



Government of Malawi  
Ministry of Health

# GUIDELINES FOR THE MANAGEMENT OF SEVERE ACUTE MALNUTRITION



BOOK T3

# Acknowledgements

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# Foreword

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Malnutrition among the under five children has remained a major public health problem in Malawi without significant improvement over the years. According to MDHS, 2000, almost half (49%) of the under five population has chronic malnutrition, 25% are underweight while 6% are wasted with about 3% of them severely wasted. These high levels of malnutrition have negative impact on survival, growth and development of under five children.

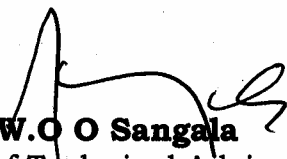
Severe cases of malnutrition are managed in health facilities through Nutrition Rehabilitation Units (NRUs) or pediatric wards spread out across the country, however, their management has for a long time not been well defined and standardized. This has led to poor standards of management, slow response to treatment, and high rate of relapses, high morbidity and mortality rates among the children.

It is against this background that the Ministry of Health in collaboration with UNICEF, WHO and other key partners developed National Guidelines for Management of Severe Malnutrition. The guidelines provides information on classification of malnutrition, admission, follow up and discharge criteria, nutritional and medical management of malnourished children in order to standardize and improve the quality of care for severe acute malnutrition across the country.

The guidelines have been developed in a collaborative process using WHO guidelines, Ministry of Health, CHAM and NGO experiences within and outside the country.

The Ministry of Health recognizes that effective management of severe acute malnutrition saves lives and reduces the burden on health care resources. It is, therefore, urging all NRU staff and other implementing partners to follow and adhere to these guidelines and all accompanying materials.

The Ministry wishes to sincerely acknowledge the dedication and contributions of all those who have tirelessly worked towards the successful completion of these guidelines through their technical input, material and financial assistance to the production of these guidelines.



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# Abbreviations

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<	Less than
>	Greater than
≤	Less than or equal to
≥	Greater than or equal to
ANC	Ante-Natal Clinic
CCP	Critical Care Pathway
CMV	Combined Mineral and Vitamin
HSA	Health Surveillance Assistant
IM	Intramuscular Injection
IMCI	Integrated Management of Childhood Illness
IV	Intravenous
LP	Likuni Phala
LW	Lactating Woman
MCH	Mother and Child Health
MM	Maize Meal
MUAC	Mid-Upper Arm Circumference
NG	Naso-Gastric
NRU	Nutrition Rehabilitation Unit
PW	Pregnant Woman
SFP	Supplementary Feeding Programme
SP	Sulphadoxine and Pyrimethamine
SS	Supplementary Suckling
TA	Traditional Authority
TFP	Therapeutic Feeding Programme
W/A	Weight-for-Age
W/H	Weight-for-Height

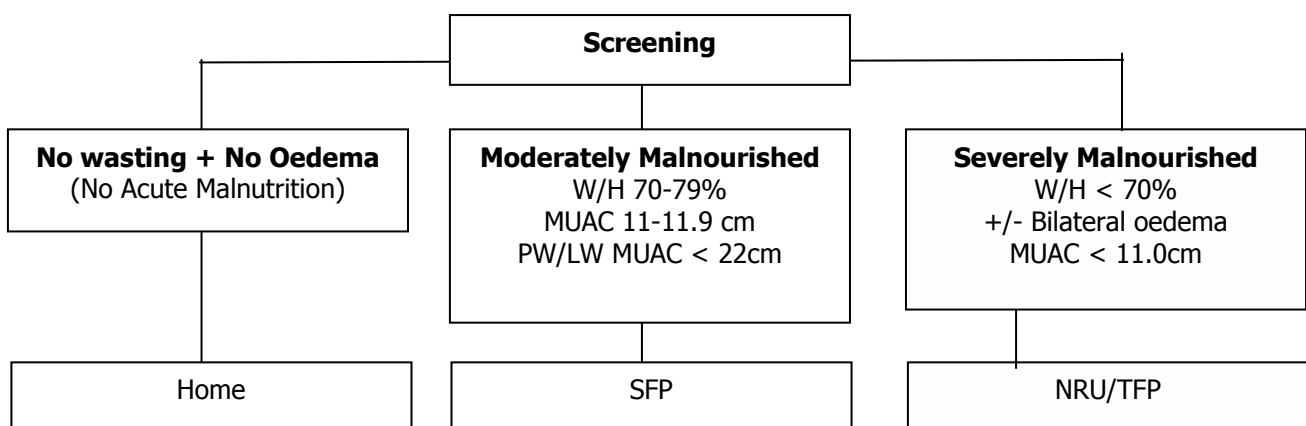
# Introduction

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This document provides practical guidelines for the identification and management of children with severe acute malnutrition. Severely malnourished children are very thin and/or have oedema (excess fluid). The screening process (chart 1 below) is an important tool in identifying which children need treatment and nutrition support. The accepted ways of identifying moderate and severe acute malnutrition include weight for height percentage median<sup>1</sup>, bilateral oedema and mid-upper arm circumference (MUAC).

Malnutrition is a consequence of many factors; medical, economic and social and may become life threatening; therefore it needs to be addressed. The treatment of severe acute malnutrition is different from that for moderate acute malnutrition. Severe acute malnutrition requires specialised treatment as an inpatient, initially in a paediatric ward or Nutrition Rehabilitation Unit (NRU), whereas moderate acute malnutrition is treated on an outpatient basis through a supplementary feeding programme (SFP). This document outlines the steps and procedures for treating severely malnourished children in an NRU, hospital or other facility that has responsibility for such patients. The guidelines contain all the essential information. More detailed explanations are provided in the National Training Manual for Treatment of Severe Acute Malnutrition. Treatment of severely malnourished infants < 6 months of age is described separately as this group present special challenge to health staff.

**Chart 1**  
**Screening process for moderate and severe acute malnutrition**



<sup>1</sup> Percentage of median is used as admission criteria as it is more sensitive to admitting smaller children who are at higher risk of mortality. Other manuals use Z-score which increases admissions of older children. Z-score tables are not available for older children, and adolescents.

Children with severe acute malnutrition must be treated differently from other children because their physiology is seriously abnormal. Many of the systems of the body 'shut down' in response to inadequate intakes. These children may die if they are treated and fed like a well-nourished child. Therefore specialised therapeutic milk has been formulated for the treatment of acute malnutrition. Common causes of death are hypoglycaemia, hypothermia, hidden infection, and heart failure from sodium and fluid overload.

Treatment of severe acute malnutrition involves 10 steps in two phases: an initial stabilisation phase for management of acute medical conditions (Phase 1), and a longer rehabilitation phase (Phase 2). Chart 2 shows the approximate time-scale of these two phases. There is a short transition period between the phases.

### Chart 2

#### Ten steps for treatment of severely malnourished children: approximate time scale

Steps and Action	Stabilisation		Rehabilitation
	Days 1-2	Days 3-7	Week 2-6
1 Prevent or treat hypoglycaemia →			
2 Prevent or treat hypothermia →			
3 Prevent or treat dehydration →			
4 Correct electrolyte imbalance →		→	→
5 Treat and prevent infection →		→	
6 Correct micronutrient deficiencies →	<b>No iron</b>	<b>No iron</b>	<b>With iron</b>
7 Start cautious feeding →		→	
8 Give catch-up diet for rapid growth			→
9 Provide loving care, play and stimulation →		→	→
10 Prepare for follow-up and discharge			→



Aim of the stabilisation phase:

- Treat infections and other urgent medical problems
- Provide sufficient energy and nutrients to stop further loss of muscle and fat tissue
- Correct fluid and electrolyte imbalance

Aim of the rehabilitation phase:

- Provide sufficient energy to have catch up growth and recover from severe malnutrition
- Treat other underlying infections or complications
- Prepare for discharge home

## Admission

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- To identify those with severe malnutrition, screen the patients using weight for height, MUAC and check for bilateral oedema.
- Calculate percentage weight for height and record bilateral oedema if present and admit if necessary. Give them priority in the queue so they can receive prompt attention. Those with signs of shock (lethargic, unconscious) or severe anaemia need emergency treatment (see treatment of complications)
- While waiting to be admitted give 50ml of 10% sugar in water (1 rounded 5ml teaspoon sugar in 50ml water) to prevent hypoglycaemia
- Explain to the caregiver the procedures of the centre and reason for admission
- When the child reaches the NRU or paediatric ward, measure weight, height (or length) and MUAC very carefully. It is essential that this admission weight is taken very accurately as this weight is used to calculate the amount of feed and medicine to give
- Register the patient in the registration book (Annex 6)
- Fill out the history and examination sheet (Annex 7)
- Fill out Critical Care Pathway (CCP) or Multi Chart for severe acute malnutrition (Annex 8)

### Admission criteria

- Weight for height < 70 percentage median and/or
- Bilateral oedema and/or
- MUAC < 11cm in children aged 1-5 years

# Treatment of patients older than 6 months

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## Phase 1

### Diet

Severely malnourished children need special feeds. Therapeutic milk, F75 (100ml = 75kcal), is used to stabilise children in phase 1.

