

Treatment Protocol

# Integrated Management of Acute Malnutrition

2017

Department of Public Health  
Ministry of Health and Sports

**COMMUNITY  
MOBILIZATION**

**OUTPATIENT  
TREATMENT  
PROGRAMME**

**SUPPLEMENTARY  
FEEDING  
PROGRAMME**

**INPATIENT  
TREATMENT  
PROGRAMME**



unicef 





# **Treatment Protocol for Integrated Management of Acute Malnutrition 2017**

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Department of Public Health  
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## Acknowledgements

This protocol is a compilation of guidance and tools to support the integrated management of acute malnutrition in Myanmar. This IMAM Protocol has been developed with the support of the National Nutrition Centre and UNICEF Myanmar. The guideline has been established with active inputs by National Nutrition Centre and other stakeholders in Myanmar.

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# Preface

Global evidence has shown that investment in nutrition is an important contribution to the socio-economic development of our country, through improved health, growth and development of children, aiming to become more productive adults. Nutrition also contributes to most of the Sustainable Development Goals (SDGs) as crucial pillar. Myanmar is proud to be part of the global Scaling Up Nutrition (SUN) movement and is committed to ensuring adequate nutrition investments are made so that children in Myanmar everywhere can grow to their full potential.

In Myanmar, severe acute malnutrition among under-five children can be still high in some areas of the country. Children suffering from severe acute malnutrition are at a greater risk of morbidity and mortality, and therefore it is critical that adequate services are available to manage these cases. The management of acute malnutrition is one of the high impacts, evidence-based nutrition interventions for children. Recognizing its contribution to under five child mortality reduction, the Ministry of Health and Sports (MoHS) is committed to implement the essential package of healthcare services in Myanmar in integrated approach; and the management of acute malnutrition is part of it.

Building local capacities and delivering Integrated Management of Acute Malnutrition (IMAM) through health facilities is a key strategy, in combination with preventive, community-based, multi-sectoral approaches to reduce malnutrition. The Integrated Management of Acute Malnutrition National Protocol and guidelines have been developed specifically for the Myanmar context based on evidence and global guidelines from World Health Organization, UNICEF and other experts. The protocol sets standards to improve quality of care for children suffering from acute malnutrition and is intended to support health workers and administrative staffs in planning, service delivery and monitoring of care, as part of the essential package of health services. This document provides guidance for health workers at all levels to ensure early detection, treatment and timely referrals of malnourished children, and is integrated into other key paediatric services that MoHS provides such as Integrated Management of New born and Childhood Illness, Ante Natal Care, Post Natal Care and Essential Newborn Care.

IMAM National Protocol links to an essential paediatric service as well as is an evidence-based nutrition intervention to reduce under 5 mortality and, hence, should be prioritized. Efficient coordination and communication between in-patient and rural outpatient facilities is vital so that a child requiring

hospital treatment is identified and referred quickly by trained basic health staff, increasing the child's chances of survival and recovery.

This protocol been developed by the National Nutrition Centre, Department of Public Health in collaboration with Peaditrcians in Myanmar, with the technical support of UNICEF.

Special thanks should go to the Department of Medical Services, Department of Health Professional Resource Development and Management under Ministry of Health and Sports and the development partners.

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# List of Acronyms

<b>ACT</b>	Artemisinin-based Combination Therapy
<b>AIDS</b>	Acquired Immuno-Deficiency Syndrome
<b>ART</b>	Anti-Retroviral Treatment
<b>ARV</b>	Anti-Retroviral
<b>AMW</b>	Auxiliary Nurse Midwife
<b>AWD</b>	Acute Watery Diarrhea
<b>BMI</b>	Body Mass Index
<b>BMS</b>	Breast Milk Substitute (Infant formula milk)
<b>CCM</b>	Community Case Management
<b>CEU</b>	Central Epidemiological Unit
<b>CFT</b>	CMAM Focus Township
<b>CHW</b>	Community Health Worker
<b>CLTS</b>	Community-Led Total Sanitation
<b>CMAM</b>	Community based Management of Acute Malnutrition
<b>CM</b>	Community Mobilisation
<b>CNC</b>	Community Nutrition Centre
<b>CMV</b>	Complex of Minerals and Vitamins
<b>CSB</b>	Corn Soya Blend
<b>EBF</b>	Exclusive breastfeeding
<b>ENA</b>	Essential Nutrition Action
<b>EPI</b>	Extended Program of Immunization
<b>ER</b>	Emergency Room
<b>FATVAH</b>	Frequency, Amount, Texture, Variety, Active feeding, Hygiene
<b>FBF</b>	Fortified Blended Food
<b>F100</b>	Therapeutic milk used in Transition/Recovery Phases of SAM treatment
<b>F100dil</b>	Diluted F100, used in the treatment of severely malnourished infants less than 6 Months
<b>F75</b>	Therapeutic milk used in Acute-phase of SAM in-patient treatment
<b>GAM</b>	Global Acute Malnutrition
<b>HA</b>	Health Assistant

<b>H/A</b>	Height-for-Age
<b>Hb</b>	Haemoglobin
<b>HC</b>	Health Centre
<b>HIV</b>	Human Immunodeficiency Virus
<b>HV</b>	Home Visit
<b>IASC</b>	Inter Agency Standing Committee
<b>IEC</b>	Information, Education, Communication
<b>IFE</b>	Infant Feeding in Emergency
<b>IM</b>	Intra-muscular
<b>IMAM</b>	Integrated Management of Acute Malnutrition
<b>IMCI</b>	Integrated Management of Childhood Illness
<b>IP</b>	In-Patient Facility
<b>IU</b>	International Units
<b>IV</b>	Intra-venous
<b>LHV</b>	Lady Health Visitor
<b>LoS</b>	Length of Stay
<b>LW</b>	Lactating Women
<b>MAM</b>	Moderate Acute Malnutrition
<b>MCH</b>	Maternal and Child Health (clinic based program)
<b>MICS</b>	Multiple Indicator Cluster Survey
<b>MNP</b>	Micro-Nutrient Powder
<b>MUAC</b>	Mid-Upper Arm Circumference
<b>MW</b>	Midwife
<b>NCHS</b>	National Centre for Health Statistics of USA
<b>NFP</b>	Nutrition Focal Point
<b>NGO</b>	Non Government Organisation
<b>NGT</b>	Naso-Gastric Tube
<b>NNC</b>	National Nutrition Centre
<b>OPD</b>	Out-Patient Department
<b>OT</b>	Outpatient Therapeutic Treatment
<b>PLW</b>	Pregnant and Lactating Women
<b>PO</b>	Per oral
<b>RDA</b>	Recommended Dietary Allowances
<b>ReSoMal</b>	modified oral Rehydrating Solution for Malnourished Children
<b>RHC</b>	Rural Health Centre

<b>RUSF</b>	Ready to Use Supplementary Food
<b>RUTF</b>	Ready-to-Use Therapeutic Food
<b>RWG</b>	Rate of Weight Gain
<b>SAM</b>	Severe Acute Malnutrition
<b>SC</b>	Stabilization Centre
<b>SFC</b>	Supplementary Feeding Centre
<b>SF</b>	Supplementary Feeding
<b>SMART</b>	Specific, Measurable, Achievable, Realistic, Timely
<b>SRHC</b>	Sub Rural Health Centre
<b>SRNFP</b>	Nutrition Focal Person at State/Region
<b>SRNT</b>	State/Regional Nutrition Team
<b>SS</b>	Supplementary Suckling Technique
<b>TBA</b>	Traditional Birth Attendant
<b>TB</b>	Tuberculosis
<b>TFC</b>	Therapeutic Feeding Centre
<b>TMO</b>	Township Medical Officer
<b>UHC</b>	Urban Health Centre
<b>VFB</b>	Village Food Bank
<b>VCT</b>	Voluntary Counselling and Testing (program for HIV/AIDS)
<b>W/A</b>	Weight-for-Age
<b>W/H</b>	Weight-for-Height
<b>W/L</b>	Weight-for-Length
<b>WHO</b>	World Health Organization







## Introduction

Malnutrition is one of the most challenging public health problems in South East Asia. According to the Demographic and Health Survey (DHS) held in 2015-2016, in Myanmar:

- 29.2% of children are stunted (too short for their age);
- 18.9% of children are underweight (too thin for their age);
- 7.0% of children are wasted (too thin for their height).

Malnourished children, particularly those with severe acute malnutrition, have a higher risk of death from common childhood illness such as diarrhoea, pneumonia, and malaria. In 2016, WHO emphasizes nutrition-related factors contribute to about 45% of deaths in children under 5 years of age<sup>1</sup>.

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<sup>1</sup> <http://www.who.int/mediacentre/factsheets/fs178/en/>

## I-I Overview of Malnutrition

Although Malnutrition consists of over-nutrition as well as under-nutrition, the term “Malnutrition” used in this protocol specifically means “under-nutrition”. There are different types of malnutrition and different underlying causes of malnutrition.

### I-I-I Types of Malnutrition

Malnutrition specifically Under-nutrition encompasses stunting (chronic malnutrition), wasting (acute malnutrition), underweight (acute or chronic), and micronutrient deficiencies. All four types of under-nutrition can overlap in the same child. The indicators for the different forms of under nutrition are described in Table 1.

TABLE 1. INDICATORS FOR DIFFERENT FORMS OF UNDER NUTRITION

	Wasting	Stunting	Underweight	Micronutrient deficiencies
Indicators	Presence of bilateral pitting oedema ———— OR ———— Low middle upper arm circumference (MUAC) ———— OR ———— Low weight for height (W/H)	Low height for age (H/A)	Low weight for age (W/A), combining wasting and stunting	Clinical signs & biochemical markers

### I-I-II Types of Acute Malnutrition

Acute malnutrition is again divided into Severe Acute Malnutrition (SAM) and Moderate Acute Malnutrition (MAM) according presence or absence of bilateral pitting oedema, Mid Upper Arm Circumference (MUAC) and Weight for Height Z Score. See Table 2.

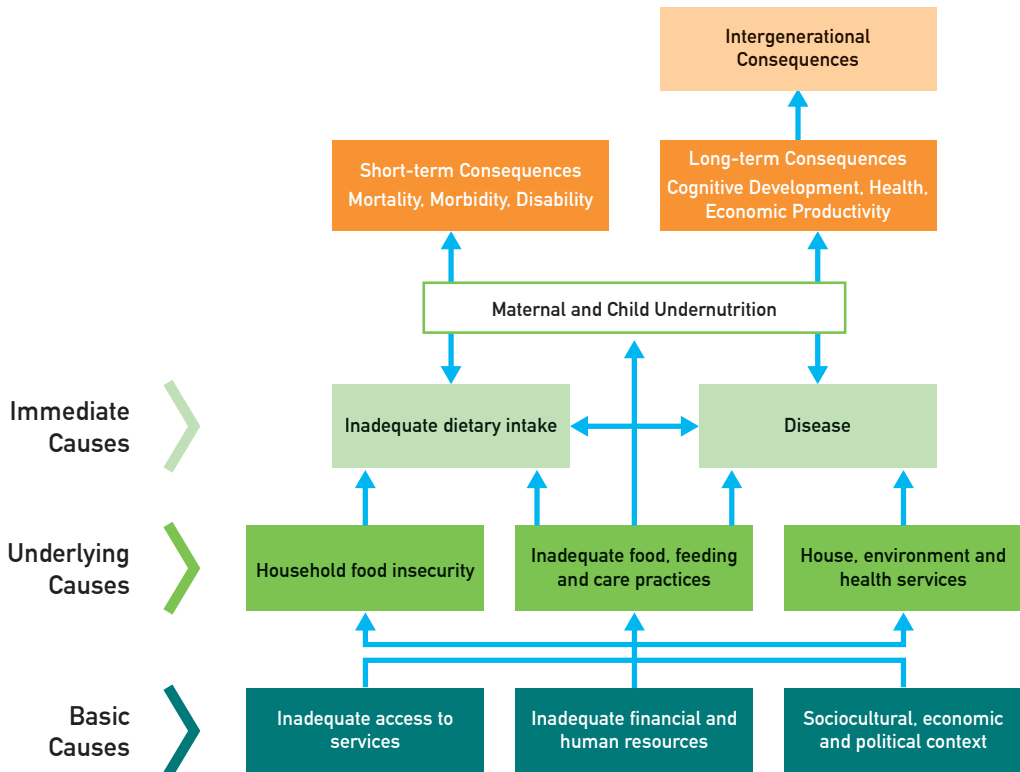
**TABLE 2. TYPES OF ACUTE MALNUTRITION**

Indicators	Moderate Acute Malnutrition	Severe Acute Malnutrition
Bilateral Pitting Oedema	Absent	Present
Mid Upper Arm Circumference (MUAC)	≥ 115 mm and <125 mm	<115 mm
Weight for Height Z-Score	≥ -3Z score and < -2Z score	< -3Z Score

### I-I-III Conceptual framework of Malnutrition

Malnutrition has several underlying causes and some of the causes are interrelated with each other. The following conceptual framework explains underlying causes of malnutrition and their interaction with each other.

**FIGURE 1. UNICEF CONCEPTUAL FRAMEWORK OF MALNUTRITION (ADAPTED)**



Source: Multi-sectoral Approaches to Nutrition: NUTRITION-SPECIFIC AND NUTRITIONSENSITIVE INTERVENTIONS TO ACCELERATE PROGRESS ([https://www.unicef.org/eapro/Brief\\_Nutrition\\_Overview.pdf](https://www.unicef.org/eapro/Brief_Nutrition_Overview.pdf))



## I-I-IV Importance of Acute Malnutrition

SAM is the life-threatening form of under nutrition, children with SAM being 9 times more likely to die before the age of five compared to normal children, and more than 12 times more likely if wasting is associated with stunting. Strong evidence exists on synergism between under nutrition and child mortality due to common childhood illnesses including diarrhoea, acute respiratory infections, malaria and measles. To prevent deaths due to severe acute malnutrition (SAM), specialized treatment and prevention interventions are required.

Moderate acute malnutrition is also one of the most life-threatening manifestations of under nutrition and children who are moderately malnourished are three to four times more likely to die compared to those children without acute malnutrition.

## I-II Integrated approach to Acute Malnutrition IMAM and its components

The World Health Organisation (WHO) recommended approach to maximize coverage for malnutrition is the Integrated Management of Acute Malnutrition (IMAM), combining community involvement, outpatient and inpatient management of acute malnutrition. The advantages of this approach are the following:

- Active case-finding in the community identifies acute malnourished children early in the progression of the condition, if cases can be identified at an early stage, only 10-15 % of severely malnourished children will require facility-based inpatient treatment, percentage decreases with the uptake of the service.
- Rational use of facility-based inpatient care allows health facilities to focus resources on the specialized care of severely malnourished children with complications.
- Access to community-based care for children without complications benefits children by reducing exposure to hospital-acquired infections and benefits families by reducing the time that caregivers spend away from home and other siblings, and by reducing opportunity costs.
- Maximum coverage and access is possible making services accessible to the highest possible proportion of acute malnourished children. By improving access to treatment, it also ensures that children continue treatment until they have recovered and thus reduces default cases.

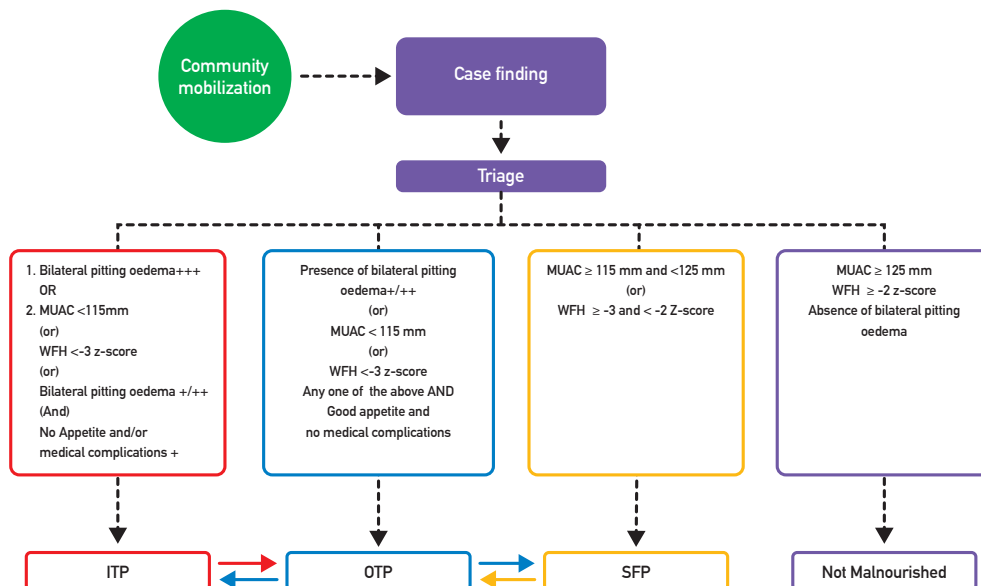
Myanmar will apply “Integrated Approach” in the management of acute malnutrition in the country. Integrated Management of Acute Malnutrition has four components:

1. **Community mobilization:** It is a process aims to raise awareness of community (on what malnutrition is, what underlying causes of malnutrition are and its consequences in short term and long term) so that they actively participate in screening or case finding of acute malnutrition to detect children with acute malnutrition in early stage and receive the respective management until the child is cured.
2. **Supplementary Feeding Programme:** The children with Moderate Acute Malnutrition are provided with Ready to Use Supplementary Food (RUSF) or Fortified Blended Food (FBF) until their MUAC reach 125 mm and above. This service will be provided in community by BHS as Fixed-site service delivery in villages with RHC/SRHC and as Outreach service delivery in villages where there is no health center. Every 2 weeks follow up is required until they reach criteria for discharge.
3. **Out-patient Treatment Programme:** The children with Severe Acute Malnutrition are treated with Ready to Use Therapeutic Food (RUTF) if they do not have complications until their MUAC is above 115 mm. This service will be delivered as Fixed-site service or Outreach service as mentioned above as well as may be delivered in hospital as Recovery Phase of Inpatient Treatment Programme. Weekly follow up is required until they reach criteria for discharge.
4. **Inpatient Treatment Programme:** When the child with Severe Acute Malnutrition has complications or oedema of +++, they are treated in hospital (which may range from Station Hospital to Tertiary Hospital) with F-75 as stabilization treatment. As soon as the complications are resolved, they are treated with F-100 or RUTF.

## I-III Linkage between SFP, OTP and ITP

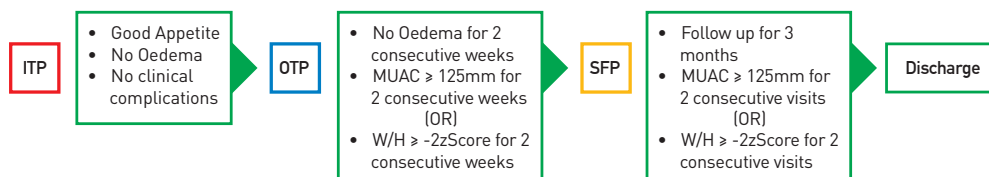
The four components of IMAM are not separate entities but they are linked with each other. See Figure 2. Linkage of four IMAM components.

FIGURE 2. LINKAGE OF FOUR IMAM COMPONENTS



Community mobilization raise the awareness of community to seek for malnutrition screening with subsequent respective treatment.

FIGURE 3A. LINKAGE OF FOUR IMAM COMPONENTS IN ITP PATIENT

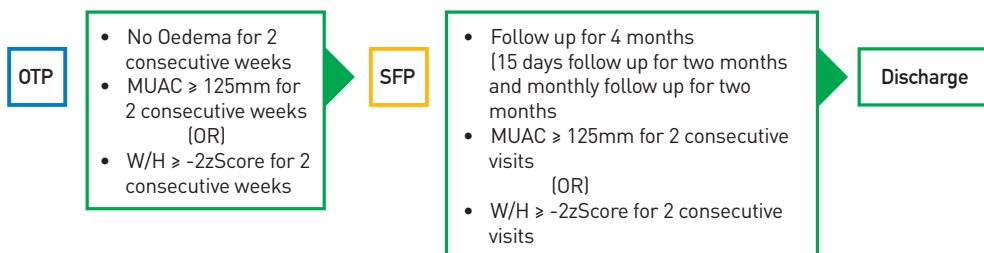


When a child treated in In-patient Treatment Programme is reached the discharged criteria after Transition Phase (good appetite returned, odema is resolved), transferred the child to Outpatient Therapeutic Programme (OTP) which may be in the same hospital or OTP service provided by BHS at his/her ward or village. If the child has reached the discharged criteria in OTP, forward the child to SFP in his/her ward or village. Provide Supplementary Feeding and discharged from SFP when the child meets the discharged criteria for ALL

<sup>2</sup> Integrated Management of Acute Malnutrition by Michael Golden: Page 73, Footnote 45.

SAM CURED CHILDREN (Follow up for 3 months and Weigh for height  $\geq$  2Z score or MUAC  $\geq$  125 mm). If SFP is not available in his/her ward or village, kept the child in OTP of the same hospital and use Table for Weight gain to reach cured criteria shown in Table 26 for Discharged Criteria<sup>2</sup>.

**FIGURE 3B. LINKAGE OF FOUR IMAM COMPONENTS IN OTP PATIENT**



If a child in Out-Patient Therapeutic Programme as fixed-site or outreach service has reached discharged criteria, forward the child to SFP where RUSF/ FBF is provided for another 4 months. Follow up at every 15 days for the first 2 months and then monthly follow up for another 2 months are provided for this child in SFP. The child is discharged from SFP when the child meets the discharged criteria for ALL SAM CURED CHILDREN (Follow up for 3 months and Weigh for height  $\geq$  2Z score or MUAC  $\geq$  125 mm). If the child develops criteria to move from OTP to ITP while receiving the treatment in OTP (signs of serious medical complications), transferred the child to ITP.

Similarly, a child in Supplementary Feeding Programme will be transferred to OTP or ITP if the child deteriorates indicated by MUAC or WFH Z Score.

## I-IV Purpose of IMAM Protocol

The National Protocol for Integrated Management of Acute Malnutrition was developed as a tool to assist health staff in the delivery of community mobilization, management of Moderate Acute Malnutrition (MAM) and Severe Acute Malnutrition (SAM) with or without complications to contribute towards reducing the under-five mortality rate due to acute malnutrition.

This protocol is intended for use by BHS ranging from Midwife and PHS-II to TMOs in community portion of IMAM \_ Community mobilization, SFP and OTP, and Clinical staff in hospital ranging from Trained Nurse to Medical Officers and Paediatricians.

This protocol is intended for treatment of acute malnutrition in under 5 years children. However, children above 5 years are identified as acute malnutrition



either in community or health facility, health staffs should give treatment appropriately.

This protocol can also be used as a guideline for the development of training materials for any health institution in Myanmar.

## LINKAGES BETWEEN OTP, ITP, SFP

- There needs to be a referral system between the OTP , ITP and SFP so that:
  - patients can be quickly and easily transferred from the ITP to the OTP as they enter the recovery phase (phase 2)
  - Those OTP patients that fail to respond appropriately or who develop a complication can be transferred (temporarily) to ITP where they will continue treatment there before going back once again to OTP.
  - In SFP those who deteriorate to meet SAM criteria will need to be referred to OTP or ITP depending on appetite/medical complications.
  - Such transfers are not “discharges” from the program.
- A patient transferring from one to another mode of treatment (e.g ITP to OTP to SFP) will keep the same AM number throughout.
- There should be monthly meetings at township level to discuss transfers that have occurred that month between ITP and OTP and vice visa.
- In the ITP there should be posted on the wall:
  - The health centres operating OTP/SFP within the catchment area of ITP
  - The names and phone numbers of the contact persons in these centres.
- In the OTP there should be posted on the wall:
  - The phone number and contact details of the person that needs to be contacted in the ITP regarding transfers from OTP.
- An example of the transfer letter that needs to go with the transfer.





## **PART 1**

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# **Integrated Management of Acute Malnutrition (IMAM)**

# 1. Community Mobilization

Community mobilization in the context of IMAM is a process which raises the awareness of community so that they become aware of what malnutrition is (including its equivalent local terminology and its manifestations), what the consequences are and what underlying causes are, with subsequent increasing demand for nutrition screening and respective treatment programme with their full participation.

Community mobilization is ongoing process and continuous in nature and it is crucial component to strengthen community access and maximize the coverage of IMAM service.

## 1.1 Purpose of Community Mobilization

After understanding the malnutrition in terms of its manifestations, short term and long term consequences and underlying causes, community are expected to actively participate, on their own decision, in case finding, receive respective malnutrition treatment from Basic Health Staff for their children together with regular follow up until the child cured and IYCF counselling for proper infant and young child feeding practices to prevent another attacks of malnutrition.

Purposes of community mobilization are:

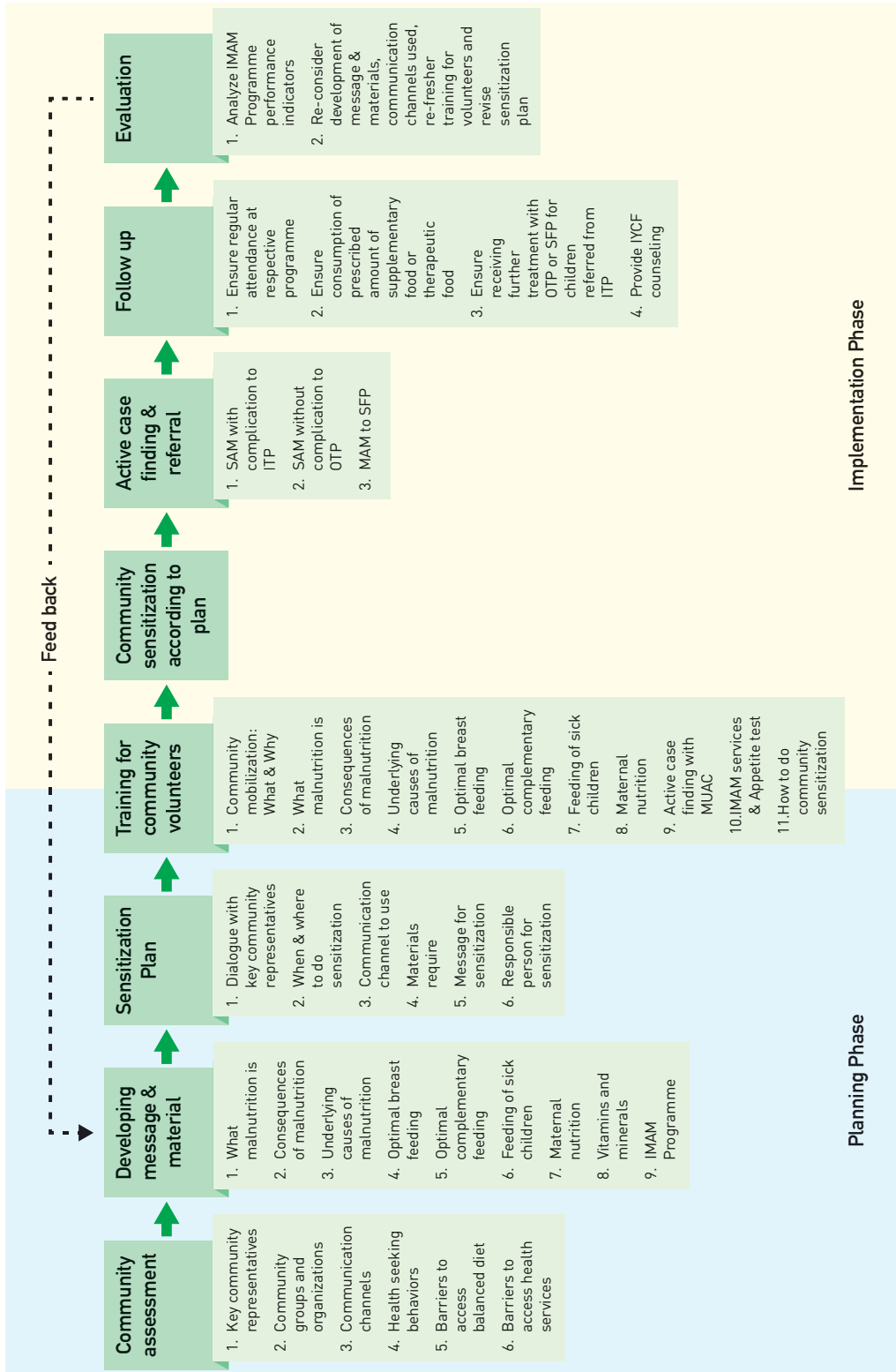
- Empowering the community by increasing knowledge on SAM and IMAM.
- Increasing access to, and coverage, of IMAM services.
- Strengthening early case-finding, referral of new SAM cases, and follow-up of problem cases.

