Training Modules on Facility Based Management of Children with Severe Acute Malnutrition in Bangladesh

Institute of Public Health Nutrition
Directorate General of Health Services
Ministry of Health and Family Welfare
Government of the People's Republic of Bangladesh

October 2019

Cover Photo Courtesy:
Nutrition Rehabilitation Unit, icddr,b

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October 2019

Foreword

Message

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Abbreviations

BBS	Bangladesh Bureau of Statistics
CCP	Critical care pathway
CMV	Combined mineral vitamin mix
CSF	Cerebrospinal fluid
IM	Intramuscular
IPHN	Institute of Public Health and Nutrition
IV	Intravenous
MUAC	Mid-upper arm circumference
MV	Multivitamin
NG	Naso gastric
ORS	Oral rehydration salts
ReSoMal	Rehydration solution for malnutrition
SAM	Severe acute malnutrition
SD	Standard deviation
UNICEF	United Nations Children's Fund
WHO	World Health Organization
IMCI	Integrated Management of Childhood Illness
WHZ	Weight-for-Height Z-score

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Standard Operating Procedure for Training

A standard SAM unit for management of children with SAM should consist of

- Doctors: Consultant, Paediatrician, Medical Officers
- Nursing staffs
- Nutritionist /Dietician
- Supporting staff

Ensuring standard care for SAM requires training of all concerned. However, this module focuses on the training of doctors, nutritionist/dietician and nurses only.

The modalities of training and training materials should be complementary to standard IMCI training course and community based management of acute malnutrition (CMAM).

The training is focused on applied skill development. A chunk of training time is spent building skills by "hands-on training" involving actual case management and counseling, the remaining time is spent in classroom sessions, building theoretical understanding of management protocols. The hands-on training is undertaken through clinical training sessions in hospitals.

Organization of Training

- **Training of Trainers (TOT**): For training of the medical doctors it would be essential to have adequate number of trainers. The TOT will be facilitated by National Facilitators of the SAM master trainers.
- **Training:** Medical doctors, nutritionists/dieticians and nurses stationed in SAM unit of the hospital. The venue of the training should be a Medical College Hospital or Specialized Hospital/Institute with admitted SAM children under management to ensure hands-on experience.
- **Number of trainees:** 20-25 per batch should be trained.
- **Resource Persons and Facilitators:** Resource Persons/Facilitators who got TOT earlier and experts in the management of SAM
- **Duration of the Training:** TOT should be 4 days long. Training of doctors for 3 days, for nurses and other health care providers should be conducted on 4 days schedule depending upon the time and resources available. Clinical sessions should be conducted in wards at bedside.

MODULE 1

Introduction

INTRODUCTION

1.0 Importance of severe acute malnutrition (SAM) as a health problem

Severe acute malnutrition is one of the most common causes of morbidity and mortality among children under the age of 5 years worldwide. Many severely malnourished children die at home without care. Case fatality rate can be substantially reduced if proper management is provided following standard guidelines.

Nearly 20 million children under 5 suffer from severe acute malnutrition (SAM) globally, which contributes to an estimated 1 million deaths among children every year.[1] Most of these children live in South Asia and sub-Saharan Africa. In Bangladesh, the proportion of children with severe wasting (using only one in saqd5f dex, i.e. weight-for-length or -height) is 1.5% to 2.3% thus the total number being 250,000 to 400,000.[2, 2a]

Severely malnourished children often die because doctors unknowingly use practices that are suitable for most children but highly dangerous for severely malnourished children. In certain hospitals that have used these case management methods over a period of time, case fatality has been reduced from over 30% to less than 5%.[3,4] With appropriate case management in hospitals and follow-up care, the lives of many children can be saved, and malnutrition wards can dramatically lower case fatality rates.

The National Guidelines for the Management of Severely Malnourished Children in Bangladesh were developed in 2008 and updated in 2017 and this course will teach how to implement these guidelines, which are intended for doctors, senior nurses and other senior health professionals responsible for inpatient therapeutic care of severely malnourished children in health facilities.

2.0 Purpose of these training modules

These modules are designed for the training course of senior nurses and doctors in hospitals that have, or plan to have, malnutrition ward for children. The course will teach skills and knowledge specifically needed for management of severely malnourished children in hospitals. The course will not teach basic medical techniques that are taught in medical colleges and nursing institutes (such as how to insert an IV cannula or to take a blood sample).

It is expected that participants will return to their health facilities and begin to implement the case management practices described in this course. In order to implement these practices, the malnutrition ward will need certain basic supplies and equipment. These required items are listed in the Annex A of the Module 1: Introduction.

[1]WHO/WFP/ UN-SCN/UNICEF (2007) *"Community-based management of severe acute malnutrition".* Joint Statement. June 2007

[2]National Institute of Population Research and Training (NIPORT), and ICF. 2019. *Bangladesh Demographic and Health Survey 2017-18: Key Indicators.* Dhaka, Bangladesh, and Rockville, Maryland, USA: NIPORT, and ICF

[2a]Bangladesh Bureau of Statistics (BBS) and UNICEF Bangladesh. 2019. *Progotir Pathey,Bangladesh Multiple Indicator Cluster Survey 2019, Survey Findings Report*. Dhaka, Bangladesh: Bangladesh Bureau of Statistics (BBS)

[3]Black, R, Allen, L, Bhutta, Z, Caulfield, L, de Onis, M, Ezzati, M, Mathers, C, Rivera, J. (2008) *"Maternal and child undernutrition): Global and regional exposures and health consequences"* The Lancet Series, 2008

[4]Collins, S. & Sadler, K., *"Outpatient care for severely malnourished children in emergency relief programmes: a retrospective cohort study,"* The Lancet 360 (2002): 1824-1830

3.0 Course methods and materials

This course uses a variety of methods of instruction, including lectures, reading, written exercises, discussions, and demonstrations, as well as practice in a facility with children with severe acute malnutrition, whether in written exercises or in the health facility, is considered a critical element of instruction.

Small groups of participants will be led and assisted by "facilitators" as they work through the seven course modules. The facilitators are not lecturers, as in a traditional classroom. Their role is to answer questions, provide individual feedback on exercises, lead discussions, 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 modules in this course include:

1. Introduction
2. Assessment of Nutritional Status and Principles of Care
3. Initial Management
4. Feeding
5. Daily Care
6. Monitoring and Problem Solving
7. Involving Mothers/Caregivers in Care

In addition to the modules, you should have the:

National guidelines for Facility-based Management of Children with Severe Acute Malnutrition in Bangladesh

ANNEX A

Equipment and supplies needed for a SAM Unit

1. Ward equipment/supplies:

- ► Glucometer/strip
- ► Thermometers (Axillary/Rectal)
- ► Child weighing scales (maximum 10 gm precision)
- ► Height/length board
- ► Haemoglobinometer
- ► Supplies for IV:
  - ✓ Scalp vein (butterfly) needles, gauge 21 or 23
  - ✓ IV cannula, gauge 24 Infusion sets
  - ✓ IV fluids
  - ✓ Cotton/Spirit/antiseptic solution

- ► Paediatric nasogastric tubes (5, 6, 8, 10)
- ► Sticky tape / micropore tape
- ► Syringes (10ml, 20ml, 50ml for feeds)
- ► Syringes (3ml, 5ml, 10ml)
- ► Sterile needles ($^{1}/_{4}$", $^{1}/_{2}$")
- ► Eye pads
- ► Bandages
- ► Sterile gauze and non-sterile gauze
- ► Supplies for blood transfusion:
  - ✓ Transfusions sets
  - ✓ ACD blood collection bags
  - ✓ Other blood collection materials

- ► Sterile and non-sterile gloves
- ► Blankets or wraps for warming children
- ► Room heater
- ► Wash basin(s)
- ► Bath bowls, plastic
- ► Soap
- ► Toys
- ► Wall Clock
- ► Calculator

2. For hygiene of mothers and staff

- ► Toilet and hand washing facilities
- ► Soap for hand washing
- ► Laundry area
- ► Waste disposal facilities
- ► Running water supply

3. For reference and record keeping

- ► *Copy of* Facility-based Management of Children with Severe Acute Malnutrition in Bangladesh
- ► Relevant tables such as:
  - ✓ Weight-for-Height Reference Tables (WHO 2006 growth standards)
  - ✓ F-75 Reference Card
  - ✓ F-100 Reference Card
  - ✓ Antibiotics Reference Card
- ► Suitable forms for record keeping, such as the CCP (Critical care pathway) or other forms requesting similar information (weight charts, monitoring records, etc.)
- ► 24-Hours Food Intake Charts

4. Kitchen equipment/supplies

- ► Dietary scales able to weigh to 1 g
- ► Electric blender or manual whisks
- ► Large containers and spoons for mixing/cooking feed for the ward

- ► Feeding cups, spoons
- ► Measuring cylinders (or suitable utensils for measuring ingredients and feeds)
- ► Jugs (1-litre and 2-litres)
- ► For making F-75 and F-100:
    - ✓ Refer to national guidelines for instructions and locally available recipes
- ► Foods similar to those used in homes (for teaching/use in transition to home foods)
- ► Electric kettle (for warm water)
- ► Cooker (with cooking facility)

5. Pharmacy equipment/supplies

- ► ReSoMal or ORS (WHO) for use in making ReSoMal
- ► Electrolyte-mineral solution (per national guidelines, Annex 2, page 63) or
- ► Combined Mineral Vitamin Mix (CMV)
- ► Electrolytes and minerals:
    - ✓ per national guidelines
- ► Multivitamin without iron
- ► Folic acid
- ► Vitamin A (100,000 IU/200,000 IU capsules)
- ► Glucose 10%
- ► IV fluids (list per national guidelines)

6. **Drugs** (see formulations listed on Antibiotics Reference Card)

- ► Amoxicillin
- ► Ampicillin
- ► Cotrimoxazole
- ► Gentamicin
- ► Metronidazole
- ► Mebendazole/Albendazole (per national guidelines)
- ► Chloramphenicol eye drops/ointment
- ► Atropine 1% eye drops
- ► Nystatin oral suspension
- ► Ceftriaxone

7. For skin

- ► Gentian violet 1%
- ► Potassium permanganate 1%
- ► Zinc-oxide ointment
- ► Petroleum jelly ointment
- ► Paraffin gauze
- ► Clotrimazole cream

8. **Laboratory resources accessible if needed**

- X-ray
- TB tests (Mantoux)
- Urine: routine & culture
- Stool: routine & culture
- Blood tests
- CSF Study

MODULE 2

Assessment of Nutritional Status and Principles of Care

ASSESSMENT OF NUTRITIONAL STATUS AND PRINCIPLES OF CARE

Introduction

This module describes different forms of undernutrition, indicators for severe acute malnutrition (SAM) and how to recognize a child with SAM. The child with SAM 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 child with SAM. This module will describe how the physiology of the severely malnourished child is different, and how these differences affect care.

Learning objectives

This module will assist you in the management of children with SAM with the following knowledge and skills:

1. Definition of different forms of undernutrition
2. Understanding indicators for SAM
3. Recognizing signs of SAM
4. Anthropometric measurement
5. Classifying nutritional status using Z-score (SD), based on weight and length/height.

In addition, the module describes:

1. How does the physiology of severe acute malnutrition affect care of the child
2. Essential components of care
3. Recipes for therapeutic feeding formulas (F-75 and F-100)
4. Important things NOT to do
5. Recommended criteria for admission and discharge

1.0 Definition of different forms of undernutrition

1.1 Under nutrition is a result of poor intake and/or absorption, infection, maternal undernutrition etc. The different forms of undernutrition that can appear alone or in combination are: underweight, wasting, stunting, acute malnutrition, SAM and micronutrient deficiencies.

Terminology	**Definitions**[5]
Underweight	Underweight is defined by a weight-for-age Z-score <-2 (WHO standards) and is usually a combination of stunting and wasting. This indicator is commonly used in growth monitoring and promotion of children.
Stunting	Stunting, or chronic undernutrition, is defined by a height-for-age Z-score <-2 . It is a result of prolonged or repeated episodes of undernutrition often starting before birth. Stunting is best addressed through preventive maternal health programmes aimed at pregnant women, infants and children <2 years.
Wasting	Wasting is a form of acute malnutrition. It is defined by a MUAC <125 mm or a weight-for-length/height Z-score <-2.
Severe wasting	Severe wasting is a sign of SAM. It is defined by a MUAC < 115 mm or a weight-for-height Z-score <-3 Severe wasting is also called marasmus. The child with severe wasting has lost fat and muscle and appears very thin. The buttocks look like "baggy pants" (folds of skin over the buttocks).
Acute malnutrition	Acute malnutrition is caused by a sudden decrease in food consumption and/or illness resulting in bilateral pitting oedema or sudden weight loss. It is defined by the presence of bilateral pitting oedema and or wasting (MUAC <125 mm and/or weight-for length/height <-2 Z-score). It includes severe acute malnutrition and moderate acute malnutrition.
Severe acute malnutrition (SAM)	SAM is defined by the presence of bilateral pitting oedema or severe wasting (MUAC <115 mm or weight-for-length/height Z- score <-3.
Moderate acute malnutrition (MAM)	MAM is defined by a MUAC between 115 mm and <125 mm or a weight-for-length/height Z-score Between -3 and <-2.
Bilateral pitting oedema	Bilateral pitting oedema, also known as nutritional oedema or oedematous malnutrition, is a sign of SAM. It can also be kwashiorkor or marasmic kwashiorkor. It is detected when thumb pressure applied on top (dorsum) of both feet for 3-5 seconds leaves an indentation in the foot after the thumb is lifted. •

[5]Adapted from the FANTA CMAM Training Module

1.2 Indicators for severe acute malnutrition

Nutrition indicators are used to measure the severity of malnutrition. The following nutrition indicators are used to identify children upto 59 months of age suffering from SAM.

- Weight-for-length/height (W/H)
- Bilateral pitting oedema
- Mid-upper arm circumference (MUAC)

MUAC is an indicator for wasting that is measured in children aged 6 to 59 months. The MUAC is relatively easy to determine, as it involves measuring only the circumference of a child's left mid-upper arm. A MUAC <115 mm indicates severe acute malnutrition. A MUAC between 115 mm and <125 mm indicates moderate acute malnutrition. The MUAC is a better indicator of mortality risk associated with acute malnutrition than weight-for- length / height Z-score (WHO 2006). A weight-for- length/height Z-score (WHZ) <-3 identifies children with SAM[6].

1.3 Recognize signs of severe acute malnutrition

You may be familiar with the following clinical manifestations or conditions that are related to severe acute malnutrition. They are used in determining whether a child should be admitted to the malnutrition ward and/or the treatment needed.

Severe wasting

The indicators are:

- MUAC < 115 mm or
- WHZ < -3

A child with severe wasting has lost fat and muscle and appears like "skin and bones". Another term used for this condition is marasmus. To look for visible 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?

[6] The cut-off points for nutrition indicators are used from WHO child growth standard population (WHO standard in the National Guidelines for Management of Severely Malnourished Children in Bangladesh)

When wasting is extreme, there are visible folds of skin on the buttocks and thighs (visible severe wasting). 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 and will have a low weight-for-height.

Bilateral pitting oedema

A child with kwashiorkor (bilateral pitting oedema) might have these characteristics:

- Loss of appetite
- Apathy, little energy
- Irritable, cries easily
- "Moon face"
- Dermatosis: flaky skin or patches of abnormally light or dark skin (in severe cases)
- Hair changes

The categories of bilateral pitting oedema are:

- Mild : Both feet (can include ankles), Grade +
- Moderate: Both feet, lower legs, hands or lower arms, Grade + +
- Severe: Generalized bilateral pitting oedema including both feet, legs, hands, arms and face, Grade + + +

Dermatosis

Dermatosis is a skin condition, which is common in severe acute malnutrition. A child with dermatosis may have patches of skin that are abnormally light or dark in colour, 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.

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 the module Daily Care.

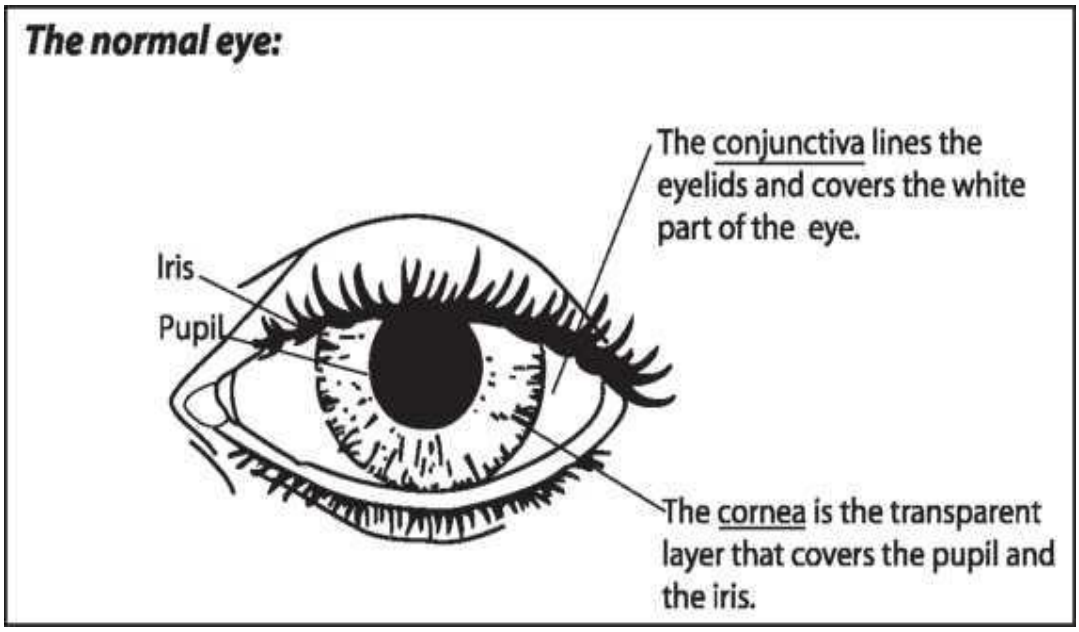
Eye signs

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

- Bitot's spots - superficial foamy dirty 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 sign of severe vitamin A deficiency. If not treated, the lens of the eye may push out and cause blindness. Corneal ulceration is an emergency and requires immediate treatment



Treatment of all eye signs are mentioned in the national guidelines (page-32) and management of corneal ulceration will be discussed in the modules Initial Management and in module Daily Care.

EXERCISE A

Please look at photographs of children below and identify the following signs:

- Severe wasting
- Oedema
- Dermatosis
- Eye signs (Bitot's spots, pus, corneal clouding, corneal ulceration)

If the child has dermatosis or oedema, try to estimate the degree of severity (+, ++, or +++).
If you see none of the signs, write NONE.

Example as seen in the picture at the right:

- Moderate (++) oedema, seen in feet and lower legs,
- Severwasting of upper arms: Ribs and collar bones clearly show.

PHOTOGRAPHS

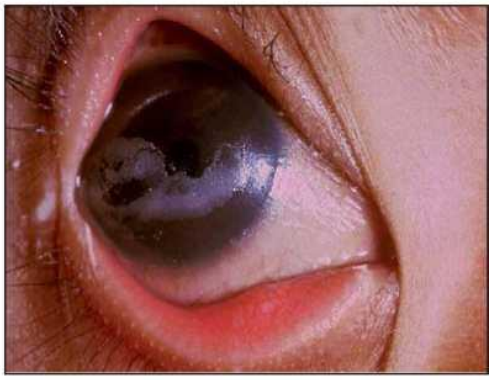
NO: 1

NO: 2

NO: 3

NO: 4

NO: 5



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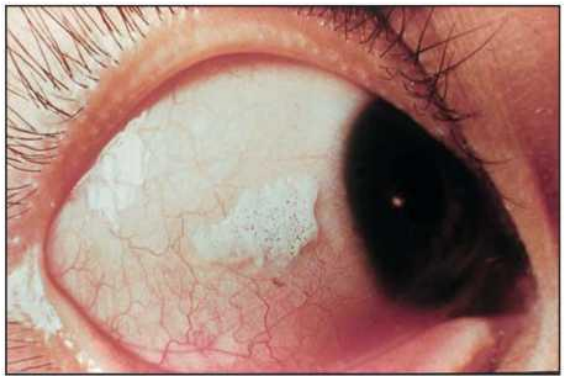


No. 7

2.0 Anthropometric measurement (length/height, weight and MUAC)

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

2.1 Measure length/height

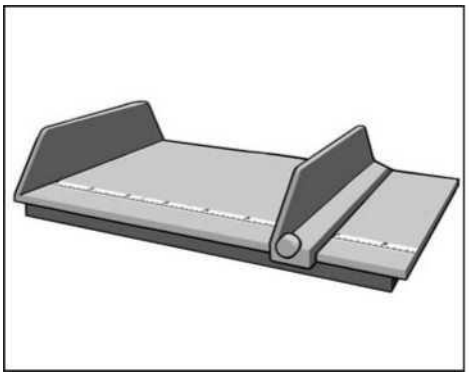
Carefully measure the child's length or height once, on the first day. For children younger than 24 months, or if the child is too weak to stand, measure the child's length while supine (lying down).

For children, aged 24 months or above, measure standing height. Note: Length is usually 4 greater than standing height by 0.7 cm. This difference has been accounted for in the weight-for-length/height reference Card. If the child is 24 months old or above but cannot be measured standing, subtract 0.7cm 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, on a stable, level table. Cover the board with a thin cloth or soft paper to avoid causing discomfort.

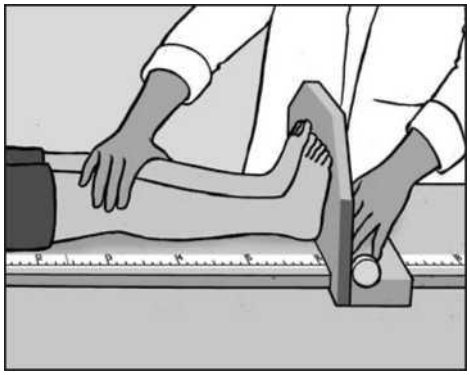


Measurement will be most accurate if the child is naked; diapers make it difficult to hold the infant's legs together and straighten them. However, if the child is upset or hypothermic, keep the clothes on, but ensure they do not get in the way of measurement. Always remove shoes and socks. Remove hair 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 headboard and:

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

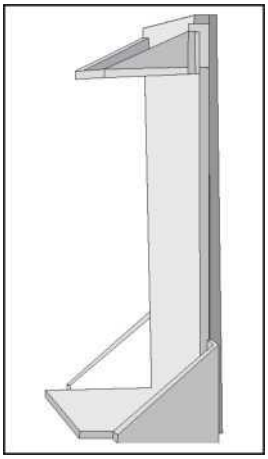
3. Hold the head with two hands and tilt upwards until the eyes look straight up, and the line of sight is perpendicular to the measuring board.
4. Check that the child lies straight along the centre line of the measuring board and does not change position.



The other person should stand alongside the measuring board and:

1. Support the child's trunk as the child is positioned on the board.
2. Place one hand on the shins or knees and press gently but firmly.
3. Straighten the knees as much as possible without harming the child.
4. 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.
5. Measure length to the last completed 0.1 cm and record immediately on the Critical Care Pathway (CCP).

To measure height (standing)



A stadiometer is a device used to measure 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:

1. Help the child stand with back of the head, shoulder blades, buttocks, calves and heels touching the vertical board.
2. Hold the child's knees and ankles to keep the legs straight and feet flat. Prevent children from standing on their toes.
3. 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:

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

2.2 Standardize length/height measuring board

Once a month, rods of known length should be measured on the measuring board. Use measure rods of 50 cm and 100 cm.

If there is 0.3 cm or more difference between the rod's known length and the measured length, re-calibration may be needed. Get a second person to re-check your measurements. Also check that:

- The measuring tape is flat on the board, not buckled, in correct position, reading 0 cm at the headboard end.
- Sliding foot piece is not too loose on the board (less than 0.2 cm wobble).
- Base of board is not warped; runners are straight and secure.

2.3 Weighing 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:

1. Remove the child's clothes, but keep the child warm with a blanket or cloth while carrying to the scale.
2. Put a cloth in the scale pan to prevent chilling the child.

3. Adjust the scale to zero with the cloth in the pan. (If using a scale with a sling or pants, adjust the scale to zero with that in place.)
4. Place the naked child gently in the pan (or in the sling or pants).
5. Wait for the child to settle and the weight to stabilize.
6. Measurement of weight to the nearest 0.01 kg (10 g) or as precisely as possible. Record immediately on the CCP.
7. Wrap the child immediately to re-warm.

2.4 Standardize weighing scale

Standardize scales daily or whenever they are moved:

1. Set the scale to zero.
2. Weigh three objects of known weight (e.g., 5, 10, and 15 kg) and record the measured weights. (A container filled with stones and sealed may be used if the weight is accurately known.)
3. Repeat the weighing of these objects and record the weights again.
4. If there is a difference of 0.01 kg (10g) 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.

2.5 Measure mid-upper arm circumference (MUAC)

In many cases there is no facility for measuring height/length of a child, in that case MUAC is used as to assess nutritional status. However when a measuring board is available and if a child's WHZ measures >-3 but the MUAC is <115 mm, the child is still continue to have SAM.

Following are the steps to measure MUAC of a child:

1. Keep your work at eye level. Sit down when possible. Very young children can be held by their mother during this procedure. Ask the mother to remove clothing that may cover the child's left arm.
2. Calculate the midpoint of the child's left upper arm by first locating the tip of the child's shoulder with your finger tips. Bend the child's elbow to make a right angle. Place the tape at zero, which is indicated by two arrows, on the tip of the shoulder and pull the tape straight down past the tip of the elbow. Read the number at the tip of the elbow to the nearest centimetre. Divide this number by two to estimate the midpoint. As an alternative, bend the tape up to the middle length to estimate the midpoint. Either you or an assistant can mark the midpoint with a pen on the arm.
3. Straighten the child's arm and wrap the tape around the arm at midpoint. Make sure the numbers are right side up. Make sure the tape is flat around the skin.
4. Make sure the tape is not too tight or too loose.
5. When the tape is in the correct position on the arm with the correct tension, read and call out the measurement to the nearest 0.1cm.

6. Remove the tape from the child's arm.

Steps of measuring MUAC

3.0 Identify the child with severe acute malnutrition

3.1 Determine Z-score based on child's weight and length/height

What is a Z-score? A Z-score is a way of comparing a measurement, in this case a child's weight-for-length, to an "average". The "averages" used in the manual and in this course are WHO normalized reference values for weight-for-height and weight-for-length. A table is given in Annex 1 in The National guidelines (page 44-62) that shows the Z-scores (standard deviations or SD) for children of different weights and heights.

It is important to consider a child's weight-for length/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-length/height. Feeding can correct wasting but cannot easily correct stunting.

To use the reference table:

1. Select the table according to child's sex
2. Locate the child's length or height in the first column of the W/H table[7].
3. Go across (to the right) in the coloured boxes to locate the child's weight.
4. Match the length/height with the weight and go upwards to the top of the column from this spot to determine the child's Z-score.

The child's weight may be between two Z-score. If so, indicate that the weight is between these scores by writing less than (<). For example, if the score is between -1 Z-score and -2 Z-score, write <-1 Z-score.

Examples of Z-score:

- A boy is 80 cm in length and weighs 9.2 kg. His score is <-1 Z-score.
- A girl is 76.5 cm in length and weighs 7.3 kg. Her score is -3 Z-score.
- A girl is 90 cm in height and weighs 10.3 kg. Her weight is between -2 Z-score and -3 Z-Z-score. Record her Z-score as <-2 Z-score.
- A boy 59 cm in length and weighs 4.3 kg. His score is <-3Z-score

[7]Note: If the length or height is between those listed, round-up or round-down as follows: If the last digit of length/height is 0.1 or 0.2 cm then round down, if it is 0.3 or 0.4 cm then round up. Likewise, if it 0.6 or 0.7 cm then round down, if it is 0.8 or 0.9 cm then round up.

EXERCISE B

Refer to the Simplified Field Tables of Z-scores (SD) in Annex 1 of the National Guidelines or on your weight-for-length/height Reference Tables. Indicate the Z- score for each child listed below.

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

2. Riyad, boy, height 101 cm, weight 11.8 kg

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

4. Karim, boy, length 82 cm, weight 8.5 kg

3.2 Recommended criteria for admission to a SAM Unit

Admit to the SAM unit all children who have:

Mid-upper arm circumference (MUAC) <115 mm
or
Weight-for-length/height Z-score (WHZ) <-3
or
Bilateral pitting edema

In areas where there is no community based management of SAM, then all children with one or more of the above criteria should be admitted to the SAM Unit.

Where there is community based management of SAM in place, the criteria of admission to a SAM Unit are presence of ***any one of the following criteria*** plus ***any of the above three criteria***:

- Grade ++ or Grade +++ Odema
- Loss of appetite
- Persistent vomiting (> 3 per hour)
- Fever (>102.20 F or 390 C axillary)
- Hypothermia (axillary <950 F or 350 C)
- Rapid breathing according to IMCI guidelines
- Severe pallor or severe anaemia (haemoglobin <5 gm/dl)
- Extensive infection requiring parental treatment
- Very weakness, apathetic, unconscious, convulsions
- Severe dehydration Shock

<u>Other criteria for inpatient admission:</u>
• Infants <6 months with severe acute malnutrition: *(WLZ <-3 or visible wasting &/or bipedal oedema)*
• Caregiver requests inpatient care for her/his child suffering from SAM
• Physician's impression

All severely malnourished children should go to the SAM ward, regardless of other presenting symptoms such as diarrhoea, respiratory infections, or other infections. Children with severe acute malnutrition are in danger of death from hypoglycaemia, 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.

EXERCISE C

Consider the information below about a child in order to determine if the child should be admitted to the malnutrition ward.

Use the criteria given on the previous page in this module. Refer to your Weight-for-Height Reference Tables as needed.

1. A girl, age 20 months. She is 67 cm in length. She weighs 6.5 kg. She has moderate (++) oedema of both feet.

   Should she be admitted to the malnutrition ward? Why or why not?

2. A girl, 6 months of age. She is 60 cm in length and weighs 4.0 kg.

   Should she be admitted to the malnutrition ward? Why or why not?

3. A boy, age 18 months. He is 65 cm in length and weighs 4.8 kg.

   Should he be admitted to the malnutrition ward? Why or why not?

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

The child with severe acute 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 acute malnutrition. The systems slow down 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. However rapid changes (such as rapid feeding or fluids) would overwhelm the systems, so feeding must be slowly and cautiously increased.

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 SAM 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 child with SAM 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 next module and are described in the National Guidelines on pages 65-66 of Annex 3.

Do not give iron early in treatment

Due to reductive adaptation, the severely malnourished child makes less haemoglobin than usual. Iron that is not used for making haemoglobin is put into storage. Thus there is "extra" iron stored in the body, even though the child may appear anaemic. Giving iron early in treatment will not cure anaemia, 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 much 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 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 oedema) instead of being properly distributed through the body.

All children with SAM should be given potassium to make up for what is lost. They should also be given magnesium, which is essential for potassium to enter the cells and be retained. Malnourished children already have excess sodium in their cells, so sodium intake should be restricted. If a child has diarrhoea, a special rehydration solution called ReSoMal should be used instead of regular ORS; ReSoMal has less sodium and more potassium than regular ORS.

SHORT ANSWER EXERCISE

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

1. Why should all severe acute malnourished children be given antibiotics?

2. Why is it dangerous to give iron early in treatment?

3. Why is ReSoMal preferable to regular ORS for severe acute malnourished children who have diarrhoea?

5.0 Overview of the essential components of care

5.1 Feeding formulas: What are F-75 and F-100?

F-75 is the "starter" formula to use during initial management, beginning as soon as possible and continuing for 3 to 7 days until the child is stabilized.

Severe acute 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. The 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, the F-100 is used as a "catch-up" formula during the rehabilitation phase to rebuild wasted tissues. **F-100 contains more calories and protein: 100 kcal and 2.9 g protein per 100 ml.**

The compositions of F-75 and F-100 are described in Annex 4 (pages 67-69) of the National Guidelines. Several recipes are also given there for locally made F-75 and F-100. The choice of recipe may depend on the availability of ingredients, particularly the type of milk, and the availability of cooking facilities. The principle behind the recipes is to provide the energy and protein needed for stabilization and catch-up. For stabilization (F-75), it is important to provide a formula with the energy and protein as shown (no less and no more). For catch-up growth (F100), the recipes show the minimum energy and protein contents needed in the rehabilitation phase.

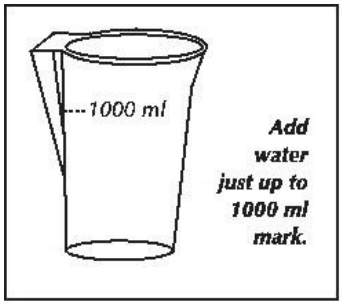
The first two recipes given for F-75 include cereal flour and require cooking. The second part of the table shows recipes for F-75 that can be used if there is no cereal flour or no cooking facilities. However, the recipes with no cereal flour have a high osmolarity and may not be tolerated well by some children with diarrhoea.

Recipes for F-75 and F-100

If you have cereal flour and cooking facilities, use one of these recipes for F-75: **(for using in > 6 months old children)**			
Alternatives	**Ingredients**	**Amount for F-75**	
If you have dried whole milk	Dried whole milk Sugar Cereal flour Vegetable oil Electrolyte mineral solution* *Water to make1000 ml*	35 g 70 g 35 g 20 g 20 ml *1000 ml***	
If you have full cream fresh cow's milk	Full cream fresh cow's milk Sugar Cereal flour Vegetable oil Electrolyte mineral solution* *Water to make1000 ml*	300 ml 70 g 35 g 20 g 20 ml *1000 ml***	
If you do not have any cooking facilities, use one of the following recipes for F-75:			
Alternatives	**Ingredients**	**Amount for F-75**	**Amount for F-100**
If you have dried whole milk	Dried whole milk Sugar Vegetable oil Electrolyte mineral solution* *Water to make1000 ml*	35 g 100 g 20 g 20 ml *1000 ml***	110 g 50 g 30 g 20 ml *1000 ml***
If you have full cream fresh cow's milk	Full cream fresh cow's milk Sugar Vegetable oil Electrolyte mineral solution* *Water to make1000 ml*	300 ml 100 g 20 g 20 ml *1000 ml***	880 ml 75 g 20 g 20 ml *1000 ml***

Contents of electrolyte mineral solution are given in Annex C of this module. Alternatively, Combined Mineral Vitamin Mix (CMV) may be used; see following page.

**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.



Electrolyte mineral solution

Electrolyte mineral solution is included in each recipe for F-75 and F-100. It is also used in making ReSoMal. The contents of the electrolyte mineral solution are listed in the table on page 47 (Annex C of this module). The solution contains potassium, magnesium, and other essential minerals. It must be included in F-75 and F-100 to correct electrolyte imbalance. The electrolyte mineral solution may be made in the pharmacy of the hospital, or a commercial product called Combined Mineral Vitamin Mix (CMV) may be used to provide the necessary minerals.

Vitamins

Vitamins are also needed in or with the feed. The multivitamin preparation should not include iron, which should be given separately during the nutritional rehabilitation phase of treatment.

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 the module Initial Management and the module Daily Care.

SHORT ANSWER EXERCISE

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

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

2. What are two important differences between F-75 and F-100?

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

4. Electrolyte mineral solution (or CMV) is included in F-75 and F-100 to correct electrolyte imbalance. What are two important minerals in this solution and why?

5. If F-75 and F-100 are made with electrolyte mineral solution instead of CMV, what must the child be given in addition to the feeds?

5.2 Process for successful management of the child with severe acute malnutrition

The following process is essential for successful management of the child with SAM. You will learn how to do these important steps in *Initial Management, Feeding*, and *Daily Care*.

1. Treat/Prevent hypoglycemia (which are often related) by feeding and treating infection.

2. Treat/prevent hypothermia (which are often related) by keeping warm and treating infection.

3. Treat/prevent dehydration using rehydration solution for malnutrition (ReSoMal).

4. Correct electrolyte imbalance (by giving feeds and ReSoMal prepared with electrolyte mineral solution or CMV).

5. Presume and treat infection with antibiotics.

6. Correct micronutrient deficiencies (by giving feeds prepared with electrolyte mineral solution or MV and by giving extra vitamins and folic acid as needed).

7. Start cautious feeding with F-75 to stabilize the child (usually 3 - 7 days) in the "stabilisation phase"

8. Rebuild wasted tissues through higher protein/calorie feeds (F-100) in the "rehabilitation phase"

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 oedema. The oedema is partly due to potassium and magnesium deficiencies that may take about 2 weeks to correct. The oedema 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 the initial feeding phase. Add iron only after the child has been on F-100 for 2 days (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 the module Initial Treatment.)

SHORT ANSWER EXERCISE

Fill in the blanks based on your reading in the module and the manual:

1. Two conditions that are related and must be treated immediately in a child with SAM 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. To correct electrolyte imbalance, it is important to give feeds prepared with_____ solution or a product called Combined Mineral Vitamin Mix (CMV).

4. If a severely malnourished child has diarrhoea, 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:

5. _____ Giving iron too early in treatment can have toxic effects.

6. _____ All severely malnourished children should be given antibiotics.

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

8. _____ Diuretics should be given to reduce oedema.

9. _____ Unless CMV is used to prepare feeds, the child needs multivitamin drops.

Check your answers to this exercise by comparing them to the answers given in the Annex A page 45

ANNEX A

ANSWERS TO SHORT ANSWER EXERCISE

The answers to the exercise on page 41 of the module are given below:

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

2. Cautious feeding with *F-75* is necessary at first to stabilize the child. Later, *F-100* is given to rebuild wasted tissues and gain weight.

3. To correct electrolyte imbalance, it is important to give feeds prepared with *electrolyte mineral* solution or a product called Combined Mineral Vitamin Mix (CMV).

4. If a severely malnourished child has diarrhoea, 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.

5. True

6. True

7. True

8. False, Diuretics should never be given to reduce oedema. With correct feeding, the oedema will eventually go away.

9. True, CMV contains vitamins. If CMV is used, separate multivitamin drops are not needed. If mineral mix without vitamins is used, multivitamin drops are needed.

MODULE 3

Initial Management

INITIAL MANAGEMENT

Introduction

The focus of initial management of a child with severe acute malnutrition is to prevent death while stabilizing the child. The first step is to check the child for emergency signs and provide emergency treatment as necessary.

In an emergency situation, many procedures must be done very quickly, almost simultaneously. Much practice and experience is needed to perform efficiently in an emergency room as a team. A severely malnourished child should be seen as quickly as possible in the emergency room.

Some of the initial management procedures described in this module may be performed in the emergency room, before the child is admitted to the malnutrition ward. It is very important that emergency room staff know to treat the severe acute malnourished child efficiently. They must be taught to recognize severe acute malnourished children and to understand that these children may be seriously ill even without showing signs of infection.

This module describes the life-saving tasks that are essential to initial management of the severely malnourished child.

The focus of initial management is to prevent death while stabilizing

Learning Objectives

This module describes and, to the extent feasible, will assist you when observing obtaining clinical practice with the following skills:

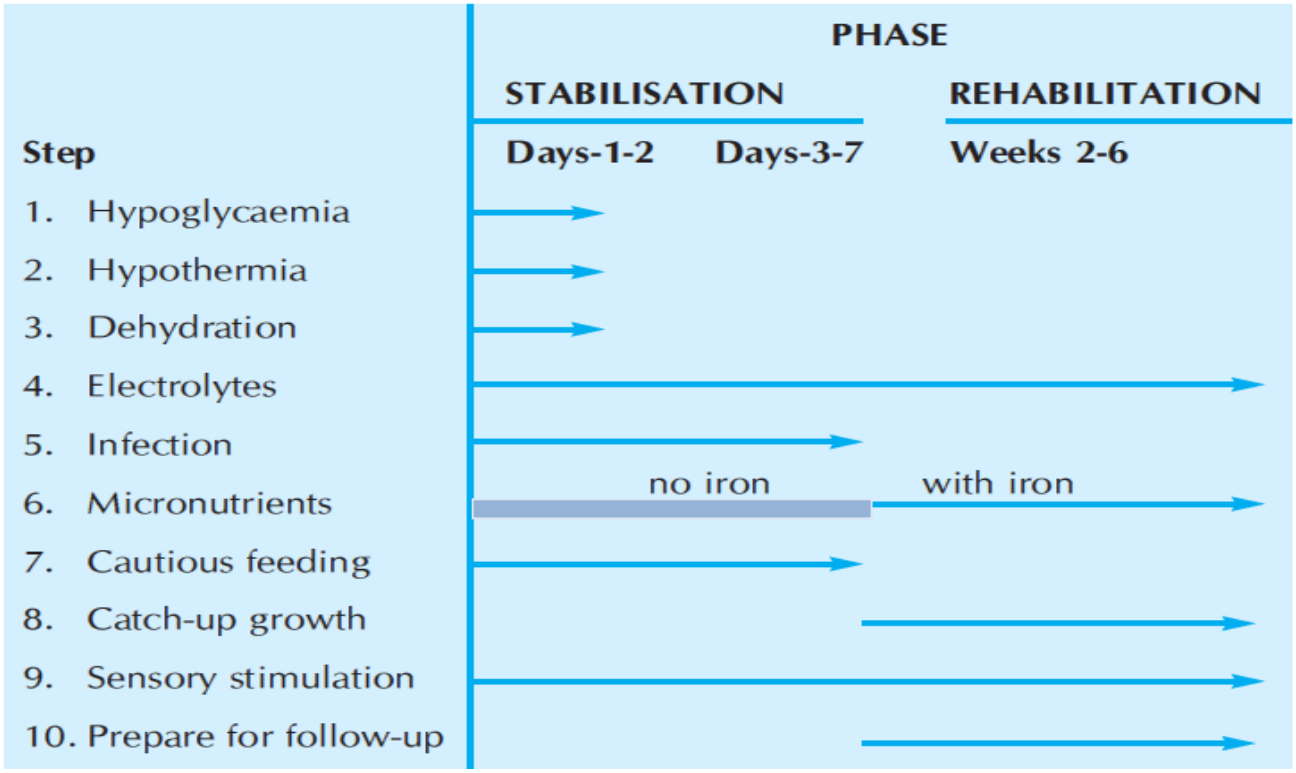
1. Identifying and managing the severely malnourished child with:

    a. Hypoglycaemia
    b. Hypothermia
    c. Shock
    d. Very severe anaemia
    e. Corneal ulceration
    f. Diarrhoea and/or vomiting
        - Preparing ReSoMal

2. Selecting appropriate antibiotics and calculating dosages

3. Keeping a written record of initial findings and treatments

1.0 Tens essential steps of management



2.0 Manage Hypoglycaemia

2.1 What is hypoglycaemia?

Hypoglycaemia is a low level of glucose in the blood (less than 3 mmol/L or <54 mg/dL). Hypoglycaemia is extremely dangerous. The hypoglycaemic child may die if not given glucose (and then food) quickly.

Hypoglycaemia and hypothermia usually occur together and are signs of serious infection.

Hypoglycaemia may occur if the malnourished child has not been fed for 4-6 hours, which particularly occurs during night.

Diagnosis of hypoglycaemia

The diagnosis of hypoglycaemia is based on measuring the blood glucose level or signs of hypoglycaemia that include **lethargy, limpness, impaired consciousness, or seizures/ convulsions. Often the only sign before death is drowsiness**. The hypoglycaemic child may also be hypothermic (low temperature) as well. Hypoglycaemia and hypothermia are also signs that the child has a serious infection.

The immediate cause of hypoglycaemia is lack of food. Severely malnourished children are more at risk of hypoglycaemia than other children and need to be fed more frequently, including during the night. Malnourished children may arrive at the hospital hypoglycaemic 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 hypoglycaemia in the hospital if they are kept waiting for admission, or if they are not fed regularly.

If suspected, hypoglycaemia should be treated immediately without laboratory confirmation.

2.2 Test blood glucose level

If facilities are available for testing blood glucose levels, take a sample on admission to the ward. However if hypoglycaemia is suspected, give treatment immediately without laboratory confirmation.

Blood glucose level can be tested using treated paper strips such as Dextrostix, Glucostix, or other similar products. When the end is covered with a blood sample, the paper strips change colour to indicate blood glucose level.

If no testing strips are available, or if it is not possible to get enough blood to test, assume that the child has hypoglycaemia and treat immediately.

2.3 Treat hypoglycaemia

If hypoglycaemia is suspected, immediately treat the child as described below depending on whether the child can drink or not.

If the child can drink, give 50 ml bolus of 10% glucose (*5 gm Glucose in 50 ml water*) orally. If the child is alert but not drinking, give the 10% glucose by NG tube.

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[8]. If the IV dose cannot be given immediately, give the NG dose first.

Start feeding F-75 30-minutes after giving glucose. Give it every half an hour for the first 2 hours. For a hypoglycaemic child, give 1/4 of the 2-hourly amount shown on the F- 75 Reference Card every 30-minutes.

Example
Ali weighs 7.4 kilograms. He has hypoglycaemia and is given a 50 ml bolus of 10% glucose orally shortly after arrival at the hospital. Half an hour after taking the glucose, Ali should be given 1/4 of the two-hourly amount of F-75 for his weight. The two-hourly amount is 80 ml, so Ali should be given 20 ml every 30-minutes for two hours.

[8]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.

2.4 Prevent hypoglycaemia / Begin feeding F-75

If the child's blood glucose is not low, begin feeding the child with F-75 right away. Feed the child every 2 hours, even during the night. Appropriate amounts are given on your F- 75 Reference Card. These frequent, small feeds will prevent hypoglycaemia and provide nutrients for the child during the initial period of stabilization.

Look at the 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 every 2 hours. The remaining columns, which show amounts for 3-hourly and 4-hourly feeds, will be used later, as the child progresses.

Note: The F-75 Reference Card shows amounts for children with/without severe oedema. Amounts for children with severe oedema (+++) are less. These amounts are given on the reverse side of your F- 75 Reference Card.

Feeding with F-75 should begin as soon as possible. Feeding will be discussed in detail in the next module.

3.0 Manage hypothermia

3.1 What is hypothermia?

Hypothermia is low body temperature (If the axillary temperature is <95°F or 35°C). Severe acute 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 hypoglycaemic. Both hypothermia and hypoglycaemia are signs that the child has a serious systemic infection.

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

3.2 Take temperature

Steps for using an axillary thermometer

- Shake thermometer to below 95.0°F
- Place thermometer under armpit (axilla).
- Keep in place for 3 minutes for an accurate reading.

3.3 Warm the child

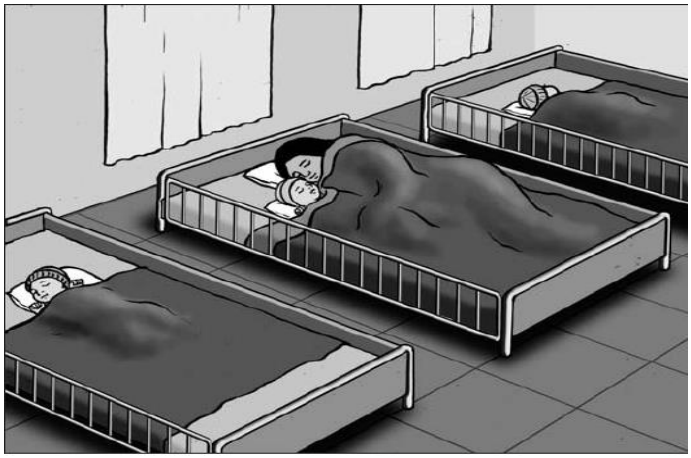
Maintain temperature (prevent hypothermia)

The following measures are important for all severe acute malnourished children:

- Cover the child, including his head.
- Stop draughts in the room. Move the child away from windows.

- Maintain room temperature of 77°F to 86°F, if possible.
- Keep the child covered at day and 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 wraped in contact with mother, and cover them with a blanket.



Keep children warmly covered: ensure especially at night

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 in contact with her skin when possible (kangaroo technique), and cover both of them with a blanket.

- Use a heater or incandescent lamp with caution. Use indirect heat (not too close). Monitor axillary 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.

CRITICAL CARE PATHWAY (CCP) - MALNUTRITION WARD

NAME Sara M (F) DATE OF BIRTH OR AGE 18 mos DATE OF ADMISSION 30/9/10 TIME 10:00 HOSP. ID NUMBER 469

INITIAL MANAGEMENT

Comments on pre-referral and/or emergency treatment already given: reffered by heath centre

SIGNS OF SEVERE MALNUTRITION Severe wasting? (Yes) No

Oedema? (0) + ++ +++ MUAC _____ mm

Dematosis? (0) + ++ +++ (raw skin, fissures)

Weight(kg): 6.3 Height/length (cm): 72

Z-score: <-3

TEMPERATURE 97 °F/_____ °C (axillary) rectal

If axillary < 95°F (35°C), or rectal < 95.9°F (35.5°C) actively warm child, Check temperature every 30 minutes.

BLOOD GLUCOSE (mmol/l): 2-4 mmol/L

If < 3mmol/l and (alert) give 50 ml bolus of 10% glucose or sucrose (oral or NG).
If < 3mmol/l and lethargic, unconscious, or convulsing, give sterile 10% glucose IV: 5 ml x ____ kg (child's wt) = ____ ml. Then give 50 ml bolus NG.
Time glucose given: (oral) NG IV

HAEMOGLOBIN (Hb) (g/dl): ___ or Packed cell vol (PCV): Blood type: ___

If Hb <5g/dl or PCV < 15% transfuse 10 ml/kg whole fresh blood (or 5-7 ml/kg Packed cells) slowly over 3 hours. Amount: ___ Time, started: ___ Ended: ___

EYE SIGNS None (Left) Right **MEASLES** Yes (No)

Bitot's spots (Pus) Inflammation Corneal clouding Corneal ulceration

If ulceration, give vitamin A & atropine immediately. Record on Dalily Care page.

Oral doses Vitamin A:	< 6 months	50 000 IU
	6 - 12 months	100 000 IU
	> 12 months	200 000 IU

FEEDING Begin feeding with F-75 as soon as possible. (If child is rehydrated, reweigh before detemining amount to feed. New Weight: _____ kg)
Amount for 2-hourly feedings: 70 **ml F-75*** **Time first fed:** 10:45

* If hypoglycaemic, feed % of this amount every half hour for first 2 hours: Continue until blood glucose reaches 3 mmol/l.

Record all feeds on 24-hour Food Intake Chart.

SIGNS OF SHOCK None Lethargic/unconsious Cold hand Slow capillary refill(>3 seconds) Weak/fast pulse

If lethargic or unconscious, plus cold hand, plus either slow capillary refill or weak/fast pulse, give oxygen. Give IV glucose as described under Blood Glucose (left). Then give IV fluids:

Amount IV fluids per hour: 15 ml X _____ kg (child's wt) = _____ ml

	Start:	Monitor every 10 minutes					* 2nd hr:	Monitor every 10 minutes				
Time							*					
Resp. rate							*					
Pulse rate							*					

* If respiratory & pulse rates are slower after 1 hour, repeat same amount IV fluids for 2nd hour; then alternate ReSoMal and F-75 for up to 10 hours as in right part of chart below. If no improvement on IV fluids, transfuse whole fresh blood. (See left, Haemoglobin.)

DIARRHOEA Watery diarrhoea? Yes (No) → if diarrhoea, Skin pinch goes back slowly
Blood in stool? Yes (No) circle signs Restiess/irritable Lethargic Thirsty
Vomiting? Yes (No) present: Sunken eyes Dry mouth/tongue No tears

If diarrhoea and/or vomiting, give ReSoMal. Every 30 minutes for first 2 hours, monitor and give: *
5 ml X ____ kg (child's wt) - ____ ml ReSoMal

For up to 10 hours, give ReSoMal and F-75 in alternate hours. Monitor every hour. Amount of ReSoMal to Offer.*
5 to 10 ml X ____ kg (child's wt) = ____ to ____ ml ReSoMal

Time	Start:													
Resp. rate														
Pulse rate														
Passed urine? Y N														
Number stools														
Number Vomits														
Hydration Signs														
Amount taken (ml)						F-75		F-75		F-75		F-75		F-75

* **Stop ReSoMal if:** Increase in pulse & resp. rates Jugular veins engorged Increasing oedema, e.g., puffy eyelids

ANTIBIOTICS (All receive) **Drug/Route**	**Dose/Frequency/Duration**	**Time of 1st dose**
Amoxicillin (125 mg/15ml) - oral	5 ml syrup, every 8 hours, for 5 days	10:30

4.0 Manage a child with severe acute malnutrition and shock

4.1 What is shock?

Shock is a dangerous condition with severe weakness, lethargy, or unconsciousness, cold extremities, and fast, weak pulse. It is caused by diarrhoea with severe dehydration, haemorrhage, burns, or sepsis. In severely malnourished children, some of the signs of shock may 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 severe acute 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 or fast pulse**
  - **160/min or more for children 2-12 months of age**
  - **140/min or more for children 1-5 years**

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

If the child is in shock (meets criteria in box above):
1. Give oxygen
2. Give sterile 10% glucose (5 ml/kg) by IV (as described in Section 2.3: Treat hypoglycaemia)
3. Give IV fluids as described below
4. Give antibiotics
5. Measure and record pulse and respiratory rates every 30 minutes
6. Keep the child warm

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

To give IV fluids:
Check the baseline respiratory and pulse rates and record them on the CCP. Also record the starting time.

1. Infuse IV fluid at 20 ml/kg over 1 hour. Use one of the following solutions, listed in order of preference:
   - ✓ Ringer's lactate solution with 5% glucose, if available OR
   - ✓ Half-strength normal saline with 5% glucose OR
   - ✓ Cholera saline with 5% glucose, If there is history of diarrhea

2. Observe the child and check respiratory and pulse rates every 30 minutes.

3. If the respiratory rate and pulse rate increase, stop the IV.

4. 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 30 minutes.

5. After 2 hours of IV fluids, switch to oral or nasogastric rehydration with ReSoMal. Give 5 - 10 ml/kg ReSoMal in alternate hours with F-75 for up to 10 hours. Leave the IV line in place in case it is needed again.

Note that the steps for checking for shock and giving IV fluids are all written on the CCP as a reminder.

SIGNS OF SHOCK	None	Lethargic/unconsious	Cold hand Slow capillary refill(>3 seconds)	Weak/fast pulse	
If lethargic or unconscious, plus cold hand, plus either slow capillary refill or weak/fast pulse, give oxygen. Give IV glucose as described under Blood Glucose (left). Then give IV fluids:					
Amount IV fluids per hour: 20ml X kg (child's wt) = ml					
Monitor every 30 minutes					
	Start:	After 30 minutes	* 2nd hr:	After 1:30 hours	3rd hour
Time			*		
Resp. rate					
Pulse rate			*		
*** If respiratory & pulse rates are slower after 1 hour, repeat same amount IV fluids for 2nd hour; then alternate ReSoMal and F-75 for up to 10 hours as in right part of chart below. If no improvement on IV fluids, transfuse whole fresh blood. (See left, Haemoglobin.)**					

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 (3 ml/kg/hour) while waiting for blood. When blood is available, stop all IV fluids, and then transfuse whole fresh blood at 10 ml/kg slowly over 3 hours. If there are signs of over-hydration (fluid overload), give diuretics as per national guidelines.

5.0 Manage very severe anaemia

5.1 What is very severe anaemia?

Anaemia is a low concentration of haemoglobin in the blood. Very severe anaemia is a haemoglobin concentration of < 5 g/dl. Very severe anaemia can cause heart failure and must be treated with a blood transfusion. As malnutrition is usually not the cause of very severe anaemia, it is important to investigate other possible causes such as malaria and intestinal parasites (for example, hookworm).

Mild or moderate anaemia is very common in severely malnourished children and should be treated later with iron, after the child has stabilized. In all cases of anaemia, oral iron (elemental iron) at 3 mg/kg/day should be given for 3 months to replenish iron stores. **When admitting children for severe acute malnutrition, do NOT give iron until the child has started to gain weight**.

If it is not possible to test haemoglobin, rely on clinical judgment. For example, judge based on paleness of gums, lips, and inner eyelids.

5.2 When to give a blood transfusion?

If haemoglobin is < 5 g/dL, give a blood transfusion.
1. Stop all 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 Furosemide (a diuretic [9]) at (1 mg/kg IV at the start of the transfusion
(see, National Guidelines, page 42)

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, the give 5–7 ml/kg packed cells over 3 hours rather than the whole blood.

[9]Diuretics MUST never be used to reduce oedema in children with severe acute 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 A

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

Case 1 - Tina

Tina is an 18-month-old girl who was referred from a health centre. Her arms and shoulders appear very thin. She has moderate oedema (both feet and lower legs). She does not have diarrhoea or vomiting, and her eyes are clear. Additional information is provided in the CCP sections below.

SIGNS OF MALNUTRITION			Severe wasting?		(Yes) No
Oedema?	0	+	(++)	+++	MUAC <115 mm
Dematosis?	(0)	+	++	+++	(raw skin, fissures)
Weight(kg): 6.3 kg				Height/length (cm): 70 cm	
Z-score: −3					

TEMPERATURE 96 °F / _____ °C (axillary) rectal
If axillary < 95°F (35°C), or rectal < 95.9°F (35.5°C) actively warm child, Check temperature every 30 minutes.

BLOOD GLUCOSE *(mmol/l)*: 3.5 mmol/l
If < 3mmol/l and alert, give 50 ml bolus of 10% glucose or sucrose (oral or NG). If < 3mmol/l and lethargic, unconscious, or convulsing, give sterile 10% glucose IV: 5 ml x ____ kg (child's wt) = ____ ml. Then give 50 ml bolus NG.
Time glucose given: Oral NG IV
HAEMOGLOBIN (Hb) (g/dl): 5.5 or Packed cell vol (PCV): Blood type: B+ve
If Hb <5g/dl, or pcv < 15% transfuse 10 ml/kg whole fresh blood (or 5-7 ml/kg Packed cells) slowly over 3 hours.
Amount: Time started: Time Ended:

1a. What is Tina's weight-for-length/height Z-score?

1b. Should Tina be admitted to the malnutrition ward? Why or why not?

1c. Is Tina hypothermic?

1d. Is Tina hypoglycaemic?

1e. Does Tina have very severe anaemia?

1f. Tina is alert and does not have cold hands. Her capillary refill is 2 seconds. Her pulse seems weak. According to the definition given in this module, is Tina in shock?

1g. What two things should be done for Tina immediately based on the above findings?

Case 2 - Johir

Johir is a 15-month-old boy who has been unwell for 5 weeks. For the last 3 days he has had no food but has been given home fluids for diarrhoea. Johir 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. Johir's temperature does not record on a s

tandard thermometer. His gums, lips, and inner eyelids appear normal in colour (not pale). Additional
information is given below:

SIGNS OF MALNUTRITION					Severe wasting? (Yes) No
Oedema?	(0)	+	+ +	+ + +	MUAC 110 mm
Dematosis?	0	(+)	+ +	+ + +	(raw skin, fissures)
Weight(kg): 5.8					Height/length (cm): 69
Z-score: <-3					

TEMPERATURE assumed <95 °F / _____ °C	axillary	rectal
If axillary < 95°F (35°C), or rectal < 95.9°F (35.5°C) actively warm child, Check temperature every 30 minutes.		

BLOOD GLUCOSE *(mmol/l)*: assumed <3 mmol/l
If < 3mmol/l and alert, give 50 ml bolus of 10% glucose or sucrose (oral or NG). If < 3mmol/l and lethargic, unconscious, or convulsing, give sterile 10% glucose IV: 5 ml x ____ kg (child's wt) = ____ ml. Then give 50 ml bolus NG.
Time glucose given: Oral NG IV
HAEMOGLOBIN (Hb) (g/dl): or Packed cell vol (PCV): Blood type:
If Hb <5g/dl, or pcv < 15% transfuse 10 ml/kg whole fresh blood (or 5-7 ml/kg Packed cells) slowly over 3 hours.
Amount: Time started: Time Ended:

SIGNS OF SHOCK	None	Lethargic/unconsious	Cold hand	Slow capillary refill (>3 seconds)	Weak/fast pulse

If lethargic or unconscious, plus cold hand, plus either slow capillary refill or weak/fast pulse, give oxygen. Give IV glucose as described under Blood Glucose (left). Then give IV fluids:

Amount IV fluids per hour: 15 ml X _____ kg (child's wt) = _____ ml

	Start:	Monitor every 10 minutes					* 2nd hr:	Monitor every 10 minutes				
Time							*					
Resp. rate							*					
Pulse rate							*					

* If respiratory & pulse rates are slower after 1 hour, repeat same amount IV fluids for 2nd hour; then alternate ReSoMal and F-75 for up to 10 hours as in right part of chart below. If no improvement on IV fluids, transfuse whole fresh blood. (See left, Haemoglobin.)

3a. What are four treatments that Johir needs immediately?

3b. What amount of sterile 10% glucose should be given by IV?

3c. What amount of IV fluids should be given over the first hour?

Johir 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. Johir 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.

3d. What should be done for the next hour?

After two hours of IV fluids, Johir is alert enough to drink, although he still appears unwell. His blood glucose has been tested and is now up to 5 mmol/l. His haemoglobin is 82 g/dl. He is weighed again, and his new weight is 6.0 kg.

3e. What should Johir be given in alternate hours over the next period of up to 10 hours?

3f. How much F-75 should be given at each feed? (*Hint: Use Johir's new weight to determine amount*.)

6.0 Give emergency eye care for corneal ulceration

6.1 What is corneal ulceration?

Corneal ulceration is a break in the surface of the cornea. The eye may be extremely red, or the child may keep the eye shut.

Corneal ulceration is very dangerous. If there is an opening in the cornea, the lens of the eye can extrude (push out) and cause blindness.

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 ulceration, give vitamin A immediately by mouth.

Child's age	Vitamin A oral dose
6<12 months	100,000 IU
≥ 12 months	200,000 IU

Also instill one drop atropine (1%) into the affected eye(s) to relax the eye and prevent the lens from pushing out. Chloramphenicol eye drops and bandaging are also needed but may wait until later in the day. If the child falls asleep with his eyes open, close them gently to protect them. Continuing treatment of corneal ulceration is described in the module *Daily Care*.

7.0 Manage watery diarrhoea and/or vomiting with ReSoMal

7.1 What is ReSoMal?

ReSoMal is Rehydration Solution for Malnutrition. 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 diarrhoea. It should be given by mouth or by nasogastric tube.

ReSoMal may be prepared from the new, low-osmolarity ORS and some additional ingredients.

ReSoMal contains approximately 45 mmol Na, 40 mmol K and 3 mmol Mg/litre.

The recipe using the ORS formulation[10] is given below:

Ingredient	**Amount**
Water (boiled and cooled)	850 ml
WHO-ORS	One 500 ml-packet
Sugar	20 g
Electrolyte-mineral solution (see below)	16.5 ml

Discard the ReSoMal solution 12 hours after preparation.

Electrolyte-mineral solution

Weigh the following ingredients and make up to2500 ml. *Add 20 ml of electrolyte mineral solution to 1000 ml of milk feed when it is made with local ingredients in absence of combined mineral-vitamin mix (CMV) .*

	Quantity (g)	Molar content of 20 ml
Potassium Chloride: KCl	224	24 miilimol
Tripotassium Citrate: C6HsK3O7.H2O	81	2 miilimol
Magnesium Chloride: MgCh.6H2O	76	3 miilimol
Zinc Acetate: Zn(CH3COO)2.2H2O	8.2	300 miilimol
Copper Sulphate: CuSO4.5H2O	1.4	45 miilimol
Water: make up to	2500 ml	-

Note: add Selenium if available (Sodium selenate 0.028 g, NaSeO410H20) and Iodine (Potassium iodide 0.012 g, KI) per 2500 ml.

Preparation: Dissolve the ingredients in cooled boiled water. Store the solution in sterilized bottles in the fridge to retard deterioration. Discard the electrolytemineral solution if it turns cloudy. Discard after one-month. even if not cloudy (make fresh each month).

7.2 Recognize the need for ReSoMal

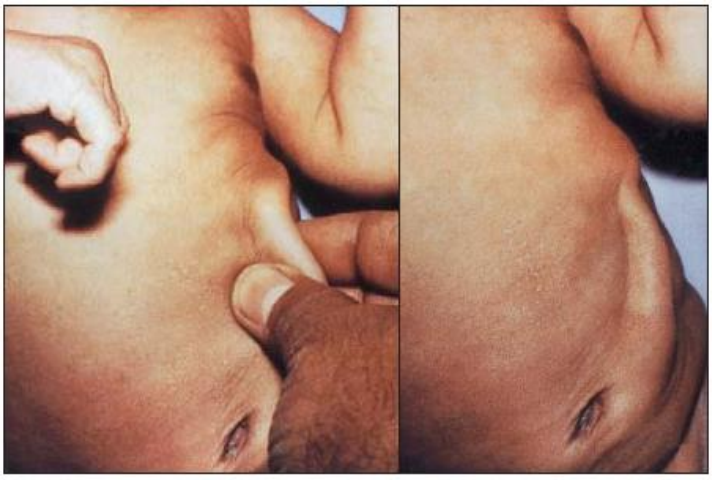
It is difficult to determine dehydration status in a severely malnourished child, as the usual signs of dehydration such as lethargy, sunken eyes (see below) may be present in these children all of the time, whether or not they are dehydrated.

Ask the mother if the child has had watery diarrhoea or vomiting. If the child has watery diarrhoea or vomiting, assume dehydration and give ReSoMal. (Also ask about blood in the stool, as this will affect choice of antibiotics.)

Signs of Dehydration

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
Absence of tears	Observe whether the child has tears when he cries.
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.
Thirsty	See if the child reaches out for the cup when you offer ReSoMal.
Skin pinch goes back slowly	Using your thumb and first finger, pinch the skin on the child's abdomen halfway between the umbilicus and the side of the abdomen. Place your hand so that the fold of skin will be in a line up and down the child's body, not across the body. Firmly pick up all the layers of skin and tissue under them. Pinch the skin for one second and then release. If the skin stays folded for a brief time after you release it, the skin pinch goes back slowly.

(Note: The skin pinch may always go back slowly in a wasted child.)



7.3 Prepare ReSoMal

If preparing ReSoMal from standard ORS and electrolyte mineral solution, prepare as follows:

1. Wash hands.

2. Empty one 500 ml packet of standard ORS into container that holds more than 1 litre.
3. Measure and add 20 grams sugar. (If possible, use a dietary scale that weighs to 5 g.)
4. Measure 16.5 millilitres of electrolyte-mineral solution in a syringe; add to other ingredients.
5. Measure and add 850 ml cooled, boiled water.
6. Stir until dissolved.
7. Use within 12 hours.

7.4 Calculate amount of ReSoMal to give

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
Alternate hours for 4 to 10 hours	5 - 10 ml/kg/hour*

** 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.* ***F-75 is given in alternate hours during this period until the child is rehydrated.***

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.

If diarrhoea is severe then the WHO-ORS (75 mmol sodium/L may be used because the loss of sodium in the stool is high and symptomatic hypnoatraemia can occur with ReSoMal (see, National Guidelines, pages 21-22).

SHORT ANSWER EXERCISE

Fill in the blanks in the following case studies:

1. Rubel has watery diarrhoea and is severely malnourished. He weighs 6.0 kilograms. 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. Yesmin arrived at the hospital in shock and received IV fluids for two hours. She has improved and is now ready to switch to ReSoMal. Yesmin weighs 8.0 kilograms. For up to _____ hours, she should be given ReSoMal and F-75 in alternate hours. The amount of ReSoMal to offer is ____ - ____ milli litres per hour.

Answer the question below:

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

EXERCISE B

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. Ramesh has diarrhoea and is just starting ReSoMal. He weighs 7.3 kg.

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

b. After 2 hours, what is the least amount of ReSoMal that Ramesh should be offered in alternate hours?

c. What is the greatest amount of ReSoMal that Ramesh should be offered in alternate hours?

2. Sultana has vomiting and watery diarrhoea. She weighs 11.6 kilograms.

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

b. After 2 hours, what is the least amount of ReSoMal that Sultana should be offered in alternate hours?

c. What is the greatest amount of ReSoMal that Sultana should be offered in alternate hours?

7.5 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.

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

7.6 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.

Signs to check

- ✓ Respiratory rate: Count for a full minute.
- ✓ Pulse rate: Count for 30 seconds and multiply by 2.
- ✓ Urine frequency: Ask: Has the child urinated since last checked?
- ✓ Stool or vomit frequency: Ask: Has the child had a stool or vomited since last checked?
- ✓ Signs of hydration: Have tears returned? Is the mouth less dry? Is the child less lethargic or irritable? Are the eyes less sunken? Does a skin pinch go back faster?

Record the above information on the CCP; 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
    - skin pinch not as slow
    - 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
- ✓ Not thirsty

If a child has 3 or more of the above signs of improving hydration status, stop giving ReSoMal routinely in alternate hours. Instead, offer ReSoMal after each loose stool, as described below.

Signs of over-hydration

Stop ReSoMal if any of the following signs appear:

- ✓ respiratory rate and pulse. (Both must increase to consider it a problem.)
- ✓ Jugular veins engorged. (Pulse wave can be seen in the neck)
- ✓ Increasing oedema (e.g., puffy eyelids)

7.7 After rehydration, offer ReSoMal after each loose stool

When the child has 3 or more signs of improving hydration (see above), stop giving ReSoMal routinely in alternate hours. However, watery diarrhoea may continue after the child is rehydrated. If diarrhoea continues, give ReSoMal after each loose stool to replace stool losses and prevent dehydration:

- For children < 2 years, give 50 - 100 ml after each loose stool.
- For children 2 years and older, give 100 - 200 ml after each loose stool.

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

Case 1 – Rahman

(For this case, use the first page of a blank CCP, available in your classroom)

Rahman is a 9-month-old boy. He has not been feeding well in the last 3 weeks. He has had loose stools and vomiting in the last 3 days. There has been no blood in the stool. Rahman is severely wasted and has some mild dermatosis. He has no oedema. His weight is 4.4 kg, and length is 64 cm and MUAC is 110 mm.

Rahman's axillary temperature is 100.4°F/38°C, and his blood glucose is 5mmol/l. His haemoglobin is 12.0 g/dl. His eyes appear clear, and he has not had measles. He has no signs of shock.

When the doctor does a skin pinch, Rahman cries but he has no tears. The skin pinch goes back slowly. Rahman has a dry mouth and drinks eagerly.

2a. Using the above information about Rahman, complete as many parts of the CCP as you can.

Note: You will not complete the section of the CCP for Antibiotics in this exercise. Although it is important to give antibiotics quickly, you will learn about these later. In the Diarrhoea section, complete only the top part now and the amount of ReSoMal to give. Do not complete the Feeding section yet.

Since Rahman has diarrhoea but no signs of shock, he needs ReSoMal. Rahman 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. Rahman has not passed urine. He has had one loose stool but no vomiting. There has been no change in hydration signs. Again Rahman takes the full amount of ReSoMal.

2b. In the Diarrhoea section of Rahman's CCP, complete the "Start" (9:00) column and the column for 9:30 a.m. (*You will need to abbreviate or write briefly in the row for hydration signs. Since Ram has had no change in hydration signs, write "same*.")

The columns below show Rahman's progress during the next hour. He continues to take the full amount of ReSoMal. You may transfer this information to Rahman's CCP if you want to.

Time	10:00	10:30
Resp. rate	28	25
Pulse rate	105	100
Passed urine? Y N	N	Y
Number stools	0	0
Number vomits	1	0
Hydration signs	Same	Moist mouth

2c. At 11:00, Rahman is ready to begin the next period of treatment, during which ReSoMal and F-75 are given in alternate hours. How much ReSoMal should Rahman be given in alternate hours? Enter this information on the CCP.

2d. What signs of over-hydration should be watched for during this period?

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

2e. Complete the column in the Diarrhoea section of Rahman's CCP for 11:00.

At 12:00 Rahman's respiratory rate remains at 25 and his pulse rate at 100. He did not pass urine or stools in the past hour, and he has not vomited. When a skin pinch is done, it returns normally. Rahman now has tears as well as a moist mouth. Rahman is weighed again. He now weighs 4.5 kg. Rahman continues to be willing to drink within the recommended range, although he does not drink eagerly.

2f. What signs of improving hydration does Rahman show?

2g. Should ReSoMal be continued routinely in alternate hours? Why or why not?

2h. What should be given to Rahman in the next hour (starting at 12:00)? How much should be given? Record this information in the Feeding section of the CCP.

Rahman should continue taking F-75 every 2 hours, even during the night. He must also be kept warm. Rahman should also be given antibiotics, which you will learn about in the next section of this module.

2i. If Rahman's diarrhoea continues, what should he be given after each loose stool? How much should he be given?

8.0 Give antibiotics

Give all severely malnourished children antibiotics for presumed infection. 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, hypoglycaemia, hypothermia, skin infections or dermatosis (+ + + with raw skin/fissures), respiratory or urinary tract infections, or lethargic/sickly appearance.

If the child appears to have no complications give

- Amoxicillin oral 15 mg/kg 8-hourly for 5 days or
- Cotrimoxazole oral; Trimethoprim 5mg/kg and Sulphamethoxazole

25mg/kg 12-hourly for 5 days. Cotrimoxazole is often resistant to many of the common bacteria that usually cause infection in SAM children.

If the child is severely ill (apathetic, lethargic or looking sick) or has complications (listed above) give:

- Ampicillin IM/IV 50 mg/kg 6-hourly for 2 days, then Amoxycillin oral 15 mg/kg 8-hourly for 5 days AND
- Gentamicin IM/IV 7.5 mg/kg once daily for 7 days. If the child is not passing urine, Gentamicin may accumulate in the body and cause deafness. Do not give second dose until the child is passing urine.

If the child fails to improve clinically by 48 hours or deteriorates by 24 hours, or if child presents with septic shock or meningitis, antibiotics with a broader spectrum may be needed e.g. Ceftriaxone ~100 mg/kg IV/IM once daily with or without Gentamicin.

In addition, where specific infections are identified for which additional treatment is required, add:

- Specific antibiotics if appropriate
- Anti-malarial treatment if the child is suspected to have malaria.

If anorexia still persists after antibiotic therapy, reassess the child fully, check for sites of infection and potentially resistant organisms, and take appropriate measures.

Ensure that vitamin and mineral supplements have been correctly given.

8.2 Choose and use the best route of administration

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 conveniently give the antibiotic intravenously without leaving an IV bag up, and it is less painful for the child.

EXERCISE D

In this exercise you will select antibiotics and determine dosages for several children. Refer to the Antibiotics Reference Card or Annex C of this module 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 – Polash

Polash is 77 cm long and weighs 8.0 kg. He has oedema of both feet. He has no hypoglycaemia, no hypothermia, no signs of shock, and no other complications.

1a. What antibiotic does Polash need? By what route should it be given?

1b. Look at the formulations listed on the dosage tables. What formulation is most likely to be available in your hospital? (Use this formulation to answer the next question.)

1c. Given Polash's weight, what should his dose be?

1d. Summarize the prescription for Polash in the table below:

Drug	Route	Dose	Frequency	Duration

Case 2 - Dipti

Dipti is 82 cm long and weighs 7.9 kg. She is two years old. She appears sickly and has fast breathing (55 breaths per minute) and chest indrawing.

3a. Dipti has signs of a specific infection (pneumonia) requiring a specific antibiotic. Look in the National Guidelines (Annex 3) to see what antibiotic is required first and record it below.

3b. Dipti will be given IM injections. What is the dose?

3c. Summarize the prescription for Dipti in the table below:

Drug	Route	Dose	Frequency	Duration

After 2 days Dipti's breathing is normal and there is no chest indrawing. She is taking F-75 well. She still weighs 7.9 kg.

3d. What choice of antibiotics should be given next? By what route?

3e. Choose one of the above antibiotics. What formulation of this drug is most likely to be available in your hospital?

3f. Given the formulation listed in 3e, what is the appropriate dose for Dipti?

3g. Summarize Dipti's new prescription in the table below:

Drug	Route	Dose	Frequency	Duration

ANNEX A

Critical Care Pathway (CCP)

CRITICAL CARE PATHWAY (CCP) - MALNUTRITION WARD

NAME _____ [M] [F] DATE OF BIRTH OR AGE _____ DATE OF ADMISSION _____ TIME _____ HOSP. ID NUMBER _____

INITIAL MANAGEMENT

Comments on pre-referral and/or emergency treatment already given: _____

SIGNS OF SEVERE MALNUTRITION	Severe wasting? Yes No
Oedema? 0 + ++ +++	MUAC _____ mm
Dematosis? 0 + ++	+++ (raw skin, fissures)
Weight(kg):	Height/length (cm):
Z-score:	

TEMPERATURE _____ °F / _____ °C axillary rectal

If axillary < 95°F (35°C), or rectal < 95.9°F (35.5°C) actively warm child, Check temperature every 30 minutes.

BLOOD GLUCOSE (mmol/l):

If < 3mmol/l and alert, give 50 ml bolus of 10% glucose or sucrose (oral or NG).
If < 3mmol/l and lethargic, unconscious, or convulsing, give sterile 10% glucose IV: 5 ml x ____ kg (child's wt) = ____ ml. Then give 50 ml bolus NG.
Time glucose given: oral NG IV

HAEMOGLOBIN (Hb) (g/dl): ___ or Packed cell vol (PCV): Blood type: ____

If Hb <5g/dl or PCV < 15% transfuse 10 ml/kg whole fresh blood (or 5-7 ml/kg Packed cells) slowly over 3 hours. Amount: ____ Time, started: ____ Ended: ____

EYE SIGNS None Left Right	**MEASLES** Yes No
Bitot's spots Pus/Inflammation Corneal clouding	Corneal ulceration

If ulceration, give vitamin A & atropine immediately. Record on Dalily Care page.

Oral doses Vitamin A:	< 6 months	50 000 IU
	6 – 12 months	100 000 IU
	> 12 months	200 000 IU

FEEDING Begin feeding with F-75 as soon as possible. (If child is rehydrated, reweigh before detemining amount to feed. New Weight: _____ kg)
Amount for 2-hourly feedings: _____ ml F-75* Time first fed: _____

* If hypoglycaemic, feed % of this amount every half hour for first 2 hours: Continue until blood glucose reaches 3 mmol/l.

Record all feeds on 24-hour Food Intake Chart.

ANTIBIOTICS (All receive) **Drug/Route**

		Dose/Frequency/Duration	**Time of 1st dose**

SIGNS OF SHOCK None Lethargic/unconsious Cold hand Slow capillary refill(>3 seconds) Weak/fast pulse

If lethargic or unconscious, plus cold hand, plus either slow capillary refill or weak/fast pulse, give oxygen. Give **IV** glucose as described under Blood Glucose (left). Then give IV fluids:

Amount IV fluids per hour: 15 ml X _____ kg (child's wt) = _____ ml

	Start:	Monitor every 10 minutes					*** 2nd hr:**	Monitor every 10 minutes				
Time							*					
Resp. rate							*					
Pulse rate							*					

* If respiratory & pulse rates are slower after 1 hour, repeat same amount IV fluids for 2nd hour; then alternate ReSoMal and F-75 for up to 10 hours as in right part of chart below. If no improvement on IV fluids, transfuse whole fresh blood. (See left, Haemoglobin.)

DIARRHOEA Watery diarrhoea? Yes No → if diarrhoea, Skin pinch goes back slowly
Blood in stool? Yes No circle signs Restiess/irritable Lethargic Thirsty
Vomiting? Yes No present: Sunken eyes Dry mouth/tongue No tears

If diarrhoea and/or vomiting, give ReSoMal. Every 30 minutes for first 2 hours, monitor and give: *
5 ml X _____ kg (child's wt) - _____ ml ReSoMal

For up to 10 hours, give ReSoMal and F-75 in alternate hours. Monitor every hour. Amount of ReSoMal to Offer.*
5 to 10 ml X _____ kg (child's wt) = _____ to _____ ml ReSoMal

Time	Start:													
Resp. rate														
Pulse rate														
Passed urine? Y N														
Number stools														
Number Vomits														
Hydration Signs														
Amount taken (ml)						F-75		F-75		F-75		F-75		F-75

*** Stop ReSoMal if:** Increase in pulse & resp. rates Jugular veins engorged Increasing oedema, e.g., puffy eyelids

DAILY CARE

	Week 1							Week 2							Week 3						
DAYS IN HOSPITAL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Date																					
Daily weight (kg)																					
Weight gain (g/kg)	Calculate daily after on F-100																				
Oedema (0) (+) (++) (+++)																					
Diarrhoea/vomit 0 D V																					
FEED PLAN : Type feed																					
# feeds daily																					
Total volume taken (ml)																					
ANTIBIOTICS	List prescribed antibiotics in left column. Allow one row for each daily dose. Draw a box around days/times that each drug should be given. Initial when given																				
FOLIC ACID	5mg	1mg																			
VITAMIN A	*		*Give day 1 routinely unless evidence of dose in past month & no eye sign. Give day 2 &												day14 if Child admitted with eye sign or recent measles						
Multivitamin (if not in feed)																					
Drug for worms																					
IRON	Begin iron after 2 days on F-100																				
2 X daily																					
FOR EYE PROBLEMS:											After 7-10 days, when eye drops are no longer needed, shade boxes for eye drops										
Tetracycline or																					
Chloramphenical																					
1 drop 4 X daily																					
Atropine																					
1 drop																					
3 X daily																					
Dermatosis (0) (+) (++) (+++)																					
Bathing, 1% permanganate																					
OTHER																					

MONITORING RECORD

Monitor respiratory rate, pulse rate, and temperature 4-hourly unil after transition to F-100 and patient is steble, Then monitoring may be less frequent (e.g., twice da)

Respiratory rate

Breaths/ Minute

Pulse rate

Beats/ minute

Temperature

104

103

102

101

100

99

98

97

96

95

94

Date/time

Danger Signs: Watch for increasing pulse and respirations, fast or difficult breathing, sudden increase or decrease in temperature, axillary temperature below 95°F, and other changes in condition. See danger signs listed on back of F-100 Reference Card. Normal ranges of pulse and raspiratory rates are also listed on back of F-100 Reference Card.

WEIGHT CHART

Name:_____

Weight on admission: _____kg

Height/lenght: _____ cm

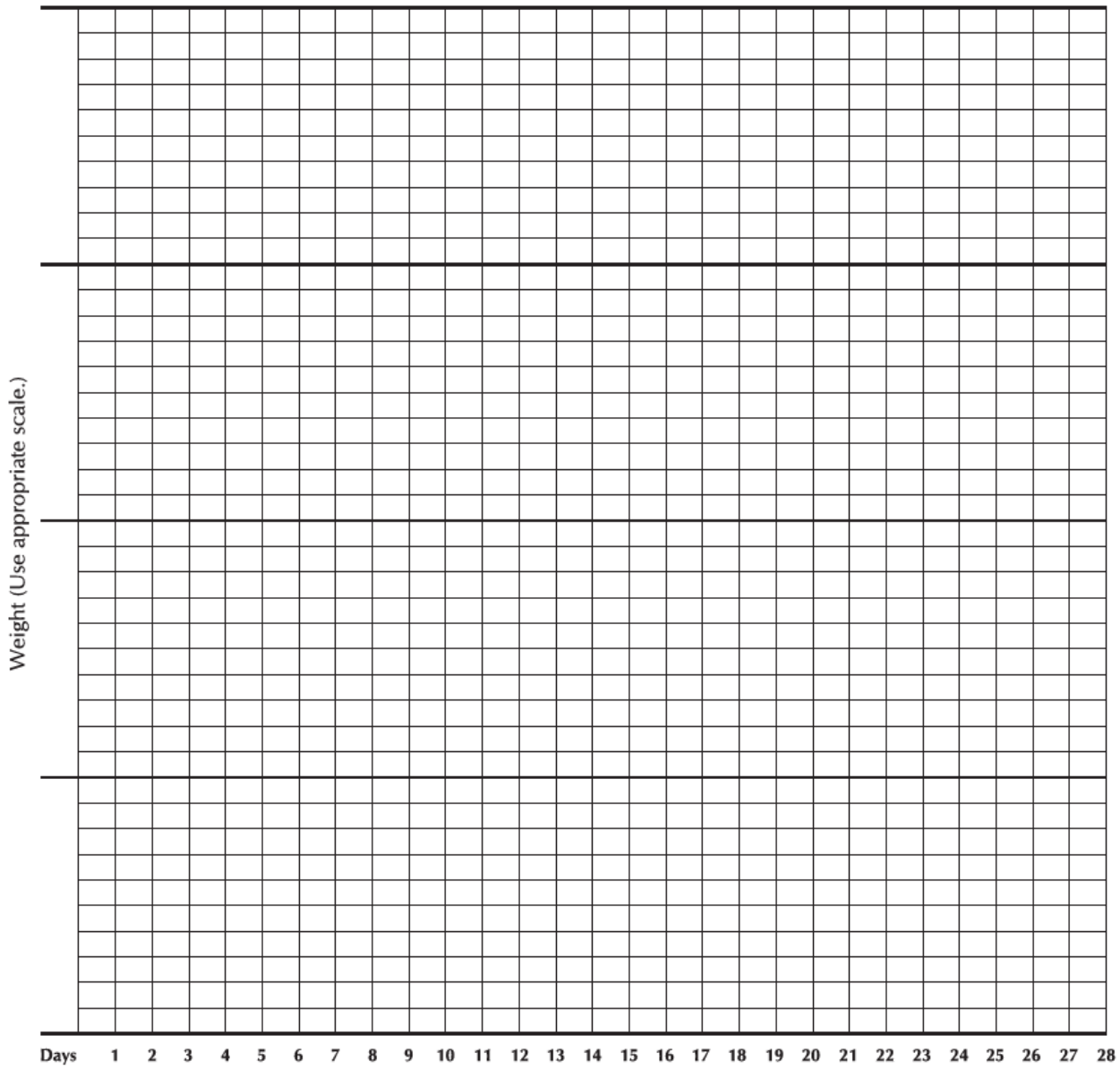
Oedema on admission: 0 + ++ +++

Desired weight at discharge
≥-2 Z-score: _____ kg
15% weight gain: _____ kg

Actual weight at discharge: ____ kg

Enter likely range of weights on the vertical axis in an appropriate scale (e.g., each row representing 0.1 kg). Allow rows below the starting weight in case weight decreases;weight may decrease by as much as 30% if the child has severe oedema.

Draw a bold horizonal line across the graph to show the desired discharge weight.



COMMENTS / OUTCOME

COMMENTS:
TRAINING GIVEN TO PARENTS/CAREGIVERS:

SPECIAL DISCHARGE AND FOLLOW-UP INSTRUCTIONS:

IMMUNIZATIONS Immunization card? Yes No — Circle immunizations already given. Initial and date by any given in hospital

Immunization	First	Second	Third	Forth
BCG	At birth			
Pentavalent	6 Weeks	10 Weeks	14 Weeks	
OPV	6 Weeks	10 Weeks	14 Weeks	With Measles Vaccine
Measles				After completion of 9 months

PATIENT OUTCOME

Circle outcome:	DATE	CIRCUMATANCES/COMMENTS
Oedema free WHZ ≥ -2		
Oedema free 15% increase in body weight from lowest weight		
Early departure (against advice)		Z-score: _____
Early discharge		Z-score: _____
Referral		Z-score: _____
Death		Number of days after admission (circle): <24 hrs 1-3 days 4-7 days >7 days Approximate time of death: Day Night Apparent cause(s): Had child received IV fluids? Yes No

ANNEX B

Antibiotic Reference Card

Antibiotic	Route/dose/ frequency/ duration	Formulation	Dose according to child's weight		
			3.0-5.9 kg	6.0-7.9 kg	8.0-9.9 kg
Amoxicillin[13]	Oral: 15 mg/kg every 8 hours for 5 days	Tablet: 250 mg	1/4 tablet	1/2 tablet	1/2 tablet
		Syrup: 125 mg/5 ml	2.5 ml	5 ml	5 ml
		Syrup: 250 mg/5 ml	1.5 ml	2.5 ml	2.5 ml
Cotrimoxazole (SMX + TMP)	Oral: 25 mg SMX + 5 mg TMP/kg every 12 hours for 5 days	Tablet, 100g SMX + 20 mg TMP	1 tablet	1 1/2 tablet	2 tablet
		Syrup: 100mg SMX + 40 mg TMP per 5 ml	2.5 ml	4 ml	5 ml

Antibiotic	Route/dose/ frequency/ duration	Formulation	Dose according to child's weight (use closest weight)								
			3 kg	4 kg	5 kg	6 kg	7 kg	8 kg	9 kg	10 kg	11 kg	12 kg
Gentamicin[14]	IV or IM: 7.5 mg/kg once daily for 7 days	IV/IM: vial containing 20 mg (2 ml at 10 mg/ml) undiluted	2.25	3.00	3.75	4.50	5.25	6.00	6.75	7.50	8.25	9.00
		IV/IM: vial containing 80 mg (2 ml at 40 mg/ml) mixed with 6 ml sterile water to give 80 mg/8 ml	2.25	3.00	3.75	4.50	5.25	6.00	6.75	7.50	8.25	9.00
		IV/IM: vial containing 80 mg (2 ml at 40 mg/ml) undiluted	0.50	0.75	0.90	1.10	1.30	1.50	1.70	1.90	2.00	2.25

Doses for Iron Syrup for Common Formulation

Weight of child	Dose of Iron Syrup: (Ferrous Fumerate)
3 to 6 kg	0.50 ml
>6 kg to 10 kg	0.75 ml
>10 to 15 kg	1.00 ml

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

MODULE 4

Feeding

FEEDING

Introduction

In managing a child with severe acute malnutrition, feeding must be started cautiously, in frequent, small amounts. If feeding begins too quickly, or if the feeds contain too much protein or sodium, the child's systems may be overwhelmed and the child may die.

Feeding should begin as soon as possible after admission 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. It is low in protein and sodium and high in carbohydrates, which are better handled by the child and provide much-needed glucose.

When the child is stabilized usually after 3
- 7 day, F-100 the "catch-up" formula is used to rebuild wasted tissues. F-100 contains more calories and protein than F-75 with 100 kcal and 2.9 g protein per 100 ml.

Learning Objectives

This module describes and, to the extent feasible, will assist you when observing and/or obtaining clinical practice with the following skills:

1. Preparing F-75 and F-100
2. Planning feeding for a 24-hour period for a child who is:
   a. Taking F-75; or
   b. Adjusting to F-100 during transition; or
   c. Feeding freely[11] on F-100.
3. Measuring and giving feeds to children
4. Recording intake and output
5. Planning feeding for a ward

Additionally, the module will help you learn how to discuss ideas for training staff at your health facility to do feeding-related tasks.

1.0 Prepare F-75 and F-100

The recipes for F-75 and F-100 are shown in next page. The first two F-75 recipes include cereal flour and require cooking.

The last two F-75 recipes can be used if there is no cereal flour or no cooking facilities. However, the recipes with no cereal flour have a high osmolarity and may not be tolerated well by some children with diarrhoea.

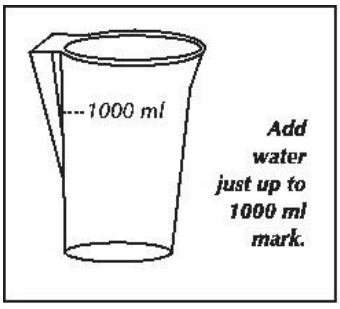
[11]For the purpose of this module, and the training course, the term "FEEDING FREELY" on F-100 is defined as: Frequent feeds (at least 4- hourly) of unlimited amounts of catch-up formula (F-100) during the rehabilitation phase. See, the National Guidelines pages 28-29.

Recipes for F-75 and F-100

If you have cereal flour and cooking facilities, use one of these recipes for F-75 **(for using in > 6 months old children)**			
Alternatives	**Ingredients**	**Amount for F-75**	-
IF YOU HAVE DRIED WHOLE MILK	DRIED WHOLE MILK SUGAR CEREAL FLOUR VEGETABLE OIL ELECTROLYTE MINERAL SOLUTION* Water to make1000 ml	35 G 70 G 35 G 20 G 20 ML 1000 ml**	-
IF YOU HAVE FULL CREAM FRESH COW'S MILK	FULL CREAM FRESH COW'S MILK SUGAR CEREAL FLOUR VEGETABLE OIL ELECTROLYTE MINERAL SOLUTION* Water to make1000 ml	300 ML 70 G 35 G 20 G 20 ML 1000 ml**	-
If you do not have any cooking facilities, use one of the following recipes			
Alternatives	**Ingredients**	**Amount for F-75**	**Amount for F-100**
IF YOU HAVE DRIED WHOLE MILK	DRIED WHOLE MILK SUGAR VEGETABLE OIL ELECTROLYTE MINERAL SOLUTION* Water to make1000 ml	35 G 100 G 20 G 20 ML 1000 ml**	110 G 50 G 30 G 20 ML 1000 ml**
IF YOU HAVE FULL CREAM FRESH COW'S MILK	FULL CREAM FRESH COW'S MILK SUGAR VEGETABLE OIL ELECTROLYTE MINERAL SOLUTION* Water to make1000 ml	300 ML 100 G 20 G 20 ML 1000 ml**	880 ML 75 G 20 G 20 ML 1000 ml**

Contents of electrolyte mineral solution are given in Annex C of this module. Alternatively, Combined Mineral Vitamin Mix (CMV) may be used; see following page.

**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.



Tips for correct preparation (all recipes)

- Wash hands before measuring ingredients.
- If possible, use a dietary scale that is accurate to at least 5 grams. Be sure that the scale is set at zero before weighing. 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.
- 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 thoroughly mix the oil. Otherwise, use a long rotary whisk so that your hands do not dip into the formula while whisking.
- If using 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 litres, use 1/2 scoop to make 1 litre.

Directions for preparing cooked F-75 with cereal flour

You will need a hand whisk a 1-litre measuring jug, a cooking pot, and a stove. The amounts of ingredients are listed on the previous page. Cereal flour may be rice or wheat flour. 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 a hand whisk:

1. Mix the desired amount of flour, milk or milk powder, sugar, oil, and electrolyte mineral solution in a 1-litre measuring jug.
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 preparing non-cooked recipes

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 electrolyte mineral solution and slowly add boiled, cooled water up to 1000 ml, stirring all the time.*

3. Whisk vigorously.

It is recommended to prepare 6-8 hours required amount of F-75 and F-100 for a ward.

*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.

To prepare F-75 and F-100, follow the instructions as mentioned in the supplied commercially available tins/sachets.

2.0 Feed the child with F-75

2.1 Determine frequency of feeds

On the first day, feed the child a small amount of F-75 every 2 hours (12 feeds in 24 hours, including through the night). If the child is hypoglycaemic, give 1/4 of the 2-hourly amount every 30 minutes for the first 2 hours.

Night feeds are extremely important. Many children die from hypoglycaemia due to missed feeds at night. Children must be awakened for these feeds. After the first day, gradually increase the volume per feed so that the child's system is not overwhelmed. 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

Use the F-75 Reference Card to determine the amount of feed appropriate to the child's body weight and the frequency of feeding.

Look at your F- 75 Reference Card now. The front of the card is for severely malnourished children with no oedema, or with mild or moderate oedema. The reverse side is only for children admitted with severe (+++) oedema.

On the front side of the card, 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 to 1.5 g protein/kg/day. This amount is appropriate until the child is stabilized.

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

Reference Card.

If the child is breastfed, encourage to continue breastfeeding but give the prescribed amounts of F-75 to make sure the child's needs are met.

Tips for using the F-75 Reference Card

- Be sure that you use the correct side of the card. Use the front side for most children, including those with mild or moderate oedema. Use the reverse side only if the child is admitted with severe (+++) oedema.

- Note that children's weights listed on the F-75 Reference Card are all in even digits (2.0 kg, 2.2 kg, 2.4 kg, etc.). If a child's weight is between these, use the amount of F-75 given for the immediate lower weight.
- While the child is on F-75, keep using the starting weight to determine feeding amounts even if the child's weight changes. (The weight is not expected to increase on F-75.)

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

SHORT ANSWER EXERCISE

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

Child 1: 6.8 kg, no oedema, 3-hourly feeds

Give ____ ml F-75 per feed

Child 2: 8.5 kg, mild (+) oedema, 2-hourly feeds

Give ____ ml F-75 per feed

Child 3: 5.2 kg, severe (+++) oedema, 2-hourly feeds

Give ____ ml F-75 per feed

Child 4: 7.0 kg, severe (+++) oedema, hypoglycaemia, 1/2-hourly feeds

Give ____ ml F-75 per feed

Child 5: 9.6 kg, moderate (++) oedema, 4-hourly feeds

Give ____ ml F-75 per feed

Check your own answers to this exercise
by comparing them to the answers given at the end of the module.
Annex A

2.3 Record the child's 24 hour feeding plan

Each child's feeding plan should be recorded on a 24-Hour Food Intake Chart. A blank copy of a 24-Hour Food Intake Chart is provided in Annex E of this module.

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

Information about feeding is also recorded on the CCP. On the Daily Care page of the CCP, record the type of feed to be given (F-75 or F-100) and the number of feeds to be given daily.

For example, if the child is on a 2-hourly feeding schedule, record that 12 feeds will be given. At the end of the day, record the total amount taken that day. The CCP will provide a brief summary of feeds, as opposed to the detailed record on the 24-Hour Food Intake Chart.

Example of CCP Excerpt:

DAILY CARE **Week 1** **Week 2**

DAYS IN HOSPITAL	1	2	3	4	5	6	7	8	9
Date	4/6	5/6	6/6						
Daily weight (kg)	4.4	4.2	4.0						
Weight gain (g/kg)	Calculate daily after on F-100								
Oedema (0) (+) (++) (+++)	+	+	0						
Diarrhoea/vomit 0 D V	D	D	0						
FEED PLAN: Type feed	F-75	F-75	F-75						
# feeds daily	12	8	6						
Total volume taken (ml)	570	560	560						
ANTIBIOTICS	List prescribed antibiotics in left column. Allow one row for each								

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). 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. 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 diarrhoea and vomiting

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

If the child vomits during or after a feed, estimate the amount vomited 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 2 hours, offer half that amount (20 ml) every 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, or if the child cannot take enough F-75 by mouth. At each feed, offer the F-75 orally first. Use an NG tube if the child does not take 80% of the feed for 2 or 3 consecutive feeds, i.e., leaves more than 20% of the feed.

NG feeding should be done only by experienced staff. The technique for insertingan NG tube is as follows:

1. Hold the tip of the tube against the child's nose, measure the distance from the nose to the ear lobe, then to the epigastrium. Mark the tube at this point

2. Firmly hold the child by another person. Lubricate The tip of the catheter with water. Pass it directly into one nostril, (Keeping the neck slightly extended) pushing it slowly. It should down pass easily into the stomach without resistance. When the measured distance is reached, fix the tube with tape at the nose.

3. Aspirate a small amount of stomach contents with a syringe to confirm that the tube is in place. If no aspirate is obtained, inject air down the tube and listen over the abdomen with a stethoscope for gurgling sounds. If there is any doubt about the location of the tube, withdraw it and pass it again.

4. When the tube is in place, fix a 20-ml syringe (without the plunger) to the end of the tube, and pour food or fluid into the syringe, allowing it to flow by gravity.

NOTE: The NG tube should be checked every time milk is given. 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 drop in slowly by gravity alone. Always offer the child milk to drink by mouth before giving another NG feed.

Remove the NG tube when the child takes:

1. 80% of the day's amount orally; or

2. Two consecutive feeds fully by mouth.

NOTE: 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 a 24-Hour Food Intake Chart

There is an example of a completed 24-Hour Food Intake Chart on the following page.

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

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

At each feed:
In the left column, record the time that the feed is given. Then record in each column as follows:

1. Record the amount of feed offered.
2. After offering the feed orally, measure and record the amount left in cup.
3. Subtract the amount left from the amount offered to determine the amount taken orally by the child.
4. If necessary, give the rest of the feed by NG tube and record this amount.
5. Estimate and record any amount vomited (and not replaced by more feed).
6. Ask whether the child had watery diarrhoea (any loose stool) since last feed.
If so, record "yes".

At the end of 24 hours:
1. Total the amount of feed taken orally (column c).
2. Total the amount of feed taken by NG tube, if any (column d).
3. Total the estimated amount lost through vomit (column e).
4. Add the totals taken orally and by NG tube. Then subtract any loss from vomiting. The result is the total volume taken over 24 hours. Record this at the bottom of the 24-Hour Food Intake Chart and on the Daily Care page of the CCP.

24-HOUR FOOD INTAKE CHART

Complete one chart for every 24-hour period

Name: Mithu **Hospital ID Number:** 406 **Admission weight (kg):** 3.2 kg **Today's weight (kg):** 3.2 kg

DATE: 4/06/10 **TYPE OF FEED:** F-75 **GIVE:** 12 **Feeds of** 35 **ml**

Time	a. Amount offered (ml)	b. Amount left in cup (ml)	c. Amount taken orally (a-b)	d. Amount taken by NG, if needed (ml)	e. Estimated amount vomited (ml)	f. Watery diarrhoea (if present, yes)
8:00	35	0	35	—		
10:00	35	15	20	—		
12:00	35	15	20	—		
14:00	35	25	10	—	10	
16:00	35	35	0	35		
18:00	35	35	0	35		
20:00	35	30	5	30		
22:00	35	25	10	25		
24:00	35	20	15	20		
2:00	35	10	25	10		
4:00	35	5	30	—		
6:00	35	5	30	—		
		Column totals	c. 200	d. 155	e. 10	Total yes: 0

Total volume taken over 24 hours = amount taken orally (c) + amount taken by NG (d) - total amount vomited (e) = 345 ml

SHORT ANSWER EXERCISE

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

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

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

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

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

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

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

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

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

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

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

11. Should Mithu's NG tube be removed?

Check your own answers to this exercise by comparing them to the answers in the Annex A

2.6 Adjust the child's feeding plan for the next day

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

Criteria for increasing volume/decreasing frequency of feeds

- ✓ If vomiting, lots of diarrhoea, or poor appetite, continue 2-hourly feeds.

- ✓ If little or no vomiting, modest diarrhoea (for example, less than 5 watery stools per day), and finishing most feeds (≥80%, orally), change to 3-hourly feeds.
- ✓ After 1 day on 3-hourly feeds: If no vomiting, less diarrhoea, and finishing most feeds, change to 4-hourly feeds.

2.7 Relactation:

Relactation is the re-establishment of adequate milk production in a mother who has a greatly reduced milk production or has stopped breastfeeding.

How to help mother to relactate?

A well motivated mother willing to breastfeed and a baby with good sucking reflex is all that is needed for relactation.

- Motivate the mother and build her confidence that she can produce milk if she wants.
- Ensure support & encouragement from family & healthcare team.
- Put the baby to the breast frequently for suckling with appropriate positioning and attachment.
- Express milk in between feeds.
- Feed the baby only at the breast, if necessary with a breastfeeding supplementer.
- Reduce supplementation slowly as the milk production increases.

Procedure of relactation using a breastfeeding supplementer:

Breastfeeding supplementer is a fine feeding tube with one end attached to a 50 cc syringe containing expressed breastmilk or infant formula and the other end of the tube taped to the breast near the nipple. The syringe is suspended from the neck of the mother in such a way that it is below the level of the breast and milk flows from it only when the baby sucks the breast and not by gravity. Baby gets the milk from the tube and the breast simultaneously when he sucks the breast. This makes breast feeding rewarding to the baby, increases calorie intake and stimulates milk production because the baby stays longer at the breast.

EXERCISE B

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

Case 1 – Delwar

Delwar was admitted to the malnutrition ward with diarrhoea. He had no oedema. At the first two feeds of the day, Delwar was still being given ReSoMal. After he was rehydrated, he began 2-hourly feeds of F-75 at 12:00 noon. His rehydrated weight was 3.8 kg, so he was given 10 feeds of 40 ml each to finish the day. He took all of his feeds very well, although his diarrhoea continued.

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

24-HOUR FOOD INTAKE CHART

Complete one chart for every 24-hour period

Name: Delwar **Hospital ID Number:** 107 **Admission weight (kg):** 3.8 kg **Today's weight (kg):** Same *rehydrated

DATE: 4/10/10 (Day 1) **TYPE OF FEED:** F-75 **GIVE:** 10 **Feeds of** 40 **ml**

Time	a. Amount offered (ml)	b. Amount left in cup (ml)	c. Amount taken orally (a-b)	d. Amount taken by NG, if needed (ml)	e. Estimated amount vomited (ml)	f. Watery diarrhoea (if present, yes)
--						
--						
12:00	40	0	40			
14:00	40	0	40			
16:00	40	0	40			Yes (small)
18:00	40	0	40			
20:00	40	0	40			
22:00	40	0	40			
24:00	40	0	40			Yes (small)
2:00	40	0	40			
4:00	40	0	40			
6:00	40	0	40			Yes (small)
		Column totals	c. 400ml	d. 0	e. 0	Total yes: 3

Total volume taken over 24 hours = amount taken orally (c) + amount taken by NG (d) - total amount vomited (e) = 400 ml

Case 1 – Delwar, continued

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

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

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

DATE	TYPE OF FEED	GIVE _____ feeds of _____ ml

1d. Starting with the first feed at 8:00 a.m., list the feeding times for Delwar on Day 2:

1e. On Day 2 Delwar took most of every feed for a total of 460 ml during the day. He had two diarrhoea stools and no vomiting. His weight has not changed, and there is still no oedema. Record information from Day 2 on the following excerpt from the Daily Care page of the CCP:

DAILY CARE **Week 1** **Week 2**

DAYS IN HOSPITAL	1	2	3	4	5	6	7	8	9
Date	4/10								
Daily weight (kg)	3.8								
Weight gain (g/kg)	Calculate daily after on F-100								
Oedema (0) (+) (++) (+++)	0								
Diarrhoea/vomit 0 D V	D								
FEED PLAN: Type feed	F-75								
# feeds daily	10								
Total volume taken (ml)	400 ml								
ANTIBIOTICS	List prescribed antibiotics in left column. Allow one row for each								

Case 2 – Firoz

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

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

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

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

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

DATE	TYPE OF FEED	GIVE _____feeds of _____ ml

Case 2 - Firoz, continued

24-HOUR FOOD INTAKE CHART

Complete one chart for every 24-hour period

Name: Firoz **Hospital ID Number:** 236 **Admission weight (kg):** 4.8 kg **Today's weight (kg):** 4.8 kg

DATE: 6/10/10 (Day **TYPE OF FEED:** F-75 **GIVE:** 8 **Feeds of** 80 **ml**

Time	a. Amount offered (ml)	b. Amount left in cup (ml)	c. Amount taken orally (a-b)	d. Amount taken by NG, if needed (ml)	e. Estimated amount vomited (ml)	f. Watery diarrhoea (if present, yes)
8:00	80	10	70			
11:00	80	0	80			yes
14:00	80	0	80			
17:00	80	20	60			
20:00	80	10	70			
23:00	80	10	70			
2:00	80	20	60			
5:00	80	0	80		Half (40 ml)	
		Column totals	c. 570 ml	d. 0	e. 40 ml	Total yes: 1

Total volume taken over 24 hours = amount taken orally (c) + amount taken by NG (d) - total amount vomited (e) = 530 ml

3.0 Feed the child in transition phase

The phase in between the stabilization and rehabilitation phase is defined as transition phase. The duration of treatment in the transition phase is 3 days.

When the child completes the Stabilization Phase, they start treatment in Transition Phase. In the transition phase the medical treatment is continued and the dietary treatment changes; F 100 (the higher calorie, higher protein "catch-up" feed intended to rebuild wasted tissues) therapeutic milk is progressively introduced in place of F-75, However, it is extremely important to make the transition to free feeding on F-100 gradually and monitor carefully. If transition is too rapid, heart failure may occur.

3.1 Recognize readiness for transition phase

- ✓ Look for the following signs of readiness, usually after 3 - 7 days:

Return of appetite (easily finishes 4-hourly feeds of F-75)

- ✓ Reducing/reduced oedema.

The child may also smile at this stage.

3.2 Begin giving F-100 slowly and gradually

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

First 48 hours (2 days):

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

Then, on the 3rd day:

Increase each feed by 10 ml as long as the child is finishing feeds. If the child does not finish a feed, offer the same amount at the next feed; then if the feed is finished, increase by 10 ml. Continue increasing the amount until some food is left after most feeds.

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

Example of feeding schedule during transition

You may remember Delwar from the last exercise. On Day 1 Delwar's rehydrated weight was 3.8 kg, and he started on 40 ml of F-75 every 2 hours. Delwar continued to feed well over the next two days.

On Day 2 he took 3-hourly feeds of 60 ml F-75. On Day 3 he took 4-hourly feeds of 85 ml F-75. He also smiled at his mother and the nurses.

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

Delwar's feeding schedule during transition will be as follows:

Day 4: 85 ml of F-100 every 4 hours (same amount and frequency as he previously took F-75)

Day 5: 85 ml of F-100 every 4 hours (same as Day 4)

Day 6: Continue 4-hourly feeds, increasing amount by 10 ml each time: 95 ml, 105 ml, 115 ml, etc. If Delwar does not finish a feed, give the same amount at the next feed. Continue increasing the amount until some food is left after most feeds.

3.3 Monitor the child carefully during transition phase

Check the child's respiratory and pulse rate every 4 hours. If F-100 is introduced carefully and gradually, problems are unlikely; however, increasing respiratory rate and pulse rate may signal heart failure. (More information on danger signs and monitoring is given in the module Daily Care.)

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

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

Enter the feeding plan for the next day on a new 24-Hour Food Intake Chart. On the third day, when feeds should increase by 10 ml (as long as the child is taking all that is offered), mark an arrow by the starting amount per feed. For example, 95ml↑:

DATE	TYPE OF FEED	GIVE _____feeds of _____ ml

EXERCISE C

Case 1 – Delwar

The following CCP excerpt summarizes Delwar's progress through the first two days of transition (Days 4 and 5). On Day 4 and Day 5 he took all of every feed of 85 ml F-100. The column for Day 6 shows what the nurse wrote on the CCP in the morning of Delwar's third day of transition.

DAILY CARE **Week 1** **Week 2**

DAYS IN HOSPITAL	1	2	3	4	5	6	7	8	9
Date	4/10	5/10	6/10	7/10	8/10	9/10			
Daily weight (kg)	3.8	3.8	3.8	3.85	3.9	4.0			
Weight gain (g/kg)	Calculate daily after on F-100				13*	25*			
Oedema (0) (+) (++) (+++)	0	0	0	0	0	0			
Diarrhoea/vomit 0 D V	D	D	0	0	0	0			
FEED PLAN: Type feed	F-75	F-75	F-75	F-100	F-100	F-100			
# feeds daily	10	8	6	6	6	6			
Total volume taken (ml)	400	460	510	510	510				
ANTIBIOTICS	List prescribed antibiotics in left column. Allow one row for each								

**These figures show Delwar 's weight gain in grams per kilogram body weight. You will learn how to calculate and interpret this gain later, in the module titled "Monitoring and Problem Solving."*

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

24-HOUR FOOD INTAKE CHART

Complete one chart for every 24-hour period

Name: Delwar **Hospital ID Number:** 107 **Admission weight (kg):** 3.8 kg **Today's weight (kg):** 4.0 kg

DATE: 9/10/10 (Day 6) **TYPE OF FEED:** F-100 **GIVE:** 6 **Feeds of** 95↑ **ml**

Time	a. Amount offered (ml)	b. Amount left in cup (ml)	c. Amount taken orally (a-b)	d. Amount taken by NG, if needed (ml)	e. Estimated amount vomited (ml)	f. Watery diarrhoea (if present, yes)
8:00	95	0	95			
12:00	105	10	95			
16:00	105	0	105			
20:00	115	10	105			
24:00	115	0	115			
4:00						
		Column totals	c.	d.	e.	Total yes:

Total volume taken over 24 hours = amount taken orally (c) + amount taken by NG (d) - total amount vomited (e) = _____ ml

Case 1 – Delwar, continued

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

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

1c. Complete the rest of the column for Day 6 on the excerpt of Delwar's CCP on page 125.

Case 2 – Rozina

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

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

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

2a. Is Rozina ready for transition? Why or why not?

2b. Enter instructions for Rozina's feeding plan for Day 7 on the following excerpt from the 24-Hour Food Intake Chart:

DATE	TYPE OF FEED	GIVE _____ feeds of _____ ml

2c. Rozina takes her feeds on Day 7 well and shows no danger signs. Enter instructions for Rozina's feeding plan for Day 8:

DATE	TYPE OF FEED	GIVE _____ feeds of _____ ml

2d. Rozina takes her feeds on Day 8 well and shows no danger signs. Enter instructions for Rozina's feeding plan for Day 9:

DATE	TYPE OF FEED	GIVE _____ feeds of _____ ml

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

4.0 Feed freely with F-100

Transition takes 3 days. After transition, the child is in the "rehabilitation" phase and can feed freely on F-100 to an upper limit of 220 kcal/kg/day. (This is equal to 220 ml of F-100 per kg/day.) Most children will consume at least 150 kcal/kg/day during rehabilitation; any amount less than this indicates that the child is not being fed freely or is unwell. You have an F-100 Reference Card that shows the 150 –220 kcal/kg/day range of intakes suitable for children of different weights up to 10 kg. A copy of this F-100 Reference Card is in Annex D.

4.1 Encourage the child to eat freely at each feed

During the rehabilitation phase, encourage the child to eat as much as s/he wants at each feed, within the range shown on the F-100 Reference Card. Continue to feed every 4 hours within this range.

If the child's weight is between the weights given on the F-100 Reference Card, use the range for the immediate lower weight.

If you need to calculate the acceptable range yourself (for example, if the child weighs more than 10 kg), multiply the child's weight by 150 ml (minimum) and 220 ml (maximum); then divide each result by 6 (for 6 feeds per day).

An easier method may be to add together the feed volumes for an appropriate combination of children's weights from the card. For example, if a child weighs 13.2 kg, add the volumes shown for a 10.0 kg child plus a 3.2 kg child.

Examples

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

Lili weighs 4.5 kg. Using the range for the immediate lower weight, 4.4 kg, Lili feeds may be in the range of 110-160 ml.

Dalia weighs 12 kg. Calculate the acceptable range of volumes of F-100 for her as follows:

Minimum:	12 kg x 150 ml = 1800 ml per day
	1800 ml ÷ 6 = 300 ml per feed
Maximum:	12 kg x 220 ml = 2640 ml per day
	2640 ml ÷ 6 = 440 ml per feed

4.2 Record intake/output; determine if intake is acceptable

Record each feed on the 24-Hour Food Intake Chart. To determine if daily intake is acceptable, compare the volume taken to the range given on the table "F-100 Reference Card". 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 diarrhoea but is still gaining weight, there is no need for concern, and no change is needed in the diet.

4.3 Adjust feeding plan as necessary

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

- Use the child's current weight to determine the appropriate range of F-100 each day.

- Choose a starting amount within the range. Base the starting amount on the amount taken in feeds during the previous day. If the child finished most feeds, offer a bit more. If 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.

EXERCISE D

Case 1 – Delwar

You may remember that Delwar began transition on Day 4. On Days 4 and 5 he was given 95 ml F-100 per feed. On Day 6 he increased to 125 ml by the last feed of the day. On Day 7 Delwar began free feeding on F-100. Delwar's 24-Hour Food Intake Chart for Day 7 is on the following page.

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

1b. On Day 8 Delwar's weight is 4.2 kg. What is the range of volumes of F-100 that is appropriate for Delwar for each 4-hourly feed?

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

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

1e. On Day 8 Delwar reached the maximum volume per feed and still wanted more. The nurse gave him no more than the maximum allowed. On Day 9 Delwar's weight is up to 4.4 kg. What should be the starting amount of F100 on Day 9? Should this amount be increased during the day?

24-HOUR FOOD INTAKE CHART

Complete one chart for every 24-hour period

Name: Delwar Hospital ID Number: 107 Admission weight (kg): 3.8 Today's weight (kg): 4.1

DATE: 10/10/10 Day 7 TYPE OF FEED: F-100 GIVE: 6 Feeds of 125↑ ml Do not exceed 155 ml

Time	a. Amount offered (ml)	b. Amount left in cup (ml)	c. Amount taken orally (a-b)	d. Amount taken by NG, if needed (ml)	e. Estimated amount vomited (ml)	f. Watery diarrhoea (if present, yes)
8:00	125	10	115			
12:00	125	0	125			
16:00	135	10	125			
20:00	135	10	125			
24:00	135	15	120			
4:00	135	5	130			
		Column totals	c. 740 ml	d. 0	e. 0	Total yes: 0

Total volume taken over 24 hours = amount taken orally (c) + amount taken by NG (d) - total amount vomited (e) = 740 ml

Case 2 – Rozina

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

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

2a. What was the total volume of F-100 taken by Rozina over 24 hours on Day 10?

2b. What is the appropriate daily range of volumes for Rozina's weight? Was the amount taken within the appropriate range?

2c. Looking back at Rozina's Monitoring Record for Day 10, the head nurse noticed that Rozina's temperature had increased just before the 16:00 feed.

What does this suggest about the cause of Rozina' s eating less?

2d. Which of the following should the head nurse do? (Tick)

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

____ Plan feeding for Day 11 to start at 145 ml F-100 again

____ Both of the above

Case 3 - Rozina, continued

24-HOUR FOOD INTAKE CHART

Complete one chart for every 24-hour period

Name: Rozina **Hospital ID Number:** 453 **Admission weight (kg):** 6.4 kg **Today's weight (kg):** 5.2 kg

DATE: 15/02/10 Day 10 **TYPE OF FEED:** F-100 **GIVE:** 6 **Feeds of** 145 ↑ **ml** Do not exceed 190 ml

Time	a. Amount offered (ml)	b. Amount left in cup (ml)	c. Amount taken orally (a-b)	d. Amount taken by NG, if needed (ml)	e. Estimated amount vomited (ml)	f. Watery diarrhoea (if present, yes)
8:00	145	10	135			
12:00	145	45	100			
16:00	145	50	95			
20:00	145	60	85			
24:00	145	70	75			
4:00	145	65	80			
		Column totals	c.	d.	e.	Total yes:

Total volume taken over 24 hours = amount taken orally (c) + amount taken by NG (d) - total amount vomited (e) = _____ ml

5.0 Plan feeding for the malnutrition ward

5.1 Prepare a Daily Ward Feed Chart to use in planning feeds

An example of a Daily Ward Feeding Chart is on the page-153. To prepare a Daily Ward Feed Chart:

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

✓ the number of feeds planned for the child for the day
✓ the amount of F-75 or F-100 needed per feed. (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.)

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

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

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

6. Round up the amount needed to the nearest litre (since the feeds are prepared in litre batches).

7. 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.

5.2 Plan staff assignments related to feeding children

The major tasks involved in feeding are:

- Preparing electrolyte mineral solution (done by pharmacy)
- Preparing F-75, F-100, and ReSoMal
- Measuring out feeds in amounts prescribed for each child
- Feeding children
- Recording feeds (and vomiting and diarrhoea) on intake chart
- Planning feeding schedule for an individual child for the next day
- Preparing the Daily Ward Feeding 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.

5.3 Prepare staff to do assigned feeding tasks

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

ANNEX A

Answers, page 106

Child 1: 110 ml F-75

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

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

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

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

Answers, page 111

1. Mithu's feeding day began at 8:00 a.m. and ended at 6:00 a.m. on the next morning.
2. 12 times
3. Mithu was offered 35 ml each time.
4. No, 20 ml is only about 60% of 35 ml.
5. No
6. He refused most of the feed and vomited the small amount that he took.
7. He was fed by NG tube. The staff realized that he had not taken enough by mouth for 3 successive feeds. (Note: They could have started the NG after 2 poor feeds.)
8. He was fed as much as he would take orally; then he was given the rest by NG tube.
9. Yes, he took about 85%.
10. 345 ml (200 ml taken orally + 155 ml taken by NG – 10 ml vomited)
11. No, the NG tube should not be removed. Although he took almost all of the last two feeds by mouth, he is still leaving a little bit. When he takes two consecutive feeds completely by mouth, the tube should be removed.

ANNEX B

F-75 Reference Card-Feed volumes children without severe oedema

Weight of child (KG)	Volume of F-75 per feed (ml)[a]			Daily total (130 ml/kg)	80% of daily total [a] (minimum)
	Every 2 hours [b]	Every 3 hours [c]	Every 4 hours (6 feeds)		
2.0	20	30	45	260	210
2.2	25	35	50	286	230
2.4	25	40	55	312	250
2.6	30	45	55	338	265
2.8	30	45	60	364	290
3.0	35	50	65	390	310
3.2	35	55	70	416	335
3.4	35	55	75	442	355
3.6	40	60	80	468	375
3.8	40	60	85	494	395
4.0	45	65	90	520	415
4.2	45	70	90	546	435
4.4	50	70	95	572	460
4.6	50	75	100	598	480
4.8	55	80	105	624	500
5.0	55	80	110	650	520
5.2	55	85	115	676	540
5.4	60	90	120	702	560
5.6	60	90	125	728	580
5.8	65	95	130	754	605
6.0	65	100	130	780	625
6.2	70	100	135	806	645
6.4	70	105	140	832	665
6.6	75	110	145	858	685
6.8	75	110	150	884	705
7.0	75	115	155	910	730
7.2	80	120	160	936	750
7.4	80	120	160	962	770
7.6	85	125	165	988	790
7.8	85	130	170	1014	810
8.0	90	130	175	1040	830
8.2	90	135	180	1066	855
8.4	90	140	185	1092	875
8.6	95	140	190	1118	895
8.8	95	145	195	1144	915
9.0	100	145	200	1170	935
9.2	100	150	200	1196	960
9.4	105	155	205	1222	980
9.6	105	155	210	1248	1000
9.8	110	160	215	1274	1020
10.0	110	160	220	1300	1040

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

[b] Feed 2-hourly for ≥ 1 day. Then, when little or no vomiting, modest diarrhoea (<5 watery stools per day), and finishing most feeds, change to 3-hourly feeds.

[c] After on 3-hourly feeds for ≥ 1 day; if no vomiting, less diarrhoea, and finishing most feeds, change to 4-hourly feeds.

Note:

- Columns 2,3, and 4 are approximately 11 ml/kg/feed, 16 ml/kg/feed and 22 ml/kg, feed respectively.
- Switch to NG feeding if intakes fall below 80% of expected daily total.

ANNEX C

F-75 Reference Card-Feed volumes children with severe oedema

Weight of child (KG)	Volume of F-75 per feed (ml)[a]			Daily total (100 ml/kg)	80% of daily total [a] (minimum)
	Every 2 hours [b]	Every 3 hours [c]	Every 4 hours (6 feeds)		
3.0	25	40	50	300	240
3.2	25	40	55	320	255
3.4	30	45	60	340	270
3.6	30	45	60	360	290
3.8	30	50	65	380	305
4.0	35	50	65	400	320
4.2	35	55	70	420	335
4.4	35	55	75	440	350
4.6	40	60	75	460	370
4.8	40	60	80	480	385
5.0	40	65	85	500	400
5.2	45	65	85	520	415
5.4	45	70	90	540	430
5.6	45	70	95	560	450
5.8	50	75	95	580	465
6.0	50	75	100	600	480
6.2	50	80	105	620	495
6.4	55	80	105	640	510
6.6	55	85	110	660	530
6.8	55	85	115	680	545
7.0	60	90	115	700	560
7.2	60	90	120	720	575
7.4	60	95	125	740	590
7.6	65	95	125	760	610
7.8	65	100	130	780	625
8.0	65	100	135	800	640
8.2	70	105	135	820	655
8.4	70	105	140	840	670
8.6	70	110	145	860	690
8.8	75	110	145	880	705
9.0	75	115	150	900	720
9.2	75	115	155	920	735
9.4	80	120	155	940	750
9.6	80	120	160	960	770
9.8	80	125	165	980	785
10.0	85	125	165	1000	800
10.2	85	130	170	1020	815
10.4	85	130	175	1040	830
10.6	90	135	175	1060	850
10.8	90	135	180	1080	865
11.0	90	140	185	1100	880
11.2	95	140	185	1120	595
11.4	95	145	190	1140	910
11.6	95	145	195	1160	930
11.8	100	150	195	1180	945
12.0	100	150	200	1200	960

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

[b] Feed 2-hourly for ≥ 1 day. Then, when little or no vomiting, modest diarrhoea (<5 watery stools per day), and finishing most feeds, change to 3-hourly feeds.

[c] After on 3-hourly feeds for ≥ 1 day; if no vomiting, less diarrhoea, and finishing most feeds, change to 4-hourly feeds.

ANNEX D

F-100 Reference Card-Range of Volumes for free feeding with F-100

Weight of child kg	Range of volumes per 4 hourly of F-100 (6 feeds daily)		Range of daily volumes of F-100	
	Minimum (ml)	Maximum (ml)	Minimum (150/ml/kg/day)	Maximum (220 ml/kg/day)
2.0	50	75	300	440
2.2	55	80	330	484
2.4	60	90	360	528
2.6	65	95	390	572
2.8	70	105	420	616
3.0	75	110	450	660
3.2	80	115	480	704
3.4	85	125	510	748
3.6	90	130	540	792
3.8	95	140	570	836
4.0	100	145	600	880
4.2	105	155	630	924
4.4	110	160	660	968
4.6	115	170	690	1012
4.8	120	175	720	1056
5.0	125	185	750	1100
5.2	130	190	780	1144
5.4	135	200	810	1188
5.6	140	205	840	1232
5.8	145	215	870	1276
6.0	150	220	900	1320
6.2	155	230	930	1364
6.4	160	235	960	1408
6.6	165	240	990	1452
6.8	170	250	1020	1496
7.0	175	255	1050	1540
7.2	180	265	1080	1588
7.4	185	270	1110	1628
7.6	190	280	1140	1672
7.8	195	285	1170	1716
8.0	200	295	1200	1760
8.2	205	300	1230	1804
8.4	210	310	1260	1848
8.6	215	315	1290	1892
8.8	220	325	1320	1936
9.0	225	330	1350	1980
9.2	230	335	1380	2024
9.4	235	345	1410	2068
9.6	240	350	1440	2112
9.8	245	360	1470	2156
10.0	250	365	1500	2200

ANNEX E

DAILY WARD FEEDING CHART

DATE:_____ WARD:_____

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

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

MODULE 5

Daily Care

DAILY CARE

Introduction

Attentive and consistent daily care will make the difference in a severe acute malnourished child's recovery. The routine of daily care in a severe acute 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 also through the night, the staff must have patience and caring with both the children and their parents.

Feeding tasks were described in the Feeding module. Weighing and measuring tasks were described in the module Principles of Care. This module will describe other aspects of daily care. You will practice skills related to daily care during ward visits. Written practice in the module will focus on completing and interpreting the Daily Care page, Monitoring Record, and Weight Chart of the Critical Care Pathway (CCP).

Learning Objectives

At the end of this module and related clinical sessions, the participants should be able to have the following skills:

1. Handling a severely malnourished child appropriately
2. Caring for the skin and bathing a severely malnourished child
3. Giving prescribed antibiotics and other medications and supplements
4. Caring for the eyes
5. Monitoring pulse, respirations, and temperature and watching for danger signs
6. Completing and interpreting the Feeding section in the *Daily Care* page and *Monitoring Record*
7. Preparing and maintaining a weight chart (graph)
8. Ensure sensory stimulation and emotional support

1.0 Handle the child gently

Severely malnourished children must be handled very gently, especially at the beginning of their care. The severely malnourished child's body is fragile and bruises easily. The child needs all his energy to recover, so s/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.
Health care staff 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 themodule *Involving Mothers/caregivers.*.

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

Check your own answers to this exercise by comparing them to those given in page 193

Example of Daily Care Page of CCP

The next page shows an example of a completed Daily Care page of the CCP. When daily care tasks are performed, nursing staff should record their initials on this page

DAILY CARE Priyanka

	Week 1						Week 2							Week 3							
DAYS IN HOSPITAL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Date	8/1	9/1	10/1	11/1	12/1	13/1	14/1	15/1	16/1												
Daily weight (kg)	8.8	8.8	8.75	8.8	8.85	8.85	8.9	8.95	9.0												
Weight gain (g/kg)	Calculate daily after on F-100				////	////	5.6	5.6	5.6												
Oedema (0) (+) (++) (+++)	0	0	0	0	0	0	0	0	0												
Diarrhoea/vomit 0 D V	D	D	D	0	0	0	0	0	0												
FEED PLAN : Type feed	F-75	F-75	F-75	F-75	F-75	F-100	F-100	F-100	F-100												
# feeds daily	12	12	8	6	6	6	6	6	6												
Total volume taken (ml)	910	1140	1130	1120	1170	1170	1170	1220	1280												
ANTIBIOTICS	List prescribed antibiotics in left column. Allow one row for each daily dose. Draw a box around days/times that each drug should be given. Initial when given																				
Amoxicillin 8:00	AL	AL	AL	AL	AL																
(250 mg) 14:00	BP	BP	BP	BP	BP																
5ml syrup																					
FOLIC ACID 8:00	AL	AL	AL	AL	AL	MP	MP	AL	AL												
VITAMIN A 200000 IU	AL	AL	*Give day 1 routinely unless evidence of dose in past month & no eye sign. Give day 2 &												day14 if Child admitted with eye sign or recent measles						
Multivitamin (if not in feed)	AL	AL	AL	AL	AL	MP	MP	AL	AL												
Drug for worms NONE																					
IRON 0.75 ml 8:00	Begin iron after 2 days on F-100					////	////	AL	AL												
2 X daily 20:00								BP	BP												
FOR EYE PROBLEMS: 8:00	AL	AL	AL	AL	AL	MP	MP				After 7-10 days, when eye drops are no longer needed, shade boxes for eye drops										
Tetracycline or 14:00	HP	HP	HP	HP	HP	CN	CN														
Chloramphenical 20:00	BP	BP	BP	BP	BP	RS	RS														
1 drop 4 X daily left eye 2:00	BP	BP	BP	BP	BP	RS	RS														
Atropine 1 drop 3 X daily NONE	//	//	//	//	//	//	//														
Dermatosis (0) (+) (++) (+++)	+++	+++	+++	+++	++	++	+	+	0												
Bathing (1% permanganate)	VR	VR	VR	VR	VR	NR	NR	VR	VR												
OTHER																					

2.0 Caring for skin and bathing 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 colour 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. Put your initials on the Daily Care page of the CCP when the bath is done. Circle "1% permanganate" if it is used. (See example on the previous page.)

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.

If potassium permanganate solution is not available, affected areas may be dabbed with gentian violet.

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 colonised with candida, use nystatin ointment or cream after bathing. (Candidiasis is also treated with oral nystatin as described on page 33 in the national guideline.)

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.

How to prepare 1% potassium permanganate: *Add 1 gm potassium permanganate in 100 ml water.*

3.0 Give prescribed antibiotics and other medications and supplements

It is efficient to give antibiotics and other medications using a nursing trolley that is wheeled around the ward regularly. As the nurse passes each bed, he or she checks the CCP and gives the child any medication needed at that time. In addition, she may monitor respirations, pulse, and temperature; give eye drops, etc.

3.0 Give antibiotics as prescribed

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

When antibiotics are prescribed, list them on the Daily Care page of the CCP. Also list the time that each dose should be given, allowing one row per dose. Draw a box around the days and times that the antibiotic should be given. If the prescription changes, be sure to update the Daily Care page of the CCP. Whenever a dose is given, initial on the Daily Care page.

Look at the example of the Daily Care page on the previous page 161. Notice how the Antibiotics section is set up and completed.

It is assumed that nursing staff know how to measure and administer oral doses. However, giving antibiotics by IM injection may be difficult in a severely malnourished child and requires special care and attention.

Possible sites for IM injections are the upper and outer quadrant of 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.
- Take care during intravenous channels/intramuscular injections

3.1 Give folic acid

Folic acid is a vitamin of the B complex that is important for treating and preventing anaemia and repairing the damaged gut. Each child should be given a large dose (5mg) on Day 1 and a smaller dose (1.25 mg) on subsequent days for at least 2 weeks.

Write your initial on the Daily Care page of the CCP when folic acid is given.

At least one-week's supply of folic acid should be sent home with the child at discharge. When the child returns for follow-up, more can be given.

3.2 Give vitamin A

Severe acute malnourished children are at high risk of morbidity and mortality due to vitamin

A deficiency. Thus, vitamin A should be given to all severely malnourished children on Day 1, unless there is definite evidence that a dose has been given in the last month and the child has no signs of eye change of vit A deficiency or measles.

Additional doses are given if:

- The child has visible clinical signs of vitamin A deficiency (Bitot' s spots, corneal clouding, or corneal ulceration);
- The child has signs of eye infection (pus, inflammation); or
- The child has measles now or has had measles in the past 3 months.
- The additional doses are given on Day 2 and at least 2 weeks later, preferably on Day 14.

Timing and oral dosages of vitamin A:

<table>
<tr><th></th><th>Timing</th><th>Age</th><th>Dosage</th></tr>
<tr><td rowspan="2">All children*</td><td>Day 1</td><td>6-12 months</td><td>100,000 IU</td></tr>
<tr><td>Day 2</td><td>>12 months</td><td>200,000 IU</td></tr>
<tr><td rowspan="2">Only children with
eye signs or recent measles</td><td rowspan="2">Day 14</td><td colspan="2">Same age-specific dose</td></tr>
<tr><td colspan="2">Same age-specific dose</td></tr>
</table>

**Unless definite evidence of a dose in the last month.*

Oral treatment with vitamin A is standard.

For oral administration an oil-based formulation is preferred.

Enter the dose in the first column of the Daily Care page, and initial when vitamin A is given.

Sometimes the first dose is given immediately when the child arrives at the hospital for emergency treatment of corneal ulceration. If so, be sure that this dose is entered on the Daily Care page, so that a duplicate dose is not given on Day 1.

On the CCP shade the boxes for Day 2 and Day 14 vitamin A if these doses are not needed (i.e., the child has no eye signs and no recent measles).

SHORT ANSWER EXERCISE

1. Look again at the example of the Daily Care page for Priyanka (page 161). Priyanka is 2 years old and was admitted with some pus in her left eye. Should she be given a dose of vitamin A on Day 14? If yes, what is the dose?

2. Another severely malnourished child, Niaz, is admitted with no signs of vitamin A deficiency or eye infection. Niaz is 12 months old and has never had measles. He has no record of previous doses of vitamin A. On what day(s) should Niaz be given vitamin A? What is the dose?

3. Joy is 3 years old and has severe oedema. He has Bitot's spots, and there is no evidence that he has had a dose of vitamin A in the past month. What is the Joy's first dose of vitamin A?

When should Joy's next dose be given? What is the dose?

4. Dalia (age 20 months) was referred from a health centre where she was given 200 000 IU vitamin A yesterday. 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 14?

Check your own answers to this exercise by comparing them to those given *in page 193*

3.4 Give a multivitamin

If electrolyte-mineral solution is used in preparing feeds, then it is needed to include appropriate vitamins. Give multivitamin drops daily (excluding iron).

Write your initial on the Daily Care page of the CCP when the multivitamin drops are given.

3.5 If the child has worms, give appropriate treatment

Worms are common in older children who play outside, and they can be a problem in severely malnourished children. They can cause anaemia.

Ask the mother if the child passes worms. If so, give an appropriate drug for worms. See page 33 of the national guidelines for appropriate drugs and dosages Treatment is usually delayed until the rehabilitation phase (after 2 days on F-100). However, treatment may be started earlier if necessary (e.g., very severe infection with worms).

If the child has worms, record on the Daily Care page the drug(s) given. Initial when drugs for worms are given. If no worms are reported, write “none” or shade out the spaces for these drugs.

3.6 After two days on F-100, give iron daily

Even if the child is anaemic, he should not be given iron until he is recovering and has been two days on F-100 (i.e., after two days of transition). If given earlier, iron can have toxic effects and reduce resistance to infection.

Calculate and administer the amount needed: Give 3 mg elemental Fe/kg/day in 2 divided doses.

Always give iron orally, never by injection. Preferably give iron between meals using a liquid preparation.

Write the dose for the specific child on the Daily Care page of the CCP in the left column. Initial twice each day when the dose is given. Continue giving iron throughout the hospital stay.

Iron syrup may come in different formulations that affect how much to measure for each dose.

The following table shows a common formulation and how much to measure for each of two daily doses so that the child receives approximately 3 mg elemental Fe/kg/day.

Doses of Iron Syrup for a Common Formulation

Weight of Child	Dose of Iron syrup: Ferrous Fumarate 100 mg per 5 ml (20 mg elemental iron per ml)
3 up to 6 kg	0.50 ml
6 up to 10 kg	0.75 ml
10 up to 15 kg	1.00 ml

Note that the amounts in the above dosages are very small (less than 1/4 teaspoon) and will need to be measured with a syringe.

4.0 Care for the eyes

Chloramphenicol 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 antibiotic and atropine eye drops may be needed.

Here is summary of the eye drops needed for the eye signs discussed in this course:

If 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/ointment
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: 1 drop, 2-3 hourly daily
- Atropine (1%): 1 drop, 3 times daily

If both types of drops are needed, they may be given at the same time for convenience. For example, give Chloramphenicol eye drops/ointment 2-3 hourly daily, and give atropine 8 hourly. Continue drops for at least 7 -10 days and until all eye signs are gone.

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.

The affected eye(s) should also be bandaged for 3 - 5 days until inflammation and irritation subside. Use eye pads soaked in normal saline (0.9% NaCl), held in place with gauze bandages. The damp pads and bandages will cool the soreness, prevent the child's scratching his eyes, and promote healing. Change pads and bandages whenever drops are given, give Chloramphenicol eye ointment at night.

- To bandage the eyes:
- Wash hands with soap
- Soak eye pads with normal saline (0.9% NaCl).
- Place a pad over each affected eye.
- Wrap a gauze bandage over the pads and around the head (not too tight, just tightly enough to hold in place).

Some severely malnourished children sleep with their eyes open. Nurses should gently close the child's eyes while sleeping to prevent abrasion.

Write your initial on the Daily Care page when eye drops are given. Separate eye drops for each child should labeled with child's name to ensure each child receives his/her eye drops. Shade out the boxes when the eye drops are no longer needed.

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 in the page 169. For each child pictured or described, determine how many doses of vitamin A are needed and what kind of eye drops are needed.

Photo 1 – It was necessary to clean and open this child's eyes to examine them. Pus and inflammation were the only eye signs found. The child has not had a dose of vitamin A in the last month.

1. On what days should this child receive vitamin A?

2. What eye drops should be given, if any?

Photo 2 - This child has corneal clouding. He has not had a dose of vitamin A in the last month.

3. On what days should this child receive vitamin A?

4. What eye drops should be given, if any?

Photo 3 - This child has a Bitot's spot and inflammation. He has not had a dose of vitamin A in the last month.

5. On what days should this child receive vitamin A?

6. What eye drops should be given, if any?

(No photo) A severely malnourished child (age 2 years) has measles. He has some inflammation in both eyes but no other eye signs. He was referred from a health centre, where he received a dose of vitamin A yesterday.

7. On what days should this child receive vitamin A?

8. What kind of eye drops should be given, if any?

(No photo) A severely malnourished child has clear eyes. The child is 20 months old and had measles two months ago. There is no evidence that he had a dose of vitamin A in the past month.

9. On what days should this child receive vitamin A?

10. What eye drops should be given, if any?

(No photo) A severely malnourished child (age 11 months) has clear eyes with no signs of eye problems. She has never had measles. She has not had a dose of vitamin A in the past month.

11. On what days should this child receive vitamin A?

12. What eye drops should be given, if any?

Photo 4 - This child has corneal ulceration. He has not had a dose of vitamin A in the past month.

13. On what days should this child receive vitamin A?

14. What eye drops should be given, if any?

Photo 1

Photo 2

Photo 3

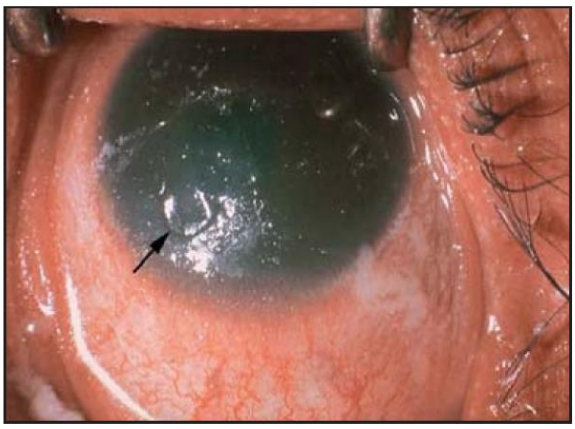


Photo 4

5.0 Monitor pulse, respirations, and temperature, and watch for danger signs

Measure pulse, count respirations and take temperature every 4 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 over-hydration 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 four hours) during initial treatment and during transition to free feeding on F-100. After the child is stable and feeding freely on F-100, 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 four hours.

Record results of monitoring on the Monitoring Record, which is the third page of the CCP. There is space on the Monitoring Record to record 6 readings per day on pulse, respirations, and temperature for a number of days. It is convenient to keep the pages of a CCP in order on a clipboard. When the first Monitoring Record is full, simply add another one to the stack.

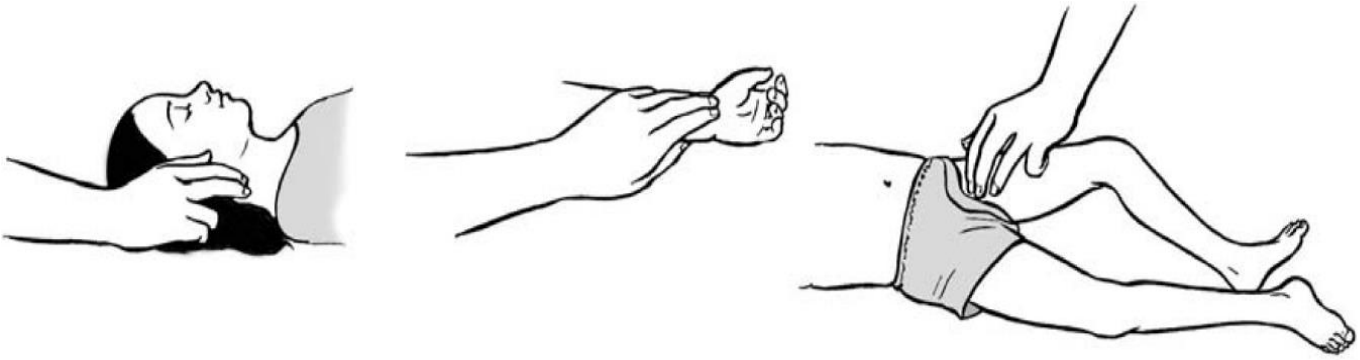
Example of Monitoring Record of the CCP

Page 176 shows an example of a completed Monitoring Record of the CCP.

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.

5.1 Count pulse rate

Find the child's pulse in one of the following places:



Count pulses (beats) per minute, or count pulses per 30 seconds and multiply by 2. Record pulses (beats) per minute on the Monitoring Record in the CCP.

5.2 Count respiratory rate

Watch the child's chest while the child is quiet. Count breaths per minute. Count for a full minute, as breathing may be irregular.

Look for breathing movement anywhere on the child's chest or abdomen. Usually you can see breathing movement even when a child is dressed. If you cannot see the movement easily, ask the mother to lift the child's shirt.

If the child starts to cry, ask the mother to calm the child before you start counting.

Record breaths per minute on the Monitoring Record of the CCP.

5.3 Take temperature

Record the temperature as discussed in the module *Initial Management*.

A graph is used for recording temperature on the Monitoring Record so that increases and decreases can easily be seen. Along the bottom of the graph, enter the times at which monitoring will be done (at 4-hour intervals). When a temperature is taken, write an X or large dot on the line above the time and across from the temperature. You may connect the points with a line.

5.4 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, confirm in 30 minutes.*
- If respiratory rate increases by 5 or more breaths per minute, 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 danger signs. Together, these increase 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 to 12 months old, a rate of 50 breaths per minute or more is considered fast. If the child is >12 months 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 95.9°F (35°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 (77 - 86°F if possible) and the child is covered. Hypothermia may be a sign of infection. If the temperature drops suddenly, call a physician.

Increase 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 on the Monitoring Record of the CCP. Notice the changes in temperature on the example of the Monitoring Record on page 176.

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 over-hydration due to feeding or rehydrating too fast)
Respirations only	Fast breathing: ≥50 breaths/minute in child 2 to 12 months old ≥40 breaths/ minute in child >12 to 59 months	Pneumonia
Temperature	Any sudden increase or decrease Axillary temperature <95°F or <35°C	Infection Hypothermia (possibly due to infection, a missed feed, or child being uncovered)

Other danger signs

Watch carefully any child with an infection such as pneumonia or sepsis, ear infection, or UTI. Keep children with infections near the nurses' station so that they can be easily watched. If a child has diarrhoea 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 danger signs such as:

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

Alert a physician if any of these danger signs appear.

Danger signs are summarized on the back of the F-100 Reference Card.

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 2 hours). This will involve gently waking the child to feed.

- Take 4-hourly measurements of pulse, respirations, and temperature.

- Watch carefully for **danger signs** and call a physician if necessary.

Proiyanka

Page ___ of ___

MONITORING RECORD *Monitor respiratory rate, pulse rate, and temperature 4-hourly unil after transition to F-100 and patient is steble, Then monitoring may be less frequent (e.g., twice da)*

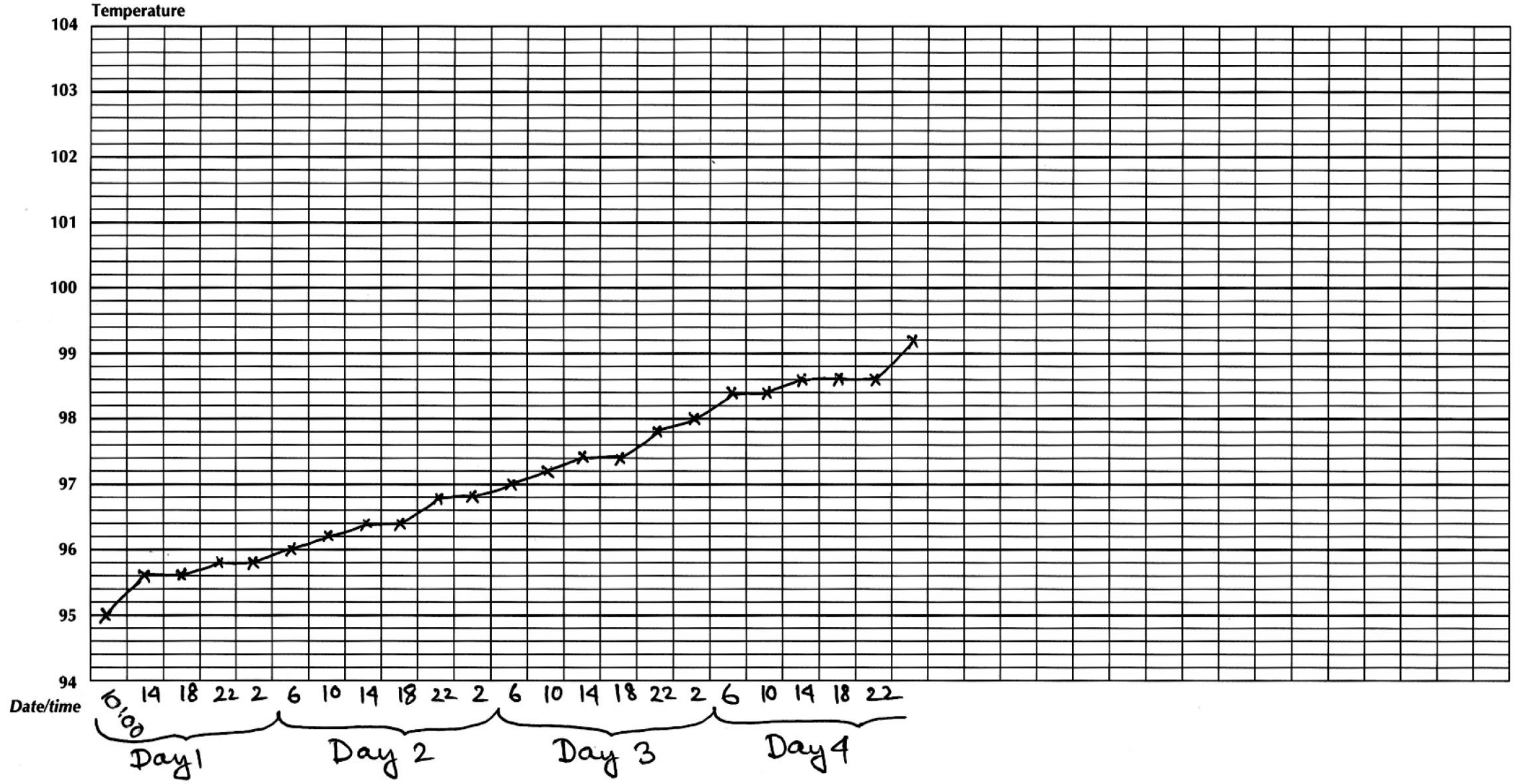
Respiratory rate

Breaths/ Minute	35	30	32	35	35	32	35	30	32	35	32	35	35	35	35	35	32	35	35	40	40

Pulse rate

Beats/ minute	90	86	90	90	92	90	86	92	86	90	90	90	90	90	92	92	90	90	92	95	95

Temperature



***Danger Signs:** Watch for increasing pulse and respirations, fast or difficult breathing, sudden increase or decrease in temperature, axillary temperature below 95°F, and other changes in condition. See danger signs listed on back of F-100 Reference Card. Normal ranges of pulse and raspiratory rates are also listed on back of F-100 Reference Card.*

SHORT ANSWER EXERCISE

The following questions relate to the example of the Monitoring Record on the opposite page. The child monitored is 2 years old.

1. What were the child's temperature, pulse rate, and respiratory rate at 14:00 on Day 2?

_____ °F _____ beats/minute and _____ breaths/minute respectively

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. At 22:00 in day 4 the nurse finds that the child has a axillary temperature of 98.6°F, 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 opposite.

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 those given in page 193

EXERCISE B

In this exercise you will make entries on a Daily Care page and Monitoring Record of a CCP. You will use the Daily Care page that you set up for Lamia in Exercise B. Obtain a blank Monitoring Record from the supply in your classroom.

Pretend that you are the nurse who cares for Lamia on her first day in the ward. At the following times you give Lamia her medications or monitor her progress. Make appropriate entries on the Daily Care page and Monitoring Record; for example, enter your initials or record results of monitoring.

Day 1

8:00 Lamia is given her first feed of F-75. It is recorded on the 24-Hour Food Intake Chart.

- You give Lamia 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 chloramphenicol and one drop of atropine in her left eye.
- Her ear is draining, and you gently wick it with a clean cloth.
- Since Lamia 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.

9:00 You check Lamia'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 100°F.

10: 00 Lamia is given her second feed of F- 75. It is recorded on the 24-Hour Food Intake Chart.

12:00 Lamia is given her third feed of F-75. It is recorded on the 24-Hour Food Intake Chart.

13:00 You check Lamia's pulse, respiratory rate, and temperature. Her pulse rate is 105 beats per minute, her respiratory rate is 35 breaths per minute, and her axillary temperature is 100°F.

14:00 Lamia is given her fourth feed of F-75. It is recorded on the 24-Hour Food Intake Chart.

- You give Lamia 1.7 ml Ampicillin IV.
- You give Lamia her multivitamin (which is needed since F-75 is not prepared with CMV

at this hospital).

- You put one drop of Chloramphenicol and one drop of atropine in her left eye.

15:00 The shift changes. Now pretend that you are the nurse on the next shift.

16: 00 Lamia is given her fifth feed of F- 75. It is recorded on the 24-Hour Food Intake Chart.

17:00 You check Lamia's pulse, respiratory rate, and temperature. Her pulse rate is 110 beats per minute, her respiratory rate is 35 breaths per minute, and her axillary temperature is 99.5°F.

18:00 Lamia is given her sixth feed of F-75. It is recorded on the 24-Hour Food Intake Chart.

Answer the following questions:

1. At 20:00 Lamia will be fed again. At that time what else should be given to Lamia?

2. When should Lamia's respiratory rate, pulse rate, and temperature next be monitored?

3. In addition to feeding, what should be done for Lamia at 2:00 a.m.?

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

EXERCISE C

In this exercise you will review several Monitoring Records and identify any signs.

Case 1 – Lamia

You will remember that Lamia was admitted with an ear infection and fever. began Lamia's Monitoring Record in the last exercise. Lamia's continuing Monitoring Record for the first two days is on the opposite page. Review her Monitoring Record; then answer the questions below.

1. What happens to Lamia's temperature at 5:00 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 Lamia's pulse and respiratory rates indicate any danger signs?

5. What should be done for Lamia at 5:00 a.m.?

Lamia

Page ___ of ___

MONITORING RECORD

Monitor respiratory rate, pulse rate, and temperature 4-hourly unil after transition to F-100 and patient is steble, Then monitoring may be less frequent (e.g., twice da)

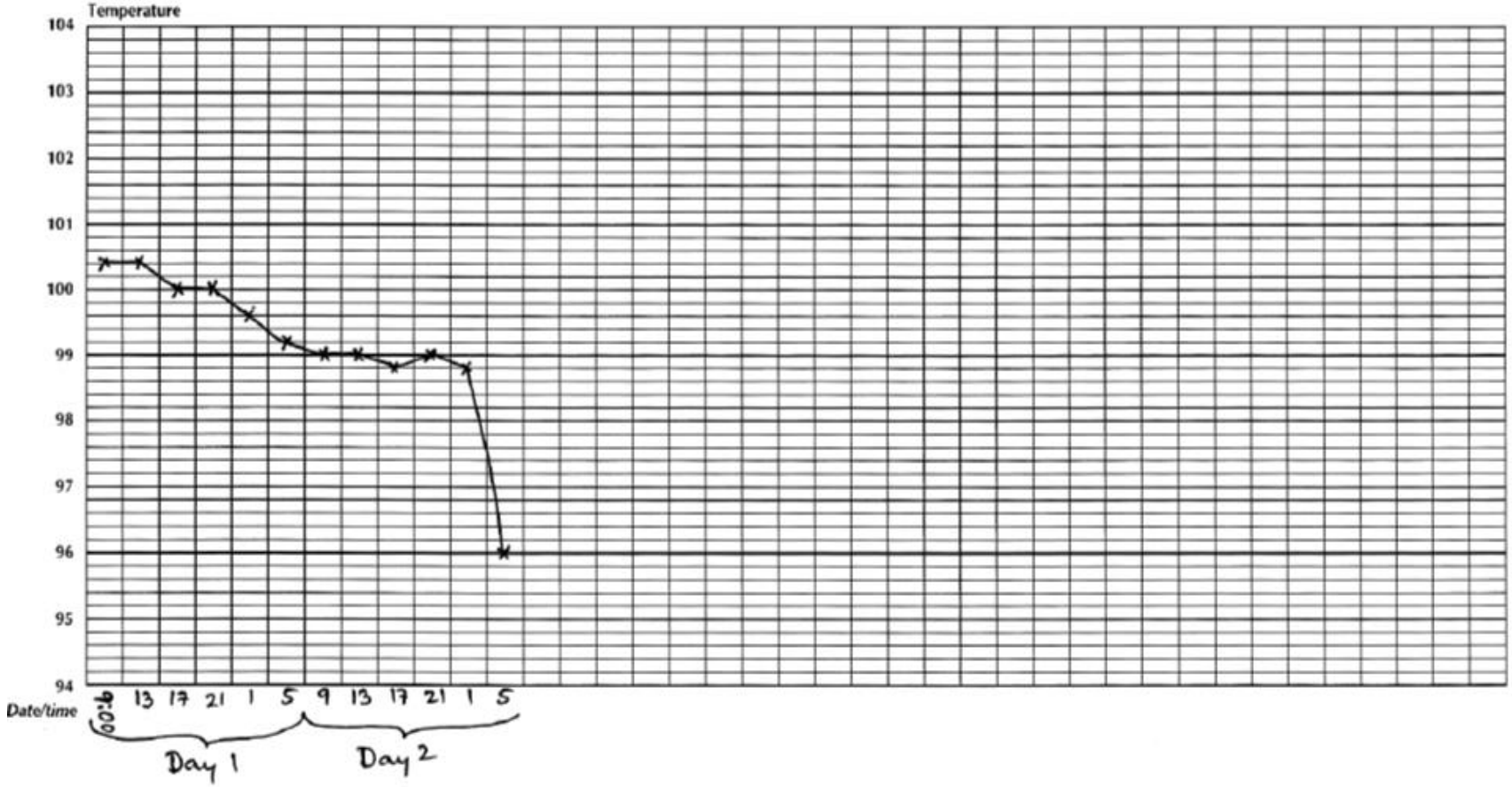
Respiratory rate

Breaths/ Minute													
	35	35	35	35	30	35	35	32	35	32	35	35	

Pulse rate

Beats/ minute													
	100	100	105	110	108	105	102	105	105	100	105	105	

Temperature



Danger Signs: Watch for increasing pulse and respirations, fast or difficult breathing, sudden increase or decrease in temperature, axillary temperature below 95°F, and other changes in condition. See danger signs listed on back of F-100 Reference Card. Normal ranges of pulse and raspiratory rates are also listed on back of F-100 Reference Card.

Case 2 – Bijlee

Bijlee is 2 years old. She is severely wasted but has no obvious complications or infections on admission. She is prescribed a routine course of Co-trimoxazole for 5 days.

Review Bijlee's Monitoring Record and answer the questions below:

1. What happens to Biijlee's temperature during the night of Day 2 and morning of Day 3? Does this indicate a danger sign?

2. Does the record of Bijlee's pulse rates suggest any danger sign? Why or why not?

3. Does the record of Bijlee's respiratory rates suggest any problem? Why or why not?

4. Should the physician be alerted?

5. The nurse notes that Bijlee has chest indrawing. What could be the problem? What treatment should be given to Bijlee?

Bijlee

Page ___ of ___

MONITORING RECORD

Monitor respiratory rate, pulse rate, and temperature 4-hourly unil after transition to F-100 and patient is steble, Then monitoring may be less frequent (e.g., twice da)

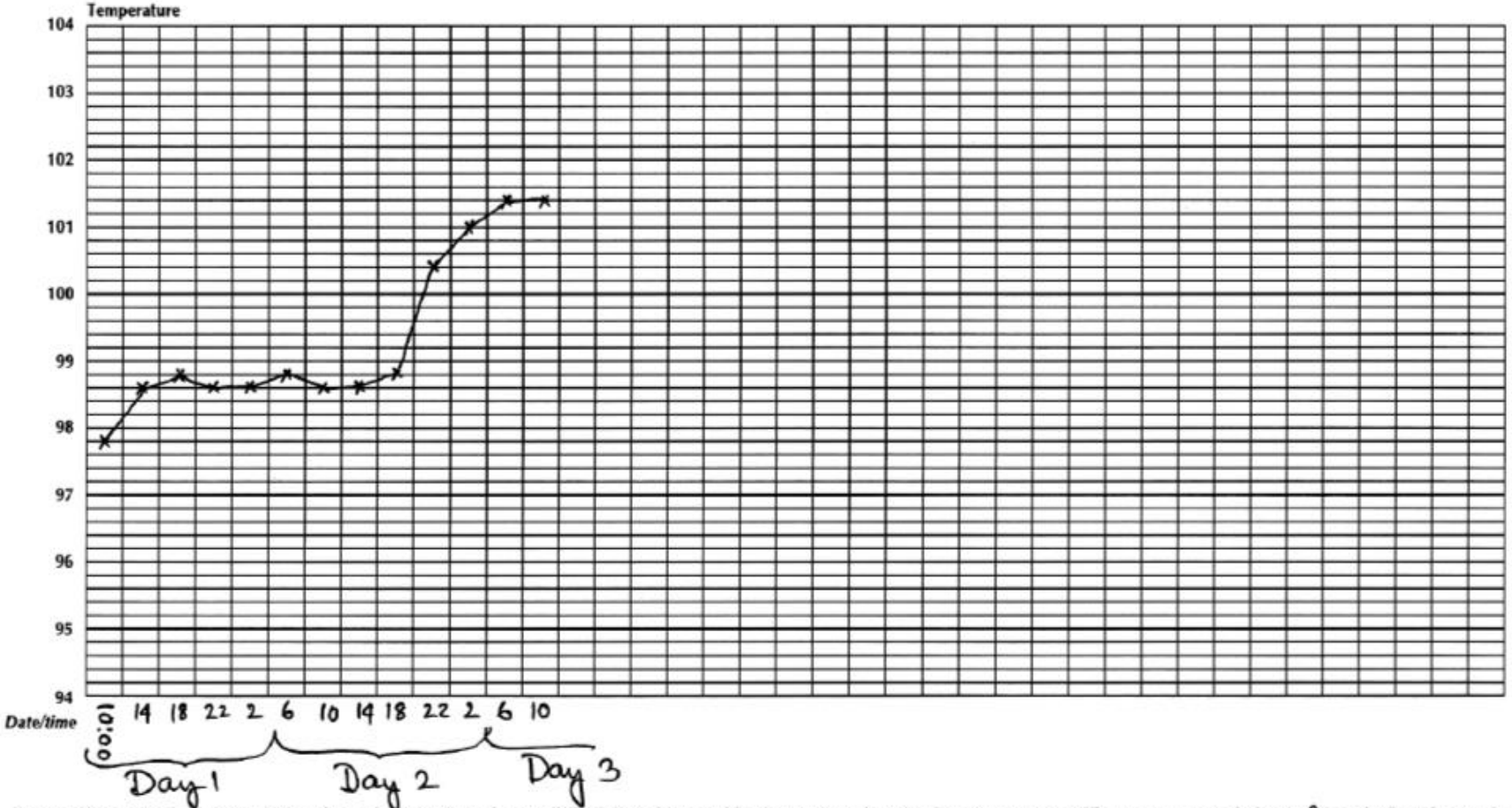
Respiratory rate

Breaths/ Minute	35	30	32	35	35	35	35	38	35	40	40	45	50

Pulse rate

Beats/ minute	90	86	90	92	90	90	90	92	90	90	96	100	110

Temperature



Danger Signs: Watch for increasing pulse and respirations, fast or difficult breathing, sudden increase or decrease in temperature, axillary temperature below 95°F, and other changes in condition. See danger signs listed on back of F-100 Reference Card. Normal ranges of pulse and raspiratory rates are also listed on back of F-100 Reference Card.

7.0 Weigh the child daily and maintain the weight chart

How to weigh the child was described in the module *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 *Daily Care* page of the CCP. Then plot the child's weight on the Weight Chart included in the CCP. The Weight Chart will visually show the child's progress towards discharge weight, any loss of weight due to oedema, or failure to improve.

An example of a completed weight chart is shown on the opposite 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 oedema, label the axis so that the starting weight will be near the bottom, but allow a little space below for possible weight loss.

  - ✓ If the child has oedema, 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 (++) oedema

    2 kg weight loss if severe (+++) oedema and child is < 7 kg

    3 kg weight loss if severe (+++) oedema and child is > 7 kg

- Use a reference table to determine the child's desired discharge weight (i.e., ≥2 Z-score weight-for-length/height). Mark the desired discharge weight with a horizontal line across the chart.

- Calculate 15% weight gain as a discharge weight taking the lowest weight of the child.

- Each day, plot the child's weight on the chart. Plot the starting weight above Day 1, the next day above 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.

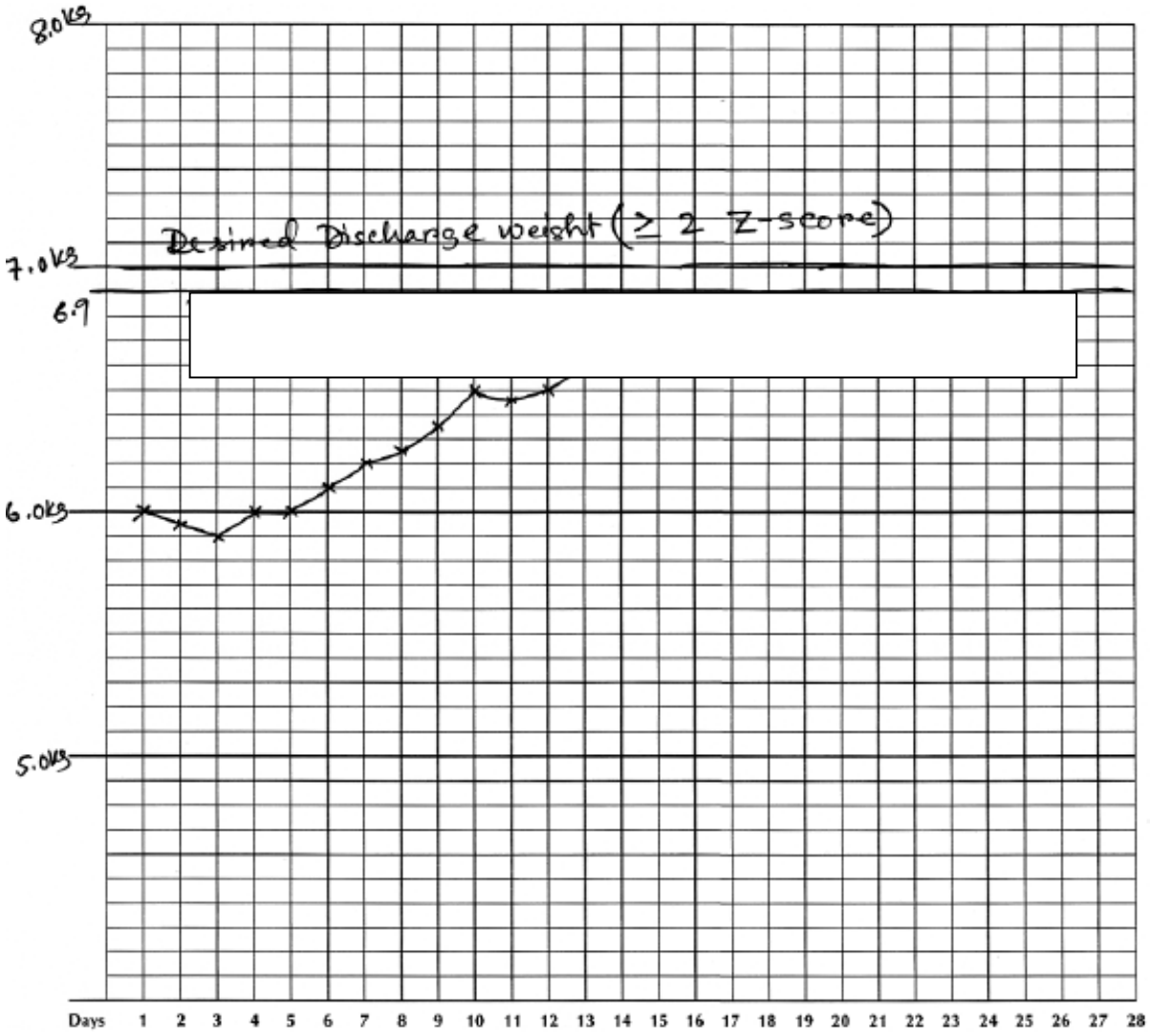
- To highlight the day that F-100 is begun (the first day of transition), draw and label an

arrow pointing to the weight for that day.

Example of weight chart for a boy with no oedema

Starting weight: 6.0 kg Length: 69 cm

Targeted discharge weight : > -2 Z-score : 7.0 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.

An example of a partially completed weight chart for a girl with mild (+) oedema is on the next page. The child's starting weight is 5.3 kg. Since she has mild oedema, 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.

SHORT ANSWER EXERCISE

1. Look up the desired discharge weight for the child whose weight chart is shown opposite. 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?

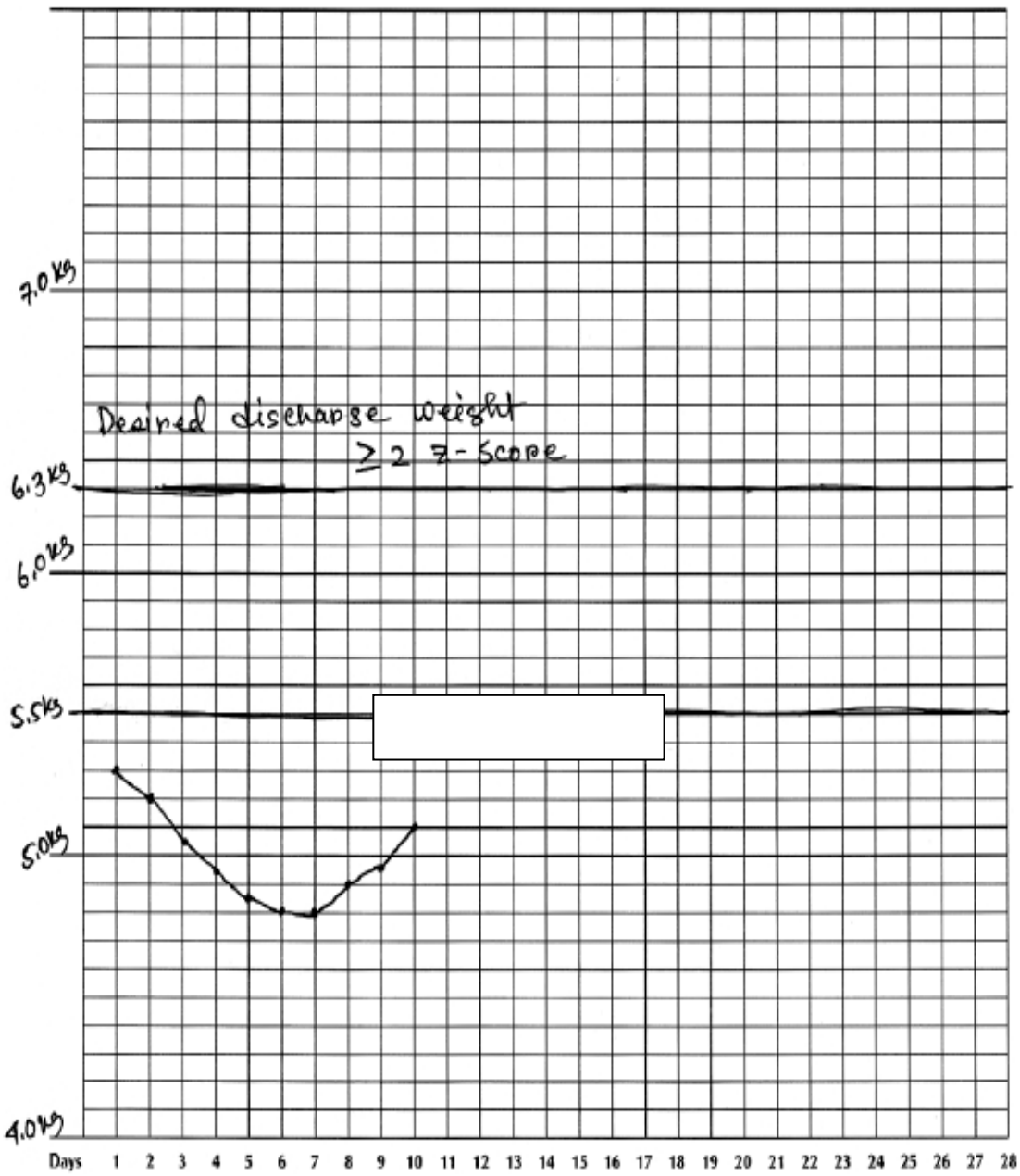
5. Has the child made progress?

Check your own answers to this exercise by comparing them to those given in page 194

Example of weight chart for a boy with no oedema

Starting weight: 5.3 kg Length: 67 cm

Targeted discharge weight : > -2 Z-score : _____ 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

ANNEX A

Answers to Short Answer Exercises

Answers, page 159

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 165

1. Yes, the child should be given a dose of 200 000 IU on Day 14.

2. Day 1 only, 100 000 IU oral.

3. Give Joy's first dose of Vitamin A 200 000 IU orally.
Give the second dose orally on Day 2. Give 200 000 IU.

4. Yes, Dalia 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 14.

Answers, page 177

1. 96.4° F, 92 beats/minute, 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 10:00 and 14:00 on Day 4.

5. A temperature of 98.6° F, 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. Also, 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 188

1. The desired discharge weight for a girl who is 67 cm long is 6.3 kg. This weight should be marked with a bold line on the weight chart. See below.

2. A reduced version of the graph is below.

3. 4.8 kg on Days 6 and 7

4. The child lost weight due to loss of oedema fluid.

5. Yes, the child has made progress in two ways. First, she lost her oedema, 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.

ANNEX B

Danger Signs Related to Pulse, Respirations, and Temperature

ALERT A PHYSICIAN IF THESE OCCUR:

1. 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

Suggests: Infection or Heart failure (possibly from overhydration due to feeding or rehydrating too fast)

2. 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

Suggests: Pneumonia

3. Temperature

- Any sudden increase or decrease rectal temperature below 95.9° F (35.5° C)

Suggests: Infection; Hypothermia (possibly due to infection, a missed feed, or child being uncovered)

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

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

MODULE 6

Monitoring and Problem Solving

MONITORING AND PROBLEM SOLVING

Introduction

Many types of problems may occur in a malnutrition ward. There may be problems with an individual child'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 child deaths.

This module 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 children or problems that may affect the entire ward.

Learning Objectives

At the end of this module and related clinical sessions, the participants should be able to have the following skills:

1. Identifying problems by monitoring:
   - ✓ Individual child progress, weight gain and care
   - ✓ Overall weight gain on the ward
   - ✓ Child outcomes (such as recovery, defaulter, referral and death)
   - ✓ Case-fatality rate for the ward
   - ✓ Case management practices
   - ✓ Food preparation, ward procedures, and hygiene

2. Investigating causes of problems

3. Determining solutions appropriate for causes

4. 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 child progress, weight gain and care, you may identify problems such as the following:

- A child's appetite has not returned
- A child 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, child outcomes, and the casefatality rate, you may identify problems such as the following:

- 20% of children on the ward have poor weight gain
- 75% of mothers leave with their children before they reach the desired discharge weight
- The case-fatality rate in the ward was 15% during the months of June through August.

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 2 hours through the night
- Staff do not consistently wash their hands with soap
- Electrolyte Mineral solution or CMV (if available) is not added to feeds.

When a problem is identified, describe it in as much detail as possible

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.

SHORT ANSWER EXERCISE

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. Tarik is not gaining weight.
   b. After gaining 10 g/kg/day for four days, Tarik has stayed the same weight for the last three days.

3. a. Dr Parvez prescribes a diuretic for severe oedema, but no other doctors do this.
   b. Diuretics are sometimes prescribed for oedema.

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 in the Annex A (Page 251)

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 child, observing and asking questions to staff, reviewing child 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.

Example of problem solving process

Problem: Weight gain on malnutrition ward is not as good as it was several months ago. Instead of good weight gain for most children on F-100 (10 g/kg/day or more), the typical weight gain is now less than 10 g/kg/day.

The designated person decides to investigate by monitoring ward procedures and food preparation. The following are some possible causes that s/he might find, along with an appropriate solution for each:

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.	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 staff 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.

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.

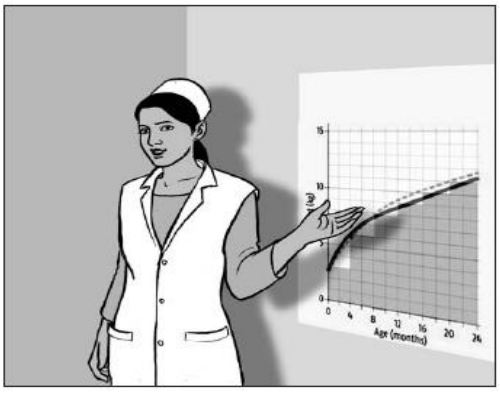
1.4 Implement solutions

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.

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 child

2.1 Monitor individual child progress and care

Nursing staff should monitor certain signs (such as pulse rate, respiratory rate, and temperature) repeatedly during the day, especially during initial treatment. If there are danger signs (such as increasing pulse and respiratory rate, or a sudden drop in temperature), the assigned staff should immediately respond as described in *Initial Management and Daily Care*. Otherwise, information is simply recorded on the *Monitoring Record* of the CCP, where it is reviewed by a doctor during rounds.

Doctors should do a ward round at least once every day. During rounds, a doctor should:

1. Observe the child and question the mother and nurse
   - ✓ Is child more alert? Smiling? Sitting up? Able to play?
   - ✓ Has the child lost oedema? - Is there less diarrhoea?
   - ✓ Has dermatosis improved?
   - ✓ How is the child's appetite?
   - ✓ How is the eye condition?

2. 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 oedema?

3. Review the CCP and food intake chart
   - ✓ Is the child getting the recommended feeds?
   - ✓ Is prescribed care (such as antibiotics, folic acid, iron) being given?
   - ✓ Are there any danger signs recorded on the CCP: increased pulse rate, respiratory rate, or temperature?

4. Daily, after a child is taking F-100, a doctor 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
   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 oedema.

Remember that this calculation will be most useful if the child is weighed at about the same time each day.

Example

Kafi began taking F-100 on Day 4 in the malnutrition ward. By Day 6 he began to gain weight. On Day 6 Kofi weighed 7.32 kg. On Day 7 he weighed 7.4 kg. His weight gain in g/kg/day can be calculated as follows:

a. 7.4 kg – 7.32 kg = 0.08 kg 0.08 kg x 1000 = 80 grams gained

b. 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. Mustaq weighed 7.25 kg on Day 10. He weighed 7.30 kg on Day 11. What was his weight gain in g/kg/day?

2. Koel weighed 6.22 kg on Day 8. She weighed 6.25 kg on Day 9. What was her weight gain in g/kg/day?

3. Gani 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 Gani lost weight, the answer will be negative.)

Check your own answers to this exercise by comparing them to the answers in the Annex A (page 251)

2.2 Identify the child who is failing to respond

A child is failing to respond if he or she:

- Does not improve initially; or
- Gains weight but then remains static or deteriorates.

Some criteria for failure to respond are listed below as a guide:

Criteria	Approximate time after admission
Failure to regain appetite ailure to start to lose oedema/oedema still present Failure to gain at least 5 g/kg/day for 3 successive days after feeding freely on F-100	Day 4 Day 4/Day 10 After feeding freely on F-100

2.3 Determine cause(s) of failure to respond

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 of this module. If your investigation is focused on one child, consider such possible causes as the following:

1. 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?

2. Insufficient micronutrient

3. Insufficient attention or lack of stimulation

4. Unrecognized infection – Infections most commonly overlooked include pneumonia, urinary tract infection, ear infection, and tuberculosis. Others include malaria, dengue, viral hepatitis B, and HIV infection. See the national guidelines for more information on identifying possible infections and treating them.

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 doctor will need to prescribe appropriate treatment as described in the national guidelines.

If the child is ruminating, it is best to have experienced staff members give special attention to the child. They need to show disapproval whenever the child begins to ruminate, without frightening the child, and encourage less harmful behaviours.

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. If the electrolyte mineral solution has not been added to the child's food, it must be added. 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 reasons behind

Problem: A child becomes hypoglycaemic during her first night on the ward.

- **One cause:** She was not fed at 2:00 and 4:00 a.m.
  - ✓ **Main reason:** The child's mother was too tired to wake up and feed her.
  - ✓ **Root cause:** There are not enough night staff, so mothers are expected to feed the children at night.
  - ✓ **Root cause:** There is no quiet time or place for mothers to rest during the day.

- **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 2-hourly feeds.

3.0 Calculate a case fatality rate for the malnutrition ward

Calculate the case-fatality rate once each month. Also calculate the case-fatality rate in any ward where the current rate is poor or unacceptable. This will allow improvements to be seen rapidly.

To calculate the case-fatality rate:

- Determine the number of children admitted to the malnutrition ward in the past month(s).
- Determine the number of those children who died. (Wait to count deaths until the outcomes for the children are known. For example, wait until mid- November to count deaths among children admitted in October.)
- Divide the number of deaths by the number of children and express the result as a percentage.

For the purposes of monitoring and evaluation, a case-fatality rate of:

> 20% = unacceptable

11-20% = poor

5 - 10% = moderate

< 5% = acceptable

Carefully review the circumstances of deaths and identify and solve related problems in order to reduce the case-fatality rate.

4.0 Monitor practices and procedures

Periodically, or to investigate causes of problems, you may need to monitor:

- Case management practices
- Food preparation
- Ward procedures, and/or
- Hygiene (personal, food, environment)

Suggestions for monitoring are provided in this section. Monitoring checklists for use during ward visits are provided in Annex C. Any "NO" answer to a question on the checklist indicates a problem that needs to be corrected.

4.1 Monitor case management practices

Deaths during initial case management are often the result of well-intentioned but incorrect practice. Monitor to ensure that all doctors are following the case management practices described in the manual, 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 2 hours at night.
V 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).
IV albumin/amino acids given	Do not give these.
Diuretics given to treat oedema	Do not give these. Oedema 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 guidelines
Rehydration done by 4 hours	Rehydrated over 4-10 hours
Child left uncovered at night	Provide blanket and ensure the child is covered at night
Anaemia treated with iron from admission	Wait to start iron until the child has been on F-100 for 2 days.

4.2 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.

Monitor the following:

- ✓ Are ingredients for the recipes 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 staff (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 the appropriate amount of oil mixed in (i.e., not left stuck in the measuring container)?
- ✓ Is electrolyte mineral solution (if available) added correctly?
- ✓ Is correct amount of water added to make up a litre of formula? (Staff should not add a litre of water, but just enough to make a litre of formula.)
- ✓ Is food served at an appropriate temperature? Is the food consistently mixed when served (i.e., oil is mixed in, not separated)?
- ✓ Are correct amounts put in the dish for each child?
- ✓ Is leftover prepared food discarded promptly?

4.3 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. 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/diarrhoea) 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 on demand and increased as the child gains weight?

Warming

- ✓ Is the room kept between 77° - 86°F (to the extent possible)?
- ✓ Are blankets provided and children kept covered at night?
- ✓ Are safe measures used for rewarming children? (by roomheater)
- ✓ Are temperatures taken and recorded correctly?

Weighing

- ✓ Are scales functioning correctly? Are they standardized weekly? (Check scales as described in the module *Daily Care*.)
- ✓ Are children weighed at about the same time each day, one hour before or after 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 CCP?
- ✓ 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 CCP?
- ✓ Is folic acid given daily and recorded on the CCP?
- ✓ Is vitamin A given according to schedule?
- ✓ Are multivitamin, zinc, potassium, magnesium given daily and recorded on the CCP?
- ✓ After children are on F-100 for 2 days, is the correct dose of iron given daily and recorded on the CCP?

Ward environment

- ✓ 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?

4.4 Monitor hygiene

Good hygiene is extremely important because children with severe acute 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. Monitor such items as the following:

Handwashing

- ✓ Are there working handwashing 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 child?

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?

General maintenance

- ✓ Are floors swept?
- ✓ Is trash disposed of properly?
- ✓ Is the ward kept as free as possible of insects and rodents?

Food preparation and storage

- ✓ Are ingredients and food kept covered and stored at the proper temperature?
- ✓ Are leftovers discarded?

Utensils washing

- ✓ Are utensils washed after each meal?
- ✓ Are they washed in hot water with soap?

Toys

- ✓ Are toys washable?
- ✓ Are toys washed regularly, and after each child uses them?

5.0 Solve problems

There are some problems that 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 diarrhoea outbreak in the ward
- An increasing case fatality rate; or
- Procedural problems involving all or many of the staff.

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.

ANNEX A

Answers to Short Answer Exercises

Answers, page 201

1. b

2. b

3. a

4. b

Answers, page 206

1. 7.30 kg – 7.25 kg = 0.05 kg 0.05 kg x 1000 = 50 grams gained grams ÷ 7.25 = 6.90 g/kg/day

2. 6.25 kg – 6.22 kg = 0.03 kg 0.03 kg x 1000 = 30 grams gained 30 grams ÷ 6.22 = 4.8 g/kg/day

3. 7.5 kg – 7.6 kg = – 0.1 kg – 0.1 kg x 1000 = –100 grams gained (or 100 grams lost) –100 grams ÷ 7.6 = –13.16 g/kg/day

ANNEX B
WEIGHT GAIN TALLY SHEET FOR WARD

Week of:	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 on F-100 for entire week:			
Totals			
% of children on F-100 in ward			

ANNEX C
Monitoring Checklists
MONITORING FOOD PREPARATION

OBSERVE:	YES	NO	COMMENTS
Are ingredients for the recipes 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 staff preparing feeds wash 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 the appropriate amount of oil mixed in (i.e., not left stuck in the measuring container)?			
Is electrolyte mineral solution added correctly?			
Is correct amount of water added to make up a litre of formula? (Staff should not add a litre of water, but just enough to make a litre of formula.)			
Is food served at an appropriate temperature?			
Is the food consistently mixed when served (i.e., oil is mixed in, not separated)?			
Are correct amounts put in the cup for each child?			
Other:			

CHECKLIST FOR MONITORING WARD PROCEDURES

OBSERVE:	YES	NO	COMMENTS
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/diarrhoea) recorded correctly after each feed?			
Are leftovers recorded accurately?			
Is food intake (and any vomiting/diarrhoea) 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 on demand and increased as the child gains weight?			
Warming			
Is the room kept between 77^0 —86^0 F (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 scales standardized weekly?			
Are children weighed at about the same time each day?			
Are they weighed about one hour before a feed (to the extent possible)?			
Do staff adjust the scale to zero before weighing?			

CHECKLIST FOR MONITORING WARD PROCEDURES, *continued*

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 CCP?			
Are weights correctly plotted on the Weight Chart?			
Giving antibiotics, medications, supplements			
Are antibiotics given as prescribed (correct dose at correct time)?			
When antibiotics are given, do staff immediately make a notation on the CCP?			
Is folic acid given daily and recorded on the CCP?			
Is vitamin A given according to schedule?			
Are multivitamin, zinc, and/or other micronutrients given daily and recorded on the CCP?			
After children are on F-100 for 2 days, is the correct dose of iron given twice daily and recorded on the CCP?			
Ward environment			
Are surroundings welcoming and cheerful?			
Are mothers offered a place to sit and sleep?			
Are mothers taught/ encouraged to be involved in care?			
Are staff consistently courteous?			
As children recover, are they stimulated and encouraged to move and play?			

CHECKLIST FOR MONITORING HYGIENE

OBSERVE:	YES	NO	COMMENTS
Handwashing			
Are there working handwashing 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 child?			
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?			
General maintenance			
Are floors swept?			
Is trash disposed of properly?			
Is the ward kept as free as possible of insects and rodents?			
Food preparation and storage			
Are ingredients and food kept covered and stored at the proper temperature?			
Are leftovers discarded?			
Utensils washing			
Are utensils washed after each meal?			
Are they washed in hot water with soap?			

CHECKLIST FOR MONITORING HYGIENE, *continued*

Toys			
Are toys washable?			
Are toys washed regularly, and after each child uses them?			

MODULE 7

Involving Mothers/ Caregivers in Care

INVOLVING MOTHERS/CAREGIVERS IN CARE

Introduction

It is essential for the mother (or other caregiver) to be with her severe acute 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 module describes and provides information necessary for you to discuss and observe:

1. Ways to encourage involvement of mothers in hospital care
2. Ways to prepare mothers to continue goodcare at home, including proper feeding of the child and stimulation using play.

1.0 Organize ward 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.

It may be helpful to organize a rotation of mothers to do these tasks under supervision. In that way each mother can make a contribution to her child's care and still have some time off duty.

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 on the ward. They also need washing facilities and a toilet, and a way to obtain food for themselves. Some mothers may need medical attention themselves if they are sick or anaemic.

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.

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.

3.0 Teach groups of mothers about feeding and care

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 Infant and Young Child Feeding (IYCF), hygiene, making ORS to treat diarrhoea, family planning, care of sick children, when and where to seek medical help 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 session is to teach parents how to prepare a nutritious food at home. This food called Khichuri, would be appropriate for children of ages 6 months to 24 months when they have recovered and are eating at home. The recipe provides 145 kcal and 2.9 g protein per 100 g.

The outline contains information, examples and visual aids, and practice. It also includes opportunities for parents to ask questions and contribute ideas.

Although local foods in your area are likely to be different, a similar teaching outline could be used.

TEACHING AND PRACTICE SESSION

Preparing Khichuri (home-based food)

Preparation:
Before the teaching session, prepare a display tray with ingredients for Khichuri. Also begin preparing a recipe for Khichuri. See outline for ingredients and recipe. Have the water boiling with rice, daal, and spices as the session begins. During the teaching session you will finish the recipe.

What is Khichuri?
Khichuri 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, the rest of the family may also like this food, too. If so, prepare enough for the whole family.

Example:
Display the following ingredients on a tray. Call attention to the amount of each.

Spices may be added for flavour (such as, garlic, ginger). If preparing for malnourished children who are still recovering in the health facility, do not add salt, since sodium should be limited. Salt may be added when the recipe is made at home for the family.

NOTE: For making 1kg khichuri, see details in page 77 of the national guideline.

Ask the parents why they think these ingredients are good for children and all family members. In discussion, explain that:

- Oil, rice (or other staple such as potatoes) are needed to give energy
- Dal is needed to build and grow the body
- Leafy green and orange-coloured vegetables are needed to give strength and good health and also to prevent blindness.

How to make Khichuri

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.

1. Wash hands before preparing food
2. Put rice, dal, pumpkin, spices, oil, and water in pot and boil
3. Keep pot covered during cooking
4. About 5 minutes before rice is cooked, add cleaned, chopped shak (leafy vegetables).

Practice:

When it is time to add the shak, have a parent do so. Have a parent clean and chop the leaves and add them to the pot.

Amount to serve

Children should be fed 5 times daily. Explain that the amount in the pot is enough for 2 meals for a one-year-old child. Cook it twice daily to make 4 meals. Increase amounts if the whole family will eat it.

Remind parents to wash hands before serving food and keep food covered. Do not store too long or the food may spoil. Khichuri can be kept at room temperature for 5 to 8 hours only.

Focus on giving this food to the discharged child until he is better. Then the child can shift to other nutritious family foods.

Practice:

Ask a parent to wash hands and serve 2 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 khichuri. Explain that it can be cooked longer to make it softer if the child needs softer food.

Discussion:

Ask parents questions about how they can prepare Khichuri at home. Encourage them to ask questions as well. Include in the discussion:

- ✓ How much do you think Khichuri costs? The price for this recipe is about 5 Taka including firewood.
- ✓ Who goes shopping for food in your family? Will they be willing to buy ingredients for Khichuri?

Review:

What are the reasons to serve Khichuri? To prevent and treat malnutrition, to prevent blindness, and to ensure strong and good health:

- ✓ How often should you feed your child khichuri? ____times per day.
- ✓ How much will you give at each meal? Show serving size.
- ✓ How will you prepare khichuri? Review the ingredients and recipe.

How to prepare Halwa:

Soak the lentils in water for 30 minutes and then mash. Roast the wheat flour on a hot pan for a few minutes, and then mix with the mashed lentils, oil and water. Melt the molasses and add to the mixture to make a thick paste. Halwa takes about 15 minute to cook and can be kept at room temperature for 6-8 hours.

4.0 Prepare for feeding the child at home

After the child recovers and reaches WHZ -2, the child should be fed at home according to the National IYCF guidelines. For a child aged 2 years or older, this means feeding the child 3 meals each day, plus twice daily giving nutritious snacks between meals.

Before returning home, the child must become accustomed to eating family meals. While the child is in the malnutrition 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 what 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 can be a 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 100g. serving) or ghee. The cereal should be soft and mashed; for infants aged 6 months or older, using 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:

- ✓ Ripe banana, papaya, mango, pineapple, lemon or other seasonal fruits
- ✓ Bean cakes
- ✓ Curd, milk, puddings made with milk
- ✓ Cooked eggs
- ✓ Bread, chapati with butter
- ✓ Biscuits, crackers, puffed rice
- ✓ Cooked potatoes

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. The Discharge Card can be used as a tool in this discussion (see, Annex 13 of the National Guidelines).

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 hospital 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 ensure 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.

5.0 Teach mothers the importance of stimulation and how to make and use toys

Severe acute malnourished children have delayed mental and behavioural development. As the child recovers, he or she needs increasing emotional and physical stimulation through play. Play programmes that begin during rehabilitation and continue after discharge can greatly reduce the risk of permanent mental retardation and emotional problems.

The hospital can provide stimulation through the environment, by decorating in bright colours, hanging colourful 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. Many ideas for toys and structured play are given in the National Guidelines (Annex 12).

Reading in the National Guidelines:

Please read pages 30 and 31 and Annexes 12 and 13 of the guidelines now.

6.0 Give general discharge instructions

In addition to feeding instructions, mothers will need to be taught:

- How to continue any needed medications, vitamins, folic acid (for 1-2 weeks), and iron (for 1 month) at home
- Signs to bring the child back for immediate care:
- Not able to drink or breastfeed
- Stops feeding
- Develops fever
- Has fast or difficult breathing
- Has a convulsion
- Has diarrhoea for more than a day, or blood in stool
- Has oedema (swelling in feet, legs, hands, or arms).

When and where to go for planned follow-up:

- At 1 week, 2 weeks, 1 month, 3 months, and 6 months;
- Then a twice yearly visit until the child is at least 5 years old.

- ✓ When to return for next immunization. Any currently needed immunizations should be given in the hospital.

- ✓ When to go to the health centre for Vitamin A (every 6 months)
- ✓ How to continue stimulating the child at home with play activities.

Example of discharge card

A sample discharge card is included with your course materials. There is a copy it he Annex of this module. The card includes home feeding instructions and other instructions such as when to return for immunizations, Vitamin A, follow-up, etc.

Of course, it is only an example and needs adaptation for local use.

- ✓ A discharge card can be useful in several ways:
- ✓ It provides instructions for home care;
- ✓ It reminds the mother when and where to go for follow-up care;
- ✓ It can serve as a letter of introduction for a health care or nutritional rehabilitation facility close to the child's home;
- ✓ It serves as a record of the child's weight-for-height, immunizations, etc.

7.0 Discharge criteria for children with severe acute malnutrition from malnutrition ward

A child who has achieved weight-for-length/height (WHZ) ≥-2 Z-score can be considered to have recovered sufficiently to be discharged but follow-up is essential. Additional discharge criteria are given in the following table:

Criteria for discharge from inpatient care in areas where there is no community-based outpatient care	
Child	✓ Oedema free WHZ ≥-2 (where follow-up facility is not available) ✓ Child eating an adequate amount of nutritious food that the mother can ✓ prepare at home ✓ All infections and other medical complications have been treated ✓ Child is provided with micronutrients ✓ Immunization is updated
Mother/ caregiver	✓ Knows how to prepare appropriate nutritious complementary foods from family foods and to feed the child ✓ Knows how to make appropriate toys and play with child ✓ Knows how to give home treatment for diarrhoea, fever and acute respiratory infections, and how to recognize the signs that s/he must seek medical assistance ✓ Follow-up plan is completed ✓ Knows about need for continuation of breastfeeding for child age below 2 years

8.0 If early discharge is unavoidable, make special arrangements for follow-up

If a child must be discharged before reaching WHZ -2 or 15% increase in body weight from lowest weight. 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 and give iron, folic acid, and multivitamins at home.

In no case should a child be discharged until the following conditions are met:

- The child is through transition to F-100 (is feeding on demand on F-100);
- Antibiotic treatment is finished;
- The child is eating well;
- The child is gaining weight and oedema free
- The mother has been thoroughly trained in how to feed the child at home and give supplements;
- Arrangements have been made for support and follow-up (e.g., home visits, or visits to an outpatient facility).

ANNEXES

ANNEX A

DISCHARGE CARD

Danger Signs – Bring Child for Immediate Care if:

Not able to drink or breastfeed Stops feeding

Vomit everything

Lethargic or Unconscious

Convulsion (fits)

Come for Scheduled Follow-Up Visits

Next Planned Follow-Up:		Record of Visits:			
Date	Place	Date	Ht/length	Weight	% wt-for ht

Vitamin A -- Bring Child for a Dose Every Six Months

Next Dose Vitamin A :		Record of Doses Received:	
Date	Place	Date	Place

DISCHARGE CARD

For Child Recovering from Malnutrition Ward

Hospital name : _____

Child's name: _____ M F Date of birth: _____

Address: _____

	Date:	Weight (kg)	Ht /length (cm)	Z-score
Admission				
Discharge				

Instructions for Feeding at Home

What to feed? (Include recipe if needed) _____

How much and how often? _____

Medications and Supplements

Give _____ drops _____(multivitamin preparation) with food once daily.

Give 1 tablet folic acid once daily for _____ days.

Give _____iron twice daily for 1 month.

Other: _____

IYCF TO BE INSERTED FROM CMAM

IYCF feeding recommendations of family diet up to 2 years of age

Age	Frequency (per day)	Amount of at each serving (In addition to breast milk)	Texture (thickness/ consistency)	Variety
6 months (181 days) to 8 months	At least 2 times Mashed family food	½ bowl (250 ml)	Thick porridge/ pap Mashed/ pureed family foods	Breastfeeding + Every day(rice, lentils, colorful and dark green leafy vegetables, fish, meat, eggs, liver) at least four types of food
9-11 months	At least 3 times foods and 1 to 2 times nutritious snacks	½ bowl (250 ml)	Finely chopped family foods Finger foods Sliced foods	
12-24 months	At least 3 times foods and 1 to 2 times nutritious snacks	1 bowl (250 ml)	Family foods Sliced foods	
Responsive Active feeding	Be patient and encourage your baby to eat actively			
Hygiene	• Feed your baby using a clean cup and spoon, **never a bottle** as this is difficult to clean and may cause your baby to get diarrhoea. • Wash your hands with soap and water before preparing food, before eating and before feeding young children.			

IMCI feeding recommendations of family diet after two years of age

Age	Frequency (per day)	Amount of at each serving (In addition to breast milk)	Texture (thickness/ consistency)	Variety
2 years and older	3 to 4 times foods and 1 to 2 times nutritious snacks	Give at least 1 bowl (250 ml) at each meal	Family foods	Animal-source foods and vitamin A rich fruit and vegetables
	• If your child refuses a new food offer "tastes" several times. Show that you like the food. Be patient. • Talk with your child during a meal and keep eye contact.			

A good daily diet should be adequate in quantity and include an energy-rich food (for example: thick cereal with added oil); meat, egg, fish, or pulses; and fruits and vegetables.

IMMUNIZATION CARD

	Just after 6 weeks of child's age	Just after 10 weeks of child's age	Just after 14 weeks of child's age	Just after 9 months of child's age	Just after 15 months of child's age
BCG	**1**				
Penta	**1st**	**2nd**	**3rd**		
OPV	**1st**	**2nd**	**3rd**		
PCV	**1st**	**2nd**	**3rd**		
IPV	**1st**		**2nd**		
MR				**1st**	**2nd**
If the child missed the 2nd or 3rd dose, as early as possible complete the dose.					