- Give 8 feeds per day. Frequent feeds (every 3 hours) help prevent hypoglycaemia and hypothermia. Night feeds are important.
- Give F75 to all children except infants < 6 months where breastfeeding is being re-established
- Continue breastfeeding on demand as usual.

### Preparation of F75

- Mix one packet of F75 with 2 litres of cooled boiled water. If making small quantities of F75 use table E, Annex 5 for calculations.
- If pre-packaged F75 is not available use one of the recipes in Table A, Annex 5, It is also necessary to add combined mineral vitamin (CMV) mix

### Amounts to give in phase 1

This is determined from the child's admission weight. Keep the amount the same for all of Phase 1 even if the child gains or loses weight.

#### Mild/Moderate oedema

If the child has no oedema (or only mild/moderate oedema) give 130ml/kg/day. Annex 1 shows the amount per feed according to the child's weight.

#### Severe Oedema

If the child has *severe oedema*, the weight may be 20-30% higher than the true weight due to excess fluid. So use the lower amounts in Annex 2. Only give to children with severe oedema and monitor closely. Move to normal quantities of Phase 1 as soon as oedema starts to subside otherwise condition may deteriorate even further

#### Naso-gastric feeding

Naso-gastric (NG) feeding is used when a child will not take sufficient F75 by mouth for a number of feeds (1-2 days). This is defined as an intake of less than 75% of the prescribed diet. A child who does not take enough by mouth will get worse and may die.

The reasons for using NG tube are:

- Poor appetite or refuses to eat
- Unconscious, lethargic or convulsing.
- Pneumonia with a rapid respiration rate
- Painful lesions of the mouth
- Cleft palate or other physical deformity

### Deficiencies

Severely malnourished children have deficiencies of potassium, magnesium, and other micronutrients and it is essential to correct these deficiencies. These nutrients have been included in the pre-packaged F75 (and F100) during manufacture. Also give additional vitamin A and folic acid as shown below. No iron is given in Phase 1 even if the child is anaemic, as giving iron too early is dangerous. If pre-packaged F75 and F100 are not available, extra potassium, magnesium, zinc, copper and multivitamins must be provided daily.

## **Routine medicines**

### **1. Vitamin A:** *(on day 1, day 2 and day 14)*

**Table 1**  
**Vitamin A treatment**

<b>Age</b>	<b>Vitamin A orally on day 1, 2 and 14</b>
< 6 months	50,000 IU (15,000µg) (2 drops, or one third a red capsule)
6 to 12 months	100,000 IU (30,000µg) (3 drops or half one red capsule)
> 12 months	200,000 IU (60,000µg) One red capsule

***Vitamin A deficiency is thought to be common among severely malnourished children in Malawi and clinical signs may be difficult to detect so 3 doses are given.***

### **2. Folic acid**

Give 5mg as one single dose on day 1. (If you are not using pre-packaged F75 or F100 give 1mg daily as well as the initial 5mg).

### 3. Systematic antibiotics

Infections are common in severely malnourished children but the usual signs such as fever are often absent. So assume all severely malnourished children have an infection and treat with antibiotics straightaway. Hypoglycaemia and hypothermia are danger signs of severe infection. For children who look sickly or have complications, give the antibiotic IV or IM. It works faster.

**Table 2**  
**Antibiotic regime**

On Admission if	Give
No Complications	Amoxycillin orally, 15mgs/kg/ three times daily for all of Phase 1 and four days extra
Complications	Gentamycin iv/im (7.5mgs/kg) once daily for 7 days <b>plus:</b>
	Chloramphenicol IV/IM (25mgs/kg) every 8hrs for 5 days (Give every 6hrs if suspected meningitis)
If child fails to improve within 48hrs ADD:	Review patients individually and add appropriate other antibiotics as necessary

***The antibiotic regimen can be changed according to local resistance patterns and should be reviewed every two years and decisions made in relation to sensitivity and resistance.***

### 4. Malaria

- If no malaria test is available then give all patients Fansidar (SP)
- If blood-smear is available then treat positive cases with Fansidar<sup>2</sup>.

**Table 3**  
**Dosage of Fansidar – One single dose only**

Weight (kg)	Dose (mg)	Tablets
< 5 (> 2months)	125	¼
5-10	250	½
11-20	500	1
21-30	750	1½
31-45	1000	2
> 45	1500	3

***Insecticide treated bed nets should be used.***

<sup>2</sup> An intravenous infusion of quinine is not safe in severe malnutrition

## 5. Measles

If no active epidemic in the area: Give one dose of measles vaccine on discharge to all children over 9 months of age unless there is a vaccination card which certifies that measles vaccine has been given.

If active measles epidemic in the area: Give all children aged from 6 months measles vaccine on admission. Give children over 9 months a second dose on discharge.

## Surveillance

- Weight is measured, entered in the multi chart and plotted on the chart each day
- The degree of oedema (0 to +++) is assessed and recorded each day.
- Body temperature is measured and recorded twice per day.
- The standard clinical signs (stools, vomiting, dehydration, cough, and respiration rate) are noted in the multi-chart each day.
- Height is taken after 21 days (when a new sheet is used)
- If the patient is absent, vomits or refuses a feed, and whether the patient is fed by NG tube or is given IV infusion or blood transfusion is recorded in appropriate place each day

## Treatment of complications

### 1- Hypoglycaemia

All severely malnourished patients can develop hypoglycaemia (blood glucose level <3mmol/l). This is more likely if there is an infection or long gaps between feeds. If the blood sugar level cannot be measured, or if the test cannot be done immediately, assume the child is hypoglycaemic and treat. One sign of hypoglycaemia is eye-lid retraction - if a child sleeps with his/her eyes slightly open, then he/she should be woken up and treated.

### Treatment

If child is conscious and able to drink:

- Give 5ml/kg of 10% sugary water orally. (dissolve 10g sugar in 100ml water). Or give a feed of F75 if this is quicker.

If child is losing consciousness:

- As above but give by NG tube.

If child is unconscious or convulsing:

- Give glucose IV immediately (5ml/kg sterile 10% glucose solution) followed by 5ml/kg 10% sucrose solution by NG tube. If IV glucose cannot be given quickly, give by NG tube.

For all severely malnourished children with hypoglycaemia:

- Begin F75 within 30 minutes. Feed frequently, preferably every 2 hours.
- Keep warm and start antibiotics immediately.

### **Prevention**

- Feed F75 immediately
- Feed every 3 hours day and night (preferably every 2 hours if the child is ill)
- Keep the child warm
- Start antibiotics immediately

## **2- Hypothermia**

Severely malnourished patients are highly susceptible to hypothermia (rectal temperature below 35.5°C or under-arm temperature below 35°C).

### **Treatment**

- Feed F75 immediately and start antibiotics
- Re-warm using the “kangaroo technique” where the child is held against the caregiver’s chest and they are both wrapped together using a blanket (or place child and caregiver near a heater)
- Put a hat on the child and wrap mother and child together
- Monitor child’s temperature every 2 hours during re-warming (or every 30 min if the child and caregiver are placed close to a heater). The temperature is normal when it reaches 36.5°C
- Feed frequently, preferably every 2 hours

### **Prevention**

- Children should sleep with their mothers for warmth
- There should be adequate blankets and a thick sleeping mat or adult bed
- Dress the child warmly, including a hat, as most heat is lost through the head
- Keep the room hot. Shut windows and doors at night
- Keep the child dry. Change wet clothes and bedding
- Feed frequently. Treat infections

### **3- Dehydration**

Dehydration is difficult to diagnose in the severely malnourished child. The clinical signs associated with dehydration in the well-nourished child as shown below are often present in the severely malnourished child without dehydration

- dry mouth
- sunken eyes
- skin lying in folds so that the child has a slow skin pinch (takes more than 2 seconds for skin to flatten)

This means that the history is very important in diagnosing dehydration in the severely malnourished child. Misdiagnosis and inappropriate treatment of dehydration is a common cause of death in the malnourished child. The standard treatment protocol for the well-nourished dehydrated child should not be used. The severely malnourished child has too much sodium and too little potassium in its body. Therefore the special low sodium, high potassium rehydration fluid ReSoMal (Rehydration Solution for Malnutrition) rather than the regular WHO ORS is recommended. See Table C + D, Annex 5 for instructions on how to make up ReSoMal.

There needs to be:

- a definite history of significant recent fluid loss - usually diarrhoea which clearly like water (not just soft or mucus) and frequent (more than 3 stools a day) with a sudden recent onset

#### **Treatment of dehydration**

Check and record pulse and respiration rate before commencing treatment. Treat dehydration with oral or naso-gastric ReSoMal. Do not treat dehydration with intravenous fluids as these children can become overloaded with fluid very quickly and this is very dangerous and can lead to heart failure.

- Re-hydrate more slowly than a well nourished child
- Give 5mls/kg ReSoMal every 30 minutes for the first 2hrs
- Continue with the ReSoMal at 5-10mls/hourly for the next 4-10hrs
- Encourage mother to give the fluid slowly, and to persist even if the child is slow to take the fluids
- If the child is refusing or vomiting insert a naso-gastric tube and commence NG fluids
- If rehydration is still continuing after six hrs start feeds using F75 and continue these 2-3 hourly alternating with ReSoMal
- Continue breastfeeding



- Length of rehydration is dependant on the child's thirst, fluid loss from vomiting and stools
- Rehydration should not continue for more than 12 hours

### **Monitoring**

It is important to monitor these children carefully during rehydration. Record the following half-hourly for two hours and then hourly:

- Respiratory rate
- Pulse rate
- Urine frequency
- Frequency of stool and vomit
- Watch for signs of overload

### **Signs of improvement**

- Decreasing pulse and respiration rate
- Reduced thirst
- Increasing urinary output
- Skin pinch is not so slow, eyes are less sunken and mouth moist (not always noticeable though in the severely malnourished child)
- Child is more alert

### **Signs of over-hydration**

- Increased heart rate by 25 beats a minute
- Increased respiration by at least 5 breaths a minute
- Signs of increased oedema (such as puffy eyelids)

If there are signs of over-hydration stop ReSoMal immediately and re-assess in one hour.

### **Prevention of dehydration in children with watery diarrhoea**

If watery diarrhoea continues after the child is rehydrated or if watery diarrhoea develops in the hospital:

- Give 30 ml ReSoMal after each watery stool
- Give slowly by cup and spoon
- Continue feeding including breastfeeding

### **Treatment of shock due to severe dehydration and/or sepsis**

Shock is a dangerous condition and requires emergency treatment. The common reasons for shock in the malnourished child are severe dehydration and sepsis. It is very difficult to differentiate shock due to severe dehydration or due to sepsis (infection) and often the shock may be due to a combination of both dehydration and sepsis. The first treatment is to commence with IV fluids and closely monitor how the child responds. If the shock is due to severe dehydration then the child will respond to the IV fluids. However if the shock is due to sepsis then the child will not recover and may quickly go into fluid overload. The main signs and symptoms are:

- Lethargic or unconscious
- Rapid weak pulse
- Cold hands and feet
- Slow capillary refill- it takes longer than 3 seconds (press on the nail until white and count number of seconds until pink colour returns)

### **Treating shock due to severe dehydration**

This patient is seriously ill and must be treated with intravenous fluids. The amount given is half or less of the fluid volume used in normal children. It is also important to keep the child warm and give glucose to prevent hypoglycaemia.

#### **Give the following:**

- IV fluids (5mls/kg/of 10% sterile glucose), prevent/treat hypoglycaemia
- IV antibiotics
- Oxygen
- IV fluids as below
  - Half strength Darrow's solution with 5% dextrose *or*
  - Ringer-lactate with 5% dextrose *or*
  - Half strength saline with 5% dextrose
- Give 15 ml/kg IV over the first hour and reassess the child. Use a paediatric giving set for safety to prevent fluid being infused too quickly
- Check pulse and respiration rate at start of treatment and then every 5-10 minutes to check for fluid overload

#### **After 1 hour:**

If there are signs of improvement (slower pulse and respiration rate)

- Repeat the 15ml/kg IV over the next hour and then stop IV infusion

- Then change to oral/NG rehydration at 10ml/kg/hr of ReSoMal for up to 10hrs
- Commence F75 after 4 hours oral/NG rehydration and continue with routine 2-3 hourly feeds alternating with ReSoMal
- Commence antibiotics, ampicillin IV (8 hourly) and gentamycin daily IM by 7 days

***If there is no improvement after one hour assume that the child has septic shock***

### **Treatment of septic shock**

All patients with signs of septic shock should immediately:

- Be given broad-spectrum antibiotics IV/IM
- Give maintenance IV fluids at 4ml/kg/hr until blood is available.
- Then transfuse at 10ml/kg slowly over 3 hours.
- Give furosemide just prior to the blood infusion at 1mg/kg IV
- Keep warm to prevent or treat hypothermia
- Keep fasting while blood infusion is in progress to prevent overloading
- Physically disturb the patient as little as possible

### **Monitor**

Monitor every 10-15 minutes for signs of deterioration, especially over-hydration and heart failure.

- Increasing respiratory rate (increasing by 5 breaths/min),
- Increasing pulse rate (25 beats /min)

If the child starts to improve following the blood transfusion, start F75 after 3 hours. If the child gets worse during the treatment stop IV fluids

## **4- Severe anaemia**

Anaemia is only a serious problem if it is very severe and there is risk of heart failure. Treat if the haemoglobin concentration is less than 40g/l or the packed-cell volume is less than 12% in the first 24 hours after admission.

- Stop all oral intake and IV fluids during the transfusion
- Give a small blood transfusion of whole fresh blood (10ml/kg) slowly over 3 hours (or 7ml/kg packed red cells if there are signs of congestive heart failure)
- Give a diuretic to make room for the blood (furosemide 1mg/kg given IV) at the start of the transfusion
- Wait 3 hours after the transfusion before starting feeding

Do not give a second transfusion even if the haemoglobin is still low.

**Do not give iron in Phase 1.**

## **5- Skin lesions**

Protect skin from damage by handling the child gently. Infections enter the body easily through broken skin or fissures. If there are raw areas:

- Apply barrier cream (zinc and castor oil ointment) or paraffin gauze dressings
- Give antibiotics as for 'Complications' (See table 2)

For sore areas around the perineum, omit diapers and keep the area dry. Apply nystatin cream twice daily if the diaper area is colonised with *candida*. Cover skin sores with a dry dressing.

## **6- Eye problems**

Corneal ulceration (from vitamin A deficiency) requires emergency care. Relax the eye to prevent the lens from being pushed out:

- Give vitamin A immediately (see table1)
- Put 1 drop of atropine into the affected eye 3 times daily to relax it
- Instil chloramphenicol or tetracycline eye drops 4 times daily for 7-10 days
- Cover the affected eye with a damp gauze pad (dampen with 0.9% saline), and bandage to hold the pad in place
- If necessary, put mittens or bandages on the hands to prevent the child touching the eye

Pus or inflammation: Instil chloramphenicol or tetracycline eye drops 4 times daily for 7-10 days.

## Transition Phase

F75 does not contain enough energy and protein for rapid weight gain so it is important to change to F100 as soon as the child is ready. The amount of F100 is controlled during the transition phase to avoid the risk of heart failure.

### Criteria for changing from phase 1 to transition phase

- Return of appetite (easily finishes feeds)
- Reduced oedema or minimal oedema. Children with severe oedema (+++) should remain in phase 1 until their oedema has reduced to moderate (++) . These children are particularly vulnerable.

## Diet

The only change that is made to the nutritional treatment on moving from phase 1 to the transition phase is a change from F75 to F100. The number of feeds, their timing and the volume given remains exactly the same in the transition phase as in phase 1.

- F100 (100ml = 100kcal) is used in the transition phase.
- Breastfeeding should continue on demand as usual.

### Preparation

Mix one packet of F100 with 2 litres of cooled boiled water. (If pre-packaged F100 is not available use one of the recipes in annex 5, table B) If small quantities are required see Annex 5.

## Surveillance

Check pulse and respiration rate frequently during the transition, preferably every 4 hours, for signs of fluid overload. Continue to record the surveillance data as for phase 1.

## **Criteria for change from transition phase to phase 2**

- For patients with no oedema, transfer after 2 days in transition phase
- Oedematous patients (kwashiorkor) should remain in transition phase until they have completely lost all their oedema

## **Criteria to move back from transition phase to phase 1**

- If any signs of fluid overload develop
- If tense abdominal distension develops
- If the patient gets significant re-feeding diarrhoea so that there is weight loss
- If a complication arises that necessitates an intravenous infusion

## **Phase 2**

The aim of phase 2 is to achieve rapid weight gain and rebuild lost tissues. This requires more energy, protein and micronutrients than were needed for phase 1. Iron is given in this phase. F100 is high energy milk and is given at this time.

## **Diet**

- F100 (100ml = 100 kcal) is used. If using the commercial product mix 1 packet of F100 in 2 litres of cooled boiled water. (See annex 5 Table B for how to prepare alternate recipes)
- Children should be allowed unlimited intake.
- Give 6 feeds (or 5 feeds if 6 is not possible) of F100 per day. Offer an additional feed of likuni phala to children who want it. This should have a similar energy and protein content to F100, so may need to be enriched (e.g. by adding peanut butter).
- Breastfeeding should continue on demand as usual.

## **Amount to give**

- Offer about 200ml/kg/day of F100 (see Annex 3 for volumes per feed)
- Encourage the child to eat until full. Never leave the child alone to feed
- Children should not be force fed

## Routine medicine

### 1. Iron

Iron is added to the diet of children in phase 2. Add 1 crushed tablet of ferrous sulphate (200mg) to each 2 litres of F100. If making 1 litre of F100, dissolve one tablet of ferrous sulphate (200mg) in 4ml water and add 2ml of the solution to the F100.

### 2. De-worming

Albendazole is given at the start of phase 2

**Table 4**  
**Albendazole treatment**

Age	< 1 year	1 ≤ 2 years	≥ 2years
Albendazole single dose	Do not give	200mg	400mg

## Surveillance

- Measure weight and check oedema three times per week
- Height is measured every 3 weeks
- Body temperature is measured each morning
- Standard clinical signs (stool, vomiting, etc) each day
- If “re-feeding oedema” occurs put back to the transition phase or to phase 1
- If a major illness occurs during phase 2, particularly during the first week, return to Phase 1 and give F75
- If significant “re-feeding diarrhoea” occurs and there is also a loss of weight, return the child to Phase 1. If the diarrhoea is mild, no change in feeding is needed

## Loving care, play and stimulation

All children need extra loving care in hospital. It is essential that the mother or caregiver is involved in the care of the child, in the feeding, washing, comforting and play particularly as the staff is often overworked.

Malnourished children also need extra stimulation because they are behind in their development. Delayed mental development can be the most serious long-term result of severe malnutrition. So help caregivers understand that playing and chatting with children helps their development and gives them a brighter future.

Some ideas to show caregivers are:

- Use tins as a drum and bang with spoons
- Put things ‘in’ and ‘out’ of a cup and teach these words whilst doing the action
- Build towers with small blocks of wood
- Make a ball (e.g. stuff a sock) and throw or kick
- Sing songs with actions (e.g. clapping hands)
- Play games like counting toes
- Look and talk around pictures
- Teach parts of the body, or names of clothes, when dressing
- Teach words like ‘*water*’ and ‘*splash*’ when bathing.

## Failure to respond

When the guidelines are followed most children should show signs of improvement within a few days. However there will be some cases that will not improve within this time frame and this is called “Primary Failure to Respond”. It is very important to identify the reasons for this failure to respond. The second group are the children who start to recover well in the initial period and then progress becomes static or the patient deteriorates. The table below outlines the different criteria for failure to respond.

When a child fails to respond then the common causes must be investigated and treated appropriately. Remember there may be multiple causes for failure to respond.

**Table 5**  
**Failure to respond**

Criteria for ‘failure to respond’	Time after admission
<b>Primary failure to respond</b>	
Failure to regain appetite	Day 4
Failure to start to lose oedema	Day 4
Oedema still present	Day 10
Failure to gain more than 5g/kg/d	Day 10
<b>Secondary failure to respond</b>	
Failure to gain more than 5g/kg/d for 3 successive days	During phase 2



## **Usual causes of failure to respond**

### Problems with the treatment facility:

- Poor environment for malnourished children
- Insufficient or poorly trained staff
- Inaccurate weighing equipment
- Food prepared or given incorrectly

### Problems of individual children:

- Insufficient food given
- Vitamin or mineral deficiency
- Malabsorption
- Rumination
- Other serious conditions and underlying diseases, especially: diarrhoea, dysentery, pneumonia, tuberculosis, urinary infection, otitis media, malaria, HIV/AIDS, schistosomiasis/leishmaniasis, hepatitis/cirrhosis

## **Primary failure to respond**

Every child with unexplained primary failure to respond should be checked carefully for feeding problems and infections as follows:

### Take a careful feeding history:

- Is the child finishing all milk feeds? Is the caregiver or another sibling taking the food, are night feeds being given? Check weight is taken properly.
- Check if feeding chart is being completed accurately
- Monitor child feeding, is the child taking other foods?
- Is there vomiting and/or diarrhoea?
- Check all aspects of preparation of feed: scales, measurements of ingredients, mixing, cooking etc

### Check Records on Multi-Chart or CCP

- Check if all medicines were given, especially antibiotics
- Check records of temperature, pulse and respiration rate

### Examine the child carefully, and retake medical history

- Take and record the temperature, pulse rate and respiration rate
- If possible, examine urine for pus cells and culture blood.
- Examine and culture sputum or tracheal aspirate for tubercule bacilli.
- Examine stool for blood, trophozoites or cysts of Giardia; culture for bacterial pathogens.
- Test for other illnesses such as TB, hepatitis or malaria
- If there are reasons to suspect HIV infection (based on clinical signs or diagnoses in the family), where possible test following pre-counselling.

## **Secondary failure to respond**

Secondary failure to respond (deterioration/regression after having progressed satisfactorily to Phase 2 with a good appetite and weight gain), is usually due to:

- Inhalation of food into the lungs. There is poor neuro-muscular co-ordination between the muscles of the throat and the oesophagus in malnutrition. It is quite common for children to inhale food into their lungs during recovery if they are:
  - a) force fed, particularly with a spoon
  - b) laid down on their back to eat/drink
- An acute infection that has been contracted in the centre from another patient
- Sometimes as the immune and inflammatory system recovers there appears to be “reactivation” of infection during recovery; acute onset of malaria and tuberculosis (for example sudden enlargement of a cervical abscess or development of a sinus) have been documented to occur several days after starting a therapeutic diet
- A limiting nutrient in the body that has been “consumed” by the rapid growth and is not being supplied in adequate amounts by the diet.

## **Discharge**

It takes about 4 weeks for a severely malnourished child to reach 85% weight for height. It takes much longer for the immune system to be repaired. Therefore children remain at risk of infection, relapse and death when they go home. Keeping them healthy and well-fed will help protect them.

## Criteria for discharge

Where there is no SFP for continuing support:

- W/H  $\geq$  85% for 3 days (two consecutive weights) and
- No oedema for 10 days

Where there is a well-functioning SFP:

- W/H  $\geq$  80% for 3 days (two consecutive weights) and
- No oedema for 10 days

## Familiarise children with enriched home foods

In the last 2-3 days prior to discharge give one meal/day of enriched family foods (in addition to F100 and likuni phala) to children >6 months so they get used to eating mixtures of local nutritious foods.

## Teach what to feed first at home

Teaching caregivers before discharge about how to prepare the food and feed children at home is essential.

- Find out which foods the family normally eats and which ones the child likes
- Discuss what other foods the family could obtain
- Discuss which mixtures of foods are best for the child. Most meals should provide extra energy, enough protein, and enough micronutrients
- Make sure the caregiver knows where to take the child for:
  - 6-monthly Vitamin A
  - Booster immunisations
- Discuss which foods would make good snacks (e.g. avocado pear, banana and other fruits, bread with peanut butter)
- Tell caregivers that frequent feeding is important (e.g. 3 meals and 2 snacks each day, plus breastfeeds, if still breastfeeding)
- Discuss ways of encouraging children to eat. They need lots of food.
- If possible, demonstrate how to make enriched meals, and let caregivers practise

## Teach the danger signs of infection and relapse

Tell caregivers to take the child to the clinic quickly if she/he develops any of the following:

- Not eating
- Fever
- Convulsions
- Cough with fast breathing or chest indrawing
- Very frequent watery stools or stools with blood
- Diarrhoea for > 4 days
- Oedema

### **Plans for follow-up**

- Explain that children will need regular follow-up at the local clinic for weighing
- Refer to the nearest SFP (supplementary feeding programme) for two weekly dry food rations and progress monitoring
- Give a referral letter or SFP referral ration card (pink ration card)

Clinic staff and health surveillance assistants are the key people involved in follow-up. They should assess progress by weighing and examining children two-weekly through the SFP and the HSA should advise the caregiver to take the child to the clinic in between if there are problems. It is essential that community health workers give the same messages as are given by the health staff in the NRU (otherwise caregivers will get confused). Therefore involve community health staff on messages about feeding practices, such as what to feed and how often.

## Treatment of infants less than 6 months or 3kg with a possibility of being breastfed

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There are many reasons for poor weight gain, or static weights in the breastfed infants <6mth or 3kg. The severely malnourished infants require nutritional and medical support to recover using the “Supplemental Suckling technique (“SS” technique) by giving some extra milk (supplemented milk) and lactation support. The aim is to give the infant enough supplemented milk for maintenance of body functions and the extra energy for growth is available from the breast milk. As the infant starts to improve, the infant suckling at the breast improves and breast milk production increases. This is the demand supply process, the more the infant feeds at the breast the more milk the mother produces.

### Admission criteria

- W/H < 70% and / or bilateral oedema

### Diet

The aim is to stimulate breast-feeding and to supplement the infant until breast milk is sufficient to allow the infant to grow properly. Breast milk is stimulated by frequent breastfeeding and also using the SS (Supplemental Suckling) technique. It is important to put the infant to the breast as often as possible.

- Breastfeed every 3 hours for at least 20 minutes, more often if the infant cries or seems to want more, alternating the breast at each feed.
- One hour after a normal breast-feed give maintenance amounts of F100-D (F100 diluted) (Annex 4) using the supplementary suckling technique described below

F100-D maintenance is 135ml/kg/day (100kcal/kg/day), divided into 8 feeds. The progress of the infant is monitored by the daily weight gain with a baby weighing scales graduated to within 10g or 20g.

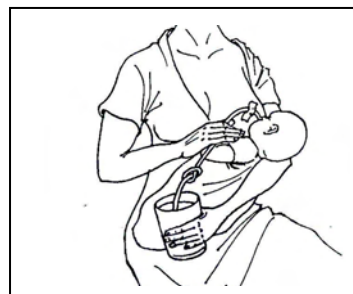
## Monitoring and regulating F100-D quantities

- If the infant gains weight with the maintenance quantity of F100-D, it means the quantity of breast milk is increasing as the infant starts to recover and gets hungrier. Therefore the supplemental milk should not be increased during the stay in the centre.
- If the infant loses weight or has static weight for 3 consecutive days, yet seems hungry and is taking all the F100-D, then breast milk amount is insufficient. Therefore add 5ml to each feed<sup>3</sup>. The volume of milk can be increased daily until weight is increasing. Then maintain at this quantity until the infant has reached target weight.
- These infants need to be monitored very closely. When the infant is gaining weight at a rate of at least 20g a day for three consecutive days, and is free from illness (with weight gains of this amount they should be free from illness) then start to reduce supplemental milk. This can be done whatever the %W/H the infant has reached.
- Decrease the quantity of F100-D by 1/3 the maintenance intake and continue for a further 2-3 days on this quantity of milk
- If the weight gain is maintained at 20g/d then reduce by a further 1/3 and continue on this quantity for a further 2-3 days then if weight gain is maintained discontinue supplemental milk. This weight gain is sufficient for catch up growth
- If the weight gain is not maintained, increase back to the previous volume of supplemental milk
- Keep the child in the centre for a further 5 days on breast milk alone to ensure that she/he continues to gain weight.
- When it is certain that the child is gaining weight on breast milk alone, she/he can be discharged no matter what the weight is. It is important to keep these infants in the centre for as short a period as possible to reduce risk of infection

## Supplementary suckling technique (SS technique)

The supplemental milk is given using a tube the same size as no 8 NGT.

- F100-D is put in a cup. The mother holds the baby in her arms and the cup with the milk in one hand.
- One end of the tube is put in the cup and the other end of the tube is put on the breast at the nipple. The infant is offered the breast in the normal way so that the infant attaches properly.



<sup>3</sup> The SS feed is giving maintenance amounts. If it is being taken and there is weight loss, either the maintenance requirement is higher than calculated or there is significant malabsorption.

- When the infant suckles on the breast, with the tube in his mouth, the milk from the cup is sucked up through the tube and taken by the infant.
- The cup should be placed at least 10cm below the level of the breast so the milk does not flow too quickly and distress the infant.
- The mother holds the tube at the breast with one hand and uses the other for holding the cup. Some mothers find it more convenient if the tube is held in place with a strip of tape, but this is not normally necessary.
- It may take one or two days for the infant to get used to the tube and taste of the F100-D but it is important to persevere.
- Once one mother is using the SS technique successfully, the other mothers find it quite easy to copy her.
- Support and reassure the mother that this technique works

## **Surveillance**

- Monitor the progress of these infants very carefully. The nurse should check progress daily, as they are particularly vulnerable.
- Record routine surveillance daily as with the other categories of malnourished, children taking particular care of accuracy of weights.
- Give routine medications as for the other severely malnourished children.

When infants are tolerating the SS feed well and recovering for a minimum of at least 7 days, then commence F100-D, diluting the F100 milk which was made for the Phase 2 with iron included.

## **Care for the mothers**

The aim is to increase breast milk and rehabilitate the infant. Therefore it is important to support the mother's breast feeding as well. Explain the SS technique to the mother. If there are other mothers in the centre using the technique, it may be easier to explain the process by showing how the other mother is doing the SS technique. Reassure the mother that the technique works and that she will produce enough milk to make her baby better.

- She should drink at least 2 litres of fluid per day
- She must eat a well balanced diet - about 2,500kcal/day
  - At least one porridge meal in the morning with CMV added
  - Two family meals
  - One porridge meal in the afternoon with CMV added

### **Routine treatment for mother**

The mother who is admitted in the centre with her malnourished child should receive vitamin A depending on age of infant (risk of new pregnancy):

### **Vitamin A for mother**

	<b>Give Mother</b>
Infant below 2mths old (No risk of mother being pregnant)	200,000IU stat

The length of stay in the NRU should be as short as possible. Therefore it is important to support the mothers and infants with all the care possible. However it is important that there is sufficient weight gain so that the infant will not relapse or fail to thrive at home.

### **Discharge criteria**

The infant is discharged as soon as

- It is clear that the infant is gaining weight on breast milk alone (daily weight gain of at least 20gm), this is sufficient for catch up growth
- The infant is free of illness

### **Follow-up**

Follow-up for these children is very important.

- The mother is admitted in the SFP and she receives a food ration to support lactation.
- The progress of the infant is monitored through the SFP
- The mother is advised to attend the MCH for ongoing growth monitoring and vaccine coverage
- The HSA follows up these infants in the community



# Treatment of infants less than 6 months or 3kg with no possibility of being breastfed

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Infants identified as severely malnourished with no opportunity of being breastfed are treated similarly to the older children but with some modifications. However the NRU is not appropriate for treating premature and low-birth-weight, non-breastfed infants below 49cm in length. These infants should be referred to the nursery for appropriate care.

On admission these infants receive F75 in phase 1 at a rate of 100kcal/kg/d. When stabilised and appetite is regained they are transferred to transition phase. In transition phase they receive F100-D (F100 diluted) but increase the volume 30%. These infants should stay in transition phase for a minimum of 2-3 days or until oedema has completely subsided and appetite returns. Then move to phase 2 where they remain on F100-D and increase the volume by a further 30%. The feeds must continue 3 hourly throughout the stay in the NRU, as these small children require frequent feeds.

## Diet

All severely malnourished infants receive F75 with the same quantities as the older children calculated by body weight (Annex 1). This is given by cup at a quantity of 130mls/kg/d in three hourly feeds. For the infants with severe oedema (+++) the chart with reduced quantities of F75 is used (Annex 2).

## Preparation

The preparation is the same as for the older children. Make up by adding 2 litres of cooled boiled water to a packet of F75 or use the recipe in Annex 5, table A.

## Routine medicine

The routine medical treatment for the infants < 6months or < 3kg is the same as for the older children. On admission they receive the following:

- Vitamin A 50,000 IU as a single dose
- Folic Acid 5mgs as a single dose on admission
- Routine antibiotics as for older children (see Table 2)

Infants with no complications ⇒ amoxicillin 3 times daily

Infants with complications ⇒ ampicillin IV and gentamycin IM

## Transition Phase

### Transfer to transition phase when

- Infant has stabilised and
- Regained appetite and
- Loss of oedema

## Diet

There is limited research on the best milk formula for severely malnourished infants but at present F100-D is given to this group of infants as it is of a similar consistency as breast-milk

- Give F100-D increasing the volume by 30% of what was given in Phase 1 (Annex 11 for quantities). The infant should remain in transition phase for a minimum of 2-3 days.
- Transfer to phase 2 if taking all milk, remains hungry and oedema has subsided completely. Ensure there are no complications such as vomiting or diarrhoea. Transfer to Phase 2

### Preparation of F100-D

Dilute one sachet F100 in 2.7 litres of cooled boiled water, instead of 2 litres, to make F100-D (Annex 5).

To make small quantities of F100-D:

- Use F100 already prepared, and take 100mls of this milk and add 35ml of cooled boiled water to get 135ml of F100-D. Do not make smaller quantities.

## Phase 2

### Diet

Give F100-D 8 hourly including overnight increasing the volume by a further 30% as shown in Annex 11. In Phase 2 the F100-D is diluted from the F100 made for phase 2 older children with iron added to the milk. If the infant is completing all the feeds and still hungry, then increase each feed by 5ml and reassess.

## Surveillance

This group needs to be closely monitored as they are particularly vulnerable and small weight changes are very important.

- Weigh daily with baby scales (to nearest 10-20gms) for accuracy and calculate weight gain or loss
- Record temperature, pulse and respiration rate at least twice daily
- Ensure infant is well clothed to reduce risk of hypothermia, and encourage the primary caregiver to sleep with the baby at night
- Closely monitor all feeds, record amount taken, and amount refused daily
- Record amount of vomit or diarrhoea
- Record medical treatment

## Discharge

When the infant reaches its target weight of 85% weight for height this infant is then changed to infant formula or another alternative breast milk substitute. This is done in close collaboration with the primary caregiver of the infant. Options of breast milk substitute are discussed with the primary caregivers considering the following:

- Alternatives need to be AFASS (acceptable, feasible, affordable, sustainable and safe).

Choices may include:

- a) modified cows milk
  - b) modified goats milk
  - c) infant formula
- Link with the IMCI facilities
  - Education on safe use of breast milk substitutes is conducted

## Discharge criteria

- W/H  $\geq$  85% for 3-4 days and
- No oedema for 10 days and
- On breastmilk substitute organised with primary caregiver

## **Follow-up**

Follow-up for these children is very important

- Refer the discharged infant to the MCH clinic advising the primary caregiver to attend for growth monitoring and vaccine coverage
- Admit the primary caregiver to the SFP programme where the caregiver will receive a food ration and follow up of the infant can be maintained

# Treatment of infants less than 6 months with nutrition problems but not severely malnourished

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Small children with static weight or losing weight but not severely malnourished, ideally should be admitted to a breastfeeding corner as it is possible that they will recover well with only support for lactation. Where possible it is better not to admit to an NRU or paediatric ward as there is increased risk of infection in a crowded environment with sick children. However if these infants are not responding to breastfeeding alone, then they can respond well to the SS technique. They receive nutrition support and the mother receives lactation support. These children do not require systematic medical care, only nutrition support. An SFP is not appropriate for the treatment of moderately malnourished infants less than 6 months old. However they do need support and this can be done with the SS technique and lactation support for the mother admitted to an SFP.

## Admission criteria

- Infant not gaining weight or losing weight but not severely malnourished
- Mother reports that she does not have enough breast milk
- Infant is weak or feeble and not suckling well but not severely malnourished

## Diet

Calculate F100-D required and give 3 three hourly feeds, one hour after breast feeding using the SS technique. Support mother with breast-feeding

## Surveillance

- Monitor weight gains daily
- When the infant is gaining at least 20g daily on SS technique reduce supplemental milk by one-third the following day
- Continue on SS for a further two days and if gaining at least 10g a day, then reduce supplemental milk again by a third.
- If the weight gain is maintained for another day (at least 10g a day) then stop the SS technique. The process of reducing the supplemental milk is faster in these infants as they are not severely malnourished and therefore should recover faster.
- If the weight gain is not maintained, then increase supplemental feed back to the previous amount and monitor weight gains closely, and repeat process.

- Keep in the centre for a further 5 days once supplemental milk has been stopped and continue with exclusive breastfeeding

## **Discharge**

Discharge home on exclusive breastfeeding when gaining weight (minimum of more than 2g/kg/d)

## **Follow up**

This is the same as for the other infants above.

# Annexes

## Annex 1

**QUANTITIES OF F75 IN PHASE 1 AND F100 IN TRANSITION PHASE**



<b>Phase 1 and Transition</b>	
<b>Class of Weight (kg)</b>	<b>8 feeds per day ml for each feed</b>
*2.0 - 2.1	40
*2.2 - 2.4	45
*2.5 - 2.7	50
*2.8 - 2.9	55
3.0 - 3.4	60
3.5 - 3.9	65
4.0 - 4.4	70
4.5 - 4.9	80
5.0 - 5.4	90
5.5 - 5.9	100
6.0 - 6.9	110
7.0 - 7.9	125
8.0 - 8.9	140
9.0 - 9.9	155
10.0 - 10.9	170
11.0 - 11.9	190
12.0 - 12.9	205
13.0 - 13.9	230
14.0 - 14.9	250
15.0 - 19.9	260
20.0 - 24.9	290
25.0 - 29.9	300
30.0 - 39.9	320
40.0 - 60.0	350

\*Do not give F100 full strength to children less than 3 kg

## Annex 2

### F75 DIET FOR CHILDREN WITH GROSS OEDEMA (+++) IN PHASE 1



<b>F75 in Phase 1 with Gross Oedema (+++)</b>	
<b>Class of Weight (kg)</b>	<b>8 feeds per day ml for each feed</b>
≤ 1.5	25
1.6 – 1.8	30
1.9 – 2.1	30
2.2 – 2.4	35
2.5 – 2.7	40
2.8 – 2.9	45
3.0 – 3.4	50
3.5 – 3.9	50
4.0 – 4.4	55
4.5 – 4.9	65
5.0 – 5.4	70
5.5 – 5.9	80
6.0 – 6.9	90
7.0 – 7.9	100
8.0 – 8.9	110
9.0 – 9.9	125
10 – 10.9	135
11 – 11.9	150
12 – 12.9	165
13 – 13.9	185
14 – 14.9	200
15 – 19.9	210
20 – 24.9	230
25 – 29.9	240
30 – 39.9	255
40 – 60	280

Review patients frequently and change quantity of phase 1 feeds as oedema starts to subside





## Annex 3

### QUANTITIES OF F100 IN PHASE 2



<b>Quantities of F100 in Phase 2</b>		
<b>Class of weight (kg)</b>	<b>ml per feed 6 feeds per 24 hr</b>	<b>ml per feed 5 feeds per 24 hr</b>
<b>Less than 3 kg</b>	<b>Full strength F100 is not used at this weight</b>	
3.0 - 3.4	110	130
3.5 - 3.9	120	150
4.0 - 4.9	150	180
5.0 - 5.9	180	200
6.0 - 6.9	210	250
7.0 - 7.9	240	300
8.0 - 8.9	270	330
9.0 - 9.9	300	360
10.0 - 11.9	350	420
12.0 - 14.9	450	520
15.0 - 19.9	550	650
20.0 - 24.9	650	780
25.0 - 29.9	750	900
30.0 - 39.9	850	1000
40.0 - 60.0	1000	1200



## Annex 4

### Maintenance F100-D for infants <6 months or <3kgs being breastfed



Maintenance F100 - D for infants < 6 months	
Class of Weight (kg)	ml of F100-D per feed (8 feeds/day)
< 1.5	30
1.6 - 1.8	40
1.9 - 2.1	40
2.2 - 2.4	45
2.5 - 2.7	50
2.8 - 2.9	55
3.0 - 3.4	60
3.5 - 3.9	65
4.0 - 4.4	70

\* if infants have static weights for 3 days or loosing weight increase each feed by 5mls and monitor closely



## Annex 5

### Recipes for making up F75, F100 and ReSoMal adding CMV (Combined Mineral and Vitamin mix)



It is possible to make up F75 and F100 from a variety of products if the commercial product is not available. In Table A and B below are recipes for making up F75 and F100 using either DSM (dry skimmed milk), DWM (dry whole milk) or fresh cow's milk. Sugar and oil are added to all recipes and three recipes also include cereal (maize flour) for making up F75. Apart from the cereal based recipe all recipes are made up with quantities of cooled boiled water. When using cereal in the recipes the mixture must be cooked for 4 minutes before serving.

**TABLE A: RECIPES TO MAKE F75**

Type of milk	Milk (g)	Sugar (g)	Oil (g)	Cereal powder (g)	Water (ml)
DSM (dry skimmed milk)	50	140	54	70	*Makeup to 2000mls
DWM (dry whole milk)	70	140	40	70	*Make up to 2000mls
Fresh cow milk	560	65	20	70	Make up to 2000mls
DSM (dry skimmed milk)	50	200	54	0	*Make up to 2000mls

\*For the recipes apart from the fresh cow's milk add about 1.82 litres to make up the 2 litres

Mix the sugar, oil, CMV and milk to make a paste then slowly add the cooled boiled water. Make up to 2 litres. If available use a food blender or whisk to make up the mix. **One red scoop of CMV (6.35g) is added to 2 litres of "made up" F 75 or F100.**

When using cereal in the F75 then add the CMV after the cereal mix has been cooked to prevent loss of minerals and vitamins during cooking process.

If CMV is not available, prepare mineral and vitamin mix as in WHO management of severe malnutrition 1999, annex 4.

**TABLE B: RECIPES TO MAKE F100**

Type of milk	Milk (g)	Sugar (g)	Oil (g)	Water (ml)
DSM (dry skimmed milk)	160	100	120	*Make up to 2000mls
DWM (dry whole milk)	220	100	60	Make up to 2000mls
Fresh cow milk	1800	100	50	Make up to 2000mls

\* add 1.7 litres to make up 2 litres of milk

One red scoop of CMV is added to 2 litres of "make up" F75 or F100



**Recipe for making up ReSoMal and table for making small quantities of ReSoMal from commercial product.**



TABLE C: RECIPE FOR RESoMAL

<b>Ingredient</b>	<b>Amount</b>
Standard WHO-ORS	One 1-litre packet
CMV (Mineral & Vitamin mix)	One red scoop 6.35 g
Sucrose (sugar)	50 g
Water	2000 ml

The standard WHO - ORS is not suitable for treatment of dehydration in the severely malnourished child. The table C above gives the ingredients required for making up ReSoMal. The standard ORS has 90 mmol of sodium while the ReSoMal has only 45 mmol sodium. Mix with cooled boiled water. It is important to check that standard ORS is being used as a new ORS with lower sodium levels is being developed and distributed.

TABLE D: FOR SMALL QUANTITIES OF RESoMAL –FROM COMMERCIAL PRODUCT

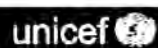
<b>Product</b>	<b>One Scoop</b>	<b>Water to add</b>
ReSoMal	One Scoop	140mls



## PREPARATION OF F100 MILK



Red scoop of F100	Water in mls	
1	18	
2	36	
3	54	
4	72	
5	90	
6	108	
7	126	
8	144	
9	162	
10	180	
F100 sachets	Water in mls	F100 milk
1/4 = 115g	500	600ml
1/2 = 230 g	1000	1200ml
1 Sachet	2000	2400ml
2 Sachets	4000	4800ml



## PREPARATION OF F100 MILK



Red scoop of F100	Water in mls	
1	18	
2	36	
3	54	
4	72	
5	90	
6	108	
7	126	
8	144	
9	162	
10	180	
F100 Sachets	Water in mls	F100 milk
1/4 = 115g	500	600ml
1/2 = 230 g	1000	1200ml
1 Sachet	2000	2400ml
2 Sachets	4000	4800ml



**F100-D**

<b>Red scoop of F100</b>	<b>Water in ml</b>	
<b>1</b>	<b>24</b>	
<b>2</b>	<b>48</b>	
<b>3</b>	<b>72</b>	
<b>4</b>	<b>96</b>	
<b>5</b>	<b>120</b>	
<b>6</b>	<b>144</b>	
<b>7</b>	<b>168</b>	
<b>8</b>	<b>192</b>	
<b>9</b>	<b>216</b>	
<b>10</b>	<b>240</b>	
<b>Sachet F100</b>	<b>Water in ml</b>	<b>F100 milk</b>
<b>1/4 = 115g</b>	<b>670</b>	<b>700ml</b>
<b>1/2 = 230 g</b>	<b>1350</b>	<b>1500ml</b>
<b>1 Sachet</b>	<b>2700</b>	<b>3000ml</b>
<b>2 Sachets</b>	<b>5400</b>	<b>6000ml</b>







Admission						Discharge				Minimum Weight	Date of Minimum Weight	Length of Stay	Outcome
Date	Weight	Height	W/H%	Oedema	MUAC	Date	Weight	Height	W/H%				

# Annex 7

## History and Examination Sheet

Registration No:.....

Name ..... Age ..... Date of Birth ..... Date of Admission .....

Weight .....kg Height.....cm %Weight for Age..... %Wt/Ht.....

HISTORY	Oedema	Y / N	How long for .....
	Diarrhoea	Y / N	How long for .....
	Vomiting	Y / N	How long for.....
	Cough	Y / N	How long for .....
	Rash	Y / N	How long for .....
	Fever	Y / N	How long for .....
	Anorexia	Y / N	How long for .....
	Other (Please specify)		.....
Breast feeding	Y / N	When stopped	

Any previous admissions? Y / N (Please give details) Diagnosis. and Dates .....

FAMILY HISTORY Any history of TB contact Y / N, (give details)  
Other Y / N (details)

Mother well Y / N (details please).....

Father well Y / N (details please).....

Parents separated Y / N when? .....

Number of Siblings Alive ..... Died .....

Siblings Well Y / N (details including age).....

Birth History ..... Vaccinations .....

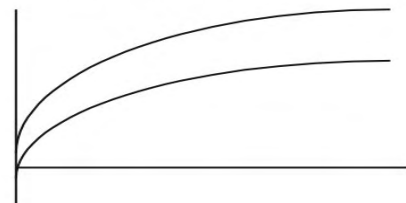
Previous blood transfusion Y / N when..... Previous drugs in last 2 weeks .....

Other.....

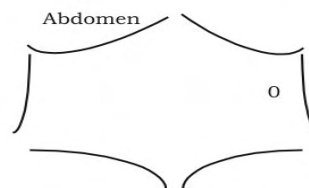
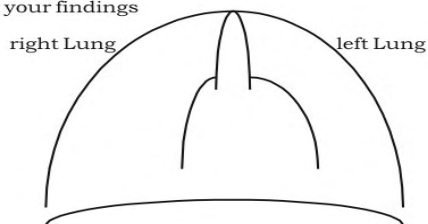
### EXAMINATION

Oedema	0	+	++	+++	
Rash	0	+	++	+++	
Skin ulcers			Y / N		
Axillary LN			Y / N		
Irritability/Apathy			Y / N		Hepatomegaly Y / N .....cm
Oral thrush/ sores			Y / N		Splenomegaly Y / N ..... Cm
					Neurological Impairment Y/N .....
Palor			Y / N		
Chest signs			Y / N		
Finger Clubbing			Y / N		

Under Fives Chart



please draw your findings



Diagnosis .....





# FORM T1 - MULTI CHART FOR SEVERE MALNUTRITION



Routine Medicine	Vit A..... iu																			
	Folic Acid 5 mg (po)																			
	Antibiotic 1 Time																			
	Malaria medicines (S/P)																			
Special Medicine	Albendazole (SP)																			
	Antibiotic 2 Time																			
	Antibiotic 3 Time																			
	Resomal																			
	IV fluid																			
Test Results	Blood																			
		Date	Result	Date	Result	Date	Result													
Test Results	Hb/ PCV																			
	Malaria smear																			
	Glucose																			
	Chest X-ray																			
	Elisa Test																			

Card	IMMUNISATION DATES					
	Y <input type="checkbox"/> N <input type="checkbox"/>	Birth	1	2	3	4
BCG						
POLIO						
DPT						
MEASLES				Extra	Extra	



# Annex 9 NRU monthly report

Name of the facility: ..... District ..... Month.....  
 TA..... Village..... Year.....  
 Prepared by: .....

Age Group	Total beginning of the month (A)	Admissions				Discharges						Total end of the month (L)  L = (A+E) - K		
		W/H<70% MUAC<11cm BMI <16 (B)	OEDEMA (C)	RE-ADMISSION (D)	TOTAL (E=B+C+D)	CURED (F)	DEATH (G)		ABSCOND (> 2 days of absence) (H)	MEDICAL TRANSFER (I)			Other (J)	TOTAL K = F+G+H +I+J
							PW	NRU		Hosp	Other			
< 6month														
6-59months														
60months - 10yrs														
Adolescents														
Adults 18 +														
<b>TOTAL</b>														
						%	%	%				%		
						>75%	<10%	<15%				Target		

**Children <59 months**

- Without Mother
- Without Father
- Without Both Parents
- With Both Parents

**Other Indicators for Children < 59 months cured**

	Marasmus	Kwashiorkor
Mean Length of Stay/ Days		
Mean Weight Gain gm/kg/d		

**Children ≤59 months:**

New admissions only

Male

Female

## Annex 10

### POSTER T3- CALCULATIONS FOR DRUG DOSAGE FOR BODY WEIGHT

Ministry of Health



Antibiotic	Route/Dose/ Frequency/ Duration	Formulation	Dosage according to child's weight		
			3-6 kg	6-8 kg	8-10 kg
<b>Amoxicillin</b>	Oral: 15mg/kg every 8 hrs for 5 days	Tablet, 250 mgs	¼ tablet	½ tablet	½ tablet
		Syrup, 125mg/5ml	2.5ml	5ml	5ml
		Syrup 250mg/5ml	1.5ml	2ml	2.5ml
<b>Chloramphenicol</b>	IV or IM: 25mgs/kg 8 hourly (6 hourly for meningitis)	IV: powder for injection 1gm vial mix with 9.2ml sterile water	1.25ml	1.75ml	2.5ml
		IM: 1gm vial mix with 3.2ml sterile water	0.75ml	1ml	1.25ml
<b>Gentamycin</b>	IV or IM: 25mgs/kg daily	IV: 10mgs (sulphate)/ml in 1ml vial 20mg, 40mg, 80mg (sulphate) /ml in 2ml vial	Calculate for individual weight	Calculate for individual weight	Calculate for individual weight
		IM: as above	Calculate for individual weight	Calculate for individual weight	Calculate for individual weight



unicef

POSTER T3



## Annex 11

### Feeding regime for infants <6months or 3kgs with no possibility of being breastfed



Transition Phase	
Class of Weight	MI of F100-D per feed (8 feeds/day)
≤1.5	40
1.6 -1.8	50
1.9 -2.1	50
2.2 – 2.4	60
2.5 – 2.7	65
2.8 – 2.9	70
3.0 – 3.4	80
3.5 -3.9	85
4.0 - 4.4	90

Phase 2	
Class of Weight	MI of F100-D per feed (8 feeds/day)
≤1.5	50
1.6 -1.8	65
1.9 -2.1	65
2.2 – 2.4	70
2.5 – 2.7	80
2.8 – 2.9	90
3.0 – 3.4	95
3.5 -3.9	105
4.0 - 4.4	110

\*If infants are still hungry on this volume then increase each feed by 5ml



## Calculations of NRU Monthly Indicators



Each month the number of cured patients, deaths, transfers and defaulters is expressed as a percentage of the total number of patients leaving the programme during the reporting month.

### **Cured Rate**

❖ (Number of patients discharged **cured** divided by number of exits) multiplied by 100

$$\frac{F \times 100}{K}$$

### **Death Rate**

❖ (Number of **deaths** in the centre divided by number of exits) multiplied by 100

$$\frac{G \times 100}{K}$$

### **Defaulter Rate** (*Absence from the centre for two consecutive distributions*)

❖ (Number of defaulters divided by number of exits) multiplied by 100

$$\frac{H \times 100}{K}$$

### **Transfer Rate**

❖ (Number of **transferred** divided by number of exits) multiplied by 100

$$\frac{I \times 100}{K}$$

### **Mean length of stay**

❖ Sum of number of days from admission day to the last day for all cured patients for this month divided by number of cured patients this month

### **Minimum Standards**

Comparison of the NRU monthly data with standard reference value allows assessment of how well the programme is functioning.

### **Reference values for Indicators:**

<b>Indicators</b>	<b>NRU Acceptable</b>	<b>NRU Alarming</b>
<b>Cured rate</b>	> 75%	< 50%
<b>Death rate</b>	< 10%	> 15%
<b>Defaulter rate</b>	< 15%	> 20%
<b>Length of stay</b>	30-40 days	> 40 days

\*Humanitarian charter and minimum standards in disaster response (Sphere)