## 1.2 Steps in Community Mobilization

The community is first thoroughly assessed. Then, based on the information obtained from the assessment, community sensitization is done. As a result, community realize manifestations, short and long term consequences, and underlying causes of malnutrition including benefits of receiving respective treatment programme. At this stage, all the community members are ready to participate in active case finding for acute malnutrition.

Community mobilization has 2 overlapping phases: Planning phase and Implementation Phase. See Figure 4 Steps in Community mobilization.

**FIGURE 4. STEPS IN COMMUNITY MOBILIZATION**



## 1.2.1 Assessing Community

This involves identifying the key features of the community that would help to sensitize the communities about screening (identification of children with acute malnutrition), the IMAM services available, and follow-up of malnourished children in the communities. The assessment focus on identifying following:

- **Identification of key community representatives:** They may include: Administrative Leaders, Traditional leaders, Political Leaders, Basic Health Staff, other government staff, Traditional health practitioners, local Social and Religious Leaders.

They have a standing in their communities and their involvement in the programme would help in gaining community acceptance and trust. Their involvement also acts as avenues for communicating and disseminating key messages about the programme to facilitate greater levels of participation.

- **Identification of community groups and organizations:** They may include groups that have been created by communities themselves and those initiated and supported by NGOs or the government such as Village Health Committee, Parent Teachers associations, Local social and religious organizations, Myanmar Maternal & Child Welfare Association (MMCWA), Myanmar Women Affair Federation, Traditional Healers Associations, and Agricultural groups for farmers.

Among these groups, the most active and influential group/groups should be identified for their help in sensitization of the communities as well as early identification of malnourished cases.

- **Identification of channels of communication:** This may include (i) formal communication channels such as Community meetings organized by local leaders to mobilize the community for development activities such as school, hospital, well or road construction, Radio & TV announcements, Posters in public places such as markets, temples, and schools, and (ii) informal communication channels - wherever people gather e.g. water points, Ceremonies, distributions.

Commonly used information channels should be identified to effectively disseminate message and information about malnutrition and IMAM programme among the community.

- **Identification of health seeking behaviour:** It should also explore how the local community seeks treatment for childhood diseases. This help to identify different health care providers to assist in the active case finding and referrals.
- **Identification of barriers to access balanced diet:** This is identification of barriers to access recommended feeding which is appropriate for age

in terms of containing 4 varieties of food with recommended frequency, recommended consistency, and recommended amount for the respective age. These barriers may be old sayings, customs, lack of health and nutritional knowledge, socio-economic status as access to food, food security, locally available foods, seasonal variation in availability of foods etc.

- **Identification of barriers to access health services.** This is identification of elements which hinder access to care. Barriers may be:
  - Physical (distance, environment, seasonal flooding)
  - Human (social – husband refusal, cultural - stigma, political, religious, ethnic)
  - Cost (choice between 2 alternatives)
  - Other (security)
  - Service related (communication problems/experiences and attitudes towards IMAM services)

This is particularly useful for formulation of IMAM Service delivery strategy to strengthen community access and maximize the coverage of IMAM Service.

## 1.2.2 Developing Message and Materials

After community assessment, the information obtained are analysed and based on the analysis findings, message and materials for sensitization are developed. Following topics should at least be included in developing message:

1. What malnutrition is
2. Short term and long term consequences of malnutrition
3. Underlying causes of malnutrition
4. Optimal breastfeeding
5. Optimal complementary feeding
6. Feeding of sick children
7. Maternal nutrition
8. Vitamins and minerals
9. IMAM Programme (Available services for Acute Malnutrition)

Materials may be printed media such as pamphlet, poster, Flip Chart, etc. or broadcast media such as TV spot, radio play, etc.

## 1.2.3 Guide for Developing Sensitisation Messages

### OBJECTIVES

The purpose of sensitisation is not to change behaviour on feeding practices at first but to specify how IMAM services (OTP, SFP etc) will be carried out and what the aims are.

### KEY MESSAGES

The following information is important for all basic sensitisation messages when developing a guide:

- Explain what is malnutrition, what are the impact for children, causes and risks of malnutrition.
- Describe the target population and also use local terms for thinness and swelling.
- Explain the benefits of outpatient management of severe acute malnutrition – including the fact that children who suffer from severe acute malnutrition but have no complications can receive treatment as an outpatient and the mother does not need to leave the family. Only children with medical complication will be hospitalised.
- Explain the referral process including the fact that the child can be screened at home by a community volunteer/health worker
- Explain that self referral is also possible, either through the community volunteer/health worker or they can go directly to the health facility where OTP/SFP/ITP is being carried out.
- Specify the time and date of OTP/SFP and the nearest health facilities where these are being conducted.
- Explain that the child can be measured again if his condition deteriorates.
- Specify that RUTF is a medicinal food and not just a food.
- Explain that RUTF is free.
- Address issues/concerns raised during the rapid socio –cultural assessment.

See Table 3 for guideline for the development of messages.

**TABLE 3. GUIDELINE FOR DEVELOPMENT OF KEY NUTRITION MESSAGE**

Topic	Key Message
Malnutrition	<ul style="list-style-type: none"> <li>• What is clinical manifestation of acute malnutrition</li> <li>• Short term and long term consequences of malnutrition</li> <li>• Causes of malnutrition</li> <li>• Screening of malnutrition</li> <li>• Types of acute malnutrition</li> </ul>
IMAM Service	<ul style="list-style-type: none"> <li>• Benefits of early detection and treatment of acute malnutrition</li> <li>• Available services for different types of acute malnutrition</li> <li>• Importance of regular follow up in treatment of acute malnutrition</li> <li>• IYCF counseling during treatment of acute malnutrition</li> </ul>
Optimal breastfeeding	<ul style="list-style-type: none"> <li>• Timely initiation of breastfeeding (within 1 hour after birth)</li> <li>• Importance of giving colostrums</li> <li>• Exclusive Breastfeeding until 6 months</li> <li>• Importance of continued breastfeeding until 2 years</li> <li>• Baby-led breastfeeding</li> <li>• Bottle feeding is dangerous</li> <li>• Cup feeding of breast milk when mother is away from home</li> <li>• In mother with HIV, Breast milk is advisable unless breast milk substitute is Acceptable, Feasible, Affordable, Sustainable and Safe (AFASS)</li> </ul>
Optimal complementary feeding	<ul style="list-style-type: none"> <li>• Timely introduction of complementary feeding at 6 months</li> <li>• Age appropriate complementary feeding i.e. age appropriate consistency, age appropriate frequency, age appropriate amount, at least 4 varieties of food in each meal, Hygienic food handling &amp; feeding, and Active feeding</li> </ul>

Topic	Key Message
Feeding of Sick Child (Under 6 months)	<ul style="list-style-type: none"> <li>• Exclusive breastfeeding is practiced together with the prescribed medicines</li> <li>• Active feeding is important</li> <li>• Frequent feeding is essential</li> <li>• If the child is too weak, provide cup feeding of breast milk</li> <li>• Increase the frequency of feeding for catch up growth during the recovery period</li> </ul>
Feeding of Sick Child (Above 6 months)	<ul style="list-style-type: none"> <li>• Frequent feeding of breast milk during illness</li> <li>• Sick child needs more fluid and food</li> <li>• If the child lost appetite, give small and frequent meals</li> <li>• Give simple food such as boil rice</li> <li>• Give one extra meal for 2 weeks after recovery</li> </ul>
Maternal nutrition (Pregnant mother)	<ul style="list-style-type: none"> <li>• Take one extra meal</li> <li>• Each meal should have at least 4 varieties of food</li> <li>• Use iodized salt for optimal development of nervous system and body of the fetus</li> <li>• Drink milk daily</li> <li>• Take Iron and Folic acid during pregnancy to prevent anemia (in total 180 tablets per pregnant women)</li> <li>• Take B1 from one month before delivery until 3 months after delivery to prevent Infantile Beri Beri</li> </ul>
Maternal nutrition (Lactating mother)	<ul style="list-style-type: none"> <li>• Take two extra meals</li> <li>• Each meal should have at least 4 varieties of food</li> <li>• Use iodized salt for optimal development of nervous system and body of the baby</li> <li>• Take Iron and Folic acid after delivery to prevent anemia</li> <li>• Continue B1 till 3 months after delivery to prevent Infantile Beri Beri</li> </ul>



Topic	Key Message
Maternal nutrition (Lactating mother)	<ul style="list-style-type: none"> <li>• Take two extra meals</li> <li>• Each meal should have at least 4 varieties of food</li> <li>• Use iodized salt for optimal development of nervous system and body of the baby</li> <li>• Take Iron and Folic acid after delivery to prevent anemia</li> <li>• Continue B1 till 3 months after delivery to prevent Infantile Beri Beri</li> </ul>
Vitamin A for children	<ul style="list-style-type: none"> <li>• Manifestation of Vitamin A deficiency (Eye, Skin)</li> <li>• Vitamin A prevents Blindness and infections</li> <li>• Vitamin A Blue Capsule for children between 6 months and one year for 2 times a year</li> <li>• Vitamin A Red Capsule for children between 1 year to 5 years for 2 times a year</li> </ul>
De-worming	<ul style="list-style-type: none"> <li>• Manifestation of anemia</li> <li>• Consequences of Iron deficiency anemia</li> <li>• Role of de-worming in prevention of Iron deficiency anemia</li> <li>• De-worming with Albendazole in under five children &amp; its frequency</li> <li>• De-worming with Mebendazole in pregnant women &amp; its frequency</li> </ul>
Immunization	<ul style="list-style-type: none"> <li>• Risks of Vaccine Preventable Diseases (VPDs)</li> <li>• Adverse effects following immunization</li> <li>• Benefits of immunization outweighs Risks of VPDs</li> <li>• Importance of completion of immunization schedule</li> <li>• National Immunization Schedule</li> </ul>
Growth monitoring and promotion	<ul style="list-style-type: none"> <li>• Children between 0 - 59 months need regular weighing &amp; visit BHS at recommended ages (Your BHS will tell you when to come for weighing)</li> <li>• Children whose body weight are static or declining or fall in red area are at high risk and receive appropriate care from BHS. They need regular visit by BHS</li> </ul>

### 1.2.3 Development of Sensitization Plan

Information from community assessment is also used in the development of sensitization plan. In the sensitization plan, it should be clearly define which message will be sensitized by who, when and which materials & communication channel will be used for a particular message. Review the sensitization plan and messages with influential persons in the respective community to make sure it is culturally appropriate before disseminating it.

### 1.2.4 Training

Volunteers need to be trained so that they can do community mobilization very well. The training should cover at least following topics:

1. What community mobilization is & why
2. What malnutrition is
3. Short term and long term consequences of malnutrition
4. Underlying causes of malnutrition
5. Optimal breastfeeding
6. Optimal complementary feeding
7. Feeding of sick children
8. Maternal nutrition
9. Active case finding with MUAC
10. Brief on IMAM services & Appetite test
11. How to do community sensitization/dissemination of sensitization message

### 1.2.5 Conducting Community Sensitization

Explain the influential persons about purpose and activities of community sensitization session on acute malnutrition & treatment in advance to get full support from them. Inform influential person when community sensitization session is conducting in the village and request him to invite community to this session.

Welcome community members and explain the purpose of session.

Discuss how community understand Acute Malnutrition, short and long terms consequences, underlying causes, in two ways communication, so that community realize Acute Malnutrition of varying degree exists among them and need to take actions to prevent and treat Acute Malnutrition so that their children are free from the consequences. It may take community more than

one session to realize these things.

Once they realize it is important to treat Acute Malnutrition in order to prevent their children from the consequences, explain them available services for detection of Acute Malnutrition by MUAC with subsequent treatments with SFP for MAM, OTP for SAM without complication and ITP for SAM with complication. Emphasise the benefits of detection of Acute Malnutrition by MUAC in under-five children in the community (Active Case Finding). It is hoped, at this stage, community is ready to take part in Active Case Finding by their own decision.

During Community Sensitization Session, it is also important to make community especially caretakers of children with Acute Malnutrition to realize that regular follow up during treatment in SFP or OTP or ITP until the child gets cured. Make caretakers of children with Acute Malnutrition to understand that they also need to receive IYCF counselling to prevent their children from another attacks of Acute Malnutrition in future.

During the sensitization session, also discuss with community about Optimal breastfeeding practices for 0 – 6 months children, Optimal complementary feeding practices for 6 – 24 months children, Feeding practices of sick children and Maternal nutrition. During discussion, community may become aware their practices are not recommended practices and may request for help. In this case, it is important to arrange them for IYCF services.

Community sensitization session is not one time activity. It can be done together with Growth Monitoring and Promotion (GMP) or it can be done every month separate from GMP.

### 1.2.6 Active Case Finding and Referral

As a result of community sensitization session, community understand and easily notice acute malnutrition and its consequences and start demand for screening with MUAC. Active case finding is identification of acute malnutrition among healthy population\_ children of 6 – 59 months. It is usually done by measuring mid-upper arm circumference by a measuring tape for convenience. The child identified as having MAM or SAM are referred to respective treatment programme.

Role of community volunteers is essential to achieve a good coverage in Active Case Finding.

### 1.2.7 Follow up

Children with Acute Malnutrition are at risk of diseases and death and therefore regular follow up during treatment in the respective programme is essential and is important to monitor them to make sure sustained improvement in their condition.

Role of community volunteers in follow up of Community Mobilization is to maintain the active and full participation of community by:

1. Conducting home visits to malnourished children at the respective frequency for a particular treatment programme
2. Ensure the child is consuming the recommended amount of FBF/RUTF and perform Appetite Test at each visit for SAM
3. Check improvement of children by MUAC and decreasing/loss of oedema
4. Provide IYCF counselling during home visit
5. Report back of child improvements/deterioration to Midwife
6. Tracking of absent or defaulting children

### 1.2.8 Evaluation and feedback

Mid-Year review and Annual review should be done to evaluate Community mobilization process. Data on New admission, Relapse, Readmission, Cured, Defaulter, Mean length of stay for cured children, Mean rate of weight gain for wasted cured children and Coverage of the programme are analysed and determine effectiveness of Community Mobilization.

If the analysis and evaluation results indicate Community Mobilization is not effective, for example, Programme coverage is <50% in rural area + high Defaulter rate i.e. >15% + low Readmission + long Mean length of stay for cured children, then consider another development of community sensitization message, developing sensitization plan again, and refresher course for volunteers, etc.



## Case Finding, Triage Procedure, Admission and Registration

## 2. Case Finding, Triage Procedure, Admission and Registration

After a child is identified as acutely malnourished by MUAC, the child is then assessed for severity of malnutrition and clinical conditions to decide type of treatment programme he or she required. As soon as the child reaches the respective programme, the child is provided with an acute malnutrition registration number.

### 2.1 Case Finding (Active and Passive)

Children with acute malnutrition can be identified by two ways Active Case Findings and Passive Case Finding.

#### 2.1.1 Active Case Finding

It is finding of children with acute malnutrition in healthy population at the age of 6 – 59 months and usually acute malnutrition is screened by MUAC measurement. Objective of performing Active case finding is to detect acute malnutrition in early stages.

It can be done as part of Community Mobilization process i.e. after the community is sensitized for acute malnutrition and its consequences together with provision of information on available services, community become actively participate in malnutrition screening done by BHS/volunteers.

It can also be done at various contact points such as Nutrition Promotion Month, health facilities outreach service programme like Reaching Every Community (REC), camp situations in emergency and other opportunities.

Active case finding can be done not only in children but also in Pregnant and Lactating Women. **See Annex 1 Oedema/Weight for Height/MUAC Measurements.**

#### 2.1.2 Passive Case Finding

It is identification of acute malnutrition among sick children of 6 – 59 months when they are taken to treatment services for an illness. Reason of Passive Case Finding is that acute malnutrition can be presented as illness and illness can also cause acute malnutrition.

Passive Case Finding can be done in out-patient department or in-patient department of a hospital, RHC/SRHC clinic days and any other contact points with sick children. Acute malnutrition is screened by clinical observation, MUAC and Weight for Height Z-score. **See Annex 1 Oedema/Weight for Height/MUAC Measurements.**

## 2.2 Triage Procedure

It is determining the severity of acute malnutrition to decide the type of treatment programme to provide i.e. SFP, OTP or ITP.

Deciding if the child has SAM or MAM or No Acute Malnutrition by initial MUAC screening by community volunteer is the first stage triage.

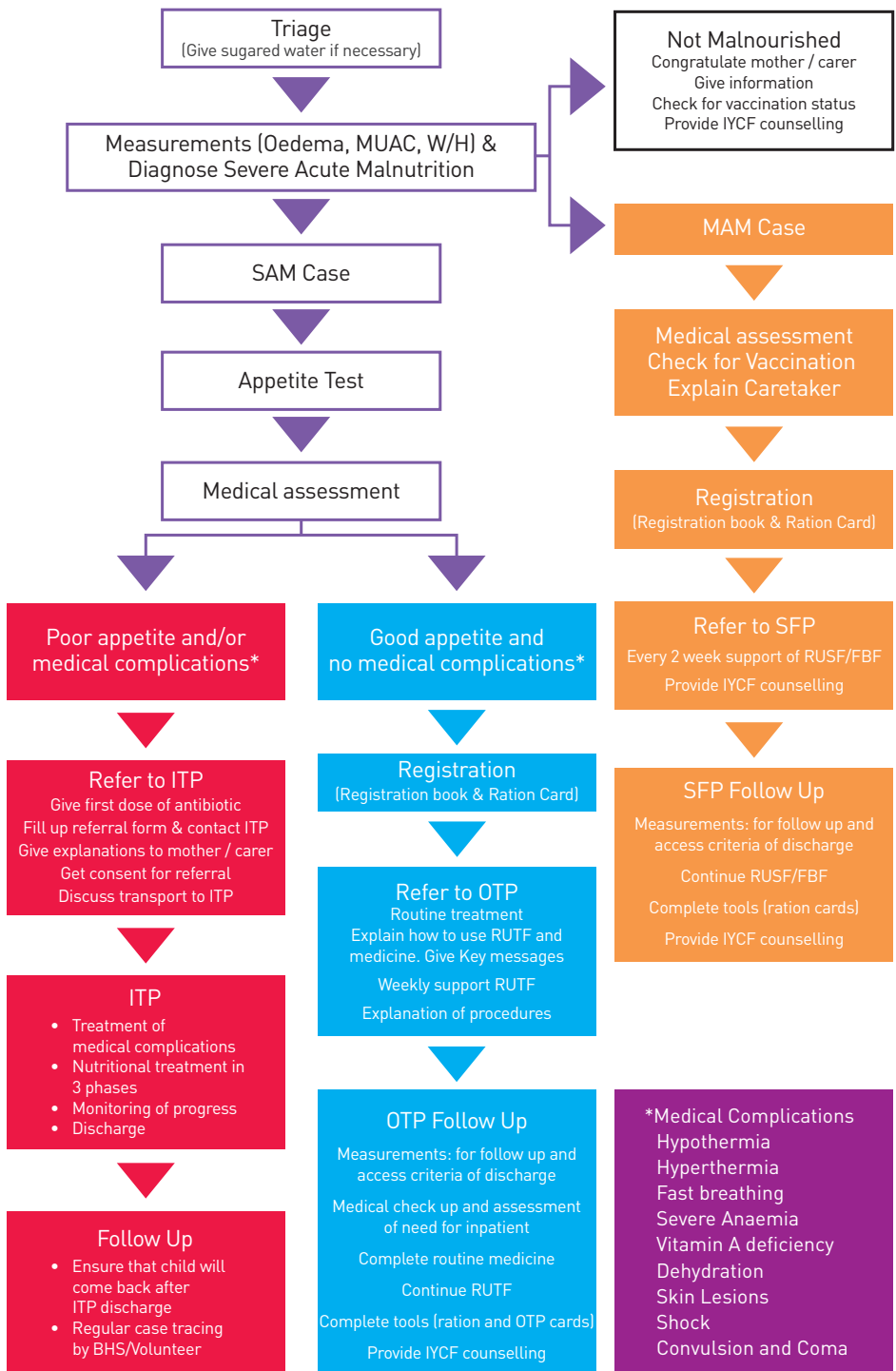
As soon as the child with acute malnutrition initially screened by MUAC is received, BHS does the following tasks:

1. If the child is obviously ill or need in-patient or other medical treatment, Give 10% sugar solution (10 g of sugar per 100 ml of water).
2. Check MUAC.
3. Check bilateral pitting oedema and note the severity of oedema. Also check temperature and look for signs of illness.
4. Measure Weight and Height if it is in RHC/SRHC. Based on MUAC, oedema, weight and height measurement confirm if the child suffers of acute malnutrition
5. Perform Appetite Test to the children with severe acute malnutrition to differentiate complicated SAM from uncomplicated SAM.
6. Diagnose any medical complications
7. Analyse the findings (anthropometric measurements, appetite and medical complications) and decide type of treatment to provide. Table 4 can be used as a reference.
8. After triage is done, refer the child to the respective programme.

**TABLE 4. DECISION MAKING FOR TRIAGE**

Indicators	SAM with Complication	SAM without Complication	MAM	No Acute Malnutrition
Bilateral pitting Oedema	+++	+ / ++	-	-
Appetite Test	Failed	Passed	N/A	N/A
Illness/ Complications	+	-	-	-
MUAC	<115 mm	<115 mm	≥115 mm and <125 mm	≥125 mm
WFH	<-3 z-score	<-3 z-score	≥-3 z-score and <-2 z-score	≥-2 z-score

**FIGURE 5. PROCEDURE FOR TRIAGE AND DIAGNOSIS OF DIFFERENT TYPES OF ACUTE MALNUTRITION**







## 2.3 Admission and Registration

Once acute malnutrition is identified and triaged, the child is admitted to the respective treatment programme and assigned Acute Malnutrition registration number.

### 2.3.1 Admission

**Under 6 month children** with visible wasting, bilateral pitting oedema and WFH < -3 z-score are admitted to hospital for ITP.

**Acutely malnourished 6 – 59 months children** are admitted to ITP, OTP or SFP according to the triage.

### 2.3.2 Registration: Acute Malnutrition Number (AM Number)

The AM-number is defined as a unique number assigned to each patient receiving treatment as part of IMAM (SFP/OTP/ITP). This number is in addition to any other registration number that may be used in certain health facilities. The AM-number is given at the first entry point of IMAM services: SFP, OTP or ITP for every new case. The same AM-number is used for old case which is defined by respective categories of admission.

The AM-Number must be used for all health facilities referral and transfer forms and documents related to that patient (SFP/OTP chart and ration card, ITP multi-charts, etc. Refer to Operational Protocol for the various tools).

- The AM-Number should normally take the following format:
- State/Region code
- Township code
- Health facility code

Patient number (starting at 0001 as four digits number in sequence with admissions in a particular health facility and should be restarted from 1 in the beginning of every calendar year)

- Programme: using one of the 3 digits (SFP-OTP-ITP)
- Year
- Number indicating frequency of attack in case of relapse

Pcode developed by Myanmar Information Management System (MIMU) will be used for State/Region and Township Codes (Ref. [mimi.info.mm](http://mimi.info.mm), **Annex 18 List of regional codes.**)

Region code/Township code/Health facility code/Patient number/  
Programme/Year

For example: A 4 years old child is found to have SAM without complication and admitted to OTP at Kyaukhmaw SRHC of Labutta Township from Ayeyarwady Region in 2015 and he is the second child receiving OTP treatment from that health center in 2015. His AM-number will be:

017/017016/Kyaukhmaw SRHC/0002/OTP/2015

- 017 = State & Region Pcode for Ayeyarwady Region
- 017016 = Township Pcode for Labutta Township
- Kyaukhmaw SRHC = Health facility name as Health facility code
- 0002 = PatientNumberindicatingheisthesecondpatientinOTP programme of that health facility
- OTP = Outpatient treatment programme
- 2015 = Year at which the child is admitted to OTP programme of that health facility.

If the child moves from Labutta to another township, according to definition of categories of admission, he is an old case and the previous AM-number\_017/017016/Kyaukhmaw SRHC/0002/OTP/2015 will be kept using in the new health center (Provided that the AM-number is still possible to trace).

For the relapse cases, above mentioned registration will be post-fixed by a number showing the frequency of relapse of acute malnutrition.

Region code/Township code/Health facility code/Patient number/  
Programme/year/ Frequency of relapse

For example, the above mentioned child is suffering from SAM without complication again after he is already discharged as cured from the programme, it is a relapse case according to the definition of admission criteria and the AM number will become:

017/017016/Kyaukhmaw SRHC/0002/OTP/2015/1

Here,

1 = Frequency of relapse (in this example, the child gets relapse of acute malnutrition for 1 time)

However, if that child is losing weight again but MUAC is between  $\geq 115$  mm and  $< 125$  mm, then the child is a new case of MAM according to the definition and a new AM-number with the programme code of SFP will be issued.

For example:

017/017016/Kyaukhmaw SRHC/0016/SFP/2015

Similarly, the same principle will be applied in case of old MAM child who develops SAM in the next time.

In case of the children admitted to health facility rather than RHC/SRHC, i.e. hospital, the name of the hospital will be used as health facility code. For example, A 3 year old girl is found to have SAM with complication and admitted to Yangon Children Hospital in Ahlone Township from Yangon Region in 2015 and she is the 35th child receiving ITP treatment from Yangon Children Hospital.

Her AM-number will be:

013/01337/Yangon Children Hospital/0035/ITP/2015



## Infant and Young Child Feeding and Counselling in IMAM

## 3. Infant and Young Child Feeding and Counselling in IMAM

Lengths of different IMAM services such as SFP, OTP or ITP are long enough to build a relationship between health staff and caretakers of children with Acute Malnutrition, and this favours opportunity to help caretakers to change/improve proper infant and young child feeding practices and behaviour by providing IYCF Counselling.

### 3.1 Why IYCF Counselling in IMAM

According to the conceptual framework of malnutrition, inadequate/inappropriate knowledge of caretaker on infant and young child feeding causing inadequate dietary intake leads to undernutrition. By providing appropriate knowledge and guidance on the practice on infant and young child feeding through serials of IYCF counselling, practice of the caretakers is hoped to develop the desired behaviour to feed infant and young child properly to prevent another attacks of malnutrition.

### 3.2 Recommended IYCF Practices

The following are recommended IYCF practices.

#### 3.2.1 Recommended breastfeeding practices

1. Skin to skin contact after birth
2. Early initiation of breastfeeding (within the first hour of birth)
3. Frequent breastfeeding in both day and night
4. Breastfeeding on demand
5. Exclusive breastfeeding until 6 months
6. Continued breastfeeding until 1 year
7. Continued breastfeeding until 2 year

#### 3.2.2 Recommended Complementary Feeding Practices

1. Timely Introduction of Complementary Feeding at 6 months
2. Age appropriate complementary feeding with characteristics of Frequency, Amount, Texture (thickness/ consistency), Variety (different foods), Active or responsive feeding, and Hygiene (FATVAH). See Figure 6. for illustration of 7 characteristics of complementary feeding.

FIGURE 6. SEVEN CHARACTERISTICS OF COMPLEMENTARY FEEDING

၂-နှစ်အောက်ကလေးသူငယ်များကို ဖြည့်စွက်စားကျွေးခြင်း <span style="float: right;">unicef</span>				
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၆-လ ဖြည့်စွက်လျှင် 	<ul style="list-style-type: none"> <li>ဖြည့်စွက်စားများကို စတင်ကျွေးပါ။ (၂-၃ ကြိမ်)</li> <li>မကြာခဏာ မိခင်နို့စို့စေခြင်း</li> </ul>	ထမင်းစားရွန်း (၂-၃ ရွန်း) အခြေခံအစားအစာနှင့် ဓာတ်တစ်စတစ်စ တိုးကျွေးပါ။ 	ဆန်ပြုတ်ပျစ်ပျစ် / နူးညံ့ပျော့အိသည့် ကင်္စီကဲ့သို့ 	ဖြည့်စွက်စားကျွေးရာတွင်..... ★ ထမင်း၊ ရှိ အာလူး၊ ကန်စွန်ညှု (အခြေခံအစား) တို့မှ တစ်မျိုး 
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### 3.3 3-Step Counselling (Assess, Analyse and Act)

As previously mentioned, 3-Step counselling supports mothers to practice on recommended IYCF. The IYCF 3-Step Counselling involves the following steps:

- Assess age appropriate feeding: ask, listen and observe. It can be done with the help of Assessment Form. See Figure (7) for the Assessment Form.
- Analyse feeding difficulty, identify difficulty and if there is more than one – prioritise and
- Act - discuss, suggest small amount of relevant information, agree on feasible, doable option that carer can try.



**FIGURE 7. IYCF COUNSELLING ASSESSMENT FORMS**

	Name of Mother/ Father/Caregiver	Name of Child	Age of Child (completed months)	Number of older children		
Observation of Mother/Caregiver						
Child illness	Child sick		Child not sick		Child recovering	
Growth curve increasing	Yes		No		Levelling off/Static	
Tell me about Breastfeeding	Yes	No	When did BF stop?	Frequency: times/day	Difficulties: How is breastfeeding going?	
Complementary Food	Is your child getting anything else to eat?		What	Frequency: times/day	Amount: how much (Ref. 250ml)	Texture: how thick/ consistent
	Staple (Porridge, other local examples)					
	Legumes (Beans, other local examples)					
	Vegetables/Fruits (local examples)					
	Animal: Meat/Fish/Offal/ Bird/Eggs/Milk products					
Liquids	Is your child getting anything else to drink?		What	Frequency: times/day	Amount: how much (Ref. 250ml)	Bottle use? Yes/No
	Other milks					
	Other liquids					
Other challenges?						
Mother/Caregiver assists child (responsive feeding)	Who assists the child when eating?					
Hygiene	Feeds baby using a clean cup and spoon		Washes hands with clean, safe water and soap before preparing food, before eating and before feeding young children		Washes child's hands with clean, safe water and soap before he or she eats	



### 3.4 Contact points for IYCF Counselling in IMAM

The contact points within IMAM where IYCF 3-Step Counselling can be conducted and rationale for conducting the counselling at the receptive points are:

**TABLE 5. IYCF 3-STEP COUNSELLING**

Contact Points in IMAM	Rationale for IYCF Counselling
Community Mobilization	Caretakers who do not know proper IYCF practices may be identified although their children are not malnourished. By providing IYCF counselling, their practice and behaviour can be improved to prevent development of acute malnutrition in their children.
Admission to SFP/OTP/ITP	As a consequence of improper IYCF practice, the child got acute malnutrition and admitted to the respective treatment programme. At this point, the practice that causes the child acute malnutrition can be identified during the counselling and options to improve the current practice to desired practice and behaviour can be offered to the caretakers.
Follow up visits in SFP/OTP	During the follow up period/stay in hospital, caretaker is developing/ passing through different stages of behaviour change and encountering the barriers which prevent further behaviour change development. Options to overcome these barriers can be offered and encourage caretaker to struggle against these barriers. Cheer her up for successful actions.
During hospital in ITP	
Discharge from SFP/OTP/ITP	When the child is discharged from the respective programme, it is important to ensure the caretaker clearly understand the recommended IYCF Practices to prevent further attacks of acute malnutrition, caretaker can overcome the barriers with provided options and to make sure caretaker is making progress in the steps of behaviour change (See Figure 8) without falling back.

### 3.5 Discussion points during IYCF Counselling in IMAM

During the IYCF Counselling in IMAM, discussion points should be based on the age of the child. Find the example in the following table.

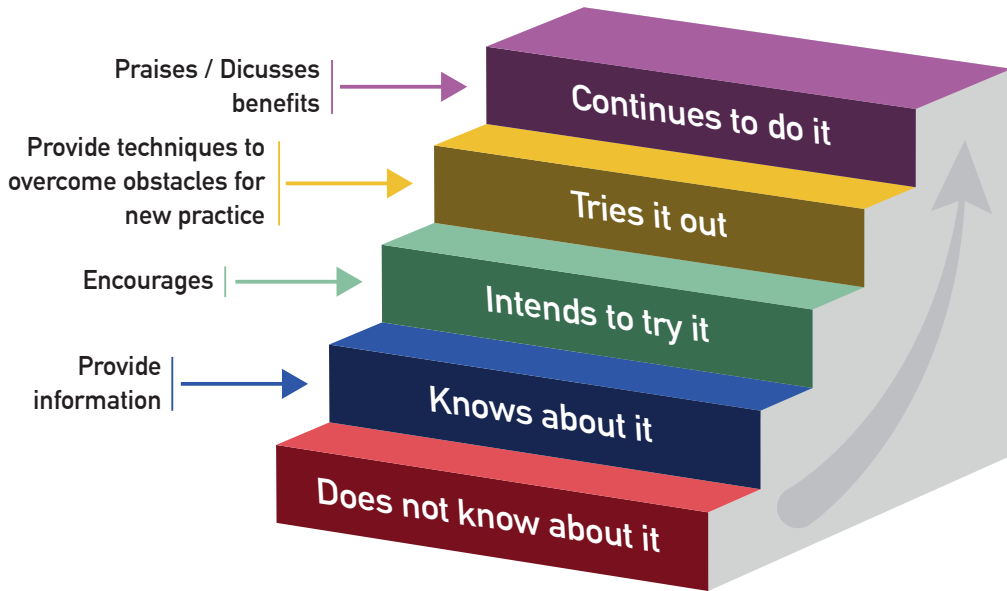
**TABLE 6. DISCUSSION POINTS DURING IYCF COUNSELLING IN IMAM**

Age	Discussion Points
1 month	<ul style="list-style-type: none"> <li>• Good positioning and attachment</li> <li>• Exclusive breastfeeding from birth up to 6 months</li> <li>• Breastfeeding on demand - up to 12 times day and night</li> <li>• Breastfeeding difficulties (plugged ducts which can lead to mastitis, and not enough breast milk)</li> <li>• Increase breast milk supply</li> <li>• Maintain breast milk supply</li> <li>• Continue to breastfeed when infant or mother is ill</li> <li>• Family planning</li> <li>• Prompt medical attention</li> </ul> <p><b>Responsive feeding and Care Practices</b></p> <ul style="list-style-type: none"> <li>• At the breast, the baby is positioned at just the right distance to be able to focus on mother's eyes; when mother feeds on one breast, and then change breasts for the next feed, the baby's brain is stimulated from both sides</li> <li>• With good attachment at the breast, the mother can see or hear the baby swallowing; baby's cheeks are rounded and not dimpled or indrawn. Mother responds with satisfaction and self-confidence.</li> <li>• Look closely into baby's eyes</li> <li>• Smile at baby; softly talk or sing to baby as you breastfeed - baby can see your face and hear your voice</li> <li>• Hold baby close</li> <li>• Mother is comfortable</li> </ul>

Age	Discussion Points
From 5 up to 6 months	<ul style="list-style-type: none"> <li>• Caretaker should not try to change positioning if infant is not having difficulties</li> <li>• Prepare mother for changes she will need to make when infant reaches 6 months (AT 6 months)</li> <li>• At 6 months, begin to offer foods 2 to 3 times a day - gradually introduce different types of foods (animal foods, staple, legumes, vegetables, and fruits) and continue breastfeeding</li> </ul>
After baby reaches 6 months of age	<ul style="list-style-type: none"> <li>• Timely introduction of complementary feeding and continue breastfeeding</li> </ul>
From 6 to 9 months	<ul style="list-style-type: none"> <li>• Age appropriate complementary feeding with characteristics of Frequency, Amount, Texture (thickness/ consistency), Variety (different foods), Active or responsive feeding, and Hygiene (FATVAH)</li> </ul> <p style="text-align: center;"><b>TOGETHER WITH Continue Breastfeeding</b></p>
From 9 to 12 months	
From 12 to 24 months	

For the detail of discussion points for IYCF Counselling during IMAM, please refer to cIYCF Facilitator Manual, Participants Manual and Key Message Booklets.

FIGURE 8. STEPS IN BEHAVIOUR CHANGE





## Management of Moderate Acute Malnutrition

## 4. Management of Moderate Acute Malnutrition

### 4.1 Principles and Objectives

The objectives is:

- To prevent deterioration to SAM (severe acute malnutrition)
- Support individuals who have recovered from severe acute malnutrition and discharged for follow up to prevent relapse (SAM Follow Up)

Management of Moderate Acute Malnutrition will take on 2 forms:

1. Supplementary Feeding
2. Nutrition Education and Counselling

When Targeted Supplementary Feeding is available Moderately Malnourished Children (MAM) may be treated with Supplementary Feeding as outpatients. While the immediate risk of mortality is much higher for a child with severe acute malnutrition, the absolute number of children affected by MAM is much higher and therefore the absolute mortality is higher also. Children with MAM usually do not require emergency medical attention and can be treated following IMCI procedures. As SAM treatment requires strong linkages with medical services it is important particularly in emergency and protracted emergency areas to prevent children with MAM from deteriorating to SAM.

Supplementary feeding is complementary to services for the management of SAM, and according to the situation, may have to be implemented simultaneously. Supplementary food should always be taken between meals.

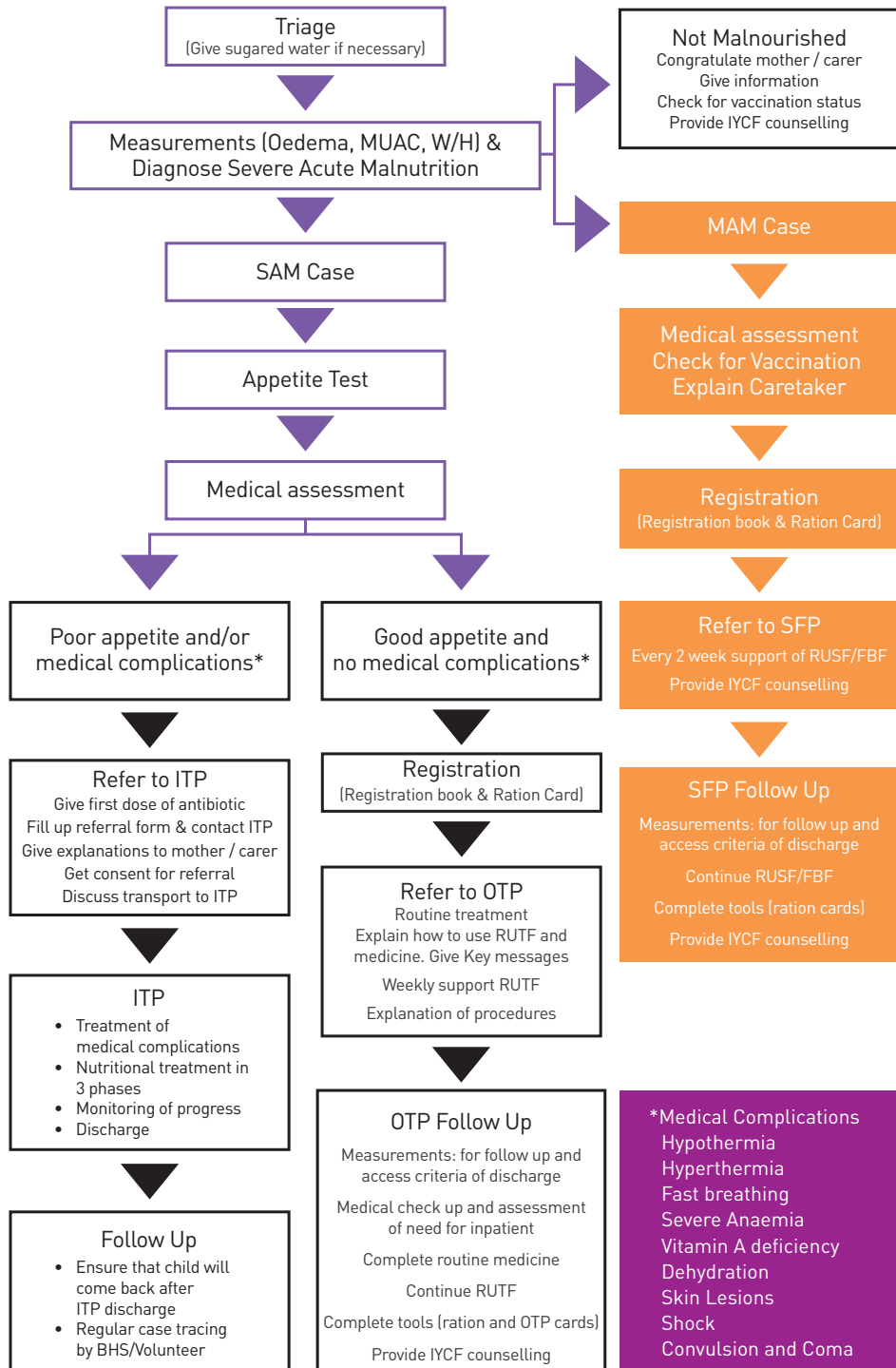
Where supplementary feeding is not available, the primary intervention is to provide appropriate dietary advice on which foods to consume and on the relative quantities, but information on IYCF, specifically breastfeeding, and hygienic and sanitary practices are also key components.

### 4.2 Structure of MAM

Supplementary Feeding Programme (SFP) for 6-59 months children will be implemented countrywide. SFP service is provided in Rural Health Centres (RHC), Sub Rural Health Centres (SRHC), Urban Health Centres (UHC), Station and Township Hospitals.

## 4.3 Decision Making Steps for Management of MAM

FIGURE 9. DECISION MAKING STEPS FOR MANAGEMENT OF MAM



## 4.4 Targeted Supplementary Feeding

SFP provides a supplementary ration to children 6-59 months and pregnant and lactating women (PLW) meeting the admission criteria.

### 4.4.1 Admission

#### 4.4.1.1 Admission Criteria

Each admission criterion is INDEPENDENT. All the children 6-59 months old and PLW, who fulfil any of the admission criteria in the following table, should be admitted for MAM treatment in SFP.

**TABLE 7. ADMISSION CRITERIA SUPPLEMENTARY FEEDING OF SFP**

Age group	Admission Criteria
Children 6-59 months	- MUAC $\geq$ 115 mm and $<$ 125 mm OR - W/H* $\geq$ -3 and $<$ -2 Z-score

\* W/H is the same as W/L

#### 4.4.1.2 Categories of admission

**TABLE 8. CATEGORIES OF ADMISSION OF SFP**

Category	Comments
New case	New Admission according to the criteria of admission
Relapse case	- Child who defaulted and readmitted after more than 2 months of absence - Child readmitted after previously being discharged as cured
Old case	This includes: - Readmission of Defaulters within 2 months of absence - Transfer from another SFP - Referral of the cured SAM child from OTP



## 4.4.2 Diet

The principle of SFP program is to provide a food supplement to complement the usual diet. Beneficiaries receive dry rations or Ready to Use Supplementary Food (RUSF) developed to fulfill the nutritional needs of patient with MAM. A take-home or dry ration is usually more than the amount required in order to compensate for family sharing when a fortified blended food is used. Depending on the availability, SFP will use one or the other of the products outlined in **Annex 5. Nutritional Products for Treatment of Moderate Acute Malnutrition**. IYCF counselling key messages focusing on children aged below 2 years are also provided in chapter 3, Table 6. Discussion points during IYCF Counselling in IMAM.

It is important to mention that, if the child is receiving MNP through a national program, the MNP ration should be suspended during the time the child receives RUSF or the Super Cereal ration to avoid over dosage of micronutrients.

The ration should provide sufficient energy and nutrient to support recovery from MAM and prevent progression to SAM.

The range of products which can be used in the SFP are outlined in **Annex 5** and are either fortified blended foods such or ready to use supplementary foods (RUSFs)

- |  |  |
|--|--|
| 1. Super Cereal Plus   | – Fortified Blended Food (FBF)                     |
| <b>Daily Ration</b>  | : 200g <sup>3</sup>                                |
| <b>Average Length of Stay</b>  | : 60 – 90 days                                     |
| 2. Ready to Use Supplementary Food (LNS)                                 | – Lipid Based Nutrient Supplement                  |
| <b>Daily Ration</b>  | : 1 sachet / day (92g) irrespective of body weight |
| <b>Average Length of Stay</b>  | : 60 – 90 days                                     |
| 3. Balanced premix ration enriched in micronutrients prepared in Myanmar | – Fortified Blended Food (FBF)                     |
| <b>Daily Ration</b>  | : 3 cups of porridge per day                       |
| <b>Average Length of Stay</b>  | : 3 months   |

<sup>3</sup> Interim Guidance on Management of Acute Malnutrition, Myanmar IASC Nutrition Cluster, 2008.

### 4.4.3 Routine Medicines

- Unless problems reported by the carer, the MAM child only needs to receive a regular fortnightly supplement of food on top of the usual diet, and counselling, to recover.
- Follow the routine medical treatment outlined below, checking the health card in order to establish whether vitamin A or Albendazole has been given recently.
- Whilst a child is receiving a FBF or RUSF as part of the SFP the service provider must ensure that they do not also receive MNP as part of an existing program.

#### Vitamin A Supplementation

- On admission check on the health record or ask the mother if the child has received Vitamin A in the last six months.
- Administer Vitamin A as outlined in **Table 9** if it has not already been taken in the past one month and it is not anticipated that it will be given in other programs within the next 2 months.

TABLE 9. VITAMIN A DOSAGES

Age	Vitamin A IU ( $\mu\text{g}$ ) Orally at Admission
6 to 11 months	100,000 (30,000 $\mu\text{g}$ )
$\geq 12$ months	200,000 (60,000 $\mu\text{g}$ )

#### Albendazole

- On admission check on the health record and/or ask the mother if the child has received Albendazole in the last six months.
- If not, administer Albendazole to all children over 11 months.

TABLE 10. ALBENDAZOLE DOSAGES

Age	Albendazole
< 12 months	None
12 to 23 months	200mg
$\geq 24$ months	400mg

## Iron/Folic Acid Supplementation

Administer Iron/Folic Acid fortnightly, as in the following table:

**TABLE 11. IRON/FOLIC ACID DOSAGES**

Children	Tablets (fortnightly)
<10 kg	1 tablet
≥10kg	2 tablets

### 4.4.4 Monitoring in SFP

**TABLE 12. MONITORING IN SFP**

Measure	Frequency
MUAC	Every 2 weeks
Weight is taken using the same scale	Every 2 weeks
Check Odemea and medical complications	Every 2 weeks
IYCF counselling	Every 2 weeks
Height	on Admission

#### 4.4.5 Failure to Respond to Treatment

Cause of failure must be identified and managed accordingly.

##### Criteria to diagnose as “Failure to Respond”

The following table shows maximum time limits for diagnosis of the patient as failure to respond to treatment – in most circumstances action should be taken before these limits are reached.

**TABLE 13. CRITERIA FOR FAILURE TO RESPOND IN SUPPLEMENTARY FEEDING PROGRAM**

Criteria for Failure to Respond	Time after Admission
Failure to gain any weight	5 weeks
Weight loss since admission to programme	14 days
Weight loss more than 5% of body weight	At any visit
Failure to reach discharge criteria	3 months

#### Causes of Failure to Respond

##### Problems with SFP

- Failure to apply the proper guideline
- Poor training of the staff.
- Poor communication between the caretakers and staffs who are running the SFP.
- If it is suspected that “short rations” are being given or that there is diversion of food, unannounced post-distribution monitoring should be implemented by re-weighing the food of recipients exiting the SFP or visiting a random selection of beneficiaries at home and examining/weighting the food they have recently received.

##### Social Problems

Where RUSF is being used and the correct instructions as to its use have been given (and the caretaker confirms that they have been followed), one of the causes of failure are social problems within the household. Thus a home visit would be recommended.

## Psychological Problems

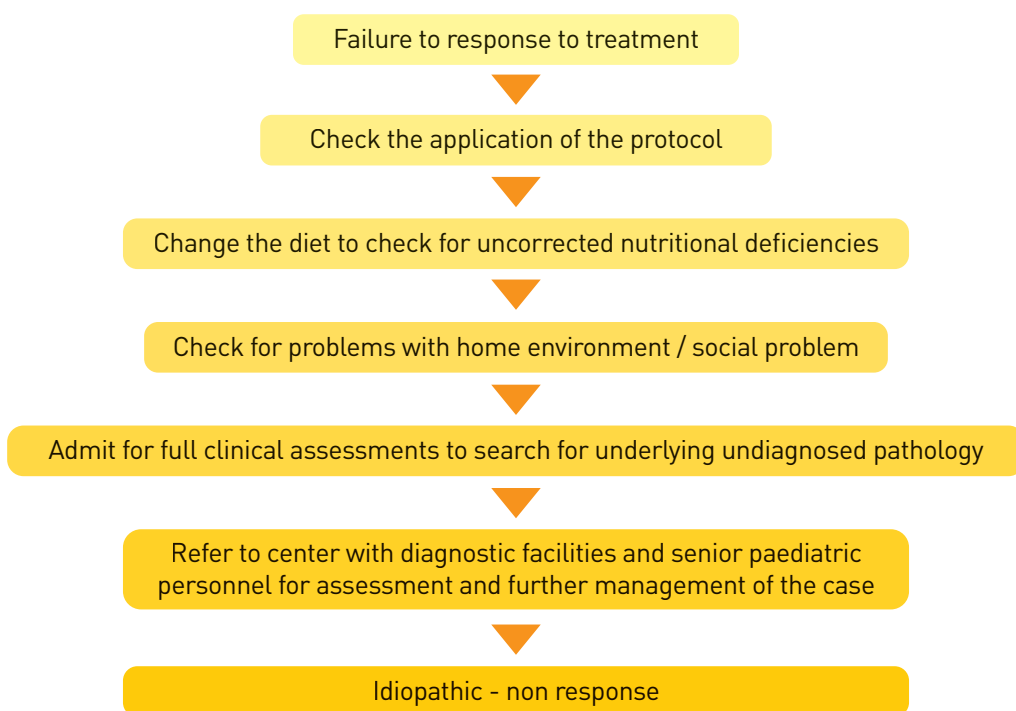
- Psychological trauma (witnessing violence or death, particularly in refugee situations and families living with HIV/AIDS)
- Psycho-social deprivation, neglect
- Rumination

## Underlying Medical Conditions

If the child has no appetite then there may be an underlying medical problem. A careful history should be taken and the child should be referred to a paediatric facility with special expertise and diagnostic facilities for the common underlying conditions; in particular, TB, HIV, Cerebral Palsy, Worm Infestations (Amoebiasis, Giardiasis, Trichuriasis), other infections, Cirrhosis, Systemic Disease (Congenital Heart, Chronic Renal Disease), Down's Syndrome, Post-meningitis Neurological damage, etc.

Figure 10 below outlines the steps of the procedure to address failure to respond.

**FIGURE 10. OVERVIEW OF STEPS FOR FAILURE TO RESPOND**



## 4.4.6 Referral

### 4.4.6.1 Criteria of Referral

Children receiving SFP who do not respond to treatment in SFP or develop signs of a serious medical complication (pneumonia, dehydration, etc.) are referred to the OTP/ITP for management of their condition until they are fit to return to SFP.

Transfer any patient being treated in the SFP to the OTP/ITP accordingly if they develop any of the followings:

- Development of oedema
- Development of any of medical complication. **See Figure - 9**
- Fulfilling any of the criteria of “**Failure to Respond to Treatment**” for further investigations in well-equipped health facilities after confirming the child receives adequate FBF. **See Table - 13**
- Major illness or death of the main caretaker so that the substitute caretaker is incapable or unwilling to look after the malnourished patient or requests transfer to in-patient care.

### 4.4.6.2 Procedure for Referral

- Respective standard treatment should be applied when referred to the ITP/OTP.
- Complete the referral form which should contain the summary of the treatment given and the AM-Number. **See Annex 3 for Transfer Form**
- If possible, inform the ITP/OTP nutrition supervisor about the referral and record it on the patient’s chart. The ITP/OTP supervisor should arrange for the patient to be admitted quickly.

## 4.4.7 Discharge

### 4.4.7.1 Discharge criteria

Discharge the children according to the following criteria outlined in Table 14:

**TABLE 14. DISCHARGE CRITERIA FOR SUPPLEMENTARY FEEDING**

Age group	Discharge Criteria
Children 6-59 months	<ul style="list-style-type: none"><li>• MUAC <math>\geq</math> 125 mm for two consecutive visits*</li></ul> <p>OR</p> <ul style="list-style-type: none"><li>• W/H** <math>\geq</math> -2 z score for two consecutive visits</li></ul>
All SAM cured children	After follow up for 4 months AND MUAC $\geq$ 125 mm (+ W/H $\geq$ -2 z Score if Height board is available )

\* Visits are every 2 weeks.

\*\* W/H is the same as W/L

### 4.4.7.2 Categories of Discharge

The categories of discharge from SFP are outlined in Table 15:

**TABLE 15. DISCHARGE CATEGORIES FOR SUPPLEMENTARY FEEDING**

Category	Comments
Cured	MAM children and PLW reaching the criteria of discharge
Defaulter	After 2 consecutive visits absences
Dead	While the child/PLW is registered in the program or within 24 hours of transfer to another health facility (follow up required when transfer). Death are not counted unless related to malnutrition
Non respondent	do not reach the cured criteria after 3 months (12 weeks) in the program

The following categories are not exits of the programme but exits of the specific health structure, they are called movements:

- Referral to ITP / OTP: they are expected to return
- Transfer to another SFP: will not return but are still in the program

### 4.4.7.3 Procedures of Discharge

As soon as the child reaches the criteria for discharge, s/he can be discharged from the program:

- Record the discharge date, weight, MUAC and the category of discharge in the registration book and in the ration card.
- Check that the immunizations are updated and inform the carer/PLW that the treatment is over.
- The caregivers of moderately malnourished children should receive information and support to improve dietary and hygiene and sanitation practices, IYCF Counselling during regular visits and screenings.

## 4.5 Nutrition Education and Counselling

Refer to **Chapter 3 IYCF** counselling.





**Outpatient Treatment of  
Severe Acute Malnutrition  
without Complications**

## 5. Outpatient Treatment of Severe Acute Malnutrition without Complications

The majority of children with Severe Acute Malnutrition (SAM) are treated in the Outpatient Therapeutic Treatment (OTP) of an IMAM programme. Around 85% - 90% of severely acutely malnourished children are normally treated in OTP. Children can be admitted directly into the OTP within a health facility, treated with routine drugs and given RUTF to eat at home.

### 5.1 Principles and Objectives

The objective of OTP is to reduce workload of hospital and burden of family if their child is required hospital admission. The OTP provides home based treatment and rehabilitation for children who are severely acutely malnourished but have appetite and are free of medical complications. They attend the OTP every week for a medical check, to receive additional medical treatments, if required, and to be given their one week supply of RUTF<sup>4</sup>.

### 5.2 Structure of OTP

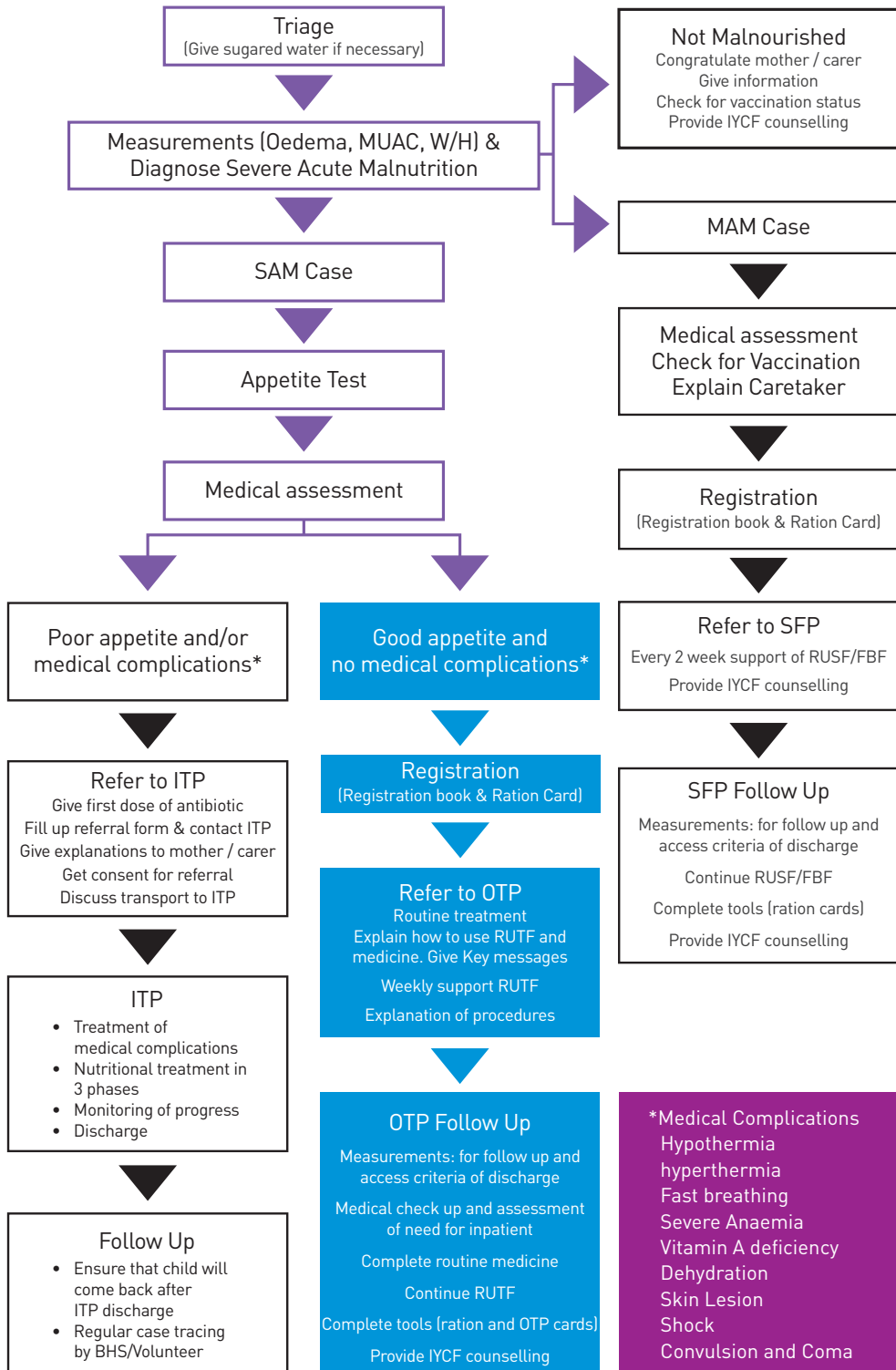
Outpatient Therapeutic Treatment for 6-59 months children will be implemented countrywide. OTP service is provided in Rural Health Centres (RHC), Sub Rural Health Centres (SRHC), Urban Health Centres (UHC), Station and Township Hospitals.

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<sup>4</sup> Community-based Therapeutic Care (CTC) .  
A Field Manual. Valid International 2006.

## 5.3 Decision Making Steps for Management

FIGURE 11. DECISION MAKING STEPS FOR OTP MANAGEMENT



Outpatient Treatment of Severe Acute Malnutrition without Complications

## 5.4 Appetite Test

### Why do the appetite test?

- Reasonably accurate assessment of the appetite is often the only way to differentiate a complicated from an uncomplicated case of SAM. Signs of severe medical illness are less reliable in the severely malnourished child.
- To detect the sign of severe metabolic-malnutrition is a reduction in appetite, and the appetite test is the most important criterion to decide if a patient should be sent for in- or outpatient management.
- A poor appetite means that the child has a significant infection or a major metabolic abnormality such as liver dysfunction, electrolyte imbalance, and cell membrane damage or damaged biochemical pathways. These are the patients at immediate risk of death. Furthermore, a child with a poor appetite will not take sufficient amounts of the therapeutic diet at home to prevent deterioration.

### When to do the appetite test?

Conduct the test after registration, it is then repeated at each follow up visit to the health facility.

### How to do the appetite test?

The appetite is tested upon admission and is repeated at each follow –up visit to the health facility.

Points to consider when conducting an appetite test are:

- Conduct the appetite test in a quiet separate area.
- Provide an explanation regarding the purpose of the test to the care giver and describe the procedure.
- Observe the child eating the RUTF during 30 minutes and decide if the child passes or fails the test.
- Advise the carer to:
  - Wash hands before giving the RUTF
  - Sit with the child in lap and gently offer the RUTF
  - Encourage the child to eat the RUTF without force feeding
  - Offer plenty of clean water to drink from a cup when child is eating RUTF

The person in charge of the “Appetite Test” should evaluate the result:

TABLE 16. APPETITE TEST IN OUTPATIENT THERAPEUTIC TREATMENT

Pass Appetite Test	Fail Appetite Test
The child eats at least one-third to half of a packet of RUTF (92g), or three teaspoons in 30 minutes.	The child does not eat at least one-third to half of a packet of RUTF (92g), or three teaspoons in 30 minutes.

A child who fails the appetite test should be admitted to inpatient care.

Failure of an appetite test at any time is an indication for full evaluation and probable transfer for inpatient assessment and treatment.

If the appetite is “passed” during the appetite test and the rate of weight gain at home is poor then a home visit should be arranged because this indicates a social problem at household level or extensive sharing of the RUTF. If the home visit is not possible, it may be necessary to bring a child into residential care to do a simple “trial of feeding”, where the intake of the child is directly observed by the staff, to detect:

- Social problem at home
- A metabolic problem with the patient/failure to respond

For sick children whose mother initially refuses inpatient care, re-perform the appetite test:

- If appetite test is now passed, explain home care to mother and give treatment for the accompanying illness. Passing the appetite test is the main criterion for outpatient management.
- If appetite test is again failed, explain to the mother of the dangers of taking the child home and try to persuade her to accept inpatient care for at least a few days. However, the mother’s decision must be respected and she should not be coerced.



# ကြုံတွေ့နိုင်သော အန္တရာယ်လက္ခဏာများ

ကြုံတွေ့နိုင်သော အန္တရာယ်လက္ခဏာများကို ကိုယ်ဝန်ဆောင်နှင့် ကိုယ်ဝန်ဆောင်မိခင် သေဆုံးမှုမဖြစ်အောင် ကြိုတင်

ပေးနိုင်မည့် ဆရာဝန်၊ ဆရာမများ၊ ဆေးရုံ၊ ဆေးခန်း နှင့် သွားရောက် မွေးဖွားနိုင်သည်။  
သော အန္တရာယ်လက္ခဏာများမှာ -

ပျင်းထန်စွာကိုက်လျှင်၊ အမြင်မှန်ဝါးလျှင်၊

အားနည်းလျှင်

အမ်းမောဝန်းလျှင်

တက်လျှင်

(၁၂)နာရီထက် မီ

လျှင်

ခဲလျှင်

ကြုံတွေ့ရပါက နီးရာ ဆေးရုံ၊ ဆေးခန်း

ကျန်းမာရေးဦးစီးဌာန (မိခင်ကလေးကျန်းမာရေးဌာန)

အန္တရာယ်လက္ခဏာများ  
သောဆေးရုံများမှာ မွေးဖွားရန် ကိုယ်ဝန်ဆောင်များအတွက် ခေတ်မီကျန်းမာရေးစောင့်ရှောက်မှုများကို ပေးအပ်နိုင်ပါသည်။  
ကိုယ်ဝန်ဆောင်မိခင် သေဆုံးမှုမဖြစ်အောင် ကြိုတင်  
ဆေးရုံ၊ ဆေးခန်း နှင့် သွားရောက် မွေးဖွားနိုင်သည်။  
သော အန္တရာယ်လက္ခဏာများမှာ -  
ပျင်းထန်စွာကိုက်လျှင်၊ အမြင်မှန်ဝါးလျှင်၊  
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တက်လျှင်  
(၁၂)နာရီထက် မီ  
လျှင်  
ခဲလျှင်  
ကြုံတွေ့ရပါက နီးရာ ဆေးရုံ၊ ဆေးခန်း  
ကျန်းမာရေးဦးစီးဌာန (မိခင်ကလေးကျန်းမာရေးဌာန)



Chart with multiple columns and rows of data, likely a health record or schedule.



## 5.5 Admission

### 5.5.1 Admission criteria to OTP

Each admission criterion is INDEPENDENT. Any patients that fulfil any of the criteria in Table 17 have severe acute malnutrition.

TABLE 17. ADMISSION CRITERIA OUTPATIENT THERAPEUTIC TREATMENT

Age group	Admission Criteria
Children 6-59 months	<ul style="list-style-type: none"><li>• Presence of bilateral pitting oedema + and ++ (OR)</li><li>• MUAC &lt; 115 mm (OR)</li><li>• W/H &lt; -3 z-scores ANY ONE OF THE ABOVE AND</li><li>• Good appetite and no medical complications</li></ul>

Oedema in all children is graded using the classification in **Annex 1. Oedema / MUAC Measurements / Weight for Height.**

### 5.5.2 Categories of Admission

TABLE 18. CATEGORIES OF ADMISSION OUTPATIENT THERAPEUTIC TREATMENT

Category	Comments
New case	New admission according to the criteria of admission
Relapse case	<ul style="list-style-type: none"><li>- Child who defaulted and re-admitted after more than 2 months of absence</li><li>- Child re-admitted after previously being discharged as cured</li></ul>
Old case	<p>This includes:</p> <ul style="list-style-type: none"><li>- Transfer from another OTP (treatment already started with a AM number)</li><li>- Referral of Cured SAM from ITP</li><li>- Re-admission after defaulting within 2 months of absence</li></ul>



### The child has to be transferred to Inpatient if s/he has any of the following conditions:

- Diarrhoea and dehydration based on history & change in appearance (clinical signs are unreliable in the malnourished and should NOT be used to diagnose dehydration)
- Severe vomiting
- Pneumonia :
  - >60 breaths/ minute for under 2 months
  - >50 breaths/minute from 2 to 12 months
  - >40 breaths/minute from 1 to 5 years
  - >30 breaths/minute for over 5 year-olds or any chest in-drawing
- Open skin lesions
- Hypothermia < 35.5°C (rectal) or <35° C (axilla)
- Fever > 39.5°C (rectal) or >39° C (axilla)
- Very pale (severe anaemia)
- Weak, apathetic or unconscious
- Convulsions
- Clinical vitamin A deficiency
- Any condition that requires an infusion or NG tube feeding
- Any other general signs or symptoms which the nurse/clinician thinks requires investigation or treatment in an in-patient facility



## 5.6 Diet

Nutritional treatment for SAM in OTP is through the use of Ready to Use Therapeutic Food (RUTF), an energy dense mineral and vitamin enriched food designed to treat severe acute malnutrition. (SAM). RUTF is oil based: it does not have to be mixed with water and therefore avoids problems of contamination. The amount of RUTF a child should consume is determined by the need for an intake of about 150 – 200 kcal per kilogram of body weight per day (150 – 200 kcal/kg/day). This is the same energy level as a child in Phase 2 of treatment in an inpatient setting and is sufficient to begin rehabilitation of a severely acutely malnourished child. The number of packets or pots per day is based on the weight of the child and simplified to make it easier for the carer. **See Table 19 for amounts of RUTF** to give on a daily and weekly basis according to weight.

To summarise, the benefits of RUTF are that:

- Each pack or pot has a standard food value
- No cooking is needed
- It does not need to be diluted with water
- It can be stored for up to six months at room temperature
- You simply open the packet or pack and feed the food directly to children
- It can be eaten at home

**See Annex 9 for Components of RUTF.**

### 5.6.1 Amounts of RUTF to give

The RUTF can be kept safely for several days after the package is opened provided it is protected from insects and rodents. It is also used in day-care management when RUTF is given for feeding overnight, at weekends or during staff shortages.

**TABLE 19. AMOUNTS OF RUTF TO GIVE**

Class of Weight (kg)	RUTF sachets (92g)	
	Sachet per day	Sachet per week
3.0 -3.4	1 ¼	8
3.5 -4.9	1 ½	10
5.0 -6.9	2	15
7.0 -9.9	3	20
10.0- 14.9	4	30
>14.9	5	35

One sachet of RUTF (92g) provides 500kcal of energy

**For patients that are being transferred to an OTP from an ITP;**

- Sufficient RUTF should be given to last until the next OTP day at the site closest to the child’s home

**For children that are first admitted directly into OTP**

- Admission to OTP are done every day while follow up visits can be once a week. Therefore, on the day of admission, the amount of RUTF to be given should be calculated according to the number of days before the follow up visit.



## Special case: Twins

Some SAM children are twins and it is important for the mother to treat equally each child, the following scenarios are possible and procedure is as follows:

- **Both children are SAM:** both children are admitted to OTP as two new admissions. In order to facilitate the understanding of the mother, both children will have the same amount of RUTF (the dose will be based on the weight of the heavier one)
- **One child is SAM and one child is not malnourished:** it is difficult for the mother not to share RUTF and the SAM child may not receive enough RUTF to recover. For this special case:
  - Both children will receive the same dose of RUTF (the dose will be based on the weight of the SAM child)
  - The non malnourished child will not be registered as in the registration book and will not have an OTP chart and a AM number; however he will be given a ration card indicating the same AM number as his twin with the mention “twin”
- **One child is SAM and one child is MAM:** one child is admitted to OTP and one is admitted to SFP; if there is no SFP follows the procedure for above (both children receive RUTF)



## 5.6.2 Key messages

Sensitize the carer of the importance of breast-feeding and that the child should always get breast-milk (if they are still breastfeeding) before they are given RUTF and as well as on demand.

FIGURE 12. EXPLAIN TO THE CARETAKER HOW TO GIVE THE RUTF AT HOME<sup>5</sup>

### KEY MESSAGES TO CAREGIVER

- For breastfed children, always give breast milk before RUTF.
- Explain the RUTF is only food the patients need to recover. It is special medicine contains all ingredients that patient needs to recover. It is not necessary to give other food to child with SAM.
- RUTF is a food and medicine for very thin children only. It should not be shared.
- Sick children often do not like to eat. Give small regular meals of RUTF and encourage the child to eat often (if possible eight meals a day)
- For children <2 years who are still breastfeeding, continue to put the child to the breast regularly
- Always offer the child plenty of clean water to drink while he or she is eating RUTF
- Use soap for children's hands before feeding
- Keep food clean and covered
- Sick children get cold quickly. Always keep the child covered and warm
- When a child had diarrhoea, never stop feeding. Give extra food and extra clean water

<sup>5</sup> Community based Therapeutic Care 9CTC. A Field Manual. Valid International.2006.

## 5.7 Routine Medicines

### 5.7.1 Systematic Antibiotic Treatment

- Children with uncomplicated severe acute malnutrition<sup>6</sup>, not requiring to be admitted and who are managed in OTP, should be given a course of oral antibiotic such as amoxicillin. Cotrimoxazole can be used as alternative if child has diarrhoea due to amoxicillin.
- Give systematic antibiotics to severely malnourished patients, even if they do not have clinical signs of systemic infection. Despite the absence of clinical signs, they nearly all have small bowel bacterial overgrowth and have at least minor infections.

See Table 20. For dosages of amoxicillin to give.

**TABLE 20. DOSAGES OF AMOXICILLIN**

Weight	Amoxicillin (15 mg/kg) Dosage - 3 times Per Day (for 5 days)	
kg	In mg	Cap/tab (250mg)
< 5	62.5 mg*3	¼ cap*3
5 -10	125 mg*3	½ cap*3
10-20	250 mg*3	1 cap*3
20 -35	375 mg*3	1½ cap*3
> 35	500 mg*3	2 cap*3

**Note:** Syrup can be given but check the strength per 5ml first (there are 2 strengths, 125mg and 250mg). Ampicillin is given in the same dose as amoxicillin.

<sup>6</sup> Guideline, Updates on the Management of Severe Acute Malnutrition in Infants and Children, WHO, November 2013.

## DOSAGES OF COTRIMOXAZOLE

1. Cotrimoxazole (24mg/kg) Dosage – Twice Per Day (for 5 days)
2. Corimoxzole 24mg/kg is 20mg/kg sulfamethoxazole and 4mg/kg trimethoprim. 1 tablet of Cotrimoxzole 400mg sulfamethoxazole and 80mg trimethoprim.
3. Syrup can be given but check the strength per 5ml of Corimoxzole 200mg sulfamethoxazole and 40mg trimethoprim.

TABLE 21. DOSAGES OF COTRIMOXAZOLE

Age	Adult Tablet (Cotrimoxzole 400mg sulfamethoxazole and 80mg trimethoprim) Dosage - 2 times Per Day (for 5 days)
6 weeks - 6 months	¼ tab*2
6 months - 5 years	½ tab*2
5 years - 12 years	1 tab*2
12 years - 18 years	2 tab*2

### Clarifying instructions:

- OTP treatment should only be with oral amoxicillin in areas where there is not widespread resistance to amoxicillin, where resistance is common, alternatively Amoxicillin/Clavulanic acid combination could be used (the level of resistance is lower than with amoxicillin alone at the moment)
- Do not give systematic antibiotics to children transferred to the OTP from ITP or have been transferred from another OTP after having already received a course of antibiotics.
- Do not give second-line antibiotics: children who require second-line antibiotic treatment or have significant infections should be treated in ITP. Therefore there are no recommendations for “second-line” antibiotics for use in out-patient treatment programs.
- Give the first dose under supervision and tell the mother that the treatment should continue for a total of 5 days. For OTP, antibiotic syrup is preferred; if it is not available the tablets should be used and cut in half by the staff before being given to the caretakers (for children <5kg).

## 5.7.2 Deworming

- On admission check on the health record or ask the mother if the child has received Albendazole in the last six months.
- If not give de worming for both those transferred from ITP to OTP and those admitted directly to OTP at the 4<sup>th</sup> outpatient visit. Anti helminths are only given to children that can walk. **See Table 22.**

TABLE 22. ANTI HELMINTH TREATMENT

Age	Albendazole
< 1 Year	None
1 to 2 Years	½ Tablet (200mg)
≥ 2 Years	1 Tablet (400mg)

## 5.7.3 Vitamin A

### Vitamin A to children with SAM with no eye sign<sup>7</sup>

No additional Vitamin A other than what is contained in RUTF<sup>8</sup> should be given. Children with SAM, if they are receiving F-75, F-100 or RUTF that comply with WHO specifications (and therefore already contain sufficient vitamin A), or vitamin A is part of other daily supplements do not require a high dose of vitamin A as a supplement

If they are given therapeutic foods that are not fortified as recommended in WHO specifications and vitamin A is not part of other daily supplements, then give a high dose of vitamin A (100,000 IU or 200,000 IU, depending on age) on admission.

<sup>7</sup> Night blindness, bitot spot, thickening of cornea, erosion of cornea

<sup>8</sup> Guideline, Updates on the Management of Severe Acute Malnutrition in Infants and Children, WHO, November 2013.

### Concerning Vitamin A to children with SAM with eye sign<sup>9</sup> or recent measles

A high dose (100,000 IU or 200,000 IU, depending on age - **See Table 9. VITAMIN A DOSAGES**) of vitamin A should be given to all children with severe acute malnutrition and eye signs of vitamin A deficiency or recent measles. Irrespective of the type of therapeutic food they are receiving.

First Dose - Day 1

Second Dose - Day 2

Third Dose - Day 15

Do not keep any child with clinical signs of vitamin A deficiency as an outpatient; the condition of their eyes can deteriorate very rapidly and they should always be transferred for in-patient management.

#### 5.7.4 Malaria

- Refer to national guidelines for non complicated malaria or malaria prophylaxis (except that quinine tablets should not be used in the severely malnourished).
- Refer severe complicated malaria cases to ITP.
- Where complicated patients refuse admission to in-patients, treat with the regimen recommended for inpatients (**see Chapter 6. ITP**).
- Give insecticide impregnated bed nets in malaria endemic regions.

#### 5.7.5 Measles

Give measles containing vaccine to children over the age of 9 months according to National Immunization Schedule.

**Note:** Do not give measles vaccine on admission to patients directly admitted to OTP because the antibody response is diminished or absent in the severely malnourished, except in the presence of a measles epidemic. The measles vaccine is given at a time when there should be sufficient recovery for the vaccine to produce protective antibodies. They are also unlikely to be incubating measles<sup>9</sup> and will not be exposed to nosocomial infection.

<sup>9</sup> Night blindness, bitot spot, thickening of cornea, erosion of cornea

<sup>10</sup> If they are incubating measles they are likely to fail the appetite test. (Ref: Immunization in Practice: A practical guide for health staff, Page 31, 2015 Update, WHO)



**TABLE 23. DOSAGES OF MEDICINE USE IN OTP**

Drug/Supplement	When	Age/Weight	Prescription	Dose
VITAMIN A	4 <sup>th</sup> week (4 <sup>th</sup> visit)	6 - 12 months	100,000 IU	1 dose
		> 1 year	200,000 IU	
		Do not use with Oedema		
No vitamin A dose is provided if the child is on F-75, F 100 or RUTF that comply with WHO specifications. Not already been taken in the past 2 months.				
AMOXYCILLIN	At Admission	All SAM cases	< 5 kg => 62.5 mg 5 -10 kg => 125 mg 10-20 kg => 250 mg 20 -35 kg => 375 mg > 35 kg => 500 mg	3 times a day for 5 days
COTRIMOXAZOLE	At Admission	All SAM cases	24mg/kg	2 times a day for 5 days
ALBENDAZOLE	4 <sup>th</sup> week (4 <sup>th</sup> visit)	< 1 year	DO NOT GIVE	None
		1 - 2 years	200 mg	Single dose
		≥ 2 years	400 mg	
MEASLES VACCINATION	4 <sup>th</sup> week (4 <sup>th</sup> visit)	> 9 months	Give a second dose if received first vaccination when SAM in ITP	

### Information for additional medication

- DO NOT give multiple excessive drugs to SAM patients, unless there is definite indication. Drugs that could decrease appetite should be given with caution (eg. antibiotics).
- Do not give cough suppressants.
- Paracetamol should only be given for documented fever.
- One dose of Folic acid (5mg)<sup>11</sup> can be given to children with clinical anaemia. There is sufficient folic acid in the RUTF to treat mild folate deficiency. High dose folic acid should not be given where Fansidar (SP) is used to treat malaria.
- For children with diarrhoea on RUTF or other therapeutic food containing zinc it is not advisable to give additional zinc as this can increase the mortality rate<sup>12</sup>.

## 5.8 Patients Monitoring in OTP

At each weekly visit, the following should be carried out as in **Table 24**, below.

**TABLE 24. SUMMARY OF PATIENT MONITORING IN OTP**

Outpatient	Frequency
MUAC is taken	Every week/visit
Weight and oedema check	Every week/visit
Appetite test is done	Every week/visit
Body temperature is measured	Every week/visit
Danger signs: (pulse rate, respiratory rate, chest indrawing, dehydration, sign of shock etc.)	Every week/visit
Height/Length is measured	At admission
W/H z score can be calculated	As required – day of admission and discharge

<sup>11</sup> This assumes that the patients are receiving the RUTF at home and that the extent of sharing within the family is very small. If there is doubt whether the child will receive sufficient RUTF then a dose of folic acid can be given.

<sup>12</sup> The increase in mortality is probably due to induced copper deficiency with high doses of zinc. This is not a danger with RUTF as the RUTF contains copper. The zinc tablets given for diarrhoea, however, do not contain additional copper.

## 5.9 Failure to respond to treatment in OTP

It is usually only when children fulfil the criteria for “failure to respond” that they need to have a full history & examination or laboratory investigations conducted.

### 5.9.1 Diagnosis of failure-to-respond

Failure to respond to standard treatment can be due to social, nutritional, psychiatric or medical problems. An attempt to diagnose the difficulty should first be made by OTP staff. In particular, the ITP has less capacity to investigate social problems than OTP staff. Referral to the ITP should not be the first response when a patient fails to respond. If inadequate social circumstances are suspected as the main cause of failure in OTP, do an appetite test, then a home visit or supervised trial of feeding at the health centre (attending daily for 3 days) before transfer to the ITP. **See Table 25.**

**TABLE 25. CRITERIA FOR FAILURE TO RESPOND IN OUTPATIENT THERAPEUTIC TREATMENT**

Criteria for Failure to Respond	Time after Admission
Failure to gain any weight (non oedematous children)	21 days (3 <sup>rd</sup> Visit)
Weight loss since admission to programme (non oedematous children)	14 days (2 <sup>nd</sup> Visit)
Failure to start to lose oedema	14 days (2 <sup>nd</sup> Visit)
Oedema still present	21 days (3 <sup>rd</sup> Visit)
Failure of appetite test	At any visit
Weight loss of 5% of body weight (non oedematous children)	At any visit
Weight loss for two successive visits	At any visit
Failure to start to gain weight satisfactorily after loss of oedema(kwashiorkar) or from Day 14 (marasmus) onwards	At any visit

## The usual causes of failure to respond are:

### Problems with OTP

- Inappropriate selection of patients to go directly to ITP
- Poorly conducted appetite test or appetite “judged” by inexperienced personnel and not measured
- Inadequate instructions given to caretakers (especially with respect to sharing within the family)
- Wrong amounts of RUTF dispensed to children
- Excessive time between OTP distributions (e.g. two weekly gives significantly worse results than weekly visits)

### Problems of Individual Children – Social

- Insufficient RUTF given by caretaker
- RUTF taken by siblings or caretaker
- RUTF is the only food a SAM child should eat; if the child has good appetite and ask for additional food this can be give after the RUTF daily ration is consumed.
- Unwilling caretaker
- Caretaker or head of family has depression, another psychiatric condition or is sick (e.g. HIV) and unable to take care of the child
- Caretaker overwhelmed with other work and responsibilities or their priorities are set an oppressive head of household (husband, mother-in-law, etc.)
- Death of caretaker or major change in family circumstances
- Purposeful discrimination against the patient
- Use of the child’s illness to access relief or other services for the whole family with attempts to ensure the child remains within the program

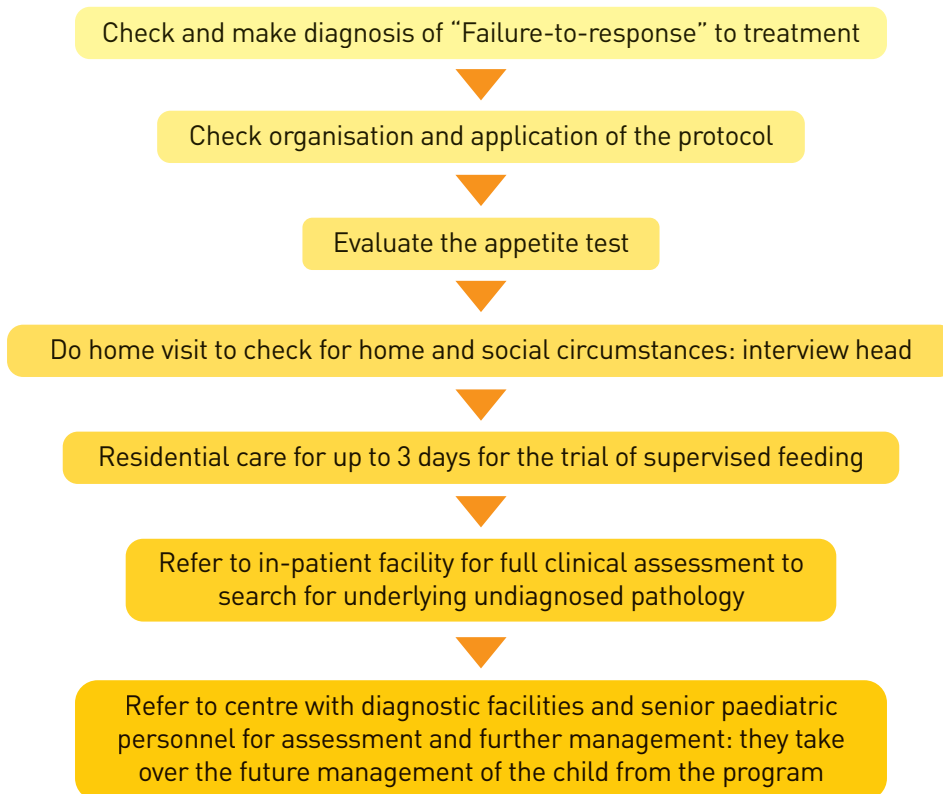
### Problems of Individual Children – Psychological

- Psychological trauma (witnessing violence or death, particularly in refugee situations and families living with HIV/AIDS)
- Psycho-social deprivation, neglect
- Rumination

## Problems of Individual Children – Medical

- Initial refusal to go to ITP despite having a medical complication or an inadequate appetite
- Undiagnosed vitamin or mineral deficiency (particularly if RUTF shared excessively)
- Malabsorption, small bowel bacterial overgrowth
- Traditional medicines/ herbs being given that are toxic or affect appetite
- Inappropriately prescribed drugs
- Bacterial resistance to routine antibiotics
- Infection, especially: Diarrhoea, dysentery, pneumonia, tuberculosis, urinary infection, otitis media, malaria, HIV/AIDS and hepatitis/cirrhosis
- Other serious underlying disease, for example, congenital abnormalities (e.g. Down's syndrome, congenital heart disease), neurological damage (e.g. cerebral palsy), surgical problems (pyloric stenosis, Hirschsprung's disease, etc.)

**FIGURE 13. STEPS TO TAKE WITH FAILURE TO RESPOND IN OUTPATIENT THERAPEUTIC TREATMENT**



## 5.10 Referral

### 5.10.1 Criteria of Referral from OTP to ITP

Outpatients who develop signs of a serious medical complication (pneumonia, dehydration, etc.) are referred to the ITP for management of their condition until they are fit to return to OTP.

Transfer any patient being treated in the OTP to the ITP if they develop any of the followings:

- Failure of the appetite test (see failure to respond procedure)
- Increase/development of oedema
- Development of re-feeding diarrhoea sufficient to lead to weight loss
- Development of any of medical complication. **See Figure. 11**
- Fulfilling any of the criteria of “failure to respond to treatment” **See Table. 25**
- Major illness or death of the main caretaker so that the substitute caretaker is incapable or unwilling to look after the malnourished patient or requests transfer to in-patient care.

### 5.10.2 Procedure for Referral

- When referred to the ITP, standard inpatient treatment should be applied.
- Complete the referral form which should contain the summary of the treatment given and the AM-Number. **See Annex 3 for Transfer Form.**
- If possible, phone the ITP nutrition supervisor to inform the ITP about the referral and record it on the patient’s chart. The ITP supervisor should arrange for the patient to be admitted quickly.

**Note:** When the patient returns to the OTP similar contact should be made to avoid losing the patient during the transfer.

## 5.11 Discharge

### 5.11.1 Discharge criteria

TABLE 26. DISCHARGE CRITERIA FROM OUTPATIENT THERAPEUTIC TREATMENT

Age group	Discharge Criteria
Children 6-59 months	1. Free from oedema for 2 consecutive visits** ————— AND —————
	2. MUAC $\geq$ 125 mm for two consecutive visits** ————— OR —————
	W/H* $\geq$ - 2 z score for two consecutive visits**

\* W/H is the same as W/L, \*\*Visits are weekly

### 5.11.2 Categories of discharge

Register the patients discharged in the registration book and chart according to the following categories in Table 27.

TABLE 27. DISCHARGE CATEGORIES FOR OUTPATIENT THERAPEUTIC TREATMENT

Category	Comments
Cured	The patient has reached the criteria for discharge
Defaulter	After 2 consecutive weeks of absences
Dead	<ul style="list-style-type: none"> <li>• If the patient died during treatment in the OTP or in transit to the ITP (follow up required when referred) or within 24 hours of transfer to another health facility</li> <li>• Death are not counted unless related to malnutrition</li> </ul>
Non respondent	Do not reach the cured criteria after 3 months (12 weeks) in the program

The following categories are not exits of the programme but exits of the specific health structure, they are called movements:

- Referral to ITP: they are expected to return
- Transfer to another OTP: will not return but are still in the program

### Note:

- When a new OTP distribution site is opened closer to the patient's home, transfer the patients to that OTP and the patient retains their AM-number and is recorded in the new OTP as a transfer (in) and not as a new admission.
- Non-respondent: Non response at discharge should very rarely occur in OTP, although this may arise when a family/caretaker refuses to go to the ITP for diagnosis and treatment, where there are intractable social problems or where there is an underlying condition for which there is no treatment available in the ITP (e.g. many cases of cerebral palsy). Where available further management of these patients should be referred to a higher health facility level with expertise in the care of such cases (medical referral) such as state/region hospitals or specialised units.

## 5.12 Follow Up

- Ensure the follow up of patients that have been discharged from the programme by the person responsible for follow up of discharges
- If there is a SFP, transfer the patients to the SFP where nutritional support will be given for another 3 months. The ration should be the same as the standard SFP ration. There should be a separate category in the SFP registration book for these patients for their follow up
- If there are no outreach workers or village volunteers, and no SFP near to the beneficiaries' home, organize the follow-up at the nearest health centre through the growth monitoring programme

### The followings need to be assessed during follow up

- Medical check up and assessment of need for inpatient
- Complete routine medicine
- Continue RUTF
- Complete tools (ration and OTP cards)
- Provide IYCF counselling





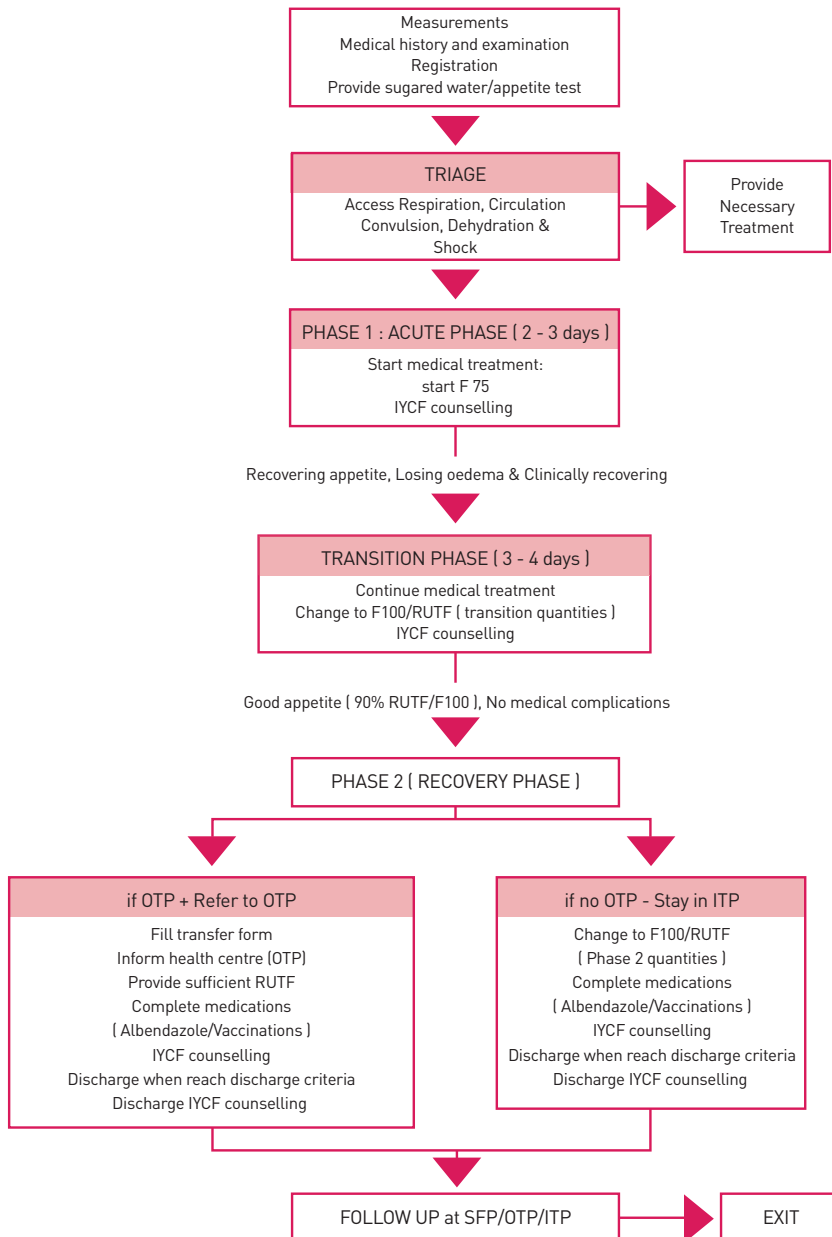
**Inpatient Treatment of  
Severe Acute Malnutrition  
with Complications  
(age 6 - 59 months)**

## 6. Inpatient Treatment of Severe Acute Malnutrition with Complications (age 6 - 59 months)

### 6.1 Structure of ITP

ITP service is provided in station hospitals, township hospitals, state/region hospitals and tertiary hospitals.

FIGURE 14. TREATMENT PHASES AT ITP



## 6.2 Principles of the Management of Inpatients (6 -59 months)

There are two main phases in treatment.

- Stabilization (Acute Phase & Transition Phase)
- Recovery Phase or Rehabilitation Phase

### Acute Phase or Phase 1

Patients with an inadequate appetite and/or an acute major medical complication are initially admitted to an ITP for acute phase treatment. Medical complications often manifest in first 48 hours of admission. The formula used during this phase (F75) promotes repair of physiological and metabolic functions and electrolyte balance.

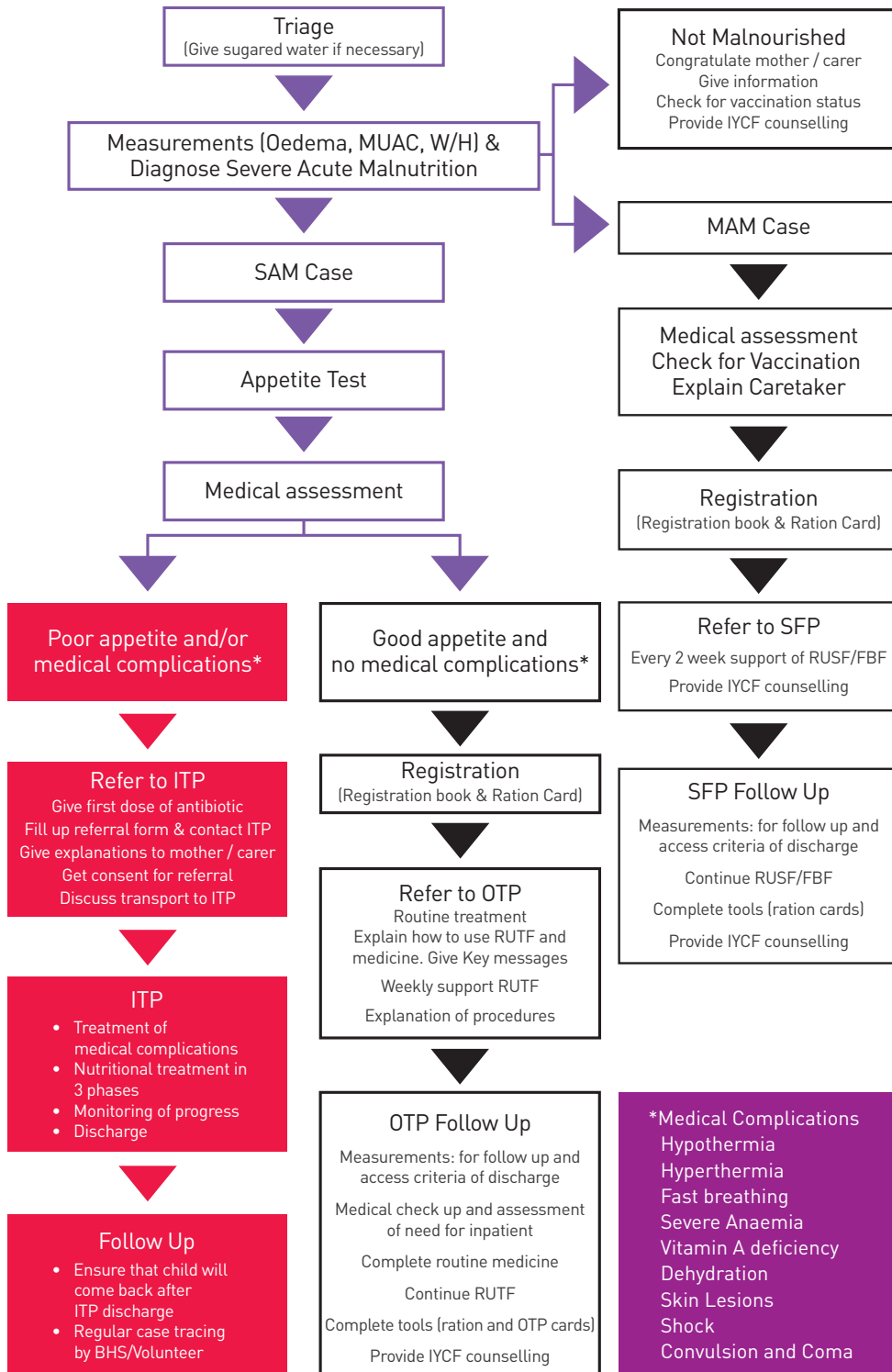
### Transition Phase

Transition phase is part of the stabilization phase usually last for 3-5 days. Sudden change to large amounts of diet before physiological function is fully restored can be dangerous and lead to electrolyte disequilibrium and “re-feeding syndrome”. Therefore a transition phase is introduced. During this phase the patients start to gain weight. The diet is changed to RUTF or F100.

### Recovery Phase or Phase 2

Whenever patients have a good appetite and no acute major medical complication, they are given RUTF and transferred to the nearest OTP to continue their treatment. If referral to OTP is not possible, the patients may have to be kept in ITP until fully recovered.

**FIGURE 15. DECISION MAKING STEPS FOR ITP MANAGEMENT**



## 6.3 Admission

### 6.3.1 Admission Criteria to ITP

See Table 28 for admission criteria for ITP

**TABLE 28. ADMISSION CRITERIA FOR INPATIENT TREATMENT**

Age group	Admission Criteria
Children 6-59 months	<ul style="list-style-type: none"><li>• Presence of bilateral pitting oedema +++ ————— OR —————</li><li>• MUAC &lt; 115 mm and No Appetite and/or medical complications(+) ————— OR —————</li><li>• W/H &lt; -3 z-scores and No Appetite and/or medical complications(+) ————— OR —————</li><li>• Presence of bilateral pitting oedema ++/+ and No Appetite and/or medical complications(+)</li></ul>

Oedema in all children is graded using the classification in **Annex 1. Oedema / MUAC Measurements / Weight for Height.**

## 6.3.2 Categories of Admission

TABLE 29. CATEGORIES OF ADMISSION FOR INPATIENT TREATMENT

Category	Comments
New case	New admission according to the criteria of admission.
Relapse Case	- Child re-admitted after more than 2 months of absence - Child re-admitted after previously being discharged as cured
Old Case	This includes: - Internal transfer from another ITP (treatment already started with an AM number) - Internal Referral from an OTP (referral form with an AM number and the treatment given) - Re-admission after absconding from hospital within 2 months

## 6.4 Management of Medical Complications

### 6.4.1 Management of Emergency Complications

When the child arrives to In-Patient access the following emergency clinical conditions and provides emergency treatments appropriately.

- Hyoglycaemia
- Hypothermia
- Fever
- Dehydration, Diarrhoea & Vomiting
- Shock (Hypovolaemic & Septic shock)
- Lethergy, Coma and Convulsion
- Severe Anaemie
- Features of Heart Failure
- Vitamin A Dificiency
- Skin Lesions

### 6.4.1.1 Treatment of Hypoglycaemia

If the child is conscious and dextrostix shows  $<3\text{mmol/l}$  or  $54\text{mg/dl}$  give:

- 50ml bolus of 10% glucose or 10% sucrose solution (1 rounded teaspoon of sugar in 3-5 tablespoons of water), orally or by naso gastric (NG) tube.
- Give the first feed of F-75 (1/4 of recommended amount of 2 hour feed at every 30 minutes) then continue feeds every 2 hours. Start appropriate antibiotic treatment IV or IM.

If the child is unconscious, lethargic or convulsing give:

- IV 10% glucose (5ml/kg), followed by 50ml of 10% glucose or sucrose by Ng tube. If IV access or IV glucose is not quickly available, give one teaspoon of sugar moistened with one or two drops of water sublingually, and repeat every 20 minutes to prevent relapses.
- When clinically appropriate, start F-75 feeds and continue with 2 hourly oral or NG feeds to prevent recurrence, day and night.
- Start appropriate antibiotic treatment IV or IM.
- If convulsion persists after IV glucose give Per Rectal Diazepam (0.3-0.5mg/kg)

#### Monitor:

Recheck blood glucose after 30 mins. If a very lethargic or unconscious patient does not respond in this way, then there is another cause for the clinical condition that has to be found and treated (e.g. cerebral malaria, dehydration etc.)

If blood glucose falls to  $<3\text{ mmol/l}$  give a further 50ml bolus of 10% glucose or sucrose solution, and continue feeding every 30 min. If temperature falls to  $<35^{\circ}\text{C}$  or level of consciousness deteriorates, repeat dextrostix and treat accordingly.

#### Prevention:

- Frequent feeding is important to prevent Hypoglycaemia.
- During transitional phase, feeding should be given 3 hourly including waking the child during the night.
- The likelihood of Hypoglycaemia is reduced if the child is given required amounts of feeding.
- Sugar water should also be given to the children who get hypothermia or have septic shock, whether or not they have low blood glucose.

### 6.4.1.2 Treatment and Prevention of Hypothermia

Hypothermia is defined when the Rectal temperature is  $<35.5^{\circ}\text{C}$  ( $<95.9^{\circ}\text{F}$ )/ Axillary temperature is  $<35.0^{\circ}\text{C}$ .

- Check and treat hypoglycaemia and infection in Hypothermic child
- Re warm the child: either clothe the child (including head), cover with a warmed blanket and place a heater or lamp nearby, or put the child on the mother's bare chest (skin to skin) and cover them with a warmed blanket
- Do not use hot water bottles/bags for warming due to danger of burning fragile skin
- Start appropriate antibiotic treatment IV or IM
- Frequent feeding is important to prevent Hypothermia

#### Monitor:

- Body temperature: during re warming. Take Rectal/Axillary temperature every 30 minutes until it rises to  $>36.5^{\circ}\text{C}$
- Ensure the child is covered at all times, especially at night; keep the head covered. Room temperature should not be less than  $27^{\circ}\text{C}$
- Check for hypoglycaemia whenever hypothermia is found

#### Prevention:

- Kangaroo mother care for preterm/LBW babies
- Keep the child covered and away from drop of air
- Avoid regular bathing and keep child dry
- Change wet nappies, clothe and bedding
- Feed regularly throughout the day and night especially during Phase 1

### 6.4.1.3 Treatment of Fever

Fever in children should be treated only when temperature rises above  $38.5^{\circ}\text{C}$ .

For moderate fevers should not treat with anti-pyretics. Severely malnourished children do not respond to anti-pyretics. Anti-pyretics are much more likely to be toxic in the malnourished than a normal child.

- Do not give aspirin and Ibuprofen to SAM children

For moderate fevers (below  $38.5^{\circ}\text{C}$ ),

- Do not treat moderate fevers, up to  $38.5^{\circ}\text{C}$  rectal or  $38.0^{\circ}\text{C}$  axillary
- Maintain routine treatment



- Remove blankets, hat and most clothes and kept in the shade in a well-ventilated area
- Give water to drink
- Check for malarial parasites and examine for infection

For fevers of over 39.0°C rectal or 38.5°C axillary, where there is possibility of hyperpyrexia developing, give the following treatments:

- Place a damp/wet room-temperature cloth over the child's scalp, redampen the cloth whenever it is dry
- Monitor the rate of fall of body temperature
- Give the child abundant water to drink
- If the temperature does not decline, the damp/wet cloth can be extended to cover a larger area of the body
- When the temperature falls below 38°C rectal, stop active cooling. There is a danger of inducing hypothermia with aggressive cooling
- Check for signs of infection (e.g. Malaria, UTI, Sepsis, Meningitis, Pneumonia, etc)
- Check for signs of dehydration

#### 6.4.1.4 Acute Watery Diarrhea & Dehydration

There are several enteric pathogenic agents commonly infected in malnourished children. Shigella, Vibrio Cholerae and Ecoli bacteria are more common aetiological agents in SAM and cause more severe infections.

Cholera is a dehydrating diarrhoeal illness that can rapidly cause death. The range of symptoms can vary from asymptomatic (around 75% of cases) to disease leading to severe dehydration (2-5% of cases). The severe cases can die within 12 hours from the onset of symptoms if not treated. The vast majority of symptomatic patients will present with a mild disease (20-25%), but during an outbreak a much higher proportion of symptomatic disease has been reported.

Dehydration is difficult to diagnose in SAM children. Sign of dehydration (non-elastic skin and sunken eyes) are often present in severely malnourished children regardless of hydration status.

Misdiagnosis and inappropriate treatment for dehydration is the commonest cause of death in the malnourished patient. Rehydration fluids are never given "routinely" to malnourished patients.

With severe malnutrition the “therapeutic window” is narrow, so that even dehydrated children can quickly go from having a depleted circulation to over-hydration with fluid overload and cardiac failure. IV infusions are rarely used. In malnutrition (both marasmus and, to a greater extent, kwashiorkor) there is a particular renal problem that makes the children sensitive to salt (sodium) overload.

A diagnosis of dehydration must be made from an examination of the clinical condition with a positive history of fluid loss which identifies the cause of dehydration (e.g. persistent vomiting or acute diarrhoea). The main diagnosis comes from the HISTORY rather than from the examination.

There needs to be:

- A definite history of significant recent fluid loss - usually diarrhoea which is clearly like water (not just soft or mucus) and frequent with a sudden onset within the past few hours or days.
- There should also be a HISTORY of a recent CHANGE in the child’s appearance.
- If the eyes are sunken then the mother must say that the eyes have changed to become sunken since the diarrhoea started.
- Absence of visible “full” superficial veins (look at the head, neck and limbs).

### Clinical Signs of Dehydration

In SAM children, the typical signs of dehydration are often unreliable because:

- In marasmus, skin turgor is poor and eyes can be sunken even in the absence of dehydration
- In kwashiorkor, skin may appear turgid because of oedema.
- DO NOT use the skin pinch test to diagnose dehydration in severely malnourished children. A positive skin pinch test may occur in a marasmic child with a normal hydration status.
- DO NOT use sunken eye as a clinical sign to diagnose dehydration in malnourished patients because they have sunken eyes. Sunken eyes must be confirmed by an accurate history. The eyes must have become sunken in the previous few days and a positive history for the cause of dehydration identified.
- The consequences of over-hydration are very much more serious than slight dehydration. On the other hand truly dehydrated children must be appropriately rehydrated if they are to survive.

- Do NOT make a definitive diagnosis of dehydration. If you think the child is dehydrated, then make a provisional diagnosis and observe the response to treatment before confirming the diagnosis.
- Concomitant signs of dehydration may include increased heart rate, temperature and/or reduced blood pressure.
- Dehydration in SAM children with oedema is difficult to diagnose. However those children may be hypovolaemic.

Therefore, the following features need to be assessed in order to assess the hydration status of the child:

**(1) Signs of mild to moderate dehydration in SAM children:**

- Ongoing or recent episode of diarrhoea;
- Thirst or restlessness in an infant;
- Recent appearance of sunken eyes.

**(2) Signs of shock in SAM children:**

- Unresponsiveness
- Uncontrollable vomiting
- Weak, thready or difficult to detect pulse
- very cold hands or feet
- reduced urine output

**TABLE 30. ASSESSMENT OF HYDRATION STATUS**

Task	Dehydration	Shock from severe dehydration
General condition/ appearance	Thirsty, anxious, alert or quiet but irritable when disturbed  Fully conscious, not lethargic  Capillary refill (< 3 seconds)	Lethargic/comatose/ drowsy  Floppy, cold hands  Slow capillary refill (> 3 seconds)
Eye signs	Normal or sunken	Very sunken
Urine out-put	Normal or reduced, high coloured urine	Anuria, empty bladder
Radial pulse	Normal or rapid	Uncountable/rapid, thready, undetectable
Systolic BP	Normal or low	Low OR immeasurable
Body weight loss	5 - 10%	> 10%

### Treatment of dehydration

In both the oedematous and non-oedematous SAM, the margin of safety between dehydration and over-hydration is very NARROW.

A decision must be taken on:

- Whether to rehydrate or not
- How to rehydrate (route, choice of solution, amount, rate of fluid)
- What to monitor during rehydration therapy

If there is no dehydration (none of the previous mentioned signs), then continue feeding and give plain water. If the child is breastfeeding, encourage the caregiver to continue.

Before starting any rehydration treatment:

- Weigh the child
- Mark the edge of the liver and the costal margin on the skin with an indelible marker pen
- Record the respiration rate
- Record the pulse rate
- Record the capillary refill time (of the nail bed) in seconds

- Record the heart sounds (presence or absence of gallop rhythm)

The management of dehydration in SAM children is based mainly on:

- Weight changes
- Clinical signs of improvement
- Clinical signs of over-hydration

### Oral Rehydration Solutions

1. Rehydration Solution for Malnutrition (ReSoMal) should be used as the standard therapy for children with SAM diagnosed with dehydration.
2. Low Osmolarity Oral Rehydration Solution (LO-ORS) may be used for the treatment of children with SAM but only for those who have a positive diagnosis of Acute Watery Diarrhoea (AWD) or Cholera.
3. Standard (full strength) Oral Rehydration Solution (ORS) does not have a suitable formulation for the treatment of dehydration in children with SAM.
  - Where ReSoMal is not available, a modified, half-strength solution of LO-ORS may be used with added potassium and glucose (45 ml of electrolyte/mineral solution and 50g of sugar for 2L of ORS).

### Intravenous Rehydration Solutions

- Ringers Lactate Solution with 5% Dextrose
- 0.45% Saline with 5% Dextrose

### (1) Oral rehydration therapy for SAM children with some dehydration or severe dehydration without shock.

If signs of some or severe dehydration are present (but NO SHOCK):

- Continue breastfeeding / feeding
- Give ReSoMal or half-strength standard WHO low-osmolarity oral rehydration solution with added potassium and glucose\* (45 ml of electrolyte/mineral solution and 50g of sugar for 2L of ORS) at a rate of 5ml/kg every 30 minutes for 2 hours (orally or by NGT); then adjust according to the weight changes observed
- Then give 5-10ml/kg in alternate hours for up to 10 hours (i.e. give ReSoMal and F75 formula in alternate hours)
- Monitor vital signs every hour or more often if needed
- Monitor the child's weight and liver size with the same frequency

- Stop ReSoMal when there are **3 or more hydration signs or signs of over hydration**:
  - weight gain too quick/excessive
  - increase in respiratory rate (by 5 cycle/min)
  - increase in pulse rate (by 25 bpm)
  - enlarging liver size
- If rehydration is still required at 10h, give starter F-75 instead of ReSoMal with the same schedule. Never exceed 100 ml/kg/day of ReSoMal
- DO NOT use IV fluids unless there are signs of SHOCK

\*Standard WHO low-osmolality oral rehydration solution (75mmol/L sodium) should not be used.

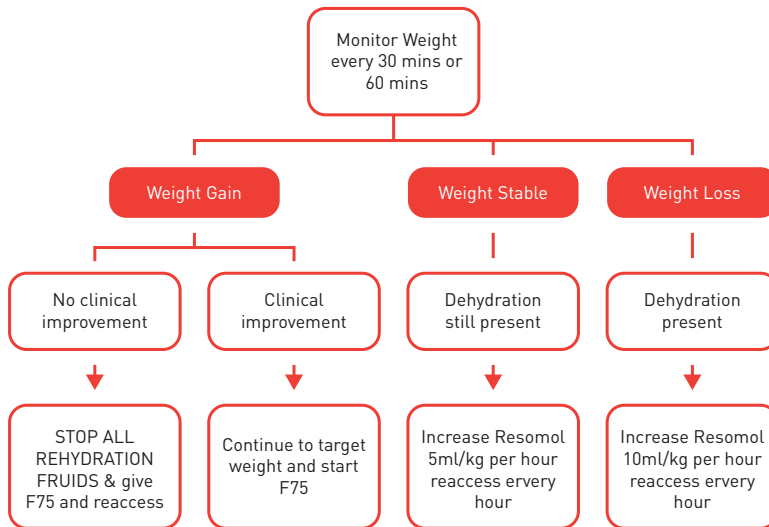
FIGURE 16. ALGORITHM FOR THE TREATMENT OF DEHYDRATION IN A CHILD WITH SAM



How often to give Resomol	Amount to give
Every 30 mins for First 2 hours	5ml/kg
Alternate hours for up to 10 hours	10ml/kg

F75 10ml/kg per 2 hours is given in alternate hours during this period until the child is rehydrated.

**FIGURE 17. ALGORITHM FOR MONITORING OF DEHYDRATION IN A CHILD WITH SAM**



The goal of rehydration therapy is based on the improvement of clinical status. A maximum target weight for rehydration therapy should be no more than 5% of body weight.

## (2) Rehydration of SAM children with severe dehydration (with Shock)

In case of severe dehydration/shock, (if no oral or NG rehydration can be done). Give IV fluids (Ringer Lactate with D5% and/or half strength Normal saline + D5% preferred) not exceeding 15 mL/kg over 1 hour. Closely monitor vital signs while hydrating IV and adjust infusion rate accordingly.

For detail, refer to the treatment of Shock.

Signs of fluid overload should be assessed at least every 10 minutes. If any signs of fluid overload appear, stop IV infusion and refer to a physician immediately. If dehydration/shock does not improve, consider sepsis then transfuse whole blood or packed red blood cells at 10 ml/kg over 3 hours, and begin feeding with F75 through NGT.

### Monitoring of rehydration

**STOP ALL REHYDRATION (ORAL OR INTRAVENOUS) THERAPY IMMEDIATELY** if any of the following are observed (**Signs of Overhydration**):

- The target weight for rehydration has been achieved (go to F75)
- The visible veins become full (go to F75)

- The development of oedema (over-hydration – go to F75)
- The development of prominent neck veins\*
- The neck veins engorge when the abdomen (liver) is pressed\*
- An increase in the liver size by more than one centimetre\*
- The development of tenderness over the liver\*
- An increase in the respiration rate by 5 breaths per minute or more\*
- The development of a “grunting” respiration (this is a noise on expiration NOT inspiration)\*
- The development of rales or crepitations in the lungs\*
- The development of a triple (gallop) rhythm\*

*\*If these signs develop then the child has fluid overload, an over-expanded circulation and is going into heart failure.*

**CONSIDER REHYDRATION IS COMPLETED** when the child is:

- no longer thirsty
- his/her urine production has normalized
- other signs of dehydration have resolved

Once hydration is re established, caregivers should continue breastfeeding with F75.

### **In the oedematous (kwashiorkor) patient**

All children with oedema have an increased total body water and sodium - they are over-hydrated.

Oedematous patients cannot be “dehydrated”, although they are frequently hypovolemic with the accumulation of fluids in the so called third space. The hypovolæmia (relatively low circulating blood volume) is due to a dilatation of the blood vessels and a low cardiac output.

If a child with oedema has watery diarrhoea, and the child is deteriorating clinically, then the fluid lost can be replaced on the basis of 30 ml of ReSoMal per episode of watery stool.



## Prevention of Cholera/Acute Watery Diarrhoea

In case of AWD/cholera outbreak, and/or in areas where reported outbreaks are common, is particularly important to deliver the following messages to the family members of all SAM children admitted in an outpatient OTP or in an inpatient department:

- Drink and use safe water (i.e., bottled with unbroken seal, boiled, treated with chlorine);
- Wash hands with soap and safe water;
- Use latrines or bury all household's members faeces; do not defecate in any body of water;
- Cook food thoroughly (especially seafood), keep it covered, eat it hot, and peel fruits and vegetables;
- Clean up safely, both in the kitchen and in places where the family bathes and washes clothes;
- If diarrhoea develops, drink ORS and go to the closest clinic quickly.

### 6.4.1.5 Shock (Hypovolaemic and Septic Shock)

Shock from dehydration and sepsis are likely to coexist in severely malnourished children. They are difficult to differentiate on clinical signs alone, as in SAM children the typical features of sepsis and septic shock can be absent. In general, children with dehydration will respond to IV fluids. Those with septic shock and dehydration will not respond. The amount of fluid given is determined by the child's response. Over hydration must be avoided.

### Diagnosis of Hypovolaemic Shock in a SAM Patient

Hypovolaemic shock is diagnosed when the patient is;

- Lethargic or unconscious and
  - Has cold hands / cold peripheries
- PLUS EITHER:
- Capillary refill time longer than 3 seconds
- OR
- Weak or fast pulse

(160/min or more for children 2-12 months, 140/min or more for children 1-5 years)

**Note:** The differential diagnosis of hypovolaemic shock and septic shock is often very difficult in a child with SAM. If another illness such as viral infection, malaria or other severe condition is present, septic shock should be assumed. Septic shock is often seen in individuals with immune-compromise or hospital acquired infections.

### **Definition of Sepsis:**

Proven or highly suspected infection + presence of more than 2 of the following conditions:

- Tachycardia
- Tachypnoea
- Hypothermia or Fever
- Malaise and/or apathy

### **Definition of Septic Shock:**

- Sepsis + signs of tissue hypoperfusion (e.g. capillary refill time > 3 seconds) despite adequate fluid resuscitation.

### **Diagnosis of Septic Shock**

Septic shock should be suspected if the child with SAM presents following signs and symptoms:

- Hypoglycemia / Hypothermia
- Lethargic or unconscious / disturbed consciousness
- A fast weak pulse with cold peripheries
- Slow capillary refill in the nail beds (more than 3 seconds)
- Absence of signs of heart failure
- Possible sign of infection

## Treatment of Hypovolaemic Shock in a SAM Patient

### To start treatment:

- Give oxygen and aim at O<sub>2</sub> saturation >93%;  
Give sterile 10% glucose (5 ml/kg) by IV; if hypoglycaemia present.  
Give IV fluid at 15 ml/kg over 1 hour. Use Ringer's lactate with 5% dextrose or half strength (0.45%) normal saline with 5% dextrose.
- Monitor constantly pulse rate, respiratory rate, pulmonary and cardiac auscultation (basal crepitation or gallop rhythm), liver size, vein engorgement and appearance of oedema (every 15 minutes during the first hour, then, if the child is improving, every 30 minutes).

If there are signs of improvement (pulse and respiration rates fall), it is most probably hypovolemic shock:

- Repeat IV 15 ml/kg over 1 hour if necessary
- Continue the infusion until there is weight gain up to 3% of body weight (increase in weight should correlate with signs of clinical improvement)
- Then switch to oral or nasogastric rehydration with ReSoMal, 10 ml/kg/h for 2 hours
- Then 5 ml/kg/h of ReSoMal in alternate hours with starter F-75 up to 10 hours (leave IV canula in place in case required again). Stop ReSoMal if there are two or more signs of hydration or any sign of over-hydration
- Then continue feeding with F-75 as soon as possible

If the child fails to improve after the first 1 hour of treatment (15 ml/kg), assume that the child has **septic shock**. In this case:

- start IV broad spectrum antibiotics
- give maintenance IV fluids (4 ml/kg/h) while waiting for blood
- When blood is available transfuse fresh whole blood at 10 ml/kg slowly over 3 hours
- Begin feeding with starter F-75

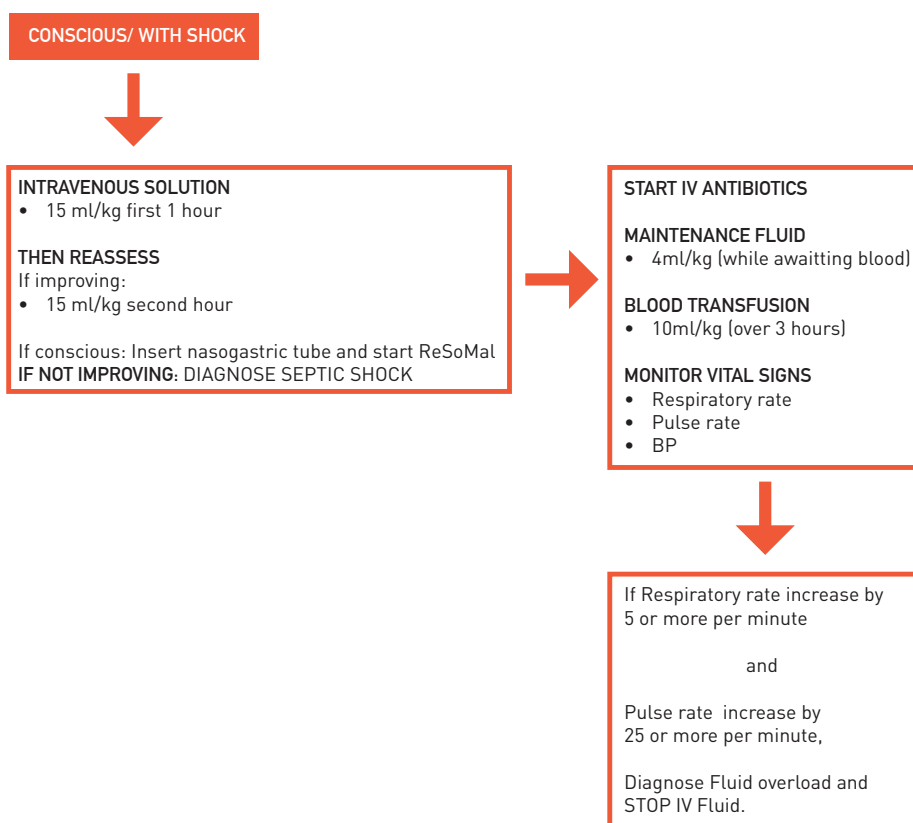
Monitor for hypoglycaemia and hypothermia and treat accordingly.

If the child gets worse during treatment (breathing increases by 5 breaths or more/min and pulse increases by 25 or more beats/min), stop the infusion to prevent the child's condition worsening and consider IV frusemide.

**TABLE 31. MONITORING A CHILD WITH SAM IN SHOCK AND TAKING ACTION**

Condition	Status	Action to be taken
<ul style="list-style-type: none"> <li>• Stronger radial pulse</li> <li>• Regain consciousness</li> </ul>	Improvement	<p>Stop IV fluid</p> <p>Continue with F75</p>
<ul style="list-style-type: none"> <li>• Both respiratory and pulse rates are increasing</li> <li>• Grunting respiration</li> <li>• Increasing liver size</li> <li>• Vein engorgement</li> </ul>	Not improved	<p>Stop IV fluid</p> <p>Continue to check respiratory and pulse rate every 10 minutes.</p> <p>Do not give oral feeds, child may have fluid overload or heart failure</p>
If both respiratory and pulse rates are slower after one hour	Slow improvement	<p>Repeat the same amount of IV fluids for another hour</p> <p>Continue to check respiratory and pulse rate every 10 minutes</p>
If no improvement after the first hour of IV fluids	Septic shock	<p>Start IV broad spectrum A/B.</p> <p>Maintain IV fluids 4ml/kg/hour while waiting for blood.</p> <p>Transfuse with whole fresh blood at 10ml/kg slowly over 3 hours, no oral feeds should be given during this time.</p>

**FIGURE 18. ALGORITHM FOR THE TREATMENT OF SEPTIC SHOCK IN A CHILD WITH SAM**



**Note:** If the child is getting worse during blood transfusion, stop the blood transfusion and consider Frusemide.

### 6.4.1.6 Severe Anaemia

Primary severe anaemia in children with SAM should be diagnosed on admission to hospital.

Diagnosis of severe anaemia is made when there is

- Severe palmar pallor
- Haemoglobin level is less than 4g/dl (40g/l) or packed cell volume is less than 12%

Children with SAM will experience a fall in haemoglobin during the early phases of treatment particularly resulting from changes in electrolyte and fluid balance. Dilutional Anaemia may occur 1 – 14 days after nutritional therapy with F75 has been started; it is secondary to this process and should not be treated through transfusion.

As oedema fluid is mobilized (kwashiorkor) and the sodium is coming out of the cells (both kwashiorkor and marasmus), the plasma volume expands but the volume of red cells remains constant so that there is a FALL IN HAEMOGLOBIN concentration. This Dilutional Anaemia happens to some extent in nearly all children as they recover. A substantial fall in haemoglobin, as a sign of an expanding circulation, is also a sign of impending or acute heart failure. **These children should never be transfused.**

### Treatment of severe Anaemia

The main treatment for Anaemia is through transfusion of whole blood or packed red cells;

Blood transfusion is required if:

- Hemoglobin (Hb) is less than 4 g/dl,
- Or if Hb is less than 6g/dl with sign of respiratory distress
- Transfusion should be provided within 48 hours from admission for primary severe Anaemia.

Give:

- Whole blood 10 ml/kg body weight slowly over 3 hours
- Furosemide 1 mg/kg IV at the start of the transfusion

It is particularly important that the volume of 10 ml/kg is not exceeded in severely malnourished children. If the severely Anaemic child has signs of cardiac failure, transfuse packed cells (10 ml/kg) rather than whole blood.

Monitor for signs of transfusion reactions. If any of the following signs develop during the transfusion, stop the transfusion:

- Fever
- Itchy rash
- Dark red urine
- Confusion
- Shock

Also monitor

- the respiratory rate
- pulse rate
- chest and heart auscultation (for basal crepitations and gallop rhythm)
- liver size every 15 minutes

Stop Oral and IV fluids before blood transfusion. If there is any change suggestive of fluid overload, reduce transfusion rate more than 3 hours and monitor fluid overload sign every 10 minutes, if deteriorate stop blood transfusion.

Following the transfusion, if the Hb remains less than 4 g/dl or between 4 and 6 g/dl in a child with continuing respiratory distress, **DO NOT REPEATS THE TRANSFUSION WITHIN 4 DAYS.**

In mild or moderate Anaemia, oral iron should be given for two months to replenish iron stores.

BUT this should not be started until the child has begun to gain weight.

### 6.4.1.7 Heart Failure

Heart failure in children with SAM may be manifested for several reasons;

- ReSoMal is incorrectly prescribed and administered by staff or caretakers
- Dehydration is incorrectly diagnosed and / or inappropriate treatment given
- Unnecessary use of intravenous fluids in conscious patients
- Severe Anaemia
- Secondary to blood transfusion
- Secondary to respiratory infection
- Secondary to septic shock
- Rapid shift of fluid and electrolytes during stabilisation / transition Phases

### Diagnosis of Heart Failure

Heart failure should be diagnosed when there is:

- Physical deterioration with a rapid gain in weight, and/or
- An increase in respiration rate with a rapid weight gain:
  - Respiration rate increased by 5 or more breaths per minute (particularly during rehydration treatment);
  - > 50 breaths/minute in infants;
  - > 40 breaths/minute in children 1-5 years.
- A sudden increase in liver size (this is why the liver is marked before starting any infusion):

- Tenderness on palpation of liver
- Grunting sound during each expiration
- Crepitations or rales in the lungs
- Prominent superficial and neck veins
- Appearance of triple (gallop) rhythm (very difficult to assess in practice)
- Increasing oedema or reappearance of oedema during treatment
- An acute fall in haemoglobin concentration or venous haematocrit

At the last stage there can be:

- Marked respiratory distress progressing to a rapid pulse, cold hands and feet, oedema and cyanosis or
- Sudden, unexpected death

Heart failure and Pneumonia are clinically similar and very difficult to distinguish. The following consideration could be helpful in making the differential diagnosis:

- If there is an increased respiratory rate and any gain in weight then heart failure should be considered
- If there is an increased respiratory rate with static or loss of weight then Pneumonia can be diagnosed

Children with oedema can go into heart failure due to expanded circulation from mobilization of oedematous tissue fluid into the vascular space without gaining in weight.

During the initial treatment of SAM, any sodium containing fluid that has been given previously will have to be safely excreted later. Initial over-treatment can lead to death several days later from heart failure when intracellular sodium (marasmus and kwashiorkor) and oedema fluid are being mobilized. F75 is a low sodium diet. A common unexpected source of sodium is sharing of the mother's food. Caretakers should always take their food away from the patient.

## Treatment

When heart failure is diagnosed,

- Stop all intakes of oral or IV fluids. No fluid or food should be given until the heart failure has improved even if this takes 24-48 hours. Small amounts of sugar-water can be given orally to prevent hypoglycaemia.
- Give furosemide (1mg/kg).



### 6.4.1.8 Vitamin A deficient eye problems in SAM child

#### Eye signs

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

- Bitot's spots – superficial foamy white spots on the conjunctiva (white part of the eye). These are associated with Vitamin A deficiency.
- Pus and inflammation (redness) are signs of eye infection.
- Corneal clouding is seen as an opaque appearance of the cornea (the transparent layer that covers the pupil and iris). It is a sign of Vitamin A deficiency.
- Corneal ulceration is a break in the surface of the cornea. It is a severe sign of Vitamin A deficiency. If not treated, the lens of the eye may push out and cause blindness. Corneal ulceration is urgent and requires immediate treatment with Vitamin A and atropine.

If the child shows any eye signs, give orally:

- Vitamin A on days 1, 2 and 15
  - For age >12 months, give 200,000 IU
  - For age 6-12 months, give 100,000 IU
  - For age 0-5 months, give 50,000 IU
- If first dose has been given in the referring centre, treat on days 1 and 15 only

If there is corneal clouding or ulceration, give additional eye care to prevent extrusion of the lens:

- Instil Chloramphenicol eye drop or Tetracycline eye ointment (3 to 4 times a day) for 7-10 days in the affected eye
- Instil Atropine eye drops (1%), 1 drop three times daily for 3-5 days
- Cover with eye pads soaked in saline solution and bandage (if there is no sign of infection)

**NOTE:** children with Vitamin A deficiency are likely to be photophobic and have closed eyes. It is important to examine the eyes very gently to prevent rupture.

### 6.4.1.9 Skin lesions

**Common skin lesions** in severely malnourished children are:

- Hypo-or hyperpigmentation
- Desquamation
- Ulceration (spreading over limbs, thighs, genitalia, groin, and behind the ears)
- Exudative lesions (resembling severe burns) often with secondary infection, including Candida (Kwashiorkor dermatosis).

**Zinc deficiency** is usual in affected children and the skin quickly improves with zinc.

In addition:

- Keep clean by bathing daily;
- Apply barrier cream (zinc and castor oil ointment, or petroleum jelly or paraffin gauze) to the raw areas.
- Avoid the use of nappies so that the perineum can remain dry.

### 6.4.1.10 Treatment of Kwashiorkor Dermatitis:

- Start the patient on antibiotic treatment + fluconazole;
- Keep clean by bathing daily if there is no risk of Hypothermia
- Do not cover with occlusive dressing during the day;
- Apply silver sulfadiazine cream or, if not available, zinc ointment.
- Cover with paraffin gauzes during the night.

## 6.4.2 Management of Other Medical Conditions

### Persistent or Chronic Diarrhoea

Diarrhoea is a common feature of malnutrition but it should subside during the first week of treatment with cautious feeding. In the rehabilitation phase, loose, poorly formed stools are no cause for concern provided that the weight gain is satisfactory.

Mucosal damage and giardiasis are common causes of persisting or chronic diarrhea. Where possible examine the stools by microscopy.

Lactose intolerance is also one of the causes of chronic diarrhea in SAM.

The appropriate treatment of persistent diarrhoea is nutritional; it is most often due to nutrient deficiency and will resolve with F75 and suppression of

small bowel bacterial overgrowth. Small bowel overgrowth is suppressed with Amoxilin. If the diarrhoea persists a course of Metronidazole (7.5 mg/kg/d) can be given.

### 6.4.3 Refeeding Syndrome and Refeeding Diarrhoea

#### Refeeding Syndrome<sup>16</sup>

Refeeding syndrome is complex metabolic reaction which the energy or nutrient load in the body causes a rapid shift of Electrolytes and Fluid between compartments in the body.

As feeds (parenteral or enteral) are initiated in a starving child, the protective mechanisms of starvation (ketosis) are disrupted. There is a rapid shift from fat metabolism (ketosis) to the utilization of carbohydrate. Excess glucose evokes a release of insulin, which acts as a driving mechanism causing an increased uptake of glucose, phosphate, potassium, magnesium, water into the cell in addition to stimulating protein synthesis. This often results in precipitous drop in serum electrolytes such as hypoglycaemia, hypophosphataemia, hypokalaemia, hypomagnesaemia, and fluid shifts. Fluid shifts may result in congestive cardiac failure, dehydration or overload, hypotension, pre-renal failure and sudden death.

The following signs and symptoms develop in malnourish children shortly after they have a rapid, large increase in their food intake: acute weakness, floppiness, lethargy, delirium, neurological symptoms, acidosis, liver and pancreatic failure, cardiac failure or sudden unexpected death. The syndrome is due to rapid consumption of key nutrients for metabolism particularly if the diet is unbalanced.

The complications arising from this can be life threatening, so judicious use of protein and calories is advised.

#### Refeeding Diarrhoea

It is exaggerated by oral feeding. Enterocytes dysfunction and atrophy of intestinal mucosa reduce absorptive capacity and increase mucosal secretion that causing diarrhoea in malnourished children. Pancreatic Atrophy can also cause osmotic diarrhoea.

#### Prevention

Malnourished patients should never take force-fed amounts of diet in excess of those prescribed in the protocol. Prevention of refeeding syndrome is the purpose of the transition phase of treatment.

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<sup>16</sup>Refeeding Syndrome: Guidelines - Cape Town Metropole Paediatric Interest Group- March 2007

## Treatment<sup>17</sup>

- For patients in the recovery phase
  - If there is deterioration during the recovery or transition phase of treatment, then the child should be returned to the acute phase.
- For patients that are in the acute phase
  - Reduce the diet to 50% of the recommended intake until all signs and symptoms disappear and then gradually increase the amount given
  - Check to make sure that there is sufficient potassium and magnesium in the diet. If the diet is not based on cow's milk (or the mother is also giving cereals/pluses etc) additional phosphorus should be given to prevent refeeding syndrome.

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<sup>17</sup> Protocol Integrated Management of Acute Malnutrition (Professor Micheal H Golden and Dr Yvonne Grellety, 2012)

**TABLE 32. MEDICAL TREATMENT IN ITP**

Criteria	Medication and dose	Duration
<b>Infections</b>		
All children with SAM with no apparent sign of infection/no complication	Oral Amoxicillin 15 mg/kg/dose	Three times a day for 5 days
If child is severely ill with apparent sign of infection/with complication	IV/IM Ampicillin 50mg/kg Followed by: Oral Amoxicillin 15 mg/kg/dose	6 hourly for 2 days  Three times a day for 5 days
	————— AND ————— IV/IM Gentamicin 7.5 mg/kg/day	Once daily for 7 days
If a child fails to improve after 48 hours or deteriorating within 24 hrs	Change or add to IV/IM Ceftriaxone 100 mg/kg/dose	Once daily for 7 days
	————— OR ————— Cefotaxime 50 mg/kg/dose	8 - 12 hourly for 7 days
<b>Where specific infections are identified:</b>		
• Pneumonia	IV Benzyl Penicillin 50,000 units/kg	6 hourly
	————— OR ————— Cefotaxime 50mg/kg/dose	Every 8 - 12hr for 7 - 10 days
If no improvement after 48-72 hours and clinical suspicion of staphylococcal infection	Add Cloxacillin 25-50 mg/kg/dose	Every 6hr for 5 days
• Bloody diarrhoea (confirmed blood in stool + fever > 38.5°C)	Oral Ciprofloxacin 10-15 mg/kg/day	Every 12hr for 5 days
If there are no signs of improvement, give 2nd line treatment	Treat with IV/IM Ceftriaxone 100 mg/kg/day	Once a day for 5 days
	Treat with Metronidazole 7.5 mg/kg/dose	Every 8hr for 5 days
Clinical suspicion of amoebic dysentery		

• Cholera	Azithromycin 20mg/kg	Single dose
	————— OR —————	
	Erythromycin 12.5mg/kg per dose	Every 6 hr for 3 days
	————— OR —————	
	Norfloxacin 10mg/kg per dose	OD or BD for 3-5 days
• Bacterial meningitis	High dose Cefotaxime IV/IM 50mg/kg 6hrly	For 10-14 days
	————— OR —————	
	IV/IM Ceftriaxone 100mg/kg/day	For 10-14 days
<b>Infections</b>		
• Typhoid fever If suspected or confirmed resistance to fluoroquinolones	Oral Ciprofloxacin 15 mg/kg/day	Twice a day for 5-7 days
	Switch to IV/IM Ceftriaxone 100 mg/kg/day	Once a day for 10-14 days depending on the severity
• Oral candidiasis If signs of severe sepsis or systemic candidiasis	Nystatin 100,000 IU (1-2ml) orally 4 times daily	For 7 days
	Infusion Fluconazole 3-6 mg/kg/day	Once daily for 7 days
<b>Antihelmiths (Deworming)</b>		
In recovery phase only (not recommended under 1 year)	Albendazole 400mg:	
	1-2 years - ½ tablet (200 mg)	One dose
	>2 years - 1 tablet (400 mg)	One dose

Vitamin A		
Children with SAM with eye sign or recent measles	Vitamin A 6-12 months : 100,000 IU >1 year : 200,000 IU	Day 1 of admission for 1 <sup>st</sup> dose Day 2 of stay for 2 <sup>nd</sup> dose Day 15 of stay (or at discharge) for 3 <sup>rd</sup> dose
Children with SAM without eye sign No vitamin A dose is provided if the child is on F-75, F 100, or RUTF that comply with WHO specifications	Vitamin A 6-12 months : 100,000 IU >1 year: 200,000 IU	After 4 weeks or upon discharge. Child is free of oedema
Anti Malaria		
For uncomplicated Malaria	Oral Coartem - Artemether (20mg) Lumefantrin (120mg) using a 6 doses regimen: 1 - 4 years 1 tablet twice daily	For 3 days
	5 -18 years 2 tablets twice daily	For 3 days
For severe Malaria	IV Artesunate ————— OR ————— IM Artemether (don't use Artemether if child is shocked)	See National Malaria Treatment Guidelines <sup>21</sup>
Vaccinations		
If no vaccination card According to vaccination status	Measles vaccine Other vaccinations	Over 9 months of age According to age

## 6.5 Acute Phase (Phase 1)

Patients that require in-patient care generally have a poor appetite and usually have a complication such as diarrhoea, dehydration, sepsis, pneumonia, severe anaemia, etc. Thus, the patients will often require treatment for both complication and malnutrition. The management of acute or life threatening complications take precedence over routine dietary treatment.

### 6.5.1 Diet - F75

The diet used in the acute-phase of treatment is F75 therapeutic milk. This is a low protein formulation (high protein at this stage increases the risk of death) containing the right balance of macro and micro nutrients to stabilise the child's condition. The diet allows their biochemical, physiological and immunological function to start to recover before they have the additional stress of making new tissues activities. It is designed for patients with severe complicated malnutrition who have impaired liver and kidney function with infection. Patients should NOT gain weight on F75..

F75 provides 75 kcal / 100 ml. The energy requirement of the child in Phase 1 is 100 kcal / kg / day. This translates to 130 ml of F75 milk / kg / day. The milk should be given in divided feeds ideally every 2-3 hours depending on the condition of the child (8-12 feeds per day).

- Half an hour before the scheduled time for giving the feed, ask the mothers to breast-feed their children;
- Calculate the total quantity of F75 to prepare according to the number of patients, their weight and the number of feeds (Refer to Annex 20 – lookup table, **Annex 16 - Daily Feeds Chart and Annex 17 – Ward Schedule**;
- Prepare the quantity of water and F75 for the feeds. **See Annex 13. Preparation of F75 and F100 Diets.**
- Ask the mother to wash their own and their children's hands;
- Give five or six feeds per day for most children (make out a time schedule and post it on the wall). **Refer to Annex 16 - Daily Feeds Chart.**
- See next page for the example Daily Feed Chart



**FIGURE 19. EXAMPLE OF DAILY FEEDS CHART**

Date: 14 March 2011      Ward: SAM ward						
Name of Child	F-75			F-100		
	Number of feeds	Amount/ feed (ml)	Total (ml)	Number of feeds	Amount/ feed (ml)	Total (ml)
San Kyi	12	55	660			
Eain Lay				6	250	1,500
Pho Hla				6	300	1,800
Lei Lei				6	180	1,080
Min Thuya	8	115	920			
Ko Ko				6	200	1,200
Khin Khin	8	100	180			
Hla Hla	6	200	1,200			
Eaindra				6	280	1,680
Chaw Yu	12	90	1,080			
				Infant Formula or F-100 Diluted		
				Number of feeds	Amount/ feed (ml)	Total (ml)
Thandar				12	25	300
Hla Tun				12	40	480
Si Thu				12	30	360
	F-75 (total ml) needed for 24 hours		4,040	F-100 (total ml) needed for 24 hours		7,260 ml
	F-75 (total packets*) needed for 24 hours		7 + 1	F-100 (packets*) needed for 24 hours		12+1
Infant Formula or F-100 for F-100 Diluted preparation (total ml) needed for 24 hours						1,140 ml
Infant Formula or F-100 for F-100 Diluted preparation (packets*) needed for 24 hours						2

\*Commonly, commercial therapeutic milk sachets of about 100 g will provide 600 ml F-75 or F-100 or 775 ml F-100 Diluted. Adapt as necessary.

Name of Child	RUTF	
	Number of feeds	Packets per day
Myo Min	6	3.0
Aung Hla	6	2.5
Kyaw Kyaw	6	2.0
Zu Zu	6	1.5
	RUTF (total packets**) needed for 24 hours	
		9.0 or 10.0

\*\*Adjust to number of packets that were fully consumed on the previous day.

### 6.5.1.1 Preparation

Add either one large packet of F75 (410g) to 2 liters of water or one small packet of F75 (102.5g) to 500 ml of water. Where small numbers of children are being treated as in-patients, do not order the large packets of F75. These are for use in emergency settings with large numbers of SAM patients. If F75 is not available use one of the recipes given in **Annex 13 Preparation of F75 and F100 Diets**.

### 6.5.1.2 Amounts to give

The amount of F75 given is dependent on the child weight and frequency of feeds per day. **See Tables 33 and 34 Therapeutic Foods Look-Up Table.**

**TABLE: 33 THERAPEUTIC FOODS LOOK-UP TABLE: VOLUME OF F-75 FOR CHILDREN 6 MONTHS AND OLDER WITH SEVERE WASTING AND OEDEMA+/\*\***

Weight of Child (kg)	Volume of F-75 per feed (ml) <sup>a</sup>			Daily total (130 ml/kg)	80% of daily total <sup>a</sup> (minimum)
	Every 2 hours <sup>b</sup> (12 feeds)	Every 3 hours <sup>c</sup> (8 feeds)	Every 4 hours (6 feeds)		
2.0	20	30	45	260	210
2.2	25	35	50	286	230
2.4	25	40	55	312	250
2.6	30	45	55	338	265
2.8	30	45	60	364	290
3.0	35	50	65	390	310
3.2	35	55	70	416	335
3.4	35	55	75	442	355
3.6	40	60	80	468	375
3.8	40	60	85	494	395
4.0	45	65	90	520	415
4.2	45	70	90	546	435
4.4	50	70	95	572	460
4.6	50	75	100	598	480
4.8	55	80	105	624	500

5.0	55	80	110	650	520
5.2	55	85	115	676	540
5.4	60	90	120	702	560
5.6	60	90	125	728	580
5.8	65	95	130	754	605
6.0	65	100	130	780	625
6.2	70	100	135	806	645
6.4	70	105	140	832	665
6.6	75	110	145	858	685
6.8	75	110	150	884	705
7.0	75	115	155	910	730
7.2	80	120	160	936	750
7.4	80	120	160	962	770
7.6	85	125	165	988	790
7.8	85	130	170	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

<sup>a</sup> Volumes in these columns are rounded to the nearest 5 ml.

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

<sup>c</sup> After a day on three-hourly feeds: If no vomiting, less diarrhoea, and finishing most feeds, change to four-hourly feeds.

**TABLE:34. THERAPEUTIC FOODS LOOK-UP TABLE:  
VOLUME OF F-75 FOR CHILDREN 6 MONTHS AND OLDER  
WITH SEVERE BILATERAL PITTING OEDEMA<sup>+++</sup>**

Weight with <sup>+++</sup> oedema (kg)	Volume of F-75 per feed (ml) <sup>a</sup>			Daily total (100 ml/kg)	80% of daily total <sup>a</sup> (minimum)
	Every 2 hours <sup>b</sup> (12 feeds)	Every 3 hours <sup>c</sup> (8 feeds)	Every 4 hours (6 feeds)		
3.0	25	40	50	300	240
3.2	25	40	55	320	255
3.4	30	45	60	340	270
3.6	30	45	60	360	290
3.8	30	50	65	380	305
4.0	35	50	65	400	320
4.2	35	55	70	420	335
4.4	35	55	75	440	350
4.6	40	60	75	460	370
4.8	40	60	80	480	385
5.0	40	65	85	500	400
5.2	45	65	85	520	415
5.4	45	70	90	540	430
5.6	45	70	95	560	450
5.8	50	75	95	580	465
6.0	50	75	100	600	480
6.2	50	80	105	620	495
6.4	55	80	105	640	510
6.6	55	85	110	660	530
6.8	55	85	115	680	545
7.0	60	90	115	700	560
7.2	60	90	120	720	575
7.4	60	95	125	740	590

7.6	65	95	125	760	610
7.8	65	100	130	780	625
8.0	65	100	135	800	640
8.2	70	105	135	820	655
8.4	70	105	140	840	670
8.6	70	110	145	860	690
8.8	75	110	145	880	705
9.0	75	115	150	900	720
9.2	75	115	155	920	735
9.4	80	120	155	940	750
9.6	80	120	160	960	770
9.8	80	125	165	980	785
10.0	85	125	165	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	895
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

<sup>a</sup> Volumes in these columns are rounded to the nearest 5 ml.

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

<sup>c</sup> After a day on three-hourly feeds: If no vomiting, less diarrhoea, and finishing most feeds, change to four-hourly feeds.

If the children tolerate larger volumes and no re-feeding diarrhoea, give 5 daily feeds. If re-feeding diarrhoea poses a problem and cannot tolerate the increased volumes, reduce the volumes and increase the frequency. Quite closely spaced during the day, should be given. Eg: Give eight (or more) feeds per day over 24 hours (night as well as daytime).

The children with following clinical conditions can experience above situation.

- those that are very severely ill
- develop re-feeding diarrhoea on the routine schedule,
- have vomited some or all of their feeds during the day
- have had an episode of hypoglycaemia
- have had hypothermia

### 6.5.1.3 Feeding Technique

The muscle weakness, slow swallowing and poor peristalsis of these children makes aspiration pneumonia very common.

The carer/giver can provide the support needed to ensure a successful feeding technique:

- Tell the mother to put the child on the mother's lap against her chest, with one arm behind her back.
- The mother's arm encircles the child and holds a saucer under the child's chin.
- The child should be sitting straight (vertical).
- Give the F75 in a cup, any dribbles that fall into the saucer are returned to the cup.
- Tell the mother not to force feed the child and never to pinch his/her nose, squeeze the cheeks to force the mouth open or lie back and have the milk poured into the mouth.
- If a child "splutters" or coughs during feeding, pause feeding and explain mother that it is probably due to incorrect feeding-technique. Re-train the mother.
- If the child continues having "splutters" or coughs, it is better to insert an NGT to prevent aspiration pneumonia.
- Meal times should be sociable.
- Make the mothers sit together in a semi-circle around an assistant.
- Encourage the mothers, talk to them, correct any faulty feeding technique and observe how the child takes the milk.

- Explain the mother not to hide unfinished F75 which can lead to bacterial over growth and underestimation of the amount taken by the child.
- Explain the mother that F75 is therapeutic food to cure malnutrition and other meals except breast milk should not be given apart from F75.

#### 6.5.1.4 Naso Gastric Feeding

Naso-gastric Tube (NGT) feeding is used when a child is not able to take sufficient amount of diet by mouth. This is defined as an intake of less than 80% of the prescribed diet (for children about 80 Kcal/ kg/ day). The reasons for use of an NG tube are:

- Taking less than 80% of prescribed diet per 24 hours
- Pneumonia with a rapid respiration rate
- Painful lesions of the mouth
- Cleft palate or other physical deformity
- Disturbances of consciousness

Every day, try patiently to give the F75 by mouth before using the NGT. The use of the NGT should not normally exceed 3 days and should only be used in the Acute-phase. **See Annex 14. How to insert a naso gastric tube.**

## 6.5.2 Routine Medicines

### 6.5.2.1 Systematic Antibiotics

The usual signs of infection such as fever are often absent so assume all severely malnourished children have infection and treat with antibiotics. Hypothermia and hypoglycaemia can be signs of severe infection.

Starting on admission, give systematic broad-spectrum antibiotic treatment to all severely malnourished children.

### Selecting Antibiotics and Prescribing the Regimen

Selection of antibiotics depends on the presence or absence of medical complications in SAM, and on local resistance patterns.

- **SAM with no apparent sign of infection (or) if no medical complications**, give first-line broad spectrum antibiotic:
  - Amoxicillin 15 mg/kg/dose every 8 hours orally for five days (Infants <3 kg amoxicillin 15 mg/kg/dose every 12 hours).

- **If apparent sign of infection and presence of medical complication**, give first-line broad spectrum antibiotic:
  - Ampicillin 50 mg/kg/dose IV (or IM) every 6 hours for 2 days (Infants <3 kg 50 mg/kg/dose every 8 hours); switch to oral amoxicillin 15 mg/kg/dose every 8 hours for 5 days (Infants <3 kg 15 mg/kg/dose every 12 hours); if not possible, continue ampicillin IV for a total of 7 days; AND
  - Gentamicin, 7.5 mg/kg IV (or IM) once a day for 7 days (Infants from 2nd week of life onwards included).
- **If the child fails to improve within 48 hours**, give second-line broad spectrum antibiotic:
  - Ceftriaxone 100 mg/kg/dose IV (or IM) once a day for 5 days (Infants <3 kg: 50 mg/kg).
- **If the child fails to improve within 48 hours and if suspected staphylococcal infection**, give:
  - Cloxacillin 25-50 mg/kg/dose IV (or IM) every 6 hours for 5 days (Infants <3 kg: 25-50 mg/kg/dose every 8 hours).
- **If the child fails to improve within 48 hours and if suspected pneumonia:**
  - Benzyl penicillin 50,000 units/kg IV (or IM) every 6 hours for 5 days (Infants <3 kg included).
- **If a specific infection is identified that requires a specific antibiotic not already being given**, give the appropriate antibiotic to address that infection. For example, dysentery may require other antibiotics. Certain skin infections, such as candidiasis, require specific antifungals.
- **If the child is HIV-positive**, in addition to the above antibiotic and antiretroviral therapy (ART), give cotrimoxazole (TMP 8 mg+ SMX 40 mg) orally every 8 hours, and link to care in line with the national guidelines for HIV/AIDS.

## Deworming

Treatment should be delayed until the recovery phase.

## Vitamin A

### Vitamin A to children with SAM with no eye sign

- Children with SAM, if they are receiving F-75, F-100 or RUTF that comply with WHO specifications<sup>18</sup> (and therefore already contain sufficient Vitamin A), or Vitamin A is part of other daily supplements do not require a high

<sup>18</sup> Guideline, Updates on the Management of Severe Acute Malnutrition in Infants and Children, WHO, November 2013.



dose of Vitamin A as a supplement.

- If they are given therapeutic foods that are not fortified as recommended in WHO specifications and Vitamin A is not part of other daily supplements, should be given a prophylaxis high dose of Vitamin A (100 000 IU or 200 000 IU, depending on age) on admission.

See Table 9. Vitamin A Dosages according to age

### Concerning Vitamin A to children with SAM with eye sign or recent measles<sup>19</sup>

- Treatment dose of Vitamin A (100 000 IU or 200 000 IU, depending on age - **See Table 9. Vitamin A DOSAGES**) of Vitamin A should be given to all children with severe acute malnutrition and eye signs of Vitamin A deficiency or recent measles on day 1, with a second and a third dose on day 2 and day 15 (or at discharge from the programme), irrespective of the type of therapeutic food they are receiving.

Any child with clinical signs of Vitamin A deficiency should be treated by in-patient management.

## Malaria

Routinely test for malaria on admission. If the child has a positive blood film (or a positive RDT) for malaria parasites:

- For uncomplicated malaria – Give Coartem (Artemether-Lumefantrine) PO using a 6 doses regimen (**see National Malaria Treatment Guidelines**)
- For severe malaria – Give IV Artesunate or IM Artemether (don't use Artemether if child is shocked) (**see National Malaria Treatment Guidelines**)

### 6.5.2.2 Medicines given under specific circumstances only

#### Anti-fungal treatment

Patient with oral candidiasis – Give Nystatin 100,000 UI orally 4 times daily for 7 days.

If signs of severe sepsis or systemic candidiasis: give IV infusion Fluconazole 3-6 mg/kg/day for at least 2 weeks although it has been associated with mild hepatic damage.

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<sup>19</sup> If they are incubating measles they are likely to fail the appetite test. (Ref: Immunization in Practice: A practical guide for health staff, Page 31, 2015 Update, WHO)

### 6.5.3 Patients Monitoring in ITP

Patient monitoring in ITP is recorded on an ITP multichart.

**TABLE 35. SUMMARY OF ITP MONITORING**

Inpatient	Frequency
Respirations Pulse rate Temperature	Every 12 hours
Weight and Oedema Stool, vomiting, urine Check Appetite Amount of therapeutic milk and feed intake Position of NG tube	Every day
MUAC is taken	Every week
W/H z score can be calculated	Day of admission and before discharge

## 6.6 Failure to Respond to Treatment

The child is diagnosed as failure to respond in-patient treatment when the following criteria are met.

**TABLE 36. CRITERIA FOR FAILURE TO RESPOND**

Criteria for Failure to Respond	Time After Admission
Failure to improve/regain appetite	Day 4
Failure to start to lose oedema	Day 4
Oedema still present	Day 10
Failure to fulfil criteria for recovery phase (either for OTP or remaining in ITP)	Day 10
Clinical deterioration after admission	Anytime

When children fulfil the criteria for “failure to respond”, they need to have an extensive history and examination or laboratory investigations conducted.

Possible causes of the failure to respond could be due to:

### Problems with the treatment facility

- Failure to apply protocol appropriately.
- Failure to treat children in a separate dedicated area
- Failure to complete the multi chart correctly (or use of traditional hospital records only)
- Insufficient staff
- Poorly trained staff
- Inaccurate weighing machines
- Failure to take an plot weight correctly
- F75 not prepared correctly

### Problems of individual children

- A severe medical complication
- Insufficient food given (criteria for NGT not applied)
- Sharing of food

- Malabsorption
- Psychological trauma (rumination)
- Craving pattern of feeding
- Infection such as viral, bacterial, fungal, drug resistance organism, diarrhoea, dysentery, pneumonia, TB, urinary infection, otitis media, malaria, HIV/AIDs
- Other serious underlying disease: congenital abnormalities, (e.g Congenital Heart disease), genetic abnormalities (e.g Down's Syndrome), neurological damage (e.g Cerebral Palsy).

### Actions Required

- Refer the child to more senior and experienced staff.
- Take a detailed history and fill the clinical history and examination form
- Examine the child carefully. Measure the temperature, pulse rate and respiration rate accurately
- Where appropriate, examine urine for pus cells and culture, blood culture sputum for C&S and AFB for TB and Cerebral Spinal Fluid (CSF) biochemistry and culture
- Chest x-ray
- Stool for Routine Examination
- Test for HIV, Hepatitis and Malaria
- Re-calibration of scales (and length-boards)
- If the children have underlying diseases (Congenital heart disease, neural tube defects, cerebral palsy, chronic renal failure and etc.) refer to the appropriate paediatric ward under the care of the paediatrician

## 6.7 Transition Phase

The transition Phase prepares the patient for Recovery-Phase: This phase is stage of the restoration of physiological systems which are indicated by the return of appetite, the reduction of oedema and the improvement in the clinical status of the child. It usually lasts between 1 and 5 days – but may be longer, particularly when there is another pathology (e.g. TB or HIV). There is no “fixed” time that a child should remain in the acute phase – individual children differ, however in case of prolonged transition phase, failure-to-respond should be kept in mind.

### 6.7.1 Criteria

The child is transferred to Transitional phase from Acute (stabilization) phase when all the following are present:

- Return of appetite; After appetite test, child is eating at least 1/3 of sachet of RUTF 92g

**AND**

- Beginning of loss of oedema (Normally judged by an appropriate and proportionate weight loss as the oedema starts to subside)

**AND**

- The patient appears to be clinically recovering (alert and active)

Patients with gross oedema (+++) should wait in Acute-Phase at least until their oedema has reduced to moderate (++) oedema. These patients are particularly vulnerable.

### 6.7.2 Diet

The ONLY change that is made to the treatment on moving from Acute-Phase to Transition-Phase is a change in the diet from F75 to RUTF, or if the RUTF is not accepted, change to F100.

The amount of energy provided in Transition Phase is increased by 30% and the amount of protein is increased. In transition Phase the child needs to increase this to 130 -150 kcal / kg / day. This is given in the form of F100 therapeutic milk. F100 contains 100 kcal / 100 ml of milk. This means that when the milk is changed from F75 to F100 in Transition Phase, the volume of milk the child has been receiving in Phase 1 remains the same; only the type of milk changes. The child should continue to breastfeed on demand.

## It is recommended to use RUTF in the Transition Phase.

Give the total amount of RUTF that should be taken during the day according to Table 37.

TABLE 37. RUTF IN THE TRANSITION PHASE

Child's weight (kg)	Transition (base on approx. 150 kcal/kg/day <sup>a</sup> )	
	Packets per day	6 feeds approx. proportion of packet
3.0 - 3.9	1.5	1/4
4.0 - 4.9	1.5	1/4
5.0 - 5.9	2	1/4
6.0 - 7.4	2.5	2/4
7.5 - 8.9	3	2/4
9.0 - 10.4	3.5	2/4
10.5 - 12.4	4	3/4
12.5 - 13.9	4.5	3/4
14.0 - 15.4	5	3/4
15.5 - 17.4	5.5	1
17.5 - 18.9	6	1
19.0 - 19.9	6	1

<sup>a</sup>Amounts in these columns are rounded.

One teaspoon RUTF is about 10g, in 1 packet of 92g you have about 9 teaspoons;  
To complete missed RUTF feeds: replace 2 teaspoons or about 20 g of RUTF  
with 130 ml F-75 or 100 ml F-100.

### REMINDER!!!

During the Transition phase it is important for the assistant to check regularly and counsel the mother to ensure that she gives the appropriate amount of RUTF. Normally you should follow up 5 times a day to check everything is going ok. The more support you can give, the more quickly they can move to recovery phase.

**NOTE:** If both F100 and RUTF are being given, they can be substituted on the basis of 100ml of F100 = 20g of RUTF.

**For children that are not taking sufficient RUTF (not gaining any weight),**

- Either give F100 for a few days and then re-introduce RUTF; or return the child to the acute-phase for a day or so and give F75;
- Do NOT give any other food to the patient during this period;
- Do NOT let the caretaker eat in the same room as the malnourished children;
- Check that the caretaker or other children do not consume the patients' RUTF;
- Make drinking water available both in the ward and also to individual children.
- The mother must offer as much water to drink as they will take during and after they have taken some of the RUTF;
- Write on the multi chart, the amount given and taken.
- If RUTF is not available, or the child does not readily take the RUTF then use F100 (130 ml = 130 kcal).

**When F100 is used the number of feeds,** their timing and the volume of the diet given remains exactly the same in Transition Phase as it was in Acute-Phase.

- Ask the mother to breastfed their children, half an hour before giving the feed;
- Prepare the diet: It is made up from one small package of F-100 (114 g) diluted into 500 ml
- of water or one large package of F100 (456g) diluted into 2 litres of water;
- Give five or six feeds per day;
- Write on the multi-chart the amount to take and taken.
- **Annex 16 Daily Feeds Chart** gives the amount of F100 (full strength) that should be offered to the patients in transition phase who are not taking RUTF. They should normally be taking 5 feeds during the day and none at night.

**TABLE 38. F100 LOOK UP TABLE TRANSITION PHASE**

Weight of Child (kg)	Range of volumes per four-hourly feed of F-100 (6 feeds daily)		Range of daily volumes of F-100	
	Minimum (ml)	Maximum <sup>a</sup> (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

<sup>a</sup> Volumes per feed are rounded to the nearest 5 ml.

### 6.7.3 Routine Medicines

Routine antibiotic should be continued for 4 more days after Acute Phase or until transferred to Recovery Phase as an outpatient (patients entering OTP after having been in a facility do not need to be given antibiotics).

### Micronutrients

If the child is NOT on therapeutic foods (RUTF, F-75 and F-100 already contain the necessary amount of micronutrients), starts multi micronutrients sprinkle after acute phase, give 1 sachet per day during hospital stay/at least 2 weeks. If multi micronutrients sprinkle is not available, give;

- Folic acid: 5 mg on day 1, then 1 mg daily
- MultiVitamin syrup 5 ml only if micronutrients not included in the feeds
- Zinc (2 mg/kg body weight)
- Copper (0.3 mg/kg body weight)

## 6.7.4 Patients Monitoring in ITP

The surveillance of Acute Phase is maintained in Transition Phase.

See TABLE 35. SUMMARY OF ITP MONITORING

## 6.7.5 Criteria to move back to Acute Phase

Move the child back to Acute-Phase:

- If there is a rapid increase in the size of the liver
- If any other signs of fluid overload develop (increased respiratory rate)
- If the patient gains weight more rapidly than 10 g/kg/d (this indicated excess fluid retention)
- If tense abdominal distension develops (indicates abnormal peristalsis, small bowel overgrowth and perhaps excess carbohydrate intake)
- If there is any complication arising which necessitates intravenous fluids
- Any increasing oedema or oedema develops when it was previously absent
- Any other significant deterioration in the child's condition
- Re-feeding syndrome
- Osmotic diarrhoea resulting from a change in diet (less common with low osmolarity feeds)
- Aspiration of the diet through improper feeding technique
- Nosocomial infection
- Inappropriate prescription / use of medications

## 6.7.6 Criteria to move to Recovery Phase

- If s/he has a good appetite - This means taking at least 90% of the RUTF (or F100) prescribed for Transition Phase
- For oedematous patients (kwashiorkor), if there is a definite and steady reduction in oedema

## 6.8 Recovery Phase (Phase 2)

Whenever patients have a good appetite and no acute major medical complication, they are given RUTF and transferred to the nearest OTP to continue their treatment. This is possible in areas where OTP services are provided in Sub Rural Health Centres (SRHC), Rural Health Centres (RHC) and Urban Health Centres (UHC)

### 6.8.1 Recovery Phase as an Inpatient

In areas where there are:

- No OTP services or supply of RUTF
- No capable caretaker
- Impossible home circumstances
- No other family willing to care for the child
- An abandoned child without an available orphanage

the patient may have to be kept in ITP until fully recovered.

### 6.8.2 Criteria to go to OTP

- Transfer the patient to the OTP:
  - If there is OTP services or supply of RUTF
  - If there is a capable caretaker
  - If the caretaker agrees to out-patient treatment
  - If there are reasonable home circumstances

### Procedure before transfer to OTP

- Complete the multi-chart and fill in a transfer form with the AM Number and give all the required information about the treatment
- Call the OTP to give them notice about the patient returning home
- Give the mother a copy of the transfer form, the name and address of the OTP and the day of the consultation and a provision of RUTF until the next appointment in the OTP
- Write in the child's health record - the treatment given and the weight at date of referral.

### 6.8.3 Diet (F100 or RUTF)

- In the Recovery Phase (Phase 2), the energy and protein intake of the child is increased to 150-220 kcal/kg/day giving F100 therapeutic milk.
- The patients have an unlimited intake (but almost never take more than 220 kcal/kg/d).
- Either F100 or RUTF are used in Phase 2 in ITP; they are nutritionally equivalent (except that F100 does not have added iron, RUTF does contain adequate iron) and one can substitute for the other.
- F100 (100ml = 100kcal): five to six feeds of F100 are given.
- The amount of F100 or RUTF to offer at each feed for 5 or 6 feeds per day or RUTF for the whole day to be used in the recovery phase in an ITP is shown in Table 39.
- Breast-fed children should always get breast-milk before they are given F100 or RUTF and also fed on demand.
- When RUTF is given, as much water as satisfies the patient's thirst must be offered during and after each feed. Because RUTF can be kept safely the amount for the whole day can be given once pe day. This is then eaten at the patient's leisure, in his/her own time.

#### ADVISE THE MOTHER TO

- While transitioning from F75 to RUTF the mother should be encouraged to continue breastfeeding on demand, to breastfed the child 30 min before giving the RUTF
- The child must never be force fed
- Tell the mother to wash hands before giving the sachet of RUTF to the child
- RUTF is a thick paste and Tell the mother to offer plenty of water to the child
- Advise the mother to keep the sachet with cover when the child has finished each session of eating
- CHECK five times during the day the amount given by the mother. It is important for the assistant to check regularly and counsel the mother and not assume that the mother will give all the RUTF to the child

**TABLE 39. F100 AND RUTF TO BE USED IN RECOVERY PHASE IN ITP**

Class of weight Kg	6 feeds/day		5 feeds/day		Whole day
	F100 ml/feed	RUTF g/feed	F100 ml/feed	RUTF g/feed	RUTF g/day
< 3 kg	Full strength F100 and RUTF are not given below 3kg: use F100 dilute				
3.0 - 3.4	110	20	130	25	120
3.5 - 3.9	125	20	150	25	130
4.0 - 4.9	135	25	160	30	150
5.0 - 5.9	160	30	190	35	175
6.0 - 6.9	180	35	215	40	200
7.0 - 7.9	200	35	240	45	220
8.0 - 8.9	215	40	260	45	235
9.0 - 9.9	225	40	270	50	250
10.0 - 11.9	230	45	280	50	260
12.0 - 14.9	260	50	310	60	290
15.0 - 19.9	300	55	360	65	330
20.0 - 24.9	370	65	440	80	400
25.0 - 29.9	420	75	500	90	450
30.0 - 39.9	450	80	540	100	500
40.0 - 60.0	530	100	640	120	600

\*One sachet of commercial RUTF contains about 92g and 500kcal  
(one gram = 5.4kcal )

### 6.8.4 Routine Medicines

Now that patients are in the recovery phase they can commence deworming treatment according to Table 40.

TABLE 40. ANTI HELMINTH TREATMENT

Age	Albendazole
< 1 Year	None
1 to 2 Years	½ Tablet (200mg)
≥ 2 Years	1 Tablet (400mg)

### Vitamin A

Give Viatmin A as a one medicine to be given in Recovery Phase, after 4 weeks of admission or at discharge or at OTP.

See Table 9. VITAMIN A DOSAGES

### Iron

- Introduce iron at the beginning of phase 2 with F-100 (3 mg/kg/day based on elemental iron), but if the child is on RUTF. **DO NOT GIVE IRON IN THE ACUTE PHASE.**

### Micronutrients

- If the child is NOT on therapeutic foods, e.g. because they are not available due to a rupture of stock (RUTF, F-75 and F-100 already contain the necessary amount of micronutrients), give the following micronutrients for 2 weeks or more:
  - Folic acid: 5 mg on day 1, then 1 mg daily
  - MultiVitamin syrup 5 ml only if micronutrients not included in the feeds
  - Zinc (2 mg/kg body weight)
  - Copper (0.3 mg/kg body weight)

## Measles

On the fourth week of hospitalization, give Measles Rubella vaccine to children over the age of **9 months**, according to the National Immunization Schedule, to those who do not received Measles containing vaccine yet. Measles vaccine as second dose should be given at least 4 weeks after the Measles Rubella vaccine.

Do not give measles vaccine on admission because the antibody response is diminished or absent in the severely malnourished, except in the presence of a measles epidemic. The measles vaccine is given at a time when there should be sufficient recovery for the vaccine to produce protective antibodies.

See Table 32. Medical Treatment in ITP.

### 6.8.5 Patients Monitoring in ITP

Patient monitoring in Recovery Phase is as in following table.

TABLE 41. SUMMARY OF ITP MONITORING

Inpatient	Frequency
Respiratory rate Pulse rate Temperature	Every day
Weight and Oedema Stool, vomiting, urine Check Appetite Amount of RUTF intake	Every day
MUAC is taken	Every week
W/H z score can be calculated	before Discharge

## 6.9 Discharge Criteria

### 6.9.1 Discharge Procedure

#### 6.9.1.1 Points to consider before discharge from hospital

It is recommended that the following elements be also considered at discharge from hospital and transfer to outpatient care (or in case of no outpatient care, discharged from hospital after end of treatment).

- Health and nutrition counselling scheme has started or completed
- Psychosocial support given to mother or carer
- Emotional and sensory stimulation given for child
- Immunisation schedule is updated
- Adequate arrangements for linking the mother and child with the primary health care facility for continued treatment and follow up in outpatient care, and with the community health worker for home support
- Appropriate linking for continued IYCF and preventative community initiatives

Discharge the patient when he reaches the discharge criteria shown in Table 42. Discharge criterion used is based on admission criterion; however always verify that no other criterion of SAM is present at discharge.

**TABLE 42. DISCHARGE CRITERIA INPATIENT TREATMENT**

Age Group	Discharge Criteria**
Children 6-59 months	1. Free from oedema for 2 consecutive weeks ————— AND —————
	2. MUAC $\geq$ 125 mm for two consecutive weeks ————— OR —————
	W/H* $\geq$ - 2 z score for two consecutive weeks

\*This also includes Weight for Length (WFL)



## 6.9.2 Categories of Discharge

Register the patients discharged in the registration book and chart according to the following categories in Table 43.

**TABLE 43. DISCHARGE CATEGORIES INPATIENT TREATMENT**

Category	Comments
Treated with success	Patients in ITP who successfully complete transition phase of treatment and are transferred to OTP to continue their treatment
Cured	The patient has reached the criteria for discharge
Defaulter	<ul style="list-style-type: none"><li>• Absconded</li><li>• DC on request</li></ul>
Dead	If the patient died during treatment in the ITP
Non respondent	Patients that have failed to respond to treatment and has been referred to more senior and experienced staff

**Note:** When OTP service is closer to the patient's home, transfer the patients to that OTP and the patient retains their AM-number and is recorded in the referred health centre as a transfer (in) and not as a new admission.

Non-respondent: Those patients who required further management should be referred to a higher Health Facility level with expertise in the care of such cases (medical referral) such as state/region hospitals or specialised units.





**Management of Severe Acute  
Malnutrition in Infants  
less than 6 months**

## **7. Management of SAM in infants less than 6 months**

### **7.1 Introduction**

There are two groups of infants less than 6 months with SAM: one group of infants with opportunity to have breastfeeding and the other is infant without opportunity to have breastfeeding.

Infants who are malnourished are weak and do not suckle strongly enough to stimulate an adequate production of breast milk. Infants without any prospect of being breastfed are particularly vulnerable because they have neither a mother nor the protection of breast milk.

All malnourished infants who are under 6 months should always be treated in hospitals and not in OTP. RUTF is NOT suitable for young infants and milk based feeds should not be given for home treatment.

### **7.2 Structure of ITP infants less than 6 months**

Those infants should always be treated in IPF and not in OTP. They should admit to HNU or general paediatric wards. The ward/room where these infants are managed should be adequately screened and private. There should be a special service/program to assist mothers who have difficulty breastfeeding established.

## **7.3 Management of infants with the possibility to breastfeed**

### **7.3.1 Principles and Objectives**

The objective of treatment of these patients is to return them to full exclusive breast-feeding. This is achieved by stimulating breast-feeding at the same time as supplementing the child during breastfeeding until the infant becomes stronger and breast milk production is sufficient to allow the child to grow properly.

## 7.3.2 Admission

### 7.3.2.1 Admission Criteria

TABLE 44. ADMISSION CRITERIA  
INFANT LESS THAN 6 MONTHS WITH FEMALE CARETAKER

Age	Admission Criteria
Infant less than 6 months  ————— OR —————	<ul style="list-style-type: none"><li>• The infant is too weak or feeble to suckle effectively  (irrespective of his/her weight for length (W/L), weight for age (W/A) or other anthropometry)</li></ul> ————— OR —————
Infant < 3kg  WITH a female caretaker capable of breastfeeding	<ul style="list-style-type: none"><li>• The infant is not gaining weight at home (by serial measurement of weight during growth monitoring i.e. change in weight for age)</li></ul> ————— OR ————— <ul style="list-style-type: none"><li>• W/L (Weight for Length) less than &lt; -3 z scores</li></ul> ————— OR ————— <ul style="list-style-type: none"><li>• Presence of bilateral oedema</li></ul>

- Each of these criteria objectively shows a failure of satisfactory breastfeeding so that the child is not gaining weight and developing normally.
- From birth to 6 months of age, weight-for-age is the most appropriate measure to assess nutritional status. At this age, failure to gain weight can be defined as acute malnutrition.

### THE CHALLENGES:

- The mother often thinks that she herself has insufficient milk and is apprehensive about her ability to adequately feed her child this also impacts negatively on milk production.
- The low output of milk is due to inadequate stimulation by the feeble infant.
- Treating the child with artificial diets rapidly leads to weaning and the mother sees that the “formula” is the only way to allow her child to recover.

### 7.3.3 Diet

- The nutritional treatment recommended for infants less than 6 months of age with SAM is mainly aimed at establishing, or re-establishing, effective exclusive breastfeeding by the mother.
- The infant should be regularly breastfed, and the mother or caregiver should be supported to breastfeed him/her. If the mother or caregiver is not breastfeeding, she should be supported to re lactate. If this is not feasible, wet nursing should be encouraged.
- Apart from breastfeeding, SS-milk should be provided. The SS-milk can be either generic infant formula or made by diluting F100 to make F100 dilute.

**Note:** Diluted F100 is not equivalent to F75. Diluted F100 contains approximately the same energy as F75 however the amount of protein and the amounts and balance of micronutrients are different. Full strength F100 should NEVER be used for small infants of children less than 3kg. The renal solute load is too high for this category of child and could provoke hypernatraemic dehydration.

#### ATTENTION!

- There are premature and small-for-gestational-age babies born who are being exclusively breast fed and gain weight at a satisfactory rate. Such infants are thriving and do not need admission to the program. The best way to differentiate those infants who are thriving from those that are becoming malnourished is to take repeated weight measures longitudinally; this is the value of the growth-monitoring program.
- If the infant is clinically well and appears to be breastfeeding satisfactorily, the mother should be counselled and given a return appointment in one or two weeks to monitor the weight change of the infant (an accurate 10g precision infant scale is needed – not a survey scale with 100g divisions).

### 7.3.3.1 Type of Milk

- For infants with **SAM but NO Oedema**, expressed breast milk is the preferred option; if this is not possible, generic infant formula or diluted F-100 may be given; **See Table. 38.**
- For infants with **SAM and Oedema** of any grade, expressed breast milk and infant formula or F-75 are the preferred supplement.
- If there is no realistic possibility of establishing or re-establishing breastfeeding, adequate generic infant formula should be prescribed under strict medical supervision, ensuring support to enable safe preparation and use, including at home after discharge from the hospital.
- F100 / F75 should never be provided for take home ration.

## COMMERCIAL MILK FORMULAS

Commercial milk formulas can be dangerous. They can expose the child to a higher risk of death when strict criteria are not adhered to. Staff should endeavour to:

- Control and prevent the use of commercial infant formulas while in inpatient care.
- Indicate to the mother that therapeutic milk is different and is a 'medical milk.'
- Ask caregivers to drink and finish any commercial milk formula they are carrying on admission themselves so the infant can be appropriately managed only with therapeutic milk.
- Give support to caregivers who will need to use commercial milk formulas after discharge (no possibility of breastfeeding or re-establishing breastfeeding has proven unsuccessful). Refer them to support available nearer their home to help ensure they can do so safely.
- Abide by the National Breast Milk Substitute Order and avoid promoting the use of commercial infant formulas.
- Unmodified powdered cow milk should never be used for infants. Remind mothers that F75/F100 are specially prepared formula to treat malnutrition and not the same as commercial milk formulas.



### 7.3.3.2 Preparation

**For Infant formula.**

- Dilute according to the supplier's instructions.

**For F100 diluted,**

- Put one small packet of F100 into 670ml of water instead of 500ml (or, if you do not have a small packet, one large packet of 457g F100 into 2.7l of water instead of 2l to make F100 diluted).
- Use 100ml of F100 already prepared and add 35ml of water, then you will get 135ml of F100 diluted. Discard any excess waste.
- Don't make smaller quantities.

### 7.3.3.3 Supplementary Suckling Technique

**At the beginning of the technique**

- Use a tube the same size as No.8 NGT (a No.5 tube can be used and is better for the infant, but the milk should be strained through cotton wool to remove any small particles that block the tube).
- Put the appropriate amount of SS-milk in a cup and hold it.
- Put the end of the tube in the cup.
- Put the tip of the tube on the breast at the nipple.
- Tell the mother to offer the breast in the normal way so that the infant attaches properly.
- At the beginning the mothers find it better to attach the tube to the breast with some tape, later as she gets experience this is not normally necessary.
- 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. It is like taking a drink through a straw.
- Help the mother at first by holding the cup and the tube in place.
- Encourages the mother confidently.
- Place the cup at first about 5 cm to 10 cm below the level of the nipple so the SS-milk can be taken with little effort by a weak infant.
- NEVER place the cup above the level of the nipple, or it will flow quickly into the infant' mouth by siphonage with a major risk of inhalation.
- Tell the mother to relax. Excessive or officious instructions about the correct positioning or attachment positions often inhibit the mothers and make her think the technique is much more difficult than it is. Any way



in which the mother is comfortable and finds that the technique works is satisfactory.

- It may take one or two days for the infant to get used of the tube and the taste of the mixture of milks, but it is important to persevere.

### Later as the infant becomes stronger

- Lower the cup progressively to about 30 cm below the breast.
- Children less than 6 months, with oedema, should be started on F75 and not on F100 diluted. When the oedema has resolved and they are suckling strongly they should be changed to infant formula or F100 diluted.
- Later when the mothers are more confident, ask if they want to manage to hold the cup and tube without assistance. The mother, instead of the assistant, can hold the tube at the breast with one hand and the other holds the infant and the cup. In this way she can perform SS-feeding without assistance.
- Use another mother who is using the technique successfully to help.
- Try to have the mothers together at the same time using the SS technique. Once one mother is using the SS-technique successfully the other mothers are greatly encouraged and find it relatively easy to copy her.
- If the SS-milk formula is changed suddenly then the infant normally takes a few days to become used to the new taste. It is preferable to continue with the same supplementary diet throughout the treatment.

PHOTO: UNICEF



This infant is suckling the breast and also getting the SS –milk (135 ml/kg/d) by the supplemental suckling technique. Raising or lowering the cup determines the ease with which the infant gets the supplement: for the very weak infants it can be at the level of the infant’s mouth. If it above this level, the feed can go into the child be siphonage when there is a danger of aspiration.

## Cleaning the tube

- After feeding, flush the tube through with clean water using a syringe.
- Then spin (twirl) the tube rapidly to remove the water in the lumen, and inspect to ensure that no water remains in the tube. If convenient the tube is then left exposed to direct sunlight. The UV rays in sunlight penetrate the plastic and can effectively sterilise the tube if it is already clean and all opaque matter is removed.

### 7.3.3.4 Amount to Give

- For Infant formula:
  - Dilute according to the supplier's instructions.
- For F100 diluted
  - Breastfeed on demand. Offer breast milk at least every 3 hours for at least 20 minutes and on demand (whenever the infant cries or demands more). As a principle, the infant should be breastfed as frequently as possible.
  - Half-hour and to an hour after a breastfeeding session, give maintenance amounts of a milk supplements (expressed breast milk, a generic infant formula or F-100 Diluted) at 130 ml/kg/day, distributed across twelve or eight feeds per day, providing 100 kcal/kg/day by supplemental suckling.
  - Two-hourly feeds are best for at least the first days and to stimulate breast milk production.
  - Give F-75 with bilateral pitting oedema until the oedema is resolved.
  - Close monitoring and recording of feeding and vital signs are crucial, and are similar as described in the older child.

Give the amount of SS-milk at each feed according to the look up table. **See Table 45.**

**TABLE 45. VOLUMES OF INFANT FORMULA MILK OR F-100 DILUTED (SEVERE WASTING), OR F-75 (OEDEMA) FOR USE IN SUPPLEMENTATION OF BREASTFED INFANTS WITH SAM**

(BASED ON 100 KCAL/KG/DAY OR 130 ML/KG/DAY)

Infant's Weight (kg)	Infant Formula or F-100 Diluted (or F-75 in case of oedema)	Infant Formula or F-100 Diluted (or F-75 in case of oedema)
	ml per feed if 12 feeds a day*	ml per feed if 8 feeds a day*
< 1.3	15	25
1.3 - 1.5	20	30
1.6 - 1.8	25	35
1.9 - 2.1	25	40
2.2 - 2.4	30	45
2.5 - 2.7	35	45
2.8 - 2.9	35	50
3.0 - 3.4	40	60
3.5 - 3.9	45	65
4.0 - 4.4	50	75
4.5 - 4.9	55	85
5.0 - 5.4	60	90
5.5 - 5.9	65	100
6.0 - 6.4	70	105
6.5 - 6.9	75	115

- Do NOT increase the amount given as the infant starts to regain strength, suckle more strongly and gain weight.
- Encourage the mother when the infant is gaining weight and tell her, that “the recovery is due to her own breast milk”.
- Ask the mother to breast-feed every 3 hours for at least 20 minutes, more often if the infant cries or seems to want more.
- Shortly after (30 to 60 minutes) giving a normal breast-feed, return the infant to the breast and help the mother to give the generic infant formula/ F100 diluted using the SS technique.
- Write the information on the infant chart. **See Annex 15 Infant SS - Chart.**

### 7.3.3.5 Supplementary Suckling Chart - SS Chart

This is a kind of monitoring chart that assess the daily weight, amount of daily intake of milk and clinical status. See 7.3.3.3 Supplementary Suckling Technique

### 7.3.3.6 Progress and follow up

Monitor the progress of the infant by the daily weight with a scale graduated within 10g (or 20g) and write on the infant chart.

**If the child loses weight over 3 consecutive days** yet seems hungry and is taking all his F100 diluted/infant formula,

- Add 5ml to each feed.

**If the child grows regularly with the same quantity of milk,**

- Tell the mother that the quantity of breast milk is increasing and she is “responsible” for recovery.
- Not need to increase the supplemental milk.

**If after some days, the child does not finish all the supplemental food, but continues to gain weight,**

- Tell the mother that the breast milk is increasing and that the infant is getting enough to fully recover.
- Reduce the amount of SS-milk given at each feed by the amount not taken.

**When a baby is gaining weight at 20g per day for 2 consecutive days (whatever her/his weight),**

- Decrease the quantity of SS-milk given at each feed to one half of the maintenance intake.

**If on half the SS-intake, the weight gain is maintained at 10g per day (whatever her/his weight),**

- Then stop supplement suckling completely. Encourage the mother that she is doing well and continue her breastfeeding.

**If the weight gain is not maintained when the SS-milk intake is cut in half,**

- Then change the amount given to 75% of the maintenance amount for 2 days and then reduce it again if weight gain is maintained.

**If the mother wishes to go home as soon as the child is taking the breast milk greedily and gaining weight,** they should be discharged.

**If the mother is agreeable,** keep in the centre for a further 2 days on breast milk alone to confirm that her infant continues to gain weight on breast milk alone.

Then discharge the infant, no matter what his current weight for age or weight for length.

## KEY MESSAGES TO MOTHER

- Do not make the mother feel guilty for the state of her child or blame her for giving other foods
- Introduce her to the other mothers in the centre and introduce her to the staff personally. Make her feel “at home” in a friendly and relaxing atmosphere
- She may not have enough milk at present – but strongly reassure the mother that the technique works and that enough milk will “come into” her breasts as her baby recovers. She will then be able, with her own milk, to make her baby better
- Tell her and encourage her to drink at least 3 litres per day

### 7.3.4 Systematic Antibiotic

If no medical complications, first line oral Amoxicillin: 15 mg/kg 3 times a day for 5 days (Infant < 3kg)

For severe infection, give IV Ampicillin 50mg/kg/dose every 8 hours for 2 days; switch to oral Amoxicillin: 15 mg/kg 2 times a day for 5 days (Infant < 3kg) and IV Gentamicin 7.5mg/kg once a day for 7 days combine with Amoxicillin for 5 days.

**NEVER USE CHLORAMPHENICOL IN YOUNG INFANTS.**

### 7.3.5 Monitoring

Monitor the infant and write it on the infant chart:

- Weight is measured daily
- Body temperature is measured twice per day.
- The standard clinical signs are assessed and noted in multi-chart each day:
  - Respiration rate
  - Stool
  - Vomiting
  - Refuse feeding

### 7.3.6 Care for Mother

- As the aim is to increase breast milk, the mother's health and nutritional status are critical for the nutritional repletion of the infant
- Check mother's MUAC and the presence of oedema
- Explain to the mother what the aim of treatment is and what is expected of her
- Tell her and encourage her to drink at least 3 litres per day
- Make the necessary arrangement for the mother so she can eat about 2500kcal/day of a high quality diet
- Give to the mother Vitamin A 200,000 IU provided that mother had not received during 42 days after delivery.
- Give Micronutrient supplementation
- Decrease as much as possible the length of stay in the facility
- If needed, give drugs which help with lactation (e.g. metaclopramide 10mg 8 hourly)

### 7.3.7 Discharge

For discharge criteria for infants less than 6 months

TABLE 46. DISCHARGE CRITERIA FOR INFANTS LESS THAN 6 MONTHS

Age	Discharge Criteria
Infant less than 6 months or less than 3 kg being breastfed	<ul style="list-style-type: none"><li>• It is clear that s/he is gaining weight on breast milk alone after the supplemental suckling technique has been used</li><li>• There is no medical problem</li><li>• The mother has been adequately supplemented with Vitamins and minerals so that she has accumulated body stores of essential nutrients</li></ul>

- Advise the mother to come to health facilities operating Mother Child Health (MCH) regularly and also an SFP if being implemented to receive high quality food to improve the quantity and quality of breast milk.

## 7.4 Management of infants less than 6 months with no possibility to breastfeed

### 7.4.1 Principles and Objectives

- These young infants are particularly vulnerable because they have neither a mother nor the protection of breast milk. (Not only at hospital but also at home)
- It is essential that the caretaker has access to adequate amounts of generic infant formula. (At home)
- Once discharged the caretaker (father/siblings) must have the knowledge and facilities to prepare the formula milk safely.
- Thus for the above reasons follow-up for these infants and their caretakers is very important.

### 7.4.2 Admission

#### 7.4.2.1 Admission Criteria

TABLE 47. ADMISSION CRITERIA FOR INFANTS LESS THAN 6 MONTHS WITHOUT A FEMALE CARETAKER

Age	Admission Criteria
Infant less than 6 months ————— OR ————— < 3 kg with no prospect of being breastfed	<ul style="list-style-type: none"><li>• The infant is not gaining weight at home (by serial measurement of weight during growth monitoring i.e. change in weight for age)</li></ul> ————— OR ————— <ul style="list-style-type: none"><li>• W/L (Weight for Length) less than &lt; -3 z scores</li></ul> ————— OR ————— <ul style="list-style-type: none"><li>• Presence of bilateral oedema</li></ul>

### 7.4.3 Management

When there is no prospect of being given breast milk then severely malnourished, less than 6 months old infants, should be treated according to the standard protocol with the following modifications. The amounts and frequency are outlined in **Table 48**. The registration process, medical treatment and surveillance are the same as for infants less than 6 months or < 3 kg.

### 7.4.3.1 Acute Phase

- Give expressed breast milk, generic infant formula milk, or F-100 Diluted (or F-75 in case of oedema) at 130 ml/kg/day, distributed across twelve or eight feeds per day, providing 100 kcal/kg/day.
- Two-hourly feeds are best for at least the first day. Then, when the infant has little or no vomiting and modest diarrhoea, change to three-hourly feeds. After a day on three-hourly feeds, and no vomiting and no diarrhoea, change the infant to four-hourly feeds.
- Close monitoring and recording of feeding and vital signs are crucial, and are similar as described in the older child.

The look-up table for replacement feeding for infants without prospect of breastfeeding are provided in TABLE 48.

### 7.4.3.2 Transition Phase

- Give expressed breast milk, infant formula milk or F-100 Diluted provided at 150-170 ml/kg/day, providing 110–130 kcal/kg/day.
- Carers are prepared for discharging the infant on a breast milk substitute, and receive nutrition counselling.
- Close monitoring and recording of feeding and vital signs are crucial, and are similar as described in the older child.

### 7.4.3.3 Recovery Phase

- Give expressed breast milk, infant formula milk or F-100 Diluted provided at 200 ml/kg/day, providing 150 kcal/kg/day.
- Carers are prepared for discharging the infant on a breast milk substitute, and receive nutrition counselling.



**TABLE 48. VOLUMES OF INFANT FORMULA OR F-100 DILUTED (SEVERE WASTING), OR F-75 (OEDEMA) FOR USE AS REPLACEMENT FEEDING IN NON-BREASTFED INFANTS WITH SAM**

(BASED ON 100 KCAL/KG/DAY OR 130 ML/KG/DAY)

Infant's Weight (kg)	Acute Phase		Transition Phase	Recovery Phase
	Infant Formula or F-100 Diluted (or F-75 in case of oedema)		Infant Formula OR F-100 Diluted	
	ml per feed if 12 feeds a day*	ml per feed if 8 feeds a day*	ml per feed if 8 feeds a day*	ml per feed if 6 feeds a day*
< 1.3	15	25		
1.3 - 1.5	20	30	30	50
1.6 - 1.8	25	35	40	60
1.9 - 2.1	25	40	45	70
2.2 - 2.4	30	45	50	80
2.5 - 2.7	35	45	55	90
2.8 - 2.9	35	50	60	100
3.0 - 3.4	40	60	70	115
3.5 - 3.9	45	65	80	130
4.0 - 4.4	50	75	90	150
4.5 - 4.9	55	85	100	165
5.0 - 5.4	60	90	110	180
5.5 - 5.9	65	100	120	200
6.0 - 6.4	70	105	130	215
6.5 - 6.9	75	115	140	230

### 7.3.4 Routine Medicines

Same as infants less than 6 months with the possibility to breastfeed.

### 7.4.4 Discharge

Discharge criteria for infants less than 6 months with no prospect of being breast fed.

**TABLE 49. DISCHARGE CRITERIA FOR INFANTS LESS THAN 6 MONTHS WITH NO PROSPECT OF BEING BREASTFED**

Age	Discharge Criteria
Infant less than 6 months or less than 3 kg with no prospect of being breastfed	<ul style="list-style-type: none"><li>• <math>\geq -2</math> z score weight for length</li><li>• No bilateral pitting oedema</li><li>• No medical complications</li></ul>

- As soon as the infant is treated for severe acute malnutrition, the diet should be switched to infant formula or any suitable milk substitute according to the availability and possibilities assessed the family and community.
- Bottle feeding should be discouraged – breast milk substitute should be given by cup.
- The infants will be discharged on generic infant formula, the diet is not changed.
- It is essential that the caretaker has access to generic infant formula. This has to be supplied by the clinic or orphanage/ foster parents as commercially produced formula are normally unaffordable by most families with malnourished infants and no mother or wet-nurse available.
- Follow-up for these infants and their caretakers is very important.



## Play and Emotional Care

## 8. Play and Emotional Care

### 8.1 Importance of Play Therapy

SAM children have delayed mental and behavioural development. Emotional and physical stimulation through play programmes that start during rehabilitation and continue after discharge can substantially reduce the risk of permanent mental and emotional damage.

Play is a natural activity of learning, exploration and communication for children. Significantly, play therapy offers children safe and comfortable environment in which they can be themselves and have the emotional support to express their feelings freely. Play therapy is intended to develop language skills and motor activities aided by simple toys. It should take place in a loving, relaxed and stimulating environment.

### 8.2 Aims of Physical Activities in Malnourished Children

#### 8.2.1 To stimulate the child in physical activity as soon as the child is physically stable

##### Play Activities

Malnourished children need interaction with other children during rehabilitation. After the initial phase of treatment the child should spend prolonged periods with other children, with mother or play guide. One nurse or volunteer should be responsible for play activities to lead play session. Activities should be selected to develop motor and language skills.

Learning through play should be fun for children. Child's effort to perform a task should always be praised and never criticized.

#### 8.2.2 To structure play therapy (maternal involvement and education)

It is essential that mother or caretaker be with her child in hospital and at Nutrition Rehabilitation center, that she be encouraged to feed, hold, comfort and play with her child as much as possible. (e.g feeding, comforting, bathing, playing)

### 8.2.3 To create stimulating environment

Rooms should be brightly coloured, with decorations that interest to children. The staff should wear normal clothing rather than uniform. The atmosphere in the ward should be relaxed, cheerful and welcoming.

Toys should be available in the room and play area. Toys should be safe, washable and appropriate for the child's age.

## 8.3 Play and Emotional Care in the ITP and OTP

- Create a friendly supportive atmosphere. Caretaker is the primary health provider for the child, nurse or volunteer provide services to her and her child; to assist and guide her in giving the best care available.
- Do not chastise the caretakers, order them about, demean them or adopt an officious attitude; never shout or become angry. Do not wear imposing uniforms (white coats).
- Teach local songs and games using fingers and toes. Get child to laugh and vocalize.
- Pick up the unsmiling children, talk or sing to them and cuddled them. It is the child that does not make eye contact or seek attention that needs it most.
- In the OTP and the ITP, organise an educational session that teaches the mothers the importance of play and exploration as part of the emotional, physical and mental stimulation that the children need. This is an integral part of treatment.
- Organise sessions where the mothers learn to make toys suitable for their children from cheap or discarded material. In the ITP, keep the mother with the child and encouraged her to feed, hold, comfort and play with him as much as possible.
- Toys should be available in the child's bed and room, as well as the play area. Inexpensive and safe toys made from cardboard boxes, plastic bottles, tin cans, old clothes, and blocks of wood and similar materials.
- They are much better than purchased toys because mothers learn to make them themselves and continue to make toys for their children after discharge.

### 8.3.1 Emotional play and stimulation

#### To avoid sensory deprivation,

- Do not cover the child's face. The child must be able to see and hear what is happening around him or her.
- Do not wrap or tie the child. The malnourished child needs interaction with other children during rehabilitation.
- After the first few days of treatment as the children recover, put them all on large play mats for one or two hours each day with the mothers or a play guide. Have the mothers tell stories, sing and play with their children.
- Teach the mothers how to make simple toys and emphasise the importance of regular play sessions at home.

#### Physical activity

- Physical activity itself promotes the development of essential motor skills and may also enhance growth during rehabilitation.
- For immobile children, encourage mother to do passive limb movements and splashing in a warm bath.
- For mobile children, encourage mother to do some activities as rolling or tumbling on a mattress, kicking and tossing a ball, climbing stairs, and walking uphill and down.
- The duration and intensity of physical activities should increase as the child's condition improves.
- There should be a member of staff nominated who has overall responsibility for all these aspects of care of the malnourished.



### 8.3.2 Activities with toys

Simple toys made from readily available materials, can be used to encourage variety of different motor activities:

#### 'Ring on a string'

- Swing the ring within reach and tempt the child to grab it.
- Suspend ring over the crib and encourage the child to knock it and make it swing.
- Let child explore the ring, then place it a little distance from child with the string stretched towards him/her and within reach.
- Teach the child to retrieve the ring by pulling on the string horizontally
- Make the child on your lap, holding the string, lower the ring towards the ground also teach child to dangle the ring round.
- Teach child to get the ring by pulling up on the string vertically.

#### 'Rattle and drum'

- Let the child explore rattle. Show child how to shake it saying 'shake shake'
- Encourage the child to shake the rattle by saying 'shake' but without demonstrating.
- Teach the child to beat drum with shaker saying 'bang bang'
- Roll drum out of reach and let child crawl after it, saying 'fetch it'
- Get child to say 'bang bang' as (s)he beats drum

#### 'In and Out' toy with blocks

Let the child explore blocks and container. Put blocks into container and shake it, then teach the child to take them out, one at a time, saying 'out' and 'give me'

- Teach the child to take out blocks by turning container upside down
- Teach the child to hold a block in each hand and bang them together
- Let the child put blocks in and out of container saying 'in' and 'out'
- Cover the blocks with container saying 'where are they, they are under the cover'. Let the child find them. Then hide them under two and then three covers (e.g., pieces of cloth).
- Turn the container upside down and teach the child to put blocks on top of the container.
- Teach the child to stack blocks: first stack two then gradually increase the number. Knock them down saying, 'up, up' then 'down'.



### Make a game of it

- Line up blocks horizontally: first line up two then more; teach the child to push them along making train or car noises. Teach older children words such as stop and go, fast and slow and next to. After this teach to sort blocks by colour, first two then more, and teach high and low building. Make up games.

### Posting bottle

- Put an object in the bottle, shake it and teach the child to turn the bottle upside down and to take the object out saying 'can you get it?'
- Then teach the child to put the object in and take it out.
- Later try with several objects.

### Stacking bottle tops

- Let the child play with two bottle tops then teach the child to stack them saying 'I'm going to put one on top of the other'.
- Later, increase the number of tops. Older children can sort tops by colour and learn concepts such as high and low.

### Books

- Sit with the child on your lap. Get the child to turn the pages, pat pictures and vocalize. Later, let the child point to the picture which you name.
- Talk about pictures; obtain pictures of simple familiar objects, people and animals. Let older children name pictures and talk about them.

### Doll

- Teach the word 'baby'. Let the child love and cuddle the doll, sing songs whilst rocking the child.
- Teach the child to identify his/her own body parts and those of the doll when you name them. Later she/he will name them.
- Put the doll in a box as a bed and give sheets, teach the words 'bed and sleep' and describe the games you play.

The toys shown in the diagram below should be made and used in both the in-patient units and the homes of the malnourished children:

**Ring on a string (from 6 months)**

Thread cotton reels and other small objects (e.g. cut from the neck of plastic bottles) on to a string. The string in a ring, leaving a long piece of string hanging.



**In-an-out toy (from 9 months)**

Any plastic or cardboard container and small objects (not small enough to be swallowed).



**Drum (from 12 months)**

Any tin with a tightly fitting lid.



**Blocks (from 9 months)**

Small blocks of wood. Smooth the surfaces with sandpaper and paint in bright colours, if possible.

**Rattle (from 12 months)**

Cut long strips of plastic from coloured plastic bottles. Place them in a small transparent plastic bottle and glue the top on family.



**Mirror (from 18 months)**

A tin lid with no sharp edges.

**Posting bottle (from 12 months)**

A large transparent plastic bottle with a small neck and small long objects that fit through the neck (not small enough to be swallowed).



**Push-along toy (from 12 months)**

Make a hole in the centre of the base and lid of a cylindrical-shaped tin. Thread a piece of wire (about 60cm long) through each hole and tie the ends inside the tin. put some metal bottle tops inside the tin and close the lid.



**Stacking bottle tops (from 12 months)**

Cut at least three identical round plastic bottles in half and stack them.



**Pull-along toy (from 12 months)**

As above, except that string is used instead of wire.



**Nesting toys (from 9 months)**

Cut off the bottom of two bottles of identical shape, but different size. The smaller bottle should be placed inside the larger bottle.



**Puzzle (from 18 months)**

Draw a figure (e.g. a doll) in a crayon on a square or rectangular shaped piece of cardboard. Cut the figure in half or quarters.

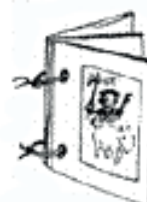


**Doll (from 12 months)**

Cut out two doll shapes from a piece of cloth and sew the edges together, leaving a small opening. Turn the doll inside-out and stuff with scraps of materials. Stitch up the opening and sew or draw a face on the doll.

**Book (from 18 months)**

Cut out three rectangular-shapes pieces of the same size from a cardboard box. Glue or draw a picture on both sides of each piece. Make two holes down one side of each piece and thread string through to make a book.



This diagram was supplied by Professor S.Grantham-McGregor



**HIV/AIDS &  
TUBERCULOSIS**

## 9. HIV/AIDS and Tuberculosis

### 9.1 HIV/AIDS

#### 9.1.1 Management of acute malnutrition with HIV

Failure to gain weight despite consuming adequate amount of RUTF/RUSF/FBF, persistent fever after appropriate antibiotic treatment or persistent anorexia are clinical features that should rise the suspicion of HIV or TB disease