium. The IV fluid continued for rehydration until 4:00 pm.
Betre was given IV plasma and a diuretic for low albumin and edema at the emergency room.
Lulit has diarrhea and vomiting.

Study the MULTI-CHART excerpts for Ketema, Betre, and Lulit on the following pages and answer the following questions:

1. What are the circumstances of each child's death?

   Ketema–

   Betre –

   Lulit –

2. Are there common factors among any of the three deaths? If so what are they?

3. What areas of case management practices or ward procedures need to be monitored to find related problems and causes?

S-6 Monitoring and Problem Solving

THERAPEUTIC TREATMENT MULTICHART FOR SEVERE MALNUTRITION

Unique SAM # .....

Registration # 324

Sheet # ..... 01 .....

Child's full name:

Ketema Dana

Address (kebele, woreda, region)

Dicho B/Sore SNNPR

Referred from: Chaka HP

(TFU/OTP/Mobile clinic - circle the right source of referral)

Age (m or yr - specify) 15 m

Sex.... m

Breast feeding (Y/N)..... N

complementary feeding (Y/N) .... N

Major Problems

1. SAM
2. Corneal clouding

Date of admission(EC) 14/ 06/ 01

Time. 10:00 AM/PM

Readmission (Y/N)..... N

If yes, from .....

Old Reg Nos.....

Date of discharge 14/ 06/ 01 at 09:00 PM

Cured ☐ Defaulter ☐ Causes

Dead ☐ UNKNOWN

Med transfer ☐ To.....

Nu transfer ☐ To.....

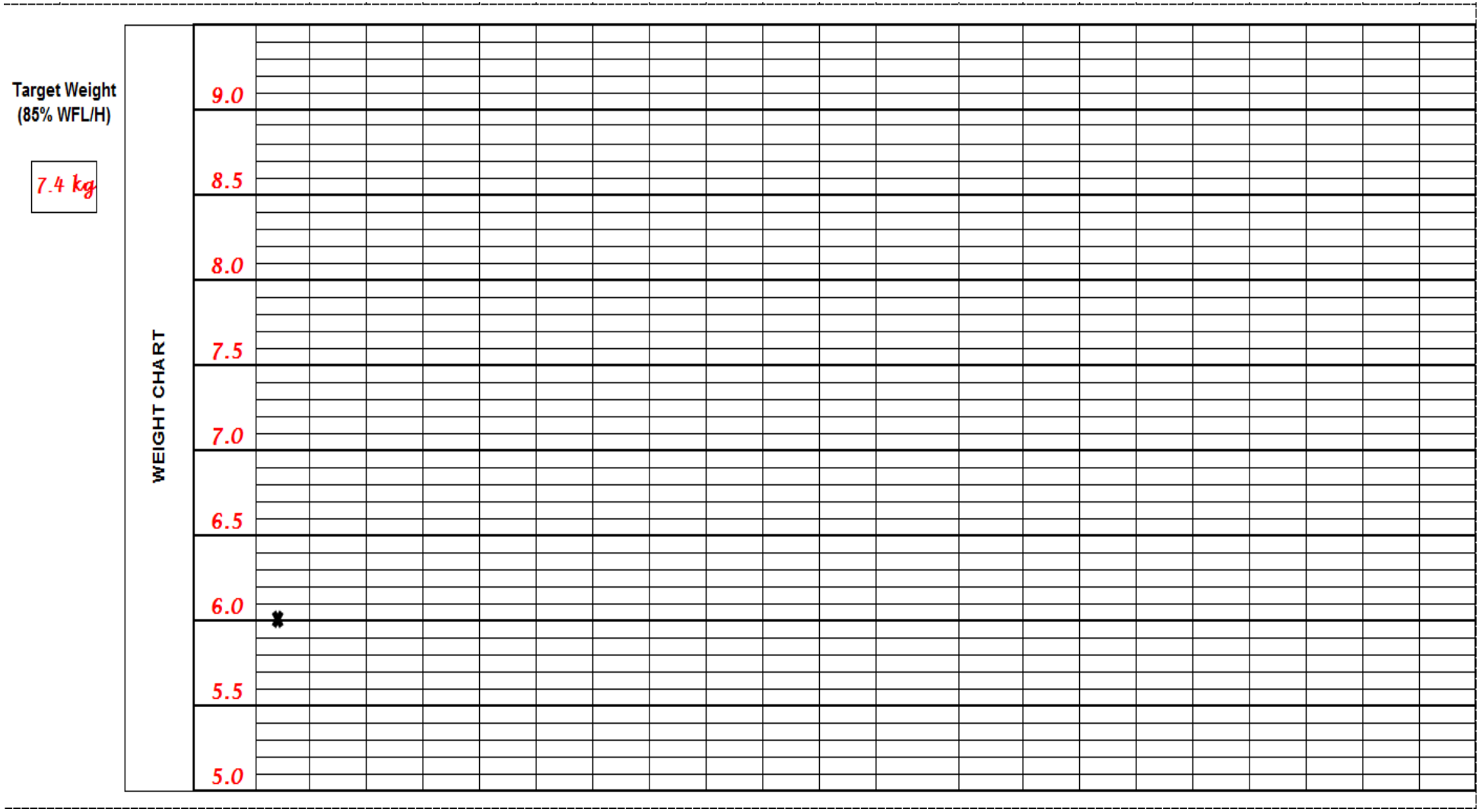
Non responder ☐ To.....

Follow up by

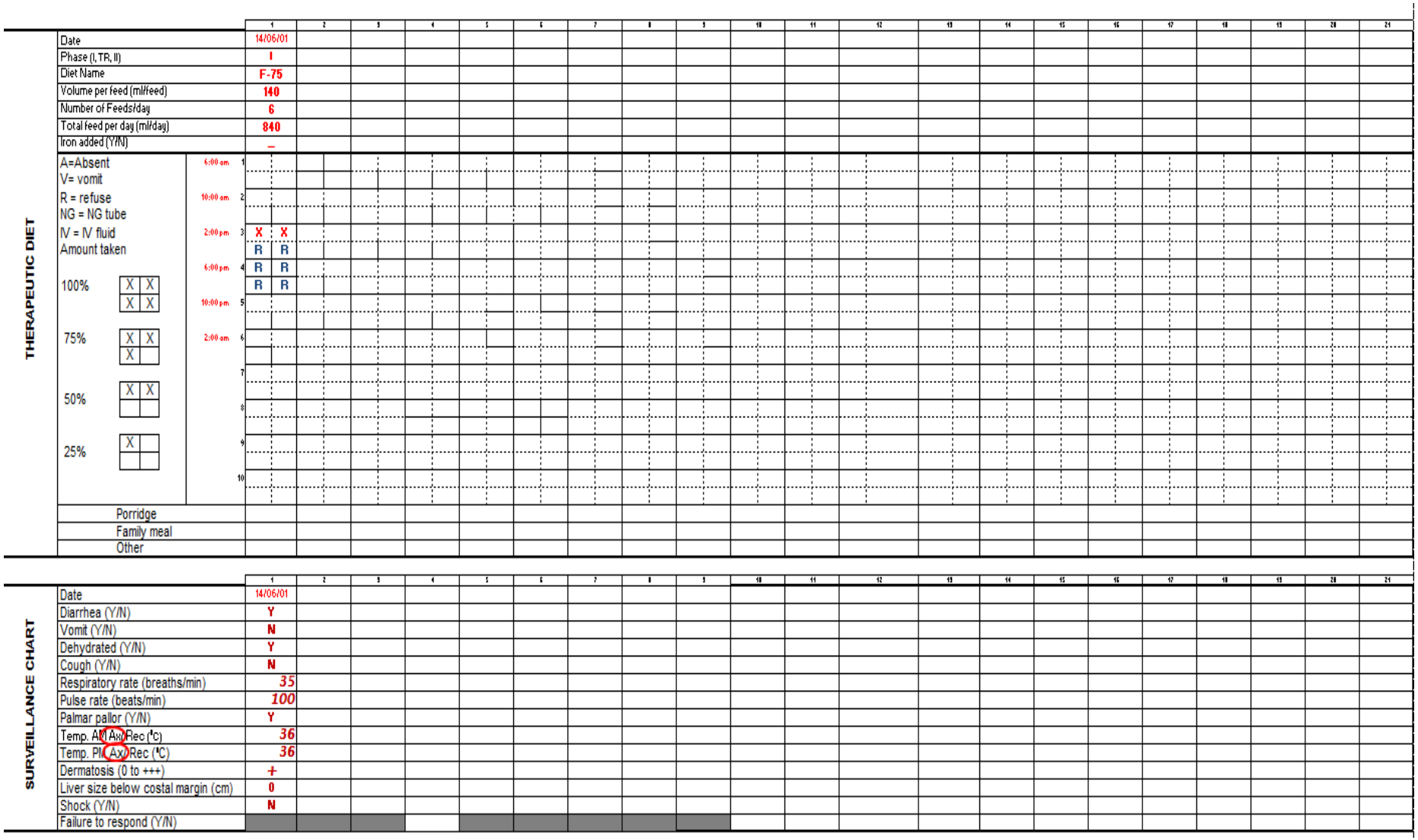
ANTHROPOMETRIC CHART

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Date	14/06/01																				
Height (cm)	71																				
Weight (kg)	6																				
W / H (%)	<70																				
MUAC (cm)	10.9																				
Edema (0 to +++)	0																				

S-6 Monitoring and Problem Solving



S-6 Monitoring and Problem Solving



THERAPEUTIC DIET

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Date		14/06/01																				
Phase (I, TR, II)		I																				
Diet Name		F-75																				
Volume per feed (ml/feed)		140																				
Number of Feeds/day		6																				
Total feed per day (ml/day)		840																				
Iron added (Y/N)		–																				
A=Absent V= vomit R = refuse NG = NG tube IV = IV fluid Amount taken	6:00 am	1																				
	10:00 am	2																				
	2:00 pm	3	X X R R																			
	6:00 pm	4	R R R R																			
	10:00 pm	5																				
	2:00 am	6																				
		7																				
		8																				
		9																				
		10																				
100%		X X X X																				
75%		X X X																				
50%		X X																				
25%		X																				
Porridge																						
Family meal																						
Other																						

SURVEILLANCE CHART

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Date	14/06/01																				
Diarrhea (Y/N)	Y																				
Vomit (Y/N)	N																				
Dehydrated (Y/N)	Y																				
Cough (Y/N)	N																				
Respiratory rate (breaths/min)	35																				
Pulse rate (beats/min)	100																				
Palmar pallor (Y/N)	Y																				
Temp. AM Ax/Rec (°C)	36																				
Temp. PM Ax/Rec (°C)	36																				
Dermatosis (0 to +++)	+																				
Liver size below costal margin (cm)	0																				
Shock (Y/N)	N																				
Failure to respond (Y/N)																					

S-6 Monitoring and Problem Solving

Enter name, dose and route of administration (oral-PO, intramuscular - IM, or intravenous-IV) for each drug. Enter your initial in the box when the drug is given.

			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
ROUTINE MEDICINES	Date		14/06/01																				
	Vit A 200,000 IU																						
	Folic Acid 5 mg (PO)																						
	Amoxicillin	Time: 9:00 AM																					
	250 mg Po	:9:000pm	KS																				
	BID																						
	Deworming in phase 2:																						
SPECIAL MEDICINE	Antibiotic 1	Time: 6:00 AM																					
		:12:00pm																					
		:6:00pm																					
		:12:00am																					
	Antibiotic 2																						
		Time: 6:00 AM																					
	Resomal																						
	IV fluid																						
	Blood																						
	NG tube																						

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	Date	14/06/01																				
	Hgb (gm/dl) / Hct (%)	9																				
	Malaria smear	_																				
	Glucose (mg/dl)	72																				
	TB test	_																				

Monitoring Record for Respiratory rate, pulse rate and temperature (6 hourly)

Name: Ketema

Respiratory Rate (breath/minute)

35	50							

Pulse Rate (beats/ minute

100	140							

Temperature

37.0									
36.5									
36.0	x	x							
35.5									
35.0									
	10 am	4 pm	10 pm	10 am					
	Day 1				Day 2				

S-3 Management of Medical Complications

THERAPEUTIC TREATMENT MULTICHART FOR SEVERE MALNUTRITION

Unique SAM # .....
Registration # 756
Sheet # .....01.....

Child's full name:
Betre Yohannes

Address (kebele, woreda, region)
Kolisho Hulla SNNPR

Referred from: Chaka HP
(TFU/OTP/Mobile clinic - circle the right source of referral)
Age (m or yr - specify) 24 m
Sex... m
Breast feeding (Y/N)..... N
complementary feeding (Y/N) .. N

Major Problems
1. SAM
2. Corneal clouding

Date of admission[EC] 05/ 10/ 01
Time. 2:45 AM/PM
Readmission (Y/N)..... N
If yes, from .....
Old Reg Nos.....

Date of discharge 06/ 10/ 01 at 07:00
Cured [ ] Defaulter [ ]
Dead [X]
Med transfer [ ] To.....
Nu transfer [ ] To.....
Non responder [ ] To.....
Follow up by

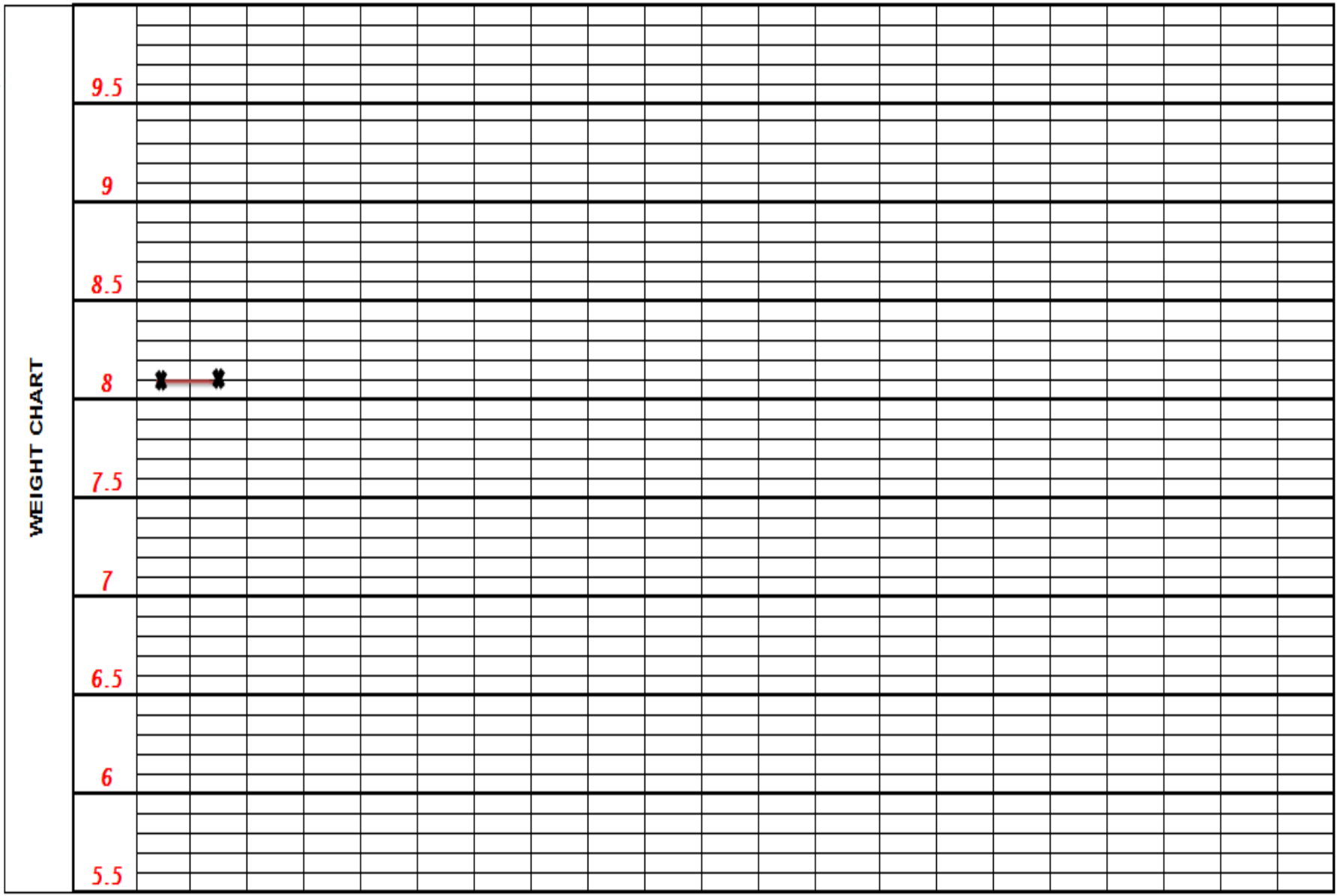
Causes
low potassium
High albumin
"+++ edema

ANTHROPOMETRIC CHART																						
	Date	10/05/01	11/05/01																			
	Height (cm)	78																				
	Weight (kg)	8.1	8.1																			
	W/H (%)	70-80	70-80																			
	MUAC (cm)	10.5																				
	Edema (0 to +++)	++	+++																			

S-6 Monitoring and Problem Solving

Target Weight
(85% WFL/H)

8.8 kg



S-6 Monitoring and Problem Solving

THERAPEUTIC DIET

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Date	05/10/01	06/10/01																			
Phase (I, TR, II)	I	I																			
Diet Name	F-75	F-75																			
Volume per feed (ml/feed)	180	180																			
Number of Feeds/day	6	6																			
Total feed per day (ml/day)	1080	1080																			
Iron added (Y/N)	–	–																			

A=Absent
V= vomit
R = refuse
NG = NG tube
IV = IV fluid
Amount taken

100% 75% 50% 25%

	6:00 a.m.	10:00 a.m.	2:00 p.m.	6:00 p.m.	10:00 p.m.	2:00 a.m.
1		R R				
		R R				
2	X X					
	X R					
3			X X			
			R R			
4				X X		
				X R		
5					X X	
					R R	
6						R X
						R R
7						
8						
9						
10						

Porridge																					
Family meal																					
Other																					

SURVEILLANCE CHART

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Date	05/10/01	06/10/01																			
Diarrhea (Y/N)	Y																				
Vomit (Y/N)	N																				
Dehydrated (Y/N)	N																				
Cough (Y/N)	N																				
Respiratory rate (breaths/min)	35																				
Pulse rate (beats/min)	90																				
Palmar pallor (Y/N)	N																				
Temp. AM Axl Rec (°c)	35.5																				
Temp. PM Axl Rec (°C)	36																				
Dermatosis (0 to +++)	0																				
Liver size below costal margin (cm)	0																				
Shock (Y/N)	N																				
Failure to respond (Y/N)																					

S-6 Monitoring and Problem Solving

Enter name, dose and route of administration (oral-PO, intramuscular - IM, or intravenous-IV) for each drug. Enter your initial in the box when the drug is given.

ROUTINE MEDICINES	Date	05/10/01	06/10/01																			
	Vit A 200,000 IU																					
	Folic Acid 5 mg (PO)																					
	Amoxicillin Time: 9:00 AM																					
	250 mg Po : 9:00 p.m.	KS																				
	BID																					
	Deworming in phase 2:																					
SPECIAL MEDICINE	Antibiotic 1 Time: 9:00 AM																					
	: 12:00 p.m.																					
	: 5:00 p.m.																					
	: 12:00 a.m.																					
	Antibiotic 2																					
	Time: 9:00 AM																					
	Resomal																					
	IV fluid																					
	Blood																					
	NG tube																					

	Date	05/10/01	06/10/01																			
	Hgb (gm/dl) / Hct (%)	_																				
	Malaria smear	_																				
	Glucose (mg/dl)	_																				
	TB test	_																				

THERAPEUTIC TREATMENT MULTICHART FOR SEVERE MALNUTRITION

Unique SAM # .....

Registration # 1064

Sheet # ..... 01 .....

Child's full name:

Lulit Aschalew

Address (kebele, woreda, region)

07, Arada, Addis Abeba

Referred from: Arada HC

(TFU/OTP/Mobile clinic - circle the right source of referral)

Age (m or yr - specify) 18 m

Sex... F

Breast feeding (Y/N)..... N

complementary feeding (Y/N) .. N

Major Problems

1. SAM
2. Marasmickwash

Date of admission(EC) 25/ 02/ 01

Time. 9:00 AM/PM

Readmission (Y/N)..... N

If yes, from .....

Old Reg Nos.....

Date of discharge 27/ 02/ 01 @ 4:00 AM

Cured [ ] Defaulter [ ] Causes: .....

Dead [X]

Med transfer [ ] To.....

Nu transfer [ ] To.....

Non responder [ ] To.....

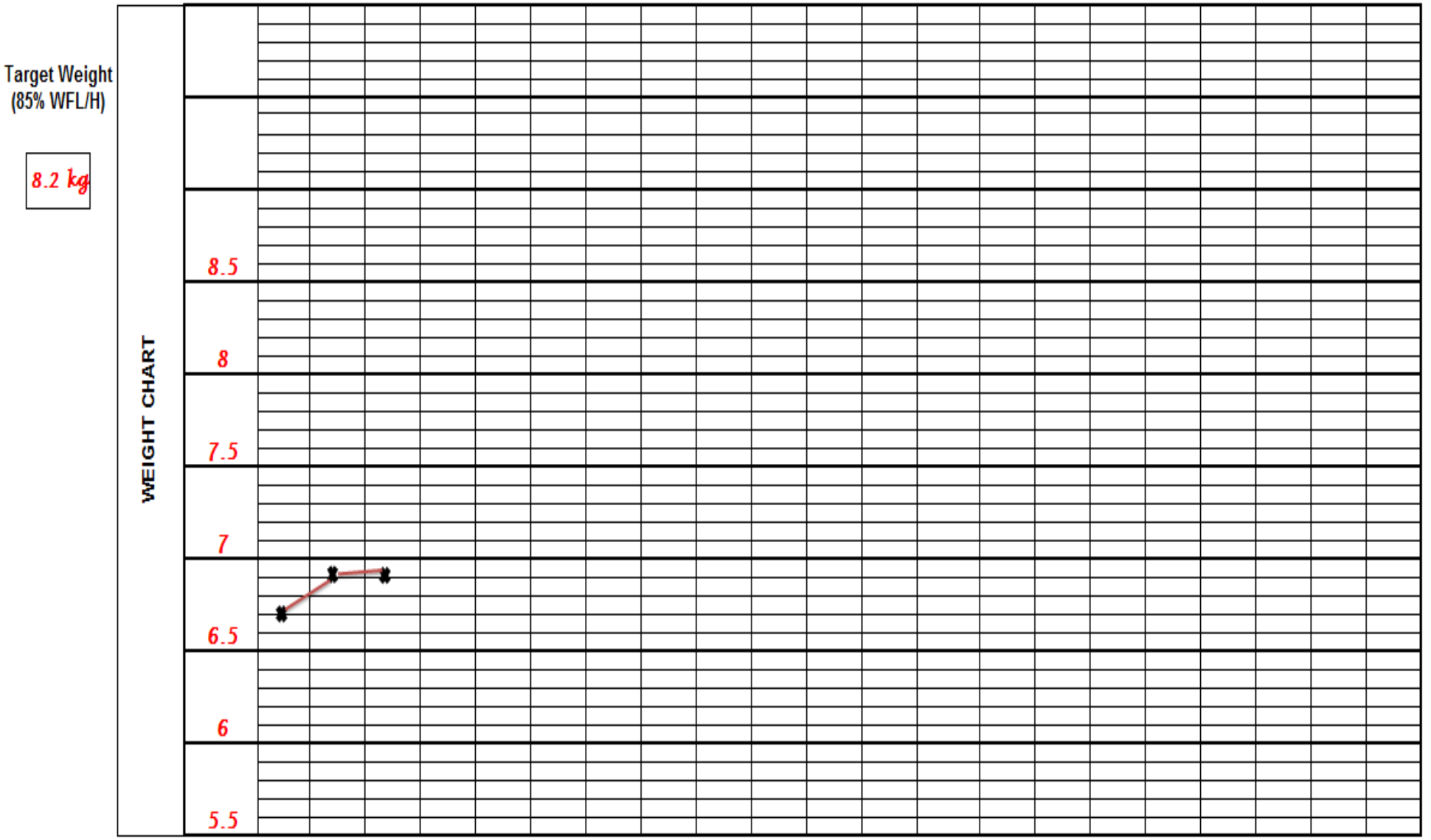
Follow up by

Milk coming out of the mouth when found; possibly chocked on vomit

ANTHROPOMETRIC CHART

	Date	25/02/01	26/02/01	27/02/01																		
	Height (cm)	75																				
	Weight (kg)	6.7	6.9	6.9																		
	W/H(%)	<70	70-80	70-80																		
	MUAC (cm)	11.2																				
	Edema (0 to +++)	+																				

S-6 Monitoring and Problem Solving



S-6 Monitoring and Problem Solving

THERAPEUTIC DIET

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Date		13/01/2003	14/01/2003	15/01/2003																		
Phase (I, TR, II)		I	I	I																		
Diet Name		F-75	F-75	F-75																		
Volume per feed (ml/feed)		140	140	140																		
Number of Feeds/day		6	6	6																		
Total feed per day (ml/day)		840	840	840																		
Iron added (Y/N)		–																				
A=Absent V= vomit R = refuse NG = NG tube IV = IV fluid Amount taken	6:00 a.m.		X	X	X	X																
			X	X	X	X																
	10:00 a.m.		X	R	X	X																
			X	X	V	V																
	2:00 p.m.		X	X	X	R																
			X	X	X	R																
	6:00 p.m.	X	X	X	X	X	X															
		X	X	R	R	X	X															
	10:00 p.m.	X	X	X	X	X	X															
		V	V	R	R	X	X															
	2:00 a.m.	X	X	X	X																	
		X	X	X	X																	
100%		X X / X X																				
75%		X X / X																				
50%		X X																				
25%		X																				
Porridge																						
Family meal																						
Other																						

SURVEILLANCE CHART

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Date	13/01/2003	14/01/2003	15/01/2003																		
Diarrhea (Y/N)	Y	N	N																		
Vomit (Y/N)	Y	N	Y																		
Dehydrated (Y/N)	Y	N	N																		
Cough (Y/N)	N	N	N																		
Respiratory rate (breaths/min)	34	34	34																		
Pulse rate (beats/min)	96	96	96																		
Palmar pallor (Y/N)	Y	Y	Y																		
Temp. AM A/ Rec (°c)	37	37.1	37																		
Temp. PM A/ Rec (°C)	36.8	37.1	37.2																		
Dermatosis (0 to +++)	+	+	+																		
Liver size below costal margin (cm)	0	0	0																		
Shock (Y/N)	N	N	N																		
Failure to respond (Y/N)																					

S-6 Monitoring and Problem Solving

Enter name, dose and route of administration (oral-PO, intramuscular - IM, or intravenous-IV) for each drug. Enter your initial in the box when the drug is given.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
ROUTINE MEDICINES	Date	13/01/2003	14/01/2003	15/01/2003																		
	Vit A 200.000 IU																					
	Folic Acid 5 mg (PO)	BT																				
	Amoxicillin Time: 8:00 AM	BT	GK	BT																		
	250 mg Po :8:00 pm	FK	RN																			
	BID																					
	Deworming in phase 2:																					
SPECIAL MEDICINE	Antibiotic 1																					
	Antibiotic 2 Time:																					
	Resomal: 30 ml/watery diarrhea	BT																				
	IV fluid																					
	Blood																					
	NG tube																					

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	Date																					
	Hgb (gm/dl) / Hct (%)																					
	Malaria smear																					
	Glucose (mg/dl)																					
	TB test																					

5.0 Monitor practices and procedures

As needed, you may monitor the following practices and procedures periodically to investigate causes of problems:

- case management practices
- food preparation
- ward procedures, and/or
- hygiene

Suggestions for monitoring are provided in this section. Monitoring Checklists for use during ward visits are provided in Annex D. Any "NO" answer to a question on the checklist indicates a problem that needs to be corrected.

5.1. Monitor case management practices

Deaths during initial case management are often the result of well-intentioned but incorrect practice. Monitor to ensure that all clinicians are following the case management practices described in the module and national protocol, particularly during initial treatment. Ensure that emergency room personnel are also following appropriate practices for severely malnourished children. No checklist is given for monitoring case management, as it would be too lengthy. However, some examples of common incorrect practices to look for are described below:

Common Incorrect Practices in Initial Treatment – These cause deaths:	**Correct Practice**
• Child not fed at night	During initial treatment ensure that the child is fed every 3 hours at night. Feeding is never less frequent than every 4 hours.
• IV fluids given even though child is not in shock	Give IV only if signs of shock (cold hand plus slow capillary refill or weak/fast pulse).
• Diuretics given to treat edema	Do not give these. Edema will resolve with correct initial treatment using F-75 with correct minerals and vitamins.
• High protein diet given immediately	Give F-75 until the child stabilizes; then start F-100.
• Antibiotics not given because no clinical signs of infection	Presume infection and give antibiotics to all severely malnourished children as described in the manual.
• Standard ORS used instead of ReSoMal	Give ReSoMal to severely malnourished children with diarrhea.
• Child left uncovered at night	Provide blanket and ensure the child is covered at night.
• Anemia treated with iron from admission	Wait to start iron until the child has been on F-100 for 2 days.

5.2 Monitor food preparation

Problems such as poor weight gain on the ward may be due to problems with food preparation. Periodically, or whenever you suspect that there is a problem, carefully observe preparation of feeds using the monitoring checklist in annex D on page 282. Monitor the following:

- Are ingredients for the recipes or F-75, F100, or RUTF is available?
- Is the correct recipe used for the ingredients that are available?
- Are ingredients stored appropriately and discarded at appropriate times?
- Are containers and utensils kept clean?
- Do kitchen staff (or those preparing feeds) wash their hands with soap before preparing food?
- Are the recipes for F-75 and F-100 followed exactly? (If changes are made due to lack of ingredients, are these changes appropriate?)
- Are measurements made exactly with proper measuring utensils (e.g., correct scoops)?
- Are ingredients thoroughly mixed (and cooked, if necessary)?
- Is correct amount of water added to make up a liter of formula? (Staff should not add a liter of water, but just enough to make a liter of formula.)
- Is food served at an appropriate temperature?
- Is the food consistently mixed when served (i.e., oil is mixed in, not separated)?

5.3 Monitor ward procedures

Problems such as inadequate weight gain on the ward, early departures, or even deaths may be due to inadequate ward procedures. Whenever you suspect that there is a problem related to ward procedures, observe staff as they do those procedures, or review relevant records (use the ward procedure monitoring record in annex D on page 282. Procedures to monitor include:

Feeding

- Are correct feeds served in correct amounts?
- Are feeds given at the prescribed times, even on nights and weekends?
- Are children held and encouraged to eat (never left alone to feed)?
- Are children fed with a cup (never a bottle)?
- Is food intake (and any vomiting/diarrhea) recorded correctly after each feed?
- Are leftovers recorded accurately?
- Are amounts of F-75 kept the same throughout the initial phase, even if weight is lost?
- After transition, are amounts of F-100 given freely and increased as the child gains weight?

Warming

- Is the room kept between 28-32°C (to the extent possible)?
- Are blankets provided and children kept covered at night?
- Are safe measures used for re-warming children?
- Are temperatures taken and recorded correctly?

Weighing

- Are scales functioning correctly?
- Are they standardized weekly? (Check scales as described in Daily Care.)
- Are children weighed at about the same time each day, one hour before a feed (to the extent possible)?
- Do staff adjust the scale to zero before weighing children?
- Are children consistently weighed without clothes?
- Do staff correctly read weight to the nearest division of the scale?
- Do staff immediately record weights on the child's MULTICHART?
- Are weights correctly plotted on the Weight Chart?

Giving antibiotics and other medications and supplements

- Are antibiotics given as prescribed (correct dose at correct time)?
- When antibiotics are given, do staff immediately make a notation on the MULTICHART?
- Is folic acid given daily and recorded on the MULTICHART?
- Is vitamin A given according to schedule?
- Is a multivitamin given daily and recorded on the MULTICHART?
- After children are on F-100 for 2 days, is the correct dose of iron given daily and recorded on the MULTICHART?

Ward environment

- Are there separate rooms for each phase (Phase 1, 2 and 3)?
- Are the children sleeping under ITN in malarious area?
- Are surroundings welcoming and cheerful?
- Are mothers offered a place to sit and sleep?
- Are mothers taught and encouraged to be involved in care?
- Are staff consistently courteous?
- As children recover, are they stimulated and encouraged to move and play?

5.4. Monitor hygiene

Good hygiene is extremely important because children with severe malnutrition are highly susceptible to infection. Whenever you suspect that a problem may be related to hygiene, or periodically, visually inspect hygiene in the ward using the Hygiene monitoring checklist in annex D on page 282. Monitor such items as the following:

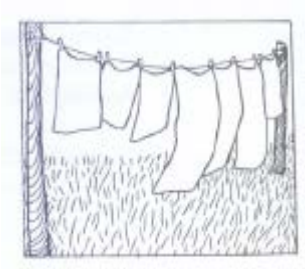
Hand washing

- Are there working hand washing facilities in the ward?
- Do staff consistently wash hands thoroughly with soap?
- Are their nails clean?
- Do they wash hands before handling food?
- Do they wash hands between each patient?

Mothers' cleanliness

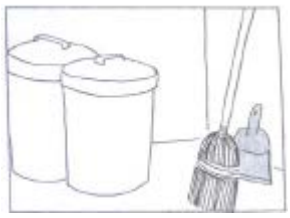
- Do mothers have a place to bathe, and do they use it?
- Do mothers wash hands with soap after using the toilet or changing diapers?
- Do mothers wash hands before feeding children?

Bedding and laundry
- Is bedding changed every day or when soiled/wet?
- Are diapers, soiled towels and rags, etc. stored in bag, then washed or disposed of properly?
- Is there a place for mothers to do laundry?
- Is laundry done in hot water?



Laundry in Line

General maintenance
- Are floors swept?
- Is trash disposed of properly?
- Is the ward kept as free as possible of insects and rodents?

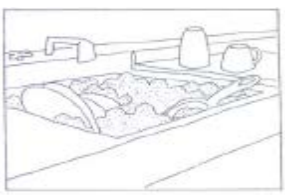


Trash bins and broom

Food storage
- Are ingredients and food kept covered and stored at the proper temperature?
- Are leftovers discarded?

Covered bowels in refrigerator

Dishwashing
- Are dishes washed after each meal?
- Are they washed in hot water with soap?



Basin with sudsy water

Toys
- Are toys washable?
- Are toys washed regularly, and after each child uses them?

6.0. Solve problems

Some problems require individual solutions and should be handled privately. For example, if you find that a particular staff member is doing a procedure incorrectly or dangerously, correct that person privately.

On the other hand, some problems may be solved by working with staff members as a group to discuss the causes and possible solutions. Some examples of problems that could be reviewed as a group might include:

- a diarrhea outbreak in the ward
- an increasing case fatality rate; or
- Procedural problems involving all or many of the staff.

S-6 Monitoring and Problem Solving

Staff may have useful information to contribute on the causes of problems and creative ideas for solutions. They are also more likely to work together towards a solution if they are involved in decision making that affects them.

Process for problem-solving in a group

When conducting a problem-solving session with a group, use the following process as a guide:

1. Welcome everyone to the meeting and explain the purpose. Be careful not to sound like you are threatening or blaming anyone. Stress that you need their ideas to understand the causes of the problem and how to solve it.

2. State the facts of the problem as clearly and completely as possible. Include when, where, and with whom the problem is occurring.

3. Discuss causes of the problem that you have discovered through monitoring. Ask the staff if they know of other causes. Ask questions to try to find the "root" causes of the problem. Causes may include:

   - obstacles (such as lack of time, insufficient staff, or lack of equipment)
   - lack of motivation (for some reason, staff are not motivated to do a task correctly)
   - lack of skill or information (staff do not know what to do or how to do it)

   The group must avoid blaming particular staff or having the discussion degenerate into a complaint session.

It may be helpful to write down causes identified on a flipchart or large paper.

4. Ask the staff to help you think of solutions appropriate for the causes. Different causes require different solutions. For example, if there is a problem due to lack of supplies, a solution is to obtain more supplies. If a task is done poorly because staff members do not enjoy it, a solution may be to rotate that task so that everyone takes a turn, but no one has to do it too often. If staff forget how to do a certain task, the solution may be to make a job aid and post it on the wall.

   Ask staff to think of solutions that they believe will work. Discuss the steps needed to implement the solutions, i.e., who will do what after the meeting.

5. Thank the staff for their ideas. Review what was decided in the meeting. After the meeting it is important to implement the solutions as quickly as possible. Be sure to give feedback to staff on how the solutions are working. They will want to know if the problem is decreasing or is solved.

SESSION 7: OUT-PATIENT TREATMENT PROGRAM (OTP)

Introduction

The majority of severe acute malnutrition cases, around 85%, are normally treated in the outpatient therapeutic component of Therapeutic Feeding program (TFP). Children can be admitted directly into the OTP, treated with routine drugs and given RUTF to eat at home. Out-patient treatment (OTP) is normally organized from the same facilities (health centers or hospitals) that have in-patients. However, out-patient care in the community can also be organized at health posts.

This session will teach participants the skills and knowledge specifically needed for out patient care for management of children with SAM in health centers and hospitals. The session will not teach knowledge and skills covered in the in-patient module if this session is given together with the inpatient care sessions.

This session introduces participants to the concepts and protocols used in outpatient care for children with severe acute malnutrition. It provides an overview of admission and discharge processes and criteria, medical treatment and nutrition rehabilitation in outpatient care. Emphasis is placed on the use of an action protocol, which helps health care providers determine which children require referral to inpatient care and which children require follow-up at home.

OTP for children are run every week; exceptions can be made for individual cases living in very remote areas, where they can be seen on fortnightly basis. Cases' regular attendance is precondition for a successful result.

The session also includes a clinical session where participants will practice assessing, admitting and treating children with SAM to OTP. Participants will also have the opportunity during this clinical session to practice the skills covered in **session 2. Recognize signs of severe acute malnutrition.**

It is expected that participants will return to their health facilities and begin to implement the case management practices for OTP described in this session. In order to implement these practices, the OTP will need certain basic supplies and equipment that are listed in Annex A of the module.

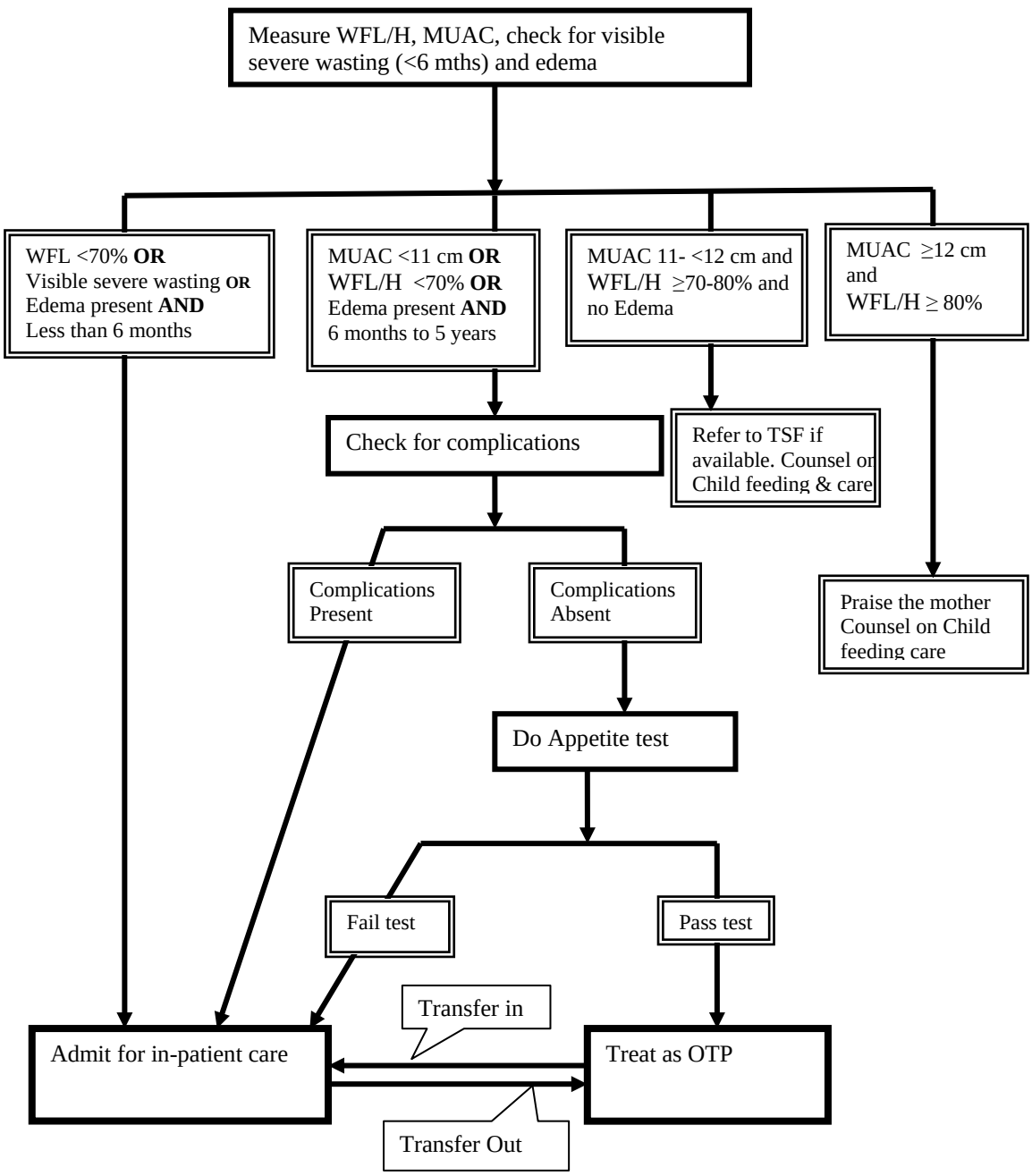
Learning objectives

By the end of the session, the participants will be able to:

- Identify a child with SAM and without medical complications.
- Explain the screening and admission procedures of OTP
- Describe the admission and discharge criteria and procedure to and from OTP
- Organize an OTP service at the facilities
- Manage children in OTP
  - Routine medicines
  - Nutritional rehabilitation with RUTF
  - key Messages for Mothers/Caregivers Used in Outpatient Care
  - Emotional and psychosocial stimulation
- Follow up a child with SAM as outpatient.
- Fill child information in OTP card.
- Mobilize community and ensure early identification of cases, low defaulter rate and linkage with programs contributing to survival and nutritional status of children.

1.0. Recommended criteria for admission to OTP

You used this admission procedure and the Assess and classification table in session 2 of the module. You can review to better identify children with SAM who need OTP.



Admission Procedure Algorithm

Table1: Assessment and Classification of a Child with Acute Malnutrition

Children age 6 Months to 5 years		
Assess	**Classify**	**Action to take**
• WFL/H < 70% of median or < -3Z score OR MUAC <11cm OR Edema of both feet (+, ++), **PLUS** o Any one of the medical complications (see list below*), or o Failed Appetite test OR • +++ Edema, OR • Marasmic Kwashiorkor (WFL/H < 70% with edema, OR MUAC <11cm with edema)	**Complicated Severe Acute Malnutrition**	**Admit for in-patient management**
• WFL/H < 70% of median or < -3Z score OR MUAC <11cm OR • Edema of both feet (+, ++) AND • No medical complication AND pass appetite test	**Uncomplicated Severe Acute Malnutrition**	**Manage in OTP using the OTP protocol or manage as in-patient if OTP service is not available**
• WFL/H ≥ 70% to < 80% or ≥ -3Z to < -2Z score OR MUAC 11cm to <12cm AND • No edema of both feet	**Moderate Acute Malnutrition**	**Refer to supplementary feeding program if available,** **Counsel on infant and child feeding/care**
• If WFL/H ≥ 80% or ≥ -2Z score OR MUAC ≥ 12 cm AND • No edema of both feet	**No acute malnutrition**	**Congratulate and Counsel the mother on infa and child feeding/care**

***List of common medical complications:**

1. Unable to breast feed, drink or feed
2. Vomiting everything
3. Convulsions
4. Very Weak, Lethargic or unconscious
5. Hypothermia: axillary temp <35 ^{0}C or rectal < 35.5 ^{0}C
6. Fever ≥ 38.5 ^{0}C
7. Pneumonia/severe pneumonia
8. Shock
9. Dehydration (*watery diarrhea with recent sunken eye balls.*)
10. Dysentery
11. Persistent diarrhoea
12. Hypoglycaemia
13. Severe anemia (*severe palmar pallor*)
14. Jaundice
15. Bleeding Tendencies
16. Dermatosis +++
17. Corneal clouding or ulceration
18. Measles (now or with eye/mouth complications)

Edema grading: bilateral edema below ankles (+); below the knees & the elbows (++); generalized edema involving the upper arms & face (+++).
Dermatosis grading: few discolored or rough patches of skin (+); multiple patches on arms and/or legs (++); flaking skin, raw skin or fissures (openings in the skin) is grade +++ dermatosis.
Measles: If a child has generalized rash with one of the following: cough, runny nose or red eys
Measles with eye or mouth complications: If a child with measles has pus draining from the eye, clouding of cornea or mouth ulcers (deep or extensive ulcers)
Most of the treatment protocols and procedures indicated in this training module also apply to children over 5 years of age. However, some areas may need to be changed to fit the age range, particularly the MUAC cut-off point for admission.

EXERCISE A

In this exercise, you will be given some information for several children. You will then answer questions about whether the child has SAM. You will also determine whether OTP or inpatient treatment is needed and why? Use the criteria and the *Assessment and Classification of a Child with Acute Malnutrition* table given on the previous page or pages 1-2 of Chart booklet as needed.

Case 1: Rosa

Rosa is two years old female child who has a MUAC of 10.9 cm and has been referred by the Health extension worker to the health center. On admission, she refuses to eat Plumpy'Nut during the appetite test. You ask her mother to move to a quiet area and try again. After a half-hour, Rosa still refuses to eat the Plumpy'Nut. During the medical assessment, you discover that she has had vomiting for two days.

- Does Rosa have SAM? Why?

- Does she need OTP or inpatient care, why?

- What action is needed?

Case 2: Ahmed

Ahmed is 17 months old boy. He lives in *Bati woreda* and *Horo kebele*. The mother brought him directly from his community because he has had watery diarrhea for the past week. He does not vomit. She reports no other problems but says he has been getting thinner for some time.

Ahmed has no edema and no dermatosis. He weighs 6.4 kg, his length is 74 cm, and MUAC is 10.4 cm. He has a rectal temperature of 36.9 °C and has 38 respirations per minute, and there are no chest retractions. He has no clinical signs of dehydration. His blood glucose level is 72 mg/dl. He is conscious but irritable. He has no other pertinent clinical findings. He has eaten half a packet of Plumpy'Nut.

- Does Ahmed have SAM? Why?

- Does he need OTP or inpatient care, why?

Case 3: Kebede

Kebede is 4 years old and presented at the hospital with bilateral pitting edema + and a MUAC of 11.2 cm. He has good appetite and no other signs of medical complications. What action is needed?

Case 4: Mimi

Mimi is a 5 months old girl. She is 65 cm in length and weighs 4.6 kg. She has good appetite and no other signs of medical complications. Should she be admitted to the OTP? Why or why not?

2.0. Outpatient Care for the management of SAM

2.1. OTP Admission Procedure

If a child meets the admission criteria for OTP,

1. Explain to the care taker the condition of the child and the need for regular follow up
2. Register the patient on the OTP registration book
3. Fill out the outpatient care treatment card (OTP card): All information is recorded on the child's OTP card, which is kept on file at the health facility. The health care provider should complete an OTP card for all children admitted to OTP.

Example of Out Patient Treatment (OTP) Card

On the next page, you will find the front and back part of an OTP card. Information has been entered about a child's admission status.

Th**e OTP card is** the primary tool used for Out-patient treatment and follow up of a child with SAM. The OTP card has two main sections: the Front page, which is used to record Admission details and the back page to record follow up information.

The **OTP card** will be used in this module as both a job aid and a record of care. As the session continues, you will learn about the sections of the card.

Until everyone is ready, in the meantime, you may study the example on the next page.

When everyone is ready, your facilitator will present a brief introduction on how to use the OTP card.

EXERCISE B

Below is all of the information needed to complete the Admission detail part of an OTP card. You should fill all the information into the OTP card.

Use Unique SAM number. The next registration number available is 002. The health facility code is AKT.

The child's name is: Abaynesh Mengistu.
She lives in Kolfe Kifle Ketema Kebele 12/13 and is admitted to Addis Ketema HC.
Abaynesh is 18 months old.
She has come directly from her community to the OTP.
Se lives in a house with his 1 brother and 2 sisters and her mother and father.

Admission anthropometry

- Weight - 7.5 kg
- Height - 72 cm
- MUAC - 9.8 cm
- Edema - 0

What is his admission criterion?

History

Abaynesh's mother says that she has no diarrhea, doesn't vomit, passes urine without problem, occasionally has a cough, her appetite is generally good, she is breast feeding.
She reports no other problems but says she has been getting thinner for sometime now.

Physical examination

Her respiration is 38 and there are no chest retractions, her temperature is 37.2 °C, no palmar pallor, her eyes are wet and have no discharge, although her skin is saggy, she shows no apparent signs of dehydration, her mouth is clear, there are no enlarged lymph glands, she has no apparent disabilities, her skin is in good condition.

Notes: Abaynesh's mother has carried her Vaccination card – she was given all her vaccinations 9 months ago, along with vitamin A.

Appetite test

By the time Abaynesh is being seen, she has already eaten half a packet of RUTF.

S-7 OTP

ADMISSION DETAILS: OUTPATIENT THERAPEUTIC PROGRAMME

Name	Ahmed Mohammed			Reg. N°	Bat/00001			
Mothers name	Sitina Ali			Health facility name	Haro Health Center			
Region	Amhara	Woreda	Bati	Kebele	Haro			
OTP site	Haro Health post			Distance to house				
Sent by	VCHW	From EOS		Self referral	Other/ Neighbour			
Age (months)	17	Sex	M	F	Date of Admission	12/6/2009		
Admission	New	Return after default	Readmission		From TFU/SC	TFU/SC Refusal		

General Danger Signs

Seizure	Yes	No	Vomiting Everything	Yes	No
Lethargic	Yes	No	Unable to feed	Yes	No

Admission Anthropometry

Weight (kg)	6.4	Height (cm)	74	W/H (%)	<70%	Oedema (0 to +++)	0	MUAC (cm)	10.4

History

Diarrhea	Yes	No		Blood in the stool	.yes	No
Vomiting	Yes	No		Breastfeeding	Yes	No
Cough	Yes	No				
If other problem specify						

Physical Examination

Respiration Rate (# min)	<30	30 - 39	40 - 49	50+	Pulse Rate		Temperature(°C)		Febrile	Normal
Eye signs	Bitot spot	Zerosis	Corneal clouding	corneal ulcer			Dermatosis (0 to +++)			

Routine Admission Medication

Admission: Drug	Date	Dosage	Drug	Date	Dosage
Amoxicillin	12/6/2009	250mg BID	Anti Malarial		
Measles			Vitamin A	12/6/2009	200,000 IU
Folic acid					

Transfer in and out during the treatment of severe malnutrition (Always use 1st adm. SAM UNIQUE NO)

Transfer in			Transfer Out		
Location	Date	Reg No of other facility	Reason	Location	Date

Home Visit(HV)

Date		Reason for HV	Date of HV	Findings

S-7 OTP

FOLLOW UP: OTP

Name	Ahmed Mohammed									Target Weight		8.1kg
Week	ADM.	2	3	4	5	6	7	8	9	10	11	12
Date	12/6/2009											
Anthropometry												
Weight (Kg)												
Weight change* (+/0/-)		*	*									
MUAC (cm) (mm)												
Oedema (+ ++ +++)												
* Check for failure to respond (weight loss since admission for wasted children, failure to start to loose Oedema on day 14; failure to gain any weight, edema still present on day 21)												
General Danger signs												
Seizure (# days)												
Lethargic (# days)												
Vomiting everything (Y/N)												
Unable to feed (Y/N)												
History												
Diarrhea (# days)												
Blood in stool (y.n.)												
Vomiting (# days)												
Fever (# days)												
Cough (# days)												
Physical Examination												
Appetite test (pass/fail)												
Temperature (^{0}C)												
Respiratory Rate (#/min)												
Dermatosis (0 to +++)												
Action Needed (Y/N)												
Routine Medication												
Amxi dose												
Malaria trt dose												
Vitamin A												
Deworming												
Measles												
Folic Acid												
Other medication (see front of card)												
RUTF (# sachets)												
Name of Examiner												
OUTCOME ***												

*** A=absent DF=defaulter (Patient that is absent for two 21 days in out-patient confirmed by a home visit.) T=transfer to TFU X=died C=discharged cured RT=refused transfer HV= home visit NR=Non-responder(did not fulfill discharge criteria after 8 WKs treatment) U= Unknown (Patient that is absent for 21 days in out-patient but his outcome (actual defaulting or death) is not confirmed/ verified by a home visit)

** Action Taken during follow up (include date)

2.2. Management of SAM in OTP

The health worker provides to the child the following outpatient care services:

- Routine medication is provided based on the National SAM treatment protocol.
- Provide RUTF adequate until the next visit
- counsel the mother/caregiver with OTP key messages
- Link to other services, programs or initiatives as appropriate (e.g., TSF, Voluntary counseling and testing [VCT], Vaccination, food security initiatives).

2.2.1. Routine Medicines

Routine medicines are given to all children admitted to outpatient care whether or not they show symptoms because ill children with SAM might have suppressed immune systems and not show symptoms until they begin to recover from SAM.

A. Give antibiotics

Amoxicillin is given routinely on admission (irrespective of any clinical sign of disease), as the presence of infections may be masked due to immune suppression which limits an appropriate response, such as fever. Enter the date and dose in the routine admission medication section in the box in front of Amoxicillin. If there is any other medication to be given write in the free space under *the other medication section*. If Amoxicillin is not available, give cotrimoxazole. You can refer the antibiotic reference table below to determine the dose.

Look at the example of the routine medication section of Ahmed's OTP card on page 218. Notice how the routine medication section is set up and completed.

Table 2: Antibiotics and oral dose

WEIGHT Kg	**AMOXYCILLIN (50-100mg/Kg/d)** Give two times/day			**COTRIMOXAZOLE (SMX+TMP) 25mg SMX+5mg TMP/Kg/d** Give two times/day		
	ADULT TABLET 500mg	**PEDIATRIC TABLET** 125 mg	**SYRUP** 125 mg/5ml	**TABLET** 240mg	**TABLET** 120mg	**SYRUP** 120mg/5ml
<5	¼	1	5.0 ml	½	1	5ml
5-10	½	2	10ml	1	2	10ml
10-20	1	4	20ml	2	4	20ml
20-35	1½			3		
>35	2			4		

B. Give folic acid

Folic acid is a vitamin important for treating and preventing anemia and repairing the damaged gut. There is sufficient folic acid in RUTF to treat mild folate deficiency.

On the day of admission, one single dose of folic acid (5 mg) should be given to children with clinical signs of anemia.

C. Give vitamin A

Severely malnourished children are at high risk of blindness due to vitamin A deficiency. Thus, vitamin A should be given orally to all children with SAM on the 4th week of treatment, except those with edema or those who received vitamin A in the past 6 months. However, for children with edema, it should be given once the edema subsides. Vitamin A should be given at the time of discharge if it was not possible to give on the 4th week due to edema.

For those transferred from inpatient do not give the second or discharge dose if it was given in the inpatient care. If the discharge dose was not given in the inpatient care, give it on the 4th week. If the child is to be discharged earlier than the 4th week, give vitamin A on discharge.

Any child with corneal clouding or ulceration should be treated as an in-patient as the condition of their eyes can deteriorate very rapidly.

Table 3: Timing and oral dosages of vitamin A

Targets	Timing	Age	Dosage
All children* directly admitted to OTP	On the 4th week of treatment	<6 months	50 000 IU
		6 – 12 months	100 000 IU
		> 12 months and >8 Kg **	200 000 IU
All children who are transferred from inpatient care to OTP	On the 4th week of treatment	Same age-specific dose	

** Don't give if vitamin A is given in the last 6 months or if a child has edema*
*** If age >12 month and child weight is <8 kg, give 100,000 IU.*

Enter the date and dose into the Vitamin A box under routine medication of the OTP card when vitamin A is given.

D. Give Measles Vaccine

All children from 9 months who are not vaccinated should be given measles vaccine on the fourth week (including those that have been initially treated as in-patients). It is given on the fourth week when there should be sufficient recovery for the vaccine to produce protective antibodies and prevent subsequent measles attack.

Note: *Patients directly admitted to OTP are unlikely to be incubating measles and will not be exposed to nosocomial infection. Measles vaccine on admission to OTP is thus omitted except in the presence of a measles epidemic.*

E. Give Deworming tabs

Worms are common in older children who play outside, and they can be a problem in severely malnourished children. They can cause dysentery and anemia

Albendazole or Mebendazole is given only once at the 2nd out-patient visit (after 7 days) for both those admitted directly to OTP and those transferred from in-patients to OTP with out receiving deworming tablets on discharge. Write the date and dose into the box next to Mebendazole on the routine medication section of OTP card.

Age	Give a single dose if child is ≥ 2 years and didn't get within the previous 6 months			
	Mebendazole 500 mg tablet, or 5 tablets of 100 mg	Mebendazole Syrup, 100mg/5ml	Albendazole 400mg tablet	Albendazole Syrup, 100mg/5ml
2 - 5 years	1 tablet (500mg)	5 tsp (25ml)	1 tablet	4 tsp (20ml)

F. Iron

Since RUTF contains the required amount of iron and folic acid, additional iron should not be given a child who is taking RUTF.

If anemia is identified, it should be treated according to IMNCI guidelines, and treatment should be given after 14 days in the OTP service. Cases of severe anemia should be referred to inpatient care.

G. Malaria Treatment

Investigate and treat malaria according to the national protocol of Malaria and IMNCI Treatment and referral guideline.

SHORT ANSWER EXERCISE

1. Neway is 15 months old severely malnourished child admitted to OTP. He has no edema and was not vaccinated for measles. He has no signs of vitamin A deficiency or eye infection. He has no record of previous doses of vitamin A.

   b) On what day(s) should Neway be given vitamin A? What is the dose?

   c) Should he be given Measles vaccine? Why and when?

   d) What other medicine should be given on admission?

2. A 3 years old female child is presented at the outpatient care site with bilateral pitting edema + and a MUAC of 11.2 cm. The child has good appetite and no other signs of medical complications. What routine medicines should she be given?

3. Aregash (age 20 months) has severe acute malnutrition. She was referred from a health centre where she got 200,000 IU vitamin A yesterday. She has no edema. She has corneal clouding.

   a) Should she be given another dose today, on Day 1 at the hospital?

   b) Should she be given a dose on Day 2 in hospital?

   Aregash was transferred back to the HC OTP on day 7.

   c) When should she get a 3rd dose of vitamin A?

   d) Should she be given Iron and Mebendazole? Why and why not?

Check your own answers to this exercise by comparing them to those given on page 271 at the end of the module.

2.2.2. Nutritional rehabilitation with RUTF (Plumpy Nut)

RUTF mainly Plumpy'nut is high-energy, nutrient-dense therapeutic food that is used to treat SAM in OTP. It is similar in composition to F100 (except RUTF contains iron and is about five times more energy nutrient dense). There are two types: soft lipid-based paste (Plumpy'nut®) or crushable nutrient bar (BP100), which is available mainly during emergencies. Plumpy'nut has a caloric value of **545 kilocalories (kcal) per 100** g of product.

RUTF has enabled the treatment of severe acute malnutrition to move outside of feeding centers and into the community because of the following properties: It has minimal water content and does not need to be cooked or mixed with water, which prevents growth of bacteria and makes it Safe and easy use for out-patient or home management of SAM.

Amount of RUTF to give

The number of packets of RUTF given is based on the weight of children and the frequency of follow up with enough amounts until the next visit. It continues to be taken regularly, until the child is fully recovered.

Determine the amount of the RUTF using the RUTF reference table for OTP (refer table 14 or page 24 of Chart booklet) and prescribe adequate amount until the next visit. Plumpy'nut is the only RUTF available at health facilities in Ethiopia. Thus, you have to refer the Plumpy'Nut section to determine the amount per day or per week.

Table 4: **RUTF reference table for OTP**

Weight (kg)	RUTF Paste		PLUMPY'NUT®		BP100®	
	Grams per **day**	Grams per **week**	sachet per **day**	sachet per **week**	bars per **day**	bars per **week**
3.0 - 3.4	105	750	1 ¼	9	2	14
3.5 - 4.9	130	900	1 ½	9	2 ½	16
5.0 – 6.9	200	1400	2	14	4	28
7.0 – 9.9	260	1800	3	21	5	35
10.0 - 14.9	400	2800	4	28	7	49
15.0 – 19.9	450	3200	5	35	9	63
20.0 – 29.9	500	3500	6	42	10	70
30.0 - 39.9	650	4500	7	49	12	84
40 - 60	700	5000	8	56	14	98

2.2.3. Counsel on Key Messages of OTP

There are key messages that should be given to mothers/caretakers with regard to:

- How to feed RUTF to the child
- When and how to give the medicines to the child
- When to return to outpatient care
- The child should be brought to the health facility immediately if his/her condition deteriorates

Counsel the mother/caretaker on the following key messages how to feed the RUTF:

- RUTF is a food and medicine for malnourished children only. It should not be shared. Opened packets of RUTF can be kept safely and eaten at a later time – the other family members should not eat any that is left over at a particular meal.

- For breast-fed children, always give breast milk before the RUTF and on demand

- RUTF is the only food the child needs to recover during his/her time in the program. It is not necessary to give other foods; a lot of other foods will delay the recovery of your child. If other foods are given, always give RUTF before other foods.

- Give small regular meals of RUTF and encourage the child to eat often, every 3-4 hours. Tell the mother how much her child should eat each day.

- Always offer plenty of clean water to drink while eating RUTF.

- Use soap and water to wash her/his hands before feeding

- Keep food clean and covered

- Always keep the child covered and warm as sick children get cold quickly,

As soon as the child is improving and has increased appetite, mothers/caregivers can start giving the child other foods (e.g., supplementary food, local food) in addition to — but after — breast milk and the RUTF.

NB – Check the mothers understanding using appropriate checking questions.

2.2.4. Emotional and physical stimulation

Severely malnourished children have delayed mental and behavioral development, which if not treated, can become the most serious long-term result of malnutrition. Emotional and physical stimulation through play programs from the start of treatment and after discharge can substantially reduce the risk of permanent mental retardation and emotional impairment. Ensure that the child is stimulated by the mother. This is described in detail supported by video in session 9: involving mothers, page 243.

EXERCISE C

Briefly answer these questions as a review of the previous section:

1. Why should all severely malnourished children be given antibiotics?

2. What are the advantages of RUTF?

3. Enter the Plumpy'nut ration for Ahmed on Admission (see page 219).

   GIVE:_____ amount per day _____ amount for one week

4. Ahmed came for follow up after one week and he weighed 7 kg. What do you give him? Write the dose and amount.

5. Regassa has passed appetite test and he has no medical complications. Review Regassa's OTP card on the next page. What treatment do you provide him? Record the treatment you are going to give in Neway's OTP card.

Tell the facilitator when you are ready to discuss these questions with the group.

S-7 OTP

ADMISSION DETAILS: OUTPATIENT THERAPEUTIC PROGRAMME

Name	Regassa Mesfin				Reg. N°	Bor/00005		
Mothers name	Kebebush Tesfaye				Health facility name		Yirba HC	
Region	SNNPR		Woreda	Boricha	Kebele	Yirba		
OTP site	Haro Health post				Distance to house			
Sent by	VCHW		From EOS		Self referral		Other/ Neighbour	
Age (months)	17	Sex	M	F			Date of Admission	10/14/2001
Admission	New	Return after default	Readmission		From TFU/SC		TFU/SC Refusal	

General Danger Signs

Seizure	Yes	No	Vomiting Everything	Yes	No
Lethargic	Yes	No	Unable to feed	Yes	No

Admission Anthropometry

Weight (kg)	6.2	Height (cm)	66	W/H (%)	85%	Oedema (0 to +++)	.++	MUAC (cm)	10.1

History

Diarrhea	Yes	No		Blood in the stool	.yes	No
Vomiting	Yes	No		Breastfeeding	Yes	No
Cough	Yes	No				
If other problem specify						

Physical Examination

Respiration Rate (# min)	<30	30 - 39	40 - 49	50+	Pulse Rate		Temperature(°C)		Febrile	Normal
Eye signs	Bitot spot	Zerosis	Corneal clouding	corneal ulcer			Dermatosis (0 to +++)			

Routine Admission Medication

nission: Drug	Date	Dosage	Drug	Date	Dosage
Amoxicillin			Anti Malarial		
Measles			Vitamin A		
Folic acid					

Transfer in and out during the treatment of severe malnutrition (Always use 1st adm. SAM UNIQUE NO)

Transfer in			Transfer Out		
Location	Date	Reg No of other facility	Reason	Location	Date

Home Visit(HV)

Date		Reason for HV	Date of HV	Findings

2.3. Follow-up

Children treated in OTP are seen by a health worker every week to assess progress, monitor weight gain, and detect associated complications requiring referral to inpatient care or risks that need home visit. The health worker should assess for the following conditions during every follow up visit:

Ask about

- Unable to feed
- Vomiting everything
- Seizure
- Mental change
- Diarrhoea, blood in stool
- Fever
- Cough
- Any other new complaint or problem
- the child is taking and finishing the prescribed RUTF

Look for:

- Danger signs (Lethargy)
- Check for medical complications
- Check temperature and RR
- Weigh the child, assess edema and measure MUAC at every visit. Write the information down on the patient's card and calculate anthropometric indicators (using pre-calculated tables). Height is measured once a month.
- Do appetite test

	Frequency
Weight and edema	each visit
Measurement of Height / Length	as required[2], every month
MUAC measurement	each visit
History of the medical condition (vomiting, stool, fever, cough, appetite, etc.)	each visit
Measurement of body temperature	each visit
Standard clinical signs, physical examination to detect medical complication	each visit
Appetite test conducted	each visit

[2] Height should be measured, if there is an unexpected change in weight (large increase or decrease) to check, if the same child has attended the OTP facility.

Decide on action to take

The health worker should take actions based on result of the above follow up assessment and document on the OTP care and registration book. A child might:

- Continue OTP without home visit if the progress is satisfactory
- Continue OTP with home visit support if there is progress but it is not satisfactory
- Be transferred to in-patient care if there are medical complications or failed the appetite test
- Referred to a higher-level referral hospital for other underlying medical complications.

Continue OTP without home visit

The child should continue the OTP without additional home visit if the child has no danger signs, medical complications, pass appetite test, no other medical reason to refer, and the weight gain is satisfactory. Most children fall in this category. The health worker should provide the following OTP services:

- Provide Mebendazole or Albendazole, Vitamin A, and measles vaccine on the 4th week and record on the OTP card.
- Counsel on the progress of the child and OTP key messages
- Provide the amount of RUTF needed until the next visit
- Provide emotional and psychosocial stimulation
- Inform when the next visit is

Continue OTP with home visit support

Some children may need to be monitored through visits by HEWs or volunteers at their homes. The HEWs or volunteers can discuss issues with the care taker, assess home environment and adapt messages to improve treatment. This may be necessary when:

- There is an unexplained lack of weight gain.
- Eats < 75% of the RUTF a week by second visit
- Returned from inpatient care (first 2 weeks)
- Refused referral to inpatient care

Transfer to and from in-patient care

Children on OTP care and who develop any danger sign or sign of medical complications (refer the page 2 of the chart booklet), should be referred to the in-patient facility for management of their condition, until they are fit to return and continue in OTP care. In addition, if the patient is being treated as an out-patient and develops any of the following s/he should be referred to the in-patient care facility.

Criteria for failure to respond and to move back from out-patient to in-patient care	Time after admission
Primary failure to respond	
Failure to start to lose edema	14 days
Edema still present	21 days
Failure to gain any weight (non-edematous children)	21 days
Secondary failure to respond	
Failure of Appetite test	At any visit
Weight loss of 5% of body weight	At any visit
Weight loss for two successive visits	During OTP care
Failure to gain more than 2.5g / kg / d for 21days (after loss of edema (kwashiorkor) or after day 14 (marasmus)	During OTP care

If a child requires in-patient care, all anthropometric measurements, medical history and physical findings are recorded in the OTP card and the child is classified as transfer. The card is filed in the discharge folder until s/he comes back after the severe medical complications have been treated.

Explain to the mother/carer that her child requires in-patient care and ask, if she is willing to go. Explain to her also, that once the child is discharged from the inpatient care, she should bring her child back to OTP. If you are referring to other health facility, clearly fill in the referral form and send to the nearest health facility providing inpatient care. Many carers refuse transfer to in-patient due to distance, cost of travel, unwilling to leave other kids at home, etc. The health worker should try to persuade the carer. If this fails, the child should be treated in OTP; it should be recorded as 'refused transfer'.

When a child returns from in-patient care, look at the referral form to see what has happened there and continue the treatment as an outpatient accordingly.

Investigate the cause of failure

The health worker should investigate the cause of treatment failure in OTP so that to identify the cause early and take remedial action timely. This will help to improve the quality and performance of the OTP care.

Usual causes of treatment failure in OTP:

Problems with the treatment facility	Problems of individual children
● Inappropriate selection of patients to go directly to OTP; ● Poorly conducted Appetite test; ● Inadequate instructions given to caretakers; ● Wrong amounts of RUTF dispensed to children; ● Excessive time between OTP attendance	● Sharing within the family; ● All eating from the same plate (the malnourished child should always have his / her own portion of food); ● Unwilling caretaker; ● Caretaker overwhelmed with other work and responsibilities. ● Illness

Action required when failure to respond is commonly seen in a program:

- Follow-up through home visits by HEWs / volunteers / outreach workers to check whether a child should be referred back to the clinic between visits.
- Discuss with carer on aspects of the home environment that may be affecting the child's progress in the program.
- A follow-up home visit is essential when:
    - Care giver refused admission to in-patient care despite advice;
    - Failure to attend appointments at the out-patient program.
- At health facility carry out medical check and Appetite test;
- Re-calibration of scales and length-boards
- Review of the supervision of staff with refresher training to improve their skills

Tracing of absentees and defaulters

If children default and do not complete the treatment, they are still at risk of death. It is necessary to understand why people are defaulting, as may be something can easily be changed e.g. changing day of follow-up. In addition, efforts can be made to encourage the mothers / carers to bring their children back to the health facility.
Each week a list of absentees / defaulters can be compiled. In order to be able to trace absentees / defaulters, it is very important that the address section of the OTP card is correctly filled out with • the child's name, • the father's name, • grandfather's name, • kebele and gott. As this registration is often not done well, it makes tracing very difficult. The health facility can liaise with community volunteers and health extension workers to follow up absentees and defaulters.
If defaulters are traced and come back to the health facility, they are admitted and continue the treatment as return after defaulting. This can happen only if they do not fulfill the discharge criteria (recovered).

2.4. Discharge criteria

A child stays in OTP until they meet the discharge criteria or until they have been in the program for a maximum of 2 months. The discharge criteria depend on the admission criteria.
Cured:

Option 1	W/H >=85% or WFH ≥ -2 z-score (WHO) for 2 consecutive weeks (14days) **and** no edema for 14 days, if a child is admitted with edema
Option 2	Target weight gain for 2 consecutive visits (see pages 27-28 of the chart booklet) **And** no edema for 14 days, if s/he is admitted with edema

Option 1 is used where the facility has the capacity to measure the height of the children and if the patient had been admitted on W/H-criteria (<70 %).

Option 2 is used particularly for adults and for children admitted to OTP on MUAC criteria MUAC(<11.0cm).

All the patients should be discharged to Targeted feeding program (TSF) for follow up where this is available.

EXERCISE D

In this exercise, you will review information of cases to determine if they are making progress or if they are failing to respond.

Case 1: Terefe

Terefe was admitted to outpatient care with a MUAC of 11.9 cm and a weight of 10 kg. He has had ++ edema at admission. By the fourth week, the child has lost weight, did not gain any weight for three weeks and now weighs 9.5 kg. The edema has reduced to +1.

- How is Terefe's progress?

- What action do you take?

Case 2: Abeba

Abeba is 7 months and was admitted with a weight of 5 kg and a weight for height of <70%. The child gained < 2.5 gm/kg/d weight the first week but has not gained weight for the past two weeks. Her medical assessment does not show any signs of illness or medical complications. Any problem with the progress of Abeba? What problem have you identified? What action do you take?

Case 3: Ahmed

You remember that Ahmed was admitted to OTP 2 months ago. His filled OTP card is provided on the next page. Study the information about Ahmed and answer the questions below.

- What routine medicine do you give on the second visit? Fill in his OTP card

- Is Ahmed making progress? If so describe the progress?

- What action do you take on the fifth visit? Why? Write the decision into the action taken section.

S-7 OTP

FOLLOW UP: OTP

Name	Ahmed Mohammed										Target Weight	8.1kg
Week	ADM.	2	3	4	5	6	7	8	9	10	11	12
Date	12/6/2009	12/13/2009	12/20/2009	12/27/2009	1/3/2010							
Anthropometry												
Weight (Kg)	6.4	6.9	7.1	7.9	8.2							
Weight change* (+/0/-)		*	*									
MUAC (cm) (mm)	10.4	10.5	10.9	11.1	11.2							
Oedema (+ ++ +++)	0	0	0	0	0							
* Check for failure to respond (weight loss since admission for wasted children, failure to start to loose Oedema on day 14; failure to gain any weight, edema still present on day 21)												
General Danger signs												
Seizure (# days)	N	N	N	N	N							
Lethargic (# days)	N	N	N	N	N							
Vomiting everything (Y/N)	N	N	N	N	N							
Unable to feed (Y/N)	N	N	N	N	N							
History												
Diarrhea (# days)		3	2	0	0							
Blood in stool (y.n.)		N	N	N	N							
Vomiting (# days)		0	1	0	0							
Fever (# days)		0	0	0	0							
Cough (# days)		0	0	0	0							
Physical Examination												
Appetite test (pass/fail)	P	P	P	P	P							
Temperature (^{0}C)	36.9	37.2	36.8	37.1	37							
Respiratory Rate (#/min)	32	36	28	30	38							
Dermatosis (0 to +++)	0	0	0	0	0							
Action Needed (Y/N)	N	N	N	N	N							
Routine Medication												
Amxi dose	250mg BID											
Malaria trt dose												
Vitamin A	200,000 IU											
Deworming												
Measles												
Folic Acid												
Other medication (see front of card)												
RUTF (# sachets)	14	14	21	21	21							
Name of Examiner	HF	HF	AB	AB	AB							
OUTCOME ***												

*** A=absent DF=defaulter (Patient that is absent for two 21 days in out-patient confirmed by a home visit.) T=transfer to TFU X=died C=discharged cured RT=refused transfer HV= home visit NR=Non-responder(did not fulfill discharge criteria after 8 WKs treatment) U= Unknown (Patient that is absent for 21 days in out-patient but his outcome (actual defaulting or death) is not confirmed/ verified by a home visit)

** Action Taken during follow up (include date)

Case 4: Kebede

Kebede, age 13 months, was admitted to OTP three weeks back. He has been prescribed Plumpy'nut and routine medicines. The Follow up part of his OTP card is provided below. Study the information about Kebede and answer the questions below.

- Is Kebede making progress? If so, describe his progress.

- If you are the health worker, what action do you take during the second Visit and the third visits?

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

Kebede's OTP card

FOLLOW UP: OTP

Name	Kebede Belachew							Target Weight				10.2kg
Week	ADM.	2	3	4	5	6	7	8	9	10	11	12
Date	3/7/2010	3/14/2010	3/21/2010									
Anthropometry												
Weight (Kg)	8.4	8.6	8.7									
Weight change* (+/0/-)		*	*									
MUAC (cm) (mm)	11.2	11.1	11.1									
Oedema (+ ++ +++)	.++	.++	.++									
* Check for failure to respond (weight loss since admission for wasted children, failure to start to loose Oedema on day 14; failure to gain any weight, edema still present on day 21)												
General Danger signs												
Seizure (# days)	N	N	N									
Lethargic (# days)	N	N	N									
Vomiting everything (Y/N)	N	N	N									
Unable to feed (Y/N)	N	N	N									
History												
Diarrhea (# days)		2	1									
Blood in stool (y.n.)		N	N									
Vomiting (# days)		0	1									
Fever (# days)		4	4									
Cough (# days)		5	5									
Physical Examination												
Appetite test (pass/fail)	P	P	P									
Temperature (^{0}C)	36.9	39	38.5									
Respiratory Rate (#/min)	32	44	42									
Dermatosis (0 to +++)	.++	.++	.++									
Action Needed (Y/N)												
Routine Medication												
Amxi dose	250mg BID											
Malaria trt dose												
Vitamin A	200,000 IU											
Deworming												
Measles												
Folic Acid												
Other medication (see front of card)												
RUTF (# sachets)	21	21	21									
Name of Examiner	HF	HF	AB									
OUTCOME ***												

*** A=absent DF=defaulter (Patient that is absent for two 21 days in out-patient confirmed by a home visit.) T=transfer to TFU X=died C=discharged cured RT=refused transfer HV= home visit NR=Non-responder(did not fulfill discharge criteria after 8 WKs treatment) U= Unknown (Patient that is absent for 21 days in out-patient but his outcome (actual defaulting or death) is not confirmed/ verified by a home visit)

** Action Taken during follow up (include date)

2.5. Organization of OTP

Setting up OTP

Outpatient care facilities can be set up at health centres or hospitals as part of the routine health services. They are often organised in the under five OPD.

Each health facility may have different options for when to see new admissions and when to appoint follow up cases. Some may offer the service every day and others may need to fix certain days as an OTP day (e.g. Wednesday & Friday). This is up to the health facilities to manage as they wish and may depend on the number of admissions, but it is advisable to accept admissions on any day as part of under five child services; the cares should be asked to come back for follow-up on the 'fixed' OTP-day. Outpatients visit the health facilities once every one week.

Resources

Human resource
A trained nurse or health worker is sufficient to staff these centers (or several, depending on size). They need to be able to identify danger signs and decide when and whether referral for inpatient care is necessary. They should be able to identify anorexia and assess progress of children, calculate indicators for monitoring and evaluation of patients (weight for height, weight gain, MUAC), fill in registration books and patient's cards and manage stores and supplies of food and drugs.

Equipment and supplies
Child MUAC tapes, height boards, scales, medicines (as per protocols), ready-to-use therapeutic food (RUTF), outpatient care treatment cards, RUTF ration cards, site tally sheets, site reporting sheets, soap; stationery, thermometer, and Job Aids are needed, in addition to the normal requirements (see Annex A for the detail list.)

Supplies must be ordered through the health centre before they run out. Forward planning is vital; especially pre planning in rainy season is advisable. The order has to pass the Woreda, zonal and regional health bureau, UNICEF; the supply is going back down the same chain.

It is necessary to follow-up on the order. The supply chain is long and the order may get stuck somewhere. Document how much RUTF and how many drugs are being used. Stocks should be carefully managed to ensure fast turn over and avoid prolonged storage.

Tell a facilitator when you have reached this point in the session. There will be a brief video showing organization of OTP.

SESSION 8: MONITORING AND REPORTING OF TFP

Introduction

This session introduces participants to monitoring the performance of TFP, and Recording and reporting systems of TFP services as an integral part of your job. Monitoring and reporting is an essential component of TFP without which the health facilities cannot provide quality health services. Monitoring and reporting of TFP service allows:

- Monitoring the individual child progress and take immediate correction of the treatment, if necessary and appropriate;
- properly track individual child when they are referred from in-patient to out-patient and vice versa;
- monitoring the performance of the TFP and take the necessary action to maintain a high quality service;
- Supervising and supporting the health care providers to maintain their skills and ensure quality TFP service.

You have practiced recording of the child progress on the OTP or Multi Chart card in the previous sessions. This session introduces the participants to the TFP recording and reporting skills including registration of children in the TFP registration book; preparation of the TFP monthly statistic reports; and calculating and interpreting TFP performance indicators.

Learning Objectives

This session will describe Monitoring and reporting of TFP especially the following knowledge and skills:

- Describe the Principles of a Monitoring System for TFP
- Describe How the Individual Child Is Tracked and Monitored
- Complete TFP Tally Sheets and facility Report; Interpret the Findings
- Calculate and Discuss Service/Program Performance
- Prepare a monthly TFP statistics Report

1.0. Monitor Performance of TFP

Quantitative data are collected on the outcome of all activities of TFP including in-patient care, and standard indicators mentioned below are calculated. This enables the quality and effectiveness of TFP in this case in-patient care to be monitored. They should be calculated for infants less than 6 months, and children 6 moths to 5 years of age separately.

1.1 Calculate Performance Indicators

Each TFP should calculate the following performance indicators separately for in-patient and out-patient. Refer the monthly statistics report chart (table) indicated on page 246. If a health center has both in-patient treatment (Stabilization Center) and out-patient treatment (OTP), the monthly performance of each should be calculated separately, and sent to the next level separately. This is because the interpretation of some of the performance indicators significantly differs for OTP and in-patient. For example, deaths in OTP are much less acceptable even if very few as the out-patient team should pick up deterioration through weekly follow up and home visit and admit any severely malnourished child who presents with complications or develops complications while on OTP follow up. In addition, while OTP is under the out-patient department, Stabilization Center is in the in-patient department in many hospitals. The performance of these two teams should be assessed separately to allow appropriate feedback for continuously increasing performance.

Death rate

Calculate the death rate monthly. This will allow improvements to be seen rapidly. To calculate the death rate:

- Determine the number of those children who died in the past month (D_2).
- Determine the total number of children who exited from the program in the past month.(F)
- Divide the number of deaths by the number of children who exited from your care in the past month and express the result as a percentage. ((D_2/F)*100)

Any death in OTP is alarming and should be thoroughly audited
For in-patient treatment, a death rate of:

- **>15% is Alarming**
- **10-15 % is poor**
- **<10% is acceptable**

Note; It should be alarming when it is more than 15% and you need to Carefully review the circumstances of deaths and identify and solve related problems in order to reduce the case-fatality rate.

Recovery (Cure) rate

= No of children that have reached the discharge criteria for TFP and discharged /
Total No of exits (D_1/F*100)

Defaulter rate

= No of true defaulters / Total No of exits (D_4/F*100)

A patient is considered as defaulter if she/he is absent for 2 consecutive weighing (2 days in in-patient and 14 days in out-patient) and it is confirmed for out-patient component of the programme that the child has not died at home. A child who didn't come for the subsequent weekly appointment should not be automatically regarded as defaulter without confirmation

Non responder rate

= No of non-responder / Total No of exits (D_5/F*100)

Transfer out rate

= No of patient transferred to another nutrition program /Total No of exits (E/F*100)

Optional Performance Indicators

The optional indicators of **Mean rate of weight gain and Mean length of stay** of cured children are calculated for children who are discharged cured ONLY . The indicators are calculated for edematous and non-edematous cases separately.

Mean length of stay

= sum of (Number of days for each recovered patient) / number of recovered patients

Mean rate of weight gain

This indicator is particularly useful to show the quality of feeding. It is calculated as:

= the discharge weight minus the minimum weight multiplied by 1000 to convert the weight gain to grams.

= This is then divided by the admission weight to give grams of weight gained per kilo body weight.

= Lastly, this total weight gain is divided by the number of days from the date of minimum weight to the date of discharge, to give g/kg/d. The Average rate of weight gain is then:

Average weight gain (g/kg/day) = Total individual weight gains/Total No of individuals

It is preferably calculated from the minimum weight and the date of minimum weight and not from the admission weight and date. When there is no record of minimum weight, then the admission weight can be used.

1.2. Minimum Standards for the performance Indictors

Reference values have been developed by the Sphere project. They provide benchmarks against which to interpret the quality and effectiveness of functioning TFP for both inpatient care and OTP. They give an indication of what might be considered "acceptable" and "bad" functioning under average conditions.

*** Reference values for the main indicators ©Sphere project**

Indicator	**Acceptable**	**Alarming**
Recovery rate	> 75%	< 50 %
Death rate	< 10%	> 15%
Defaulter rate	< 15%	> 25%
Mean Weight gain*	>= 8 g/kg/day	< 8 g/kg/day
Mean Length of stay*	< 4 weeks	> 6 weeks

Note:* The MWG and MLS of >8g and <4weeks are for cases managed in inpatient. For those who are managed in OTP, they are usually >5g/kg/d and <8weeks.

2.0. Recording and Reporting

2.1. Assign Unique Registration Number

Each child receives a registration number when she/he is first admitted to outpatient care or inpatient care to overcome the problems of confusing registration. The patient then keeps this same number during all transfers.

The importance of registration and being able to follow a patient, as they are transferred from OTP to inpatient care, and to ensure that the person is not lost from the system is critical

Each registration number has three parts: the health facility's name or code, the child's individual number, and the service code indicating where the child started treatment (inpatient care or outpatient care). Child individual number is assigned sequential 5 digit number. The first child to start the treatment in the facility will be given 00001.Most children will be admitted to outpatient care, as it is the most decentralized service and, therefore, the most common and accessible entry point for treatment.

Example: Standard 3-part numbering system: NYL/00001/OTP or IN

NYL: The code of the health facility

001: Child's individual allocated number (the numbers run sequentially). This child is the first to be enrolled in the OTP service of this facility.

OTP: Outpatient care, the service where the child started treatment or **IN**: In-patient Care if the child is admitted for inpatient Care.

Note: The Facility Registration – number, which is a number used by the facility for internal filing only (5-digit number followed by year) and is not used for transfer of children in TFP or for constructing a database of children in TFP. This number should also be recorded on the child Multi Chart or OTP card.

2.2. Recording in the individual follow-up cards

Inpatient multi-chart

You need to fill all the information for the individual child on the In-patient therapeutic treatment multi-chart if a child is admitted for in-patient care. You have learned how to fill the Multi-chart in session 2 and as you progress through the previous in patient sessions.

OTP card

This OTP card should be filled for each patient. It is the primary tool for monitoring individual child progress and managing malnutrition in OTP. You have learned how to fill the OTP card in session 6 and as you progress through the previous sessions.

2.3. Recording in TFP Registration book

All the information regarding the children under the program needs to be compiled in the TFP registration book (see next page for a sample of the Registration book). This will help you to prepare the monthly OTP statistics report in section 2.4 below.

The information needed include:

- Identification information, e.g. names, address
- Anthropometric information, e.g. MUAC, height, weight
- All admissions by category (new admission, readmission)
- Outcome or exits (discharge) by category (cured(recovered), died, defaulted, and non-responder), transfer out and transfer in to/from OTP or Inpatient and medical transfer, are registered daily on the TFP registration book.

In the case of OTP, there is an additional category of outcome – UNKNOWN. This is used for children that fail to attend the OTP for three weeks and a home visit has not yet determined if they have defaulted, moved away or has died.

2.4. Prepare monthly TFP statistic report

The admissions and discharge/exit outcomes from the registration book are summarized monthly using the monthly TFP reporting format (see on page 246) .This will help to calculate performance indicators for in-patient care or OTP.

It should be filled for infants less than 6 months, and children 6 moths to 5 years of age separately. Review the monthly report during morning meeting or quarterly review meeting to assess and improve the performance of your facility. After utilizing the data, report to the next level (district, Zone or Regional Health bureau).

The facilitator will explain the TFP registration book and monthly reporting format

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REGISTRATION BOOK FOR THERAPEUTIC FEEDING

Serial #	Unique SAM #	Facility Registration #	Full Name		Address	Age (months/Years)	Sex F/M	New admission Y/N	Transfer or re-admission Y/N	Admission						
										Date	Weight kg.g	Height cm	W/H% BMI	Oedema 0,+,++, +++	MUAC mm	Diagnosis (Marasmus/ Kwash.)
1																
2																
3																
4																
5																

S-8 Monitoring and Reporting of TFP

REGISTRATION BOOK FOR THERAPEUTIC FEEDING										
Serial #	Discharge						Minimum Weight		Outcome (cured, dead, defaulter, unknown, non-responder, medical transfer, transfer out)	Remarks
	Date	Weight kg.g	Height cm	W/H% BMI	Oedema 0,+,++, +++	MUAC mm	Mini. Weight (kg)	Date mini. Weight		
1										
2										
3										
4										
5										

S-8 Monitoring and Reporting of TFP

MONTHLY STATISTICS REPORT - MANAGEMENT OF SEVERE ACUTE MALNUTRITION - THERAPEUTIC FEEDING PROGRAMMES

FACILITY	
REGION	
ZONE	
WOREDA	
OPENING DATE	

Implementing agency/ Health facility	
Report prepared by	
MONTH / YEAR of reporting (ethio calendar)	

TYPE OF PROGRAMME	*In-patient*	*Out-patient*	*Mobile clinic*

Group age	Total beginning of the month (A)	New admissions			Re-admission (B4) after defaulting	Transfer in (B5) from another therapeutic unit	Total admissions (C)	Discharges (D)						Transfer out (E)		Total discharges (F)	Total end of the month (G)
		W/H<70% *or* MUAC<110mm (children) *or* MUAC<180mm (adults) (B1)	OEDEMA (B2)	Relapse (B3)				CURED (D1)	DEATH (D2)	UNKNOWN (D3)	DEFAULTER (D4)	NON-RESPONDER (D5)	MEDICAL TRANSFER (D6)	Transfer out (E1) to out-patient	Transfer out (E2) to in-patient		
< 6 months																	
6-59 months																	
5-10 years																	
11-17 years																	
> 18 years																	
TOTAL																	
								%	%	%	%	%	%	%	%		

Average weight gain and average length of stay (only for children 6-59 months cured)		
Average weight gain	g/kg/day	#
Average length of stay	day	#

*** Marasmic kwash cases should be reported under edema, to avoid double counting .*

Description of the Admission and Discharge boxes of in the Monthly Statistics Report

ADMISSIONS

New admission

Patients that are directly admitted to in-patient care/ward to start the nutritional treatment (new admissions to phase 1 or direct new admission to phase 2) are new admissions. They are recorded into three different columns:

1- **"Marasmic patients" (B1)**
2- "Kwashiorkor patients" (B2)
3- "Relapses" (B3)

Note: **"Relapses":** A case is considered a relapse if that patient has ever been severely malnourished before and cured. Children that have relapsed are particularly vulnerable and the fact that they are relapses should be noted in the major problem section of their charts – relapses should normally start treatment as in-patients. For the relapse cases, identify how many are edematous and non-edematous.

Readmission after defaulting (B4): Patient that have defaulted from a nutritional treatment program and he/she is re-admitted in your unit/ward with in a period of less than 2 months. If the defaulter patient is coming back after 2 weeks (In-patient) or after 2 months (out-patient) then he/she is recorded as new admission.

Transfer In (B5)

Patients that have started the nutritional therapeutic treatment in a different OTP site or TFU or other facility and is referred to your program to continue the treatment.

DISCHARGE

Cured (Recovered) (D1): Patient that has reached the discharge criteria from in-patient care

Death (D2: Patient that has died while he/she was in the program at your facility

Unknown (D3): Patient that has left the program his outcome (actual defaulting or death) is not confirmed/verified by home visits.

Defaulter (D4): Patient that is absent for two consecutive days in in-patient and confirmed by home visit.

Non-responder (D5): Patient that has not reached the discharge criteria after 40 days in the in-patient care

Medical transfer (D6): Patient that is referred to other health facility/ hospital for medical reasons and this health facility will not continue the nutritional treatment or transfer the patient back to the program.

TRANSFER OUT (E) - this is not a discharge.

Patient who has started the nutritional therapeutic treatment in your in-patient care and is referred to OTP or another site to continue the treatment:

"Transfer Out to OTP" (E1): patient referred to OTP.

"**Transfer Out to in-patient care" (E2):** patient referred to other in-patient care.

TOTAL END OF THE MONTH (G):

= Total beginning of the month (A) + Total admissions (C) - Total discharge (F)

EXERCISE A

Calculate the performance indicators for the In-patient care or OTP. State whether the rate is unacceptable, poor, or acceptable.

1. The TFU at Hawasa Hospital is small. Over the past 1 month, there have been 30 admissions and 20 exits. Five of these children died. What is the death rate

2. Look at the Hamle TFP monthly report of Jimma Hospital that was extracted from the TFP registration book on the next page. Calculate the performance indicators. What do you think the performance of Jimma Hospital inpatient care?

3. Examine the Gondar TFP registration book of Gondar Hospital inpatient care (page 250). Prepare the monthly TFP report using the TFP monthly report provided to you. What do you think is the performance of the in patient care?

4. Review the Debarek Health Center OTP Monthly Reporting format on page 251. Calculate the Death, cure, and defaulter rates for Debarek HC. What problem did you identify? What are the possible causes and solutions?

5. Look at the Nehassie OTP monthly report of Addis Ketema Health center on page 252 that was extracted from the TFP registration book. Calculate the performance indicators: Death, cure, and defaulter rates. What do you think the performance of Addis Ketema HC OTP care? What are the possible causes and solutions?

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

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MONTHLY STATISTICS REPORT - MANAGEMENT OF SEVERE ACUTE MALNUTRITION - THERAPEUTIC FEEDING PROGRAMMES

FACILITY	*Jimma University*
REGION	*Oromia*
ZONE	*Jimma*
WOREDA	*Jimma City Administration*
OPENING DATE	*07-05-96*

Implementing agency/ Health facility	*JU Hospital*
Report prepared by	*Sr Birknesh*
MONTH / YEAR of reporting (ethio calendar)	*Hamle 2001*

TYPE OF PROGRAMME	*In-patient*	*Out-patient*	*Mobile clinic*

Group age	Total beginning of the month (A)	New admissions			Re-admission (B4) after defaulting	Transfer in (B5) from another therapeutic unit	Total admissions (C)	Discharges (D)						Transfer out (E)		Total discharges (F)	Total end of the month (G)
		W/H<70% or MUAC<110mm (children) or MUAC<180mm (adults) (B1)	OEDEMA (B2)	Relapse (B3)				CURED (D1)	DEATH (D2)	UNKNOWN (D3)	DEFAULTER (D4)	NON-RESPONDER (D5)	MEDICAL TRANSFER (D6)	Transfer out (E1) to out-patient	Transfer out (E2) to in-patient		
< 6 months																	
6-59 months	*18*	*15*	*4*	*1*	*0*	*10*		*5*	*2*	*0*	*2*	*1*	*0*	*5*	*0*		
5-10 years																	
11-17 years																	
> 18 years																	
TOTAL																	
								%	%	%	%	%	%	%	%		

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Gondar Hospital							Admission							Discharge					
No	Reg. No	Name	Address	Age (Mo)	Sex	Readmission (Y/N)	Date	Weight (Kg)	Height (cm)	W/H % BMI	Edema	MUAC	Diagnosis	Date	Wt	Min Wt	Date of Min Wt	Outcome	Remark
1	1114	Abebe		9	M	N	1/10/2000	4.4	63		0		SAM	2/19/2000	5.5	4.4	1/10/2000	Cured	
2	1118	Abera		9	M	N	1/19/2000	5.5	65		+		SAM	2/9/2000	6.0	5.40	1/21/2000	cured	
3	1119	Tesfome		15	M	N	1/19/2000	4.5	71		+		SAM	2/22/2000	7.5	4.15	1/25/2000	cured	
4	1121	Frew		8	M	N	1/20/2000	4.4	63		0		SAM	2/11/2000	5.5	4.40	2/1/2000	cured	
5	1122	Demelash		18	M	N	1/21/2000	4.4	72		++		SAM	2/2/2000	7.7	4.40	1/21/2000	cured	
1	1123	Chaltu		10	F	N	1/23/2000	8.6	71		+++		SAM	1/25/2000	8.1	8.1	1/27/2000	Dead	
2	1124	Saron		18	F	Y	1/23/2000	5.1	70.5		+		SAM	2/24/2000	7.0	5.55	2/8/2000	Trans to OTP	
8	1125	Beletu		10	F	N	1/24/2000	4.8	69		+		SAM	2/2/2000	7.1	4.40	1/24/2000	cured	
9	1121	Dereb		9	F	Y	1/25/2000	4.1	68.2		0		SAM	2/21/2000	6.7	4.10	1/21/2000	Defaulter	
10	1130	Halima		18	F	N	1/21/2000	5.5	74		+		SAM	2/11/2000	5.7	5.5	1/21/2000	Dead	
11	1128	Mehret		9	F	N	1/22/2000	8.5	68		+++		SAM	2/11/2000	8.7	7.0	2/5/2000	Trans to OTP	
12	1129	Abdul		21	M	N	1/30/2000	13.3	78		+++		SAM	2/22/2000	10.6	10.1	2/8/2000	cured	
13	1131	Kebede		4	M	N	2/1/2000	4	61		+		SAM						
14	1132	Jemale		18	M	N	2/1/2000	7	78		0		SAM						
15	1133	Kedir		11	M	N	2/1/2000	6	72.6		0		SAM						
11	1134	Kedija		15	F	N	2/5/2000	6.3	73.1		0		SAM						
12	1135	Berhe		2	M	Y	2/1/2000	4	54		+++		SAM						
18	1131	Tayitu		31	F	N	2/2/2000	8.1	82.3		+		SAM						
19	1132	Rehila		13	F	N	2/9/2000	5.7	73.8		0		SAM						
20	1138	Rahel		11	F	N	2/10/2000	5.2	70.6		0		SAM						
21	1140	Eyerus		2	F	N	2/15/2000	3.5	51		++		SAM						
22	1141	Rebca		8	F	N	2/11/2000	5.1	66		+		SAM						
23	1142	Fatuma		8	F	N	2/18/2000	5.3	67.2		+		SAM						
25	1145	Haile		21	M	N	2/22/2000	6.5	72.7		+		SAM						
21	1141	Keneni		30	M	N	2/24/2000	8.0	86.4		0		SAM						
22	1142	Girma		9	M	N	2/25/2000	5.9	70.3		0		SAM						
29	1149	Wogari		58	M	N	2/28/2000	13.1	110		+		SAM						
30	1151	Tayech		14	F	N	2/30/2000	6.1	74.6		0		SAM						

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MONTHLY STATISTICS REPORT - MANAGEMENT OF SEVERE ACUTE MALNUTRITION - THERAPEUTIC FEEDING PROGRAMMES

FACILITY	Debark HC
REGION	Amhara
ZONE	South Gondar
WOREDA	Debark
OPENING DATE	04-05-98

Implementing agency/ Health facility	Debark Health Center
Report prepared by	Sr Aster
MONTH / YEAR of reporting (ethio calendar)	Hamle 2001

TYPE OF PROGRAMME	In-patient	Out-patient	Mobile clinic

Group age	Total beginning of the month (A)	New admissions			Re-admission (B4) after defaulting	Transfer in (B5) from another therapeutic unit	Total admissions (C)	Discharges (D)						Transfer out (E)		Total discharges (F)	Total end of the month (G)
		W/H<70% or MUAC<110mm (children) or MUAC<180mm (adults) (B1)	OEDEMA (B2)	Relapse (B3)				CURED (D1)	DEATH (D2)	UNKNOWN (D3)	DEFAULTER (D4)	NON-RESPONDER (D5)	MEDICAL TRANSFER (D6)	Transfer out (E1) to out-patient	Transfer out (E2) to in-patient		
< 6 months																	
6-59 months	50	48	0	0	1	4	49	30	3	0	6	9	0	0	0	48	
5-10 years																	
11-17 years																	
> 18 years																	
TOTAL																	
								%	%	%	%	%	%	%	%		

S-8 Monitoring and Reporting of TFP

MONTHLY STATISTICS REPORT - MANAGEMENT OF SEVERE ACUTE MALNUTRITION - THERAPEUTIC FEEDING PROGRAMMES

FACILITY	Addis Keterma HC
REGION	Addis Ababa
ZONE	
WOREDA	Kolfe Kifle Ketema
OPENING DATE	03-05-00

Implementing agency/ Health facility	Addis Ketema HC
Report prepared by	Sr Meron
MONTH / YEAR of reporting (ethio calendar)	Nehassie 2002

TYPE OF PROGRAMME	In-patient	Out-patient	Mobile clinic

Group age	Total beginning of the month (A)	New admissions			Re-admission (B4) after defaulting	Transfer in (B5) from another therapeutic unit	Total admissions (C)	Discharges (D)						Transfer out (E)		Total discharges (F)	Total end of the month (G)
		W/H<70% or MUAC<110mm (children) or MUAC<180mm (adults) (B1)	OEDEMA (B2)	Relapse (B3)				CURED (D1)	DEATH (D2)	UNKNOWN (D3)	DEFAULTER (D4)	NON-RESPONDER (D5)	MEDICAL TRANSFER (D6)	Transfer out (E1) to out-patient	Transfer out (E2) to in-patient		
< 6 months																	
6-59 months	140	110	10	0	7	7	134	60	15	0	18	4	0	0	5	102	
5-10 years																	
11-17 years																	
> 18 years																	
TOTAL																	
								%	%	%	%	%	%	%	%		

SESSION 9: INVOLVING MOTHERS IN CARE

Introduction

It is essential for the mother (or other caregiver) to be with her severely malnourished child in the hospital. For the following reasons, she must be encouraged to feed, hold, comfort, and play with her child as much as possible:

- Emotional and physical stimulation are crucial for the child's recovery and can reduce the risk of developmental and emotional problems.
- The child's mother can provide more continuous stimulation and loving attention than busy staff.
- When mothers are involved in care at the hospital, they learn how to continue care for their children at home.
- Mothers can make a valuable contribution and reduce the workload of staff by helping with activities such as bathing and feeding children.

Learning Objectives

This Session will describe and allow you to discuss and observe:

- ways to encourage involvement of mothers in hospital care; and
- ways to prepare mothers to continue good care at home, including proper feeding of the child and stimulation using play.

On the ward or in role-plays, this Session will allow you to practice:

- teaching a mother to bathe or feed a child; and
- giving complete discharge instructions.

1.0 Organize facility routine to encourage mothers' involvement

There are many ways to encourage mothers' involvement in hospital care. Mothers can be taught to:

- prepare food
- feed children
- bathe and change children; and
- play with children, supervise play sessions, and make toys.

The staff must be friendly and treat mothers as partners in the care of the children. A mother should never be scolded or blamed for her child's problems or made to feel unwelcome. Teaching, counseling and befriending the mother are essential to long-term treatment of the child.

Mothers should have a place to sit and sleep (preferably sleep with their children) in the TFU or ward. They also need washing facilities and a toilet, and a way to obtain food for them. Some mothers may need medical attention themselves if they are sick or anemic.

The staff should also make other family members feel welcome. All family members are important to the health and well-being of the child. When possible, fathers should be involved in discussions of the child's treatment and how it should be continued at home. Fathers must be kept informed and encouraged to support mothers' efforts in care of the children.

EXERCISE A

The group will discuss ways that facilities encourage mothers and other family members to be involved, as well as things that may hinder involvement. You may discuss examples from your own facilities and from the ward that you have visited during this training course.

Prepare for the discussion by listing a few ideas below.

Ways to encourage mothers and other family members to be involved:

Things that hinder involvement of mothers and other family members:

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

2.0 Involve mothers in comforting, feeding, and bathing children

Staff should informally teach each individual mother certain skills. First, they may need to show the mother how to hold her child gently and quietly, with loving care. Immediately after any unpleasant procedure, staff should encourage the mother to hold and comfort her child.

When teaching tasks such as feeding or bathing, staff should:

1. First, show the mother how to do the task, explaining each step.

2. Let the mother try the task, assisting and encouraging her as she tries.

3. Ask checking questions to make sure the mother understands what to do. For example, if you have just explained how to feed the child, ask the mother such questions as:

   What will you feed your child?
   How often will you feed him?
   How much will you give him for a serving?

4. Observe when the mother does the task independently the first time.

5. Give positive feedback, that is, tell the mother what she did well. Make suggestions for improvements without discouraging the mother. For example, say "Let's try together to do it this way…".

At all times staff must communicate clearly with mothers in a way that builds their confidence in their ability to take care of their children. For example, when a clinician examines the child, he should explain what is happening and show the mother how to hold the child during the exam. Staff must treat the mothers as partners in helping the child to health.

Tell a facilitator when you have reached this point in the module.

EXERCISE B

This exercise will include two role-plays of situations in which a nurse is teaching a mother to bathe or feed a child. Your facilitator may assign you the role of a nurse or a mother; if so, you will be given some information to help you prepare for your role. If you are an observer of the role play, you will take notes below.

Role Play 1

How would you feel if you were the mother in this situation?

How did the nurse encourage or discourage the mother?

Role Play 2

How would you feel if you were the mother in this situation?

How did the nurse encourage or discourage the mother?

3.0 Teach mothers about feeding and care

3.1 Teach groups of mothers about preparing feeding

There are many topics that can efficiently be presented to groups of mothers and other interested family members. Group teaching sessions may be held on topics such as nutrition and feeding, hygiene, making ORS to treat diarrhea, family planning, etc.

Staff members with good communication skills should be assigned to teach these group sessions. There may be several staff members who can take turns presenting different topics. The selected staff must **know the important information to cover on a topic** and be able to:

- communicate clearly in a way that mothers understand
- prepare and use suitable visual aids such as posters, real foods, etc.
- demonstrate skills when necessary (e.g., cooking procedures, hand washing, making ORS)
- lead a discussion in which mothers can ask questions and contribute ideas.

The sessions should not be limited to lecture, but should include demonstrations and practice whenever possible. Encourage questions from the mothers so that the session is interactive.

Example outline of teaching session

On the following page is an outline of a teaching session that could be used with parents of malnourished children. The purpose of the training session is to teach parents how to prepare a nutritious food at home. Different types of food can be prepared depending on the available local foods that would be appropriate for children of ages 6 to 24 months when they have recovered and are eating at home (refer FMOH 2005.Complementary food preparation food guide to select recipe for this session or for actual practice in your health facilities). For this session, the recipes given on the next page is selected which provides 295 kcal and 7.3 g protein.

The outline contains information, examples and visual aids, and practice. It also includes opportunities for parents to ask questions and contribute ideas.

S-9 Involving Mothers in Care

Teaching Session: Preparing Home-Based Nutritious Food

Preparation: Before the teaching session, prepare a display tray with ingredients for the selected food recipe.

I. What is this recipe?

A. Information: this recipe is a nutritious home-based food for children. It will help children continue to recover at home. This food should be given in addition to breast milk. While this food should definitely be given to the child. However, if the rest of the families like this food too, prepare enough for the whole family.

B. Example: Display the following ingredients on a tray. Call attention to the amount of each.

Ingredient	Amount	Amount in gram
Teff flour	half cup of coffee	45 gm
Tomato	1	35 gm
Carrot	One small	20 gm
Milk	1 cup of coffee	75 ml
Oil	One and half teaspoon	7 ml
water	Four and half cup of coffee	315 ml
Iodized salt	For taste	

C. Discussion: Ask the parents why they think these ingredients are good for children and all family members. In discussion, explain that:

- Oil, Teff (or other staple such as Barley, Enset) are needed to give energy
- milk is needed to build and grow the body
- Leafy green and orange-colored vegetables like the tomato and carrot are needed to give strength and good health and also to prevent blindness.

II. How to make the recipe

A. Information and example: Describe the recipe, pointing to each ingredient on the tray as you talk. If the parents can read, the recipe may be given to them in writing. If not, a picture recipe may be used. Tell parents what you have already done to begin the cooking.

- Wash hands before preparing food
- Blend the teff with milk and water in a pot. Add salt and boil to make porridge
- Peel the carrot and boil. When it is cooked, smash it
- Boil the tomato and peel off the cover. Then chop it into small pieces
- Add the tomato, smashed carrot, and oil into the porridge and mix until it is cooked

B. Practice: When it is time to add the carrot, tomato, and oil, has a parent do so. Have a parent boil, peel, and chop and add them to the pot.

III. Amount to serve

A. Information and example: Children should be fed 5 times daily. Explain that the amount in the pot is enough for one meal for a one-year-old child. Give also as snack ('Mekses') a quarter of Papaya or one banana. They can use different recipe for other meal.

Remind parents to wash hands before serving food and keep food covered. Does not store too long or the food may spoil.

Focus on giving this food to the discharged child until he is better. Then the child can shift to other nutritious family foods.

B. Practice: Ask a parent to wash hands and serve two portions of food from the pot. Show parents that this is the correct serving size for a one-year-old. Show and describe the portion in relation to the size of the bowl or plate. Let parents (and children, if present) taste the food.

IV. Discussion and review

A. Discussion: Ask parents questions about how they can prepare this recipe at home. Encourage them to ask questions as well. Include in the discussion:

Will they be willing to buy ingredients for their child to prepare recipe like this?

How much do you think this recipe costs? Estimate the price for this recipe including firewood.

B. Review: What are the reasons to serve nutritious foods like this for children? To prevent and treat malnutrition, prevent blindness, and ensure strong and good health.

- How often should you feed your child this recipe or other types? ___ times per day.
- How much will you give at each meal? Show serving size (it depends the age of the child).
- Review the ingredients and recipe.

3.2 Prepare for feeding the child at home

After the child recovers and reaches weight for length or weight for height > 85% on more than one occasion, or transferred to OTP, the child should be fed at home according to national IMNCI and IYCF guideline recommendations. For a child 6 to 24 months of age, this means 2-3 meals plus 1-2 other solid foods (mekses) each day. For a child age 2 year or older, this means giving the child 3 meals each day, plus giving nutritious food between meals twice daily.

While the child is on the ward, gradually reduce and eventually stop the feeds of F-100, while adding or increasing the mixed diet of home foods, until the child is eating as he or she will eat at home.

Appropriate mixed diets are the same as those recommended for a healthy child. They should provide enough calories, vitamins, and minerals to support continued growth. Home foods should be consistent with the guidelines below:

- The mother should continue breastfeeding as often as the child wants.
- If the child is no longer breastfeeding, animal milk is an important source of energy, protein, minerals and vitamins.
- Solid foods should include a well-cooked staple cereal. To enrich the energy content, add vegetable oil (5-10 ml for each 100 g serving) or butter. The cereal should be soft and mashed; for infants use a thick pap.
- Give a variety of well-cooked vegetables, including orange and dark-green leafy ones. If possible, include fruit in the diet as well.
- If possible, include meat, fish, or eggs in the diet. Pulses and beans are also good sources of protein.
- Give extra food between meals (healthy snacks).
- Give an adequate serving size (large enough that the child leaves some).

Examples of healthy snacks that are high in energy and nutrients include:

- Bread with butter, or margarine (‘Yedabo kebe’)
- Biscuits
- Yoghurt, milk,
- Ripe banana, papaya, avocado, mango, other fruits
- Cooked potatoes

S-9 Involving Mothers in Care

To prepare the mother to continue appropriate feeding at home:

- Discuss with the mother (and other family members, if possible) the child's previous diet and the foods that are available at home.

- Discuss practical ways to address specific problems in the child's past diet.

    - Be sure to involve the mother as a partner in deciding what to feed the child, so that the decisions will be practical.

    - Explain how to use or adapt available foods for a healthy diet that will meet the criteria on the previous page.

- Summarize what to feed the child, how much to give at each meal, and how many meals and snacks to give. Write it down or give the mother a prepared card with feeding instructions. Use pictures for mothers who cannot read.

- Remind the mother to sit with the child and encourage the child to eat.

- Before discharge, when the child is adjusting to home foods under health facilities supervision, have the mother practice preparing recommended foods and feeding them to her child.

- Review instructions before discharge and ask the mother checking questions to be sure she understands what to do, for example:

    - What will you feed your child? Where will you get the ingredients to prepare foods at home as you have done it here?

    - How many meals and snacks will you feed your child each day?

    - How much will you feed your child at each meal or snack?

- • Provide additional information and instruction if the mother needs it.

Tell a facilitator when you have reached this point in the module. There will be a brief video showing an educational session about preparing home food.

EXERCISE C

This exercise will be a group discussion of how hospitals can successfully prepare mothers to continue proper feeding at home. To prepare for the discussion, consider the questions below.

1. In your hospital, what will mothers be taught about feeding children at home?

    a. What mixtures of foods will make good meals in your area?

    b. What will be the main messages taught about feeding?

    c. Will you need more information before deciding what to teach?

    d. What information is needed and how will you get it?

2. Who will teach mothers about home foods and how will they teach?

    a. Who is most suited to teaching mothers about feeding?

    b. How will demonstrations or examples be given in teaching sessions?

    c. How can mothers practice making home foods in the hospital?

    d. How can transition to home foods be supervised in the hospital?

    e. How can nurses work with mothers to ensure that advice about home feeding is practical and will be followed?

A group discussion of these questions will follow the video on preparing home food.

4.0 Teach mothers the importance of stimulation

Severely malnourished children have delayed mental and behavioral development. As the child recovers, he or she needs increasing emotional and physical stimulation through play. Play programs that begin during rehabilitation and continue after discharge can greatly reduce the risk of permanent mental retardation and emotional problems.

Create a stimulating environment in the centers, provide opportunities for play activities with toys and interaction between children and with their mothers or careers. Promote physical activity of children that can move and passive mobilization of limbs for those that cannot. Avoid wrapping the child: the child should be able to move freely.

A comprehensive emotional and physical stimulation program should be set up in each centre, lead by a person from the health staff. The hospital can provide stimulation through the environment, by decorating in bright colors, hanging colorful mobiles over cots, and having toys available.

Mothers should be taught to play with their children using simple, homemade toys. It is important to play with each child individually at least 15-30 minutes per day, in addition to informal group play.

Tell a facilitator when you have finished reading the above sections. When everyone is ready, there will be a showing of a video about how to play with children to stimulate mental development.

5.0 Give general discharge instructions

Signs to bring the child back for immediate care:

- Not able to drink or breastfeed
- Stops feeding
- Develops a fever
- Has fast or difficult breathing
- Has a convulsion
- Has diarrhea for more than a day, or blood in stool
- Has edema (swelling in feet, legs, hands, or arms).

In addition to feeding instructions, mothers will need to be taught:

- When and where to go for planned follow-up at OTP or out patient follow up of a hospital: -at 2 weeks, 1 month, 3 months, and 6 months; -then twice yearly visits until the child is at least 3 years old.

- Any currently needed immunizations should be given in the hospital.; when to return for next immunization.

- When to go to the health centre for vitamin A (every 6 months);

- How to continue stimulating the child at home with play activities.

If early discharge is unavoidable, make special arrangements for follow-up

If a child must be discharged before reaching weight for length or weight for height $\geq$ 85% it is critical to make arrangements for follow-up of the child (for example, special visits by a health worker to the child's home, or outpatient care at a health facility or nutritional rehabilitation centre). Mothers will need special training to prepare feeds.

In no case should a child be discharged until the following conditions are met:

- The child is in phase 2(is feeding freely on F-100);
- Antibiotic treatment is finished;
- The child is eating well;
- The child is gaining weight;
- Arrangements have been made for support and follow-up (e.g., home visits, or visits to an outpatient facility).

ANSWERS TO SHORT ANSWER EXERCISE

Answers to short answer exercises

SESSION 2: PRINCIPLE OF CARE

Answers, page 37

1. Two conditions that are related and must be treated immediately in a severely malnourished child are *hypoglycemia* and *hypothermia.*

2. Cautious feeding with *F-75* is necessary at first to stabilize the child. Later, *F-100 or RUTF (Pulmpy' nut)* is given to rebuild wasted tissues and gain weight.

3. If a severely malnourished child has diarrhea, a special rehydration solution called *ReSoMal* should be given. This solution has less *sodium* and more *potassium* than regular ORS. Note: ReSoMal also has more sugar than regular ORS.

4. *True*

5. *False: Diuretics should never be given to reduce edema. With correct feeding, the edema will eventually go away.*

SESSION 3: MANAGEMENT OF MEDICAL COMPLICATIONS

Answers, page 53

The answers to the exercise on page 53 of the Session are written in the blanks below:

1. Rediet has watery diarrhea and is severely malnourished. He weighs 6.0 kilograms. He should be given 30 ml ReSoMal every 30 minutes for 2 hours. Then he should be given 30-60 ml ReSoMal for up to 10 hours. In the other hours during this period, F-75 should be given.

2. Yetayesh arrived at the hospital in shock and received IV fluids for two hours. She has improved and she is ready to switch to ReSoMal. Yetayesh weighs 8.0 kilograms. For up to 10 hours, she should be given ReSoMal and F-75 in alternate hours. The amount of ReSoMal to offer is 40 - 80 millilitres per hour.

3. Answers:

   - The child's willingness to drink
   - The amount of ongoing losses in the stool

Answers to short answer exercises

SESSION 4: FEEDING

Answers, page 85

Child 1: 110 ml F-75
Child 2: 180 ml F-75
Child 3: 90 ml F-75
Child 4: 32 ml F-75 every half hour (Divide 3-hourly amount by 4.)
Child 5: 190 ml F-75

Answers, page 90

1. 6 times
2. Mattios was offered 75 ml each time.
3. Yes, the three boxes are marked which means he took 75% of the 75 ml.
4. He refused most of the feed and vomited the small amount that he took.
5. He was fed by NG tube. The staff realized that he had not taken enough by mouth for two successive feeds.
6. He was fed as much as he would take orally; then he was given the rest by NG tube.

SESSION 5: DAILY CARE

Answers, page 123

1. Answers b, c, and d should be ticked.
2. Answers a, b, c, and e should be ticked.
3. Answer b should be ticked. Answers a and d may be appropriate in certain circumstances. If the mother is extremely tired, it may be best to let her sleep and feed the child yourself. If several mothers can be trusted to take turns feeding and sleeping, then answer d may be appropriate.

   Answer C would make the mother feel guilty and afraid, and would never be appropriate

Answers, page 130

1. Yes, the child should be given a dose of 200 000 IU on Day 15. She should be give measles vaccine on admission
2. Day 1 only, 50 000 IU oral. No, she is less than 9 months.
3. Yes, Dasash should be given a dose on Day 1 at the hospital since she has corneal clouding.
   No, she should not be given a dose on Day 2 because that would be the third day in a row to receive vitamin A.
   Yes, she should be given a dose on Day 15.

Answers to short answer exercises

Answers, page 144

1. 36.5 ^{0}C, 92 beats/minute and 30 breaths/minute
2. Answer b should be ticked.
3. There has been no significant change in the child's pulse rate.
4. Yes, the respiratory rate increased from 35 to 40 beats per minute between 6:00 am and 12:00 p.m.on Day 4.
5. A temperature of 38 ^{0}C, pulse rate of 100 beats/minute, and respiratory rate of 45 breaths/minute should be entered on the Monitoring Record.
6. Yes, there is a danger sign. There is a sudden increase in temperature. In addition, the respiratory rate has again increased by 5 breaths/minute and is at 45, which is considered fast breathing for a 2-year-old. The physician should be called.

Answers, page 154

1. The desired discharge weight for a girl who is 67 cm long is 6.5 kg.

2. This weight should be marked with a bold line on the weight chart. See below.

3. 4.8 kg on Days 6 and 7

4. The child lost weight due to loss of edema fluid.

5. Yes, the child has made progress in two ways. First, she lost her edema, and her weight fell to her true weight of 4.8 kg. Then she put on new tissue and her weight increased to 5.3 kg.

SESSION 6: MONITORING AND PROBLEM SOLVING

Answers, page 160

1. b
2. b
3. a
4. b

Answers, page 166

1 7.30 kg – 7.25 kg = 0.05 kg 0.05 kg × 1000 = 50 grams gained 50 grams ÷ 7.25 = 6.90 g/kg/day .It moderate weight gain.

2 6.25 kg – 6.22 kg = 0.03 kg 0.03 kg × 1000 = 30 grams gained 30 grams ÷ 6.22 = 4.8 g/kg/day .It is poor weight gain

3 7.5 kg – 7.6 kg = – 0.1 kg

– 0.1 kg × 1000 = –100 grams gained (or 100 grams lost)

– 100 grams ÷ 7.6 = –13.16 g/kg/day .It is poor and Geremew lost weight.

Answers to short answer exercises

SESSION 7: OTP

Answers, page 223

1. Neway:

- 200,000 IU of Vitamin A has to be given on on the 4th week of treatment.
- Measles vaccine should be given on the 4th week of treatment.
- Amoxicillin should be given.

2. This child should be given Albendazole 400 mg one tablet once.

3. Aregash:

a) Yes.
b) No
c) She should be given on day 15
d) She should not be given Iron since RUTF contains adequate iron.
Mebendazole should not be given, since her age is less than two years.

ANNEXES

A*nnex A: Equipment and supplies needed for a severe malnutrition care*

1. **In-Patient Equipment/Supplies**

Dextrostix
Thermometers
Child weighing scales (must be functioning correctly)
Items of known weight for checking scales
Board for measuring length
MUAC tape
Supplies for IV:
Scalp vein (butterfly) needles, canula gauge 21 or 23
Pediatric nasogastric tubes
Sticky tape
Syringes (50 ml for feeds)
Sterile needles
Supplies for blood transfusion
Blankets or wraps for warming
Incandescent lamp or heater
Wash basin for bathing children
Safe, homemade toys
Clock
Calculator

2. For hygiene of mothers and staff:

Toilet and hand washing facilities
Soap for hand washing
Place for washing bedding and clothes
Method for trash disposal

3. **For reference and record keeping:**

National protocol for management of SAM, March 2007.
Five laminated reference cards such as: Weight-for-height reference card
Weight-for-height reference card
F-75 reference card for phase 1
F-100 and RUTF reference card for transition and Phase 2
SAM classification wall chart

4. Kitchen Equipment/Supplies

Large containers and spoons for mixing/cooking feed for the ward
Feeding cups, saucers, spoons
Measuring cylinders (or suitable utensils for
measuring ingredients and leftovers)
Jugs (1-litre and 2-litre)
Refrigeration
Commercially manufactured F-75,F-100, and RUTF(Plumpy'Nut)
For making F-75 and F-100 from local ingredients: (Dried skimmed milk, whole dried milk, fresh whole milk, Sugar, Cereal flour, Vegetable oil and Clean water supply)

5. Pharmacy Equipment/Supplies

WHO ORS for use in making ReSoMal (or commercial ReSoMal)
Combined Mineral Vitamin Mix (CMV)
Folic acid
Vitamin A (100 000 / 200 000 IU capsules)
Glucose (or sucrose) IV fluids – one of the following, listed in order of preference:
Ringer's lactate solution with 5% glucose*
0.9% (half-normal) saline with 5% glucose*
*If either of these is used, sterile potassium chloride (20 mmol/l) should be added if possible. 0.9% saline (for soaking eye pads)
Sterile water for diluting
Vaccines (BCG, OPV, Pentavalent, and Measles)

Annexes

6. **Drugs (See formulations listed on Antibiotics Reference Card)**

Amoxicillin
Ampicillin
Chloramphenicol
Cotrimoxazole
Gentamicin
Ceftriaxone
Augmentin
Metronidazole
Nalidixic acid
Mebendazole or albendazole
Tetracycline or chloramphenicol eye drops
Atropine eye drops

Formulations For skin

Gentian violet
Potassium permanganate
Zinc-boric ointment
Petroleum jelly ointment
Nystatin ointment or cream (for Candidiasis)
Paraffin gauze (tulle gras)

7. **Laboratory resources accessible if needed**

TB tests (x-ray, culture of sputum, Mantoux)
Urinalysis
Stool culture
Blood culture
Cerebrospinal fluid culture

2. Materials needed for OTP

Estimation per facility:

Item

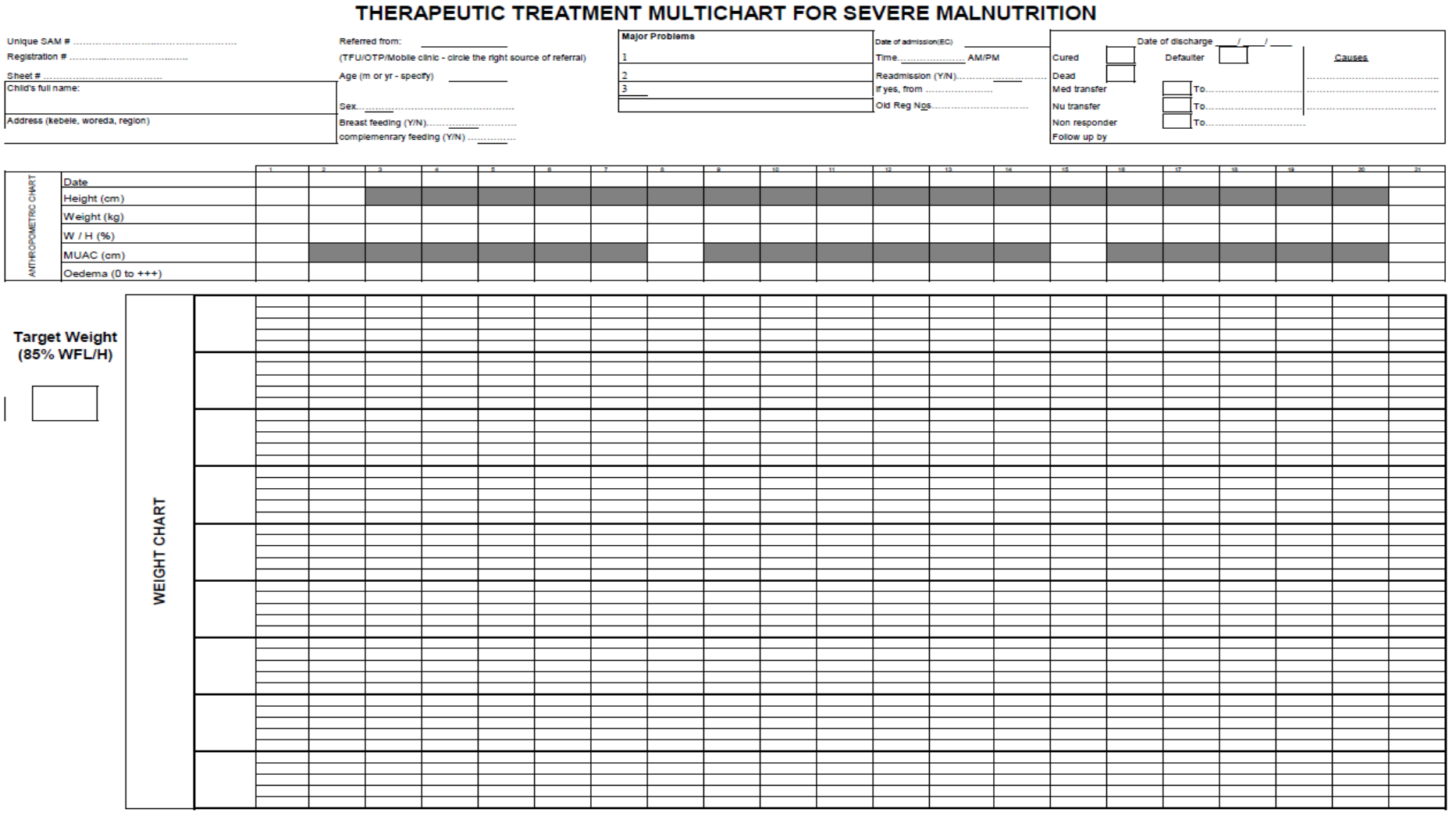
Equipment	***Quantity***
–File for admission cards	1 per clinically
–Soap for hand washing	1 bar
–Water jug (with lid)	2
–Plastic cups	10
–Metal spoons	2
–Thermometer	3
–Salter scale (25 kg) plus pants	1
–Height board	1
–MUAC tape	5
–Weight-for-height reference card	1
–SAM classification wall chart	1
–Target weight	1
–Appetite test card.	1
–SAM management reference card	1
–RUTF reference card	2

Annexes

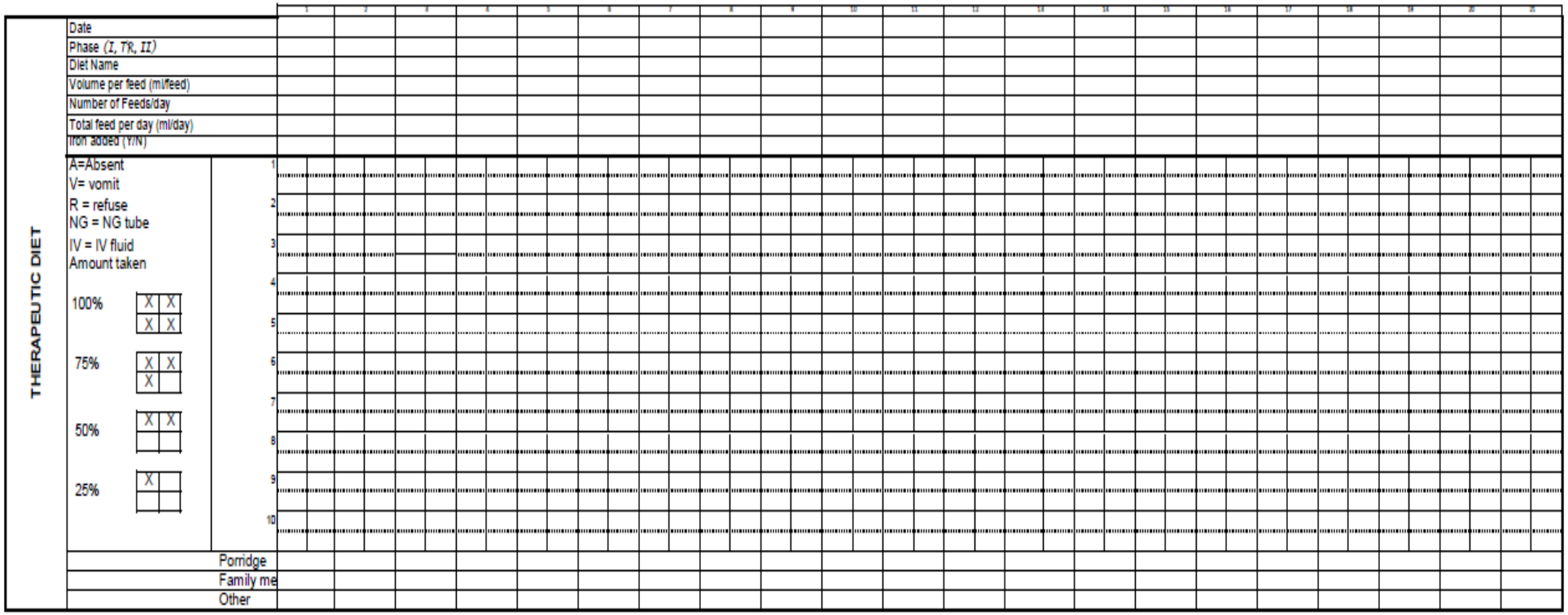
Minimum stock to keep

–Outpatient care cards for new admissions	100
–Outpatient care ration cards for new admissions	100
- Registration books	
– Formats for reporting	
–Drinking water	1 jerry can
–Sugar to make 10 % sugar solution	500 g
–RUTF	2 month stock
–Routine Medicines (**per 500 children)**	
–Amoxicillin	500 bottles
–Vitamin A	1 Tin
–Albendazole or Mebendazole	4 Tin
–Folic acid	
- ReSoMal	2 Packet

Annex B: Therapeutic Treatment Multi-Chart



Annexes


THERAPEUTIC DIET
Date
Phase (I, TR, II)
Diet Name
Volume per feed (ml/feed)
Number of Feeds/day
Total feed per day (ml/day)
Iron added (Y/N)
A=Absent
V= vomit
R = refuse
NG = NG tube
IV = IV fluid
Amount taken
100%
75%
50%
25%
Porridge
Family me
Other
SURVEILLANCE CHART
Date
Diarrhea (Y/N)
Vomit (Y/N)
Dehydrated (Y/N)
Cough (Y/N)
Respiratory rate (breaths/min)
Pulse rate (beats/min)
Palmar pallor (Y/N)
Temp. AM Ax/ Rec (°C)
Temp. PM Ax/ Rec (°C)
Dermatosis (0 to +++)
Liver size below costal margin (cm)
Shock (Y/N)
Failure to respond (Y/N)

Annexes

Enter name, dose and route of administration (oral-PO, intramuscular - IM, or intravenous-IV) for each drug. Enter your initial in the box when the drug is given.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
ROUTINE MEDICINES	Date																					
	Vit A _____ IU																					
	Folic Acid 5 mg (PO)																					
	Amoxicillin Time:																					
	:																					
	Deworming in phase 2:																					
SPECIAL MEDICINE	Antibiotic 1 Time																					
	Antibiotic 2 Time																					
	Resomal																					
	IV fluid																					
	Blood																					
	NG tube																					

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	Date																					
	Hgb (gm/dl) / Hct (%)																					
	Malaria smear																					
	Glucose (mg/dl)																					
	TB test																					

OBSERVATION: Make sure that the admission history and examination is documented in a separate sheet.

Card	Birth	1	2	3	4
Y ☐					
N ☐					
BCG					
POLIO					
Pentavalent					
Measles					

DISCHARGE		
Education given on	**Dates**	**Sign**
Cause of malnutrition		
Diarrhea, RTI, fever		
Skin, eye and ear infection		
Play and stimulation		
child nutrition		
child care		
hygiene		
sexually transmitted disease		
Family planning		
Other		
Vitamin A given		
Immunization up to date		
Breast feeding on discharge		

Annex C: Tips for correct preparation F-75 and F-100

- 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.

  For measuring oil, choose a small container to reduce the surface to which the oil can stick. Let the oil drain out well when transferring it to the blender or jug. Then rinse the container with a little boiled water and add the rinsing to the blender or jug.

- Be sure that the scale is set at zero before weighing.
- Wash hands before measuring ingredients.

- If using scoops for measurement, level 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 is a bigger volume. Therefore, one must either weigh these ingredients or know the corresponding volume for each

- Mix oil well so that it does not separate out. Oil is a vital source of energy; if oil 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 mix the oil. 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 liters, use ½ scoop to make 1 liter. Carefully measure to determine the exact amount in ½ scoop.

- Be careful to add the correct amount of water to make 1000 ml of formula. If 1000 ml of water is mistakenly added, the resulting formula will be about 15% too dilute.

Directions for making cooked F-75 with cereal flour

You will need a 1-litre electric blender or a hand whisk (rotary whisk or balloon whisk), a 1-litre measuring jug, a cooking pot, and a stove or hot plate. Amounts of ingredients are listed on the previous page. Cereal flour may be maize meal, rice flour, or whatever is the staple cereal in the area.

It is important to use cooled, boiled water even for recipes that involve cooking. The cooking is only 4 minutes of gentle boiling, and this may not be enough to kill all pathogens in the water.

The water should be cooled because adding boiling water to the powdered ingredients may create lumps.

If using an electric blender:

1. Put about 200 ml of the boiled, cooled water into the blender. (If you will use liquid milk instead of milk powder, omit this step.)
2. Add the flour, milk or milk powder, sugar, oil, and mineral mix. Blend.
3. Add cooled, boiled water to the1000 ml mark and blend at 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 boiled water to make 1000 ml. Blend again.

If using a hand whisk:

1. Mix the flour, milk or milk powder, sugar, oil, and mineral mix in a 1-litre measuring jug. (If using milk powder, this will be a paste.)
2. Slowly add cooled, boiled water up to 1000 ml.
3. Transfer to cooking pot and whisk the mixture 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 1000 ml. Whisk again.

Directions for no-cooking recipes

If using an electric blender:

1. Put about 200 ml of the boiled, cooled water into the blender. (If you will use liquid milk instead of milk powder, omit this step.)
2. Add the required amounts of milk or milk powder, sugar, oil, and mineral mix.
3. Add boiled cooled water to the 1000 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-litre measuring jug; then 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.)
2. Add mineral mix, and slowly add boiled, cooled water up to 1000 ml, stirring all the time.*
3. Whisk vigorously.

Whether using a blender or a whisk, it is important to measure up to the 1000 ml mark before blending/whisking. Otherwise, the mixture becomes too frothy to judge where the liquid line is.

Annex D: Monitoring Checklist

1. Checklist for monitoring food preparation

No	OBSERVE:	YES	NO	COMMENTS
1	Are ingredients for the recipes available?			
2	Is the correct recipe used for the ingredients that are available?			
3	Are ingredients stored appropriately and discarded at appropriate times?			
4	Are containers and utensils kept clean?			
5	Do kitchen staff (or those preparing feeds) wash hands with soap before preparing food?			
6	Are the recipes for F-75 and F-100 followed exactly? (If changes are made due to lack of ingredients, are these changes appropriate?)			
7	Are measurements made exactly with proper measuring utensils (e.g., correct scoops)?			
8	Are ingredients thoroughly mixed (and cooked, if necessary)?			
9	Is the appropriate amount of oil mixed in (i.e., not left stuck in the measuring container)?			
10	Is mineral mix added correctly?			
11	Is correct amount of water added to make up a liter of formula? (Staff should not add a liter of water, but just enough to make a liter of formula.)			
12	Is food served at an appropriate temperature?			
13	Is the food consistently mixed when served (i.e., oil is mixed in, not separated)?			
14	Are correct amounts put in the dish for each child?			
15	Is leftover prepared food discarded promptly?			
16	Other:			

2. Check List for Monitoring Ward Procedures

No	OBSERVE:	YES	NO	COMMENTS
	Feeding			
1	Are correct feeds served in correct amounts?			
2	Are feeds given at the prescribed times, even on nights and weekends?			
3	Are children held and encouraged to eat (never left alone to feed)?			
4	Are children fed with a cup (never a bottle)?			
5	Is food intake (and any vomiting/diarrhea) recorded correctly after each feed?			
6	Are leftovers recorded accurately?			
7	Are amounts of F-75 kept the same throughout the initial phase, even if weight is lost?			
8	After transition, are amounts of F-100 given freely and increased as the child gains weight?			
	Warming			
9	Is the room kept between 25^0C to 30^0C (to the extent possible)?			
10	Are blankets provided and children kept covered at night?			
11	Are safe measures used for re-warming children?			
12	Are temperatures taken and recorded correctly?			
	Weighing			
13	Are scales functioning correctly?			
14	Are scales standardized weekly?			
15	Are children weighed at about the same time each day?			
16	Are they weighed about one hour before a feed (to the extent possible)?			

17	Do staff adjust the scale to zero before weighing?			
18	Are children consistently weighed without clothes?			
19	Do staff correctly read weight to the nearest division of the scale?			
20	Do staff immediately record weights on the child's MULTICHART?			
21	Are weights correctly plotted on the Weight Chart?			
	Giving antibiotics, medications, supplements			
22	Are antibiotics given as prescribed (correct dose at correct time)?			
23	When antibiotics are given, do staff immediately make a notation on the MULTICHART?			
24	Is folic acid given daily and recorded on the MULTICHART?			
25	Is vitamin A given according to schedule?			
26	Is a multivitamin given daily and recorded on the MULTICHART?			
27	After children are on F-100 for 2 days, is the correct dose of iron given twice daily and recorded on the MULTICHART?			
	Ward environment			
28	Are surroundings welcoming and cheerful?			
29	Are mothers offered a place to sit and sleep?			
30	Are mothers taught/ encouraged to be involved in care?			
31	Are staff consistently courteous?			
32	As children recover, are they stimulated and encouraged to move and play?			

3. Check List for Monitoring Hygiene

No	OBSERVE:	YES	NO	COMMENTS
	Hand washing			
1	Are there working hand-washing facilities in the ward?			
2	Do staff consistently wash hands thoroughly with soap?			
3	Are their nails clean?			
4	Do they wash hands before handling food?			
5	Do they wash hands between each patient?			
	Mothers' cleanliness			
6	Do mothers have a place to bathe, and do they use it?			
7	Do mothers wash hands with soap after using the toilet or changing diapers?			
8	Do mothers wash hands before feeding children?			
	Bedding and laundry			
9	Is bedding changed every day or when soiled/wet?			
10	Are diapers, soiled towels and rags, etc. stored in bag, then washed or disposed of properly?			
11	Is there a place for mothers to do laundry?			
12	Is laundry done in hot water?			
	General maintenance			
13	Are floors swept?			
14	Is trash disposed of properly?			
15	Is the ward kept as free as possible of insects and rodents?			
	Food storage			
16	Are ingredients and food kept covered and stored at the proper temperature?			
17	Are leftovers discarded?			
	Dishwashing			
18	Are dishes washed after each meal?			
19	Are they washed in hot water with soap?			
	Toys			
20	Are toys washable?			
21	Are toys washed regularly, and after each child uses them?			

Annex E : Calculating Estimated RUTF Needs

Estimated ready-to-use therapeutic food (RUTF) needs for outpatient care per facility per month are based on a RUTF diet (Plumpy'nut®) of 200 kilocalories (kcal) per kg per day per child on average

Each child in outpatient care consumes about 20 packets of Plumpy'nut a week. Total consumption in outpatient care per facility per time period is calculated as follows:

A	Number of outpatient care beneficiaries per facility	**A**
B	Monthly consumption per child (20 packets/child/week)	**80 Sachets**
C	Monthly packet consumption for outpatient per facility	**AXB**
D	Monthly carton consumption for outpatient care	**C/150**
E	Monthly net weight (MT) (13.8 kg/carton)	**D x 13.8/1000**
F	Monthly gross weight (MT) (14.9 kg/carton)	**D x 14.9/1000**

Example

A	Number of outpatient care beneficiaries per facility	**100**
B	Monthly consumption per child (20 Sachets/child/week)	**80 Sachets**
C	Monthly Sachets consumption for outpatient per facility	**80X100= 8000 Sachets**
D	Monthly carton consumption for outpatient care	**8000/150= 53.3 Cartoon**
E	Monthly net weight (MT) (13.8 kg/carton)	**53.3 x 13.8/1000= 0.73 MT**
F	Monthly gross weight (MT) (14.9 kg/carton)	**D x 14.9/1000= 0.01 MT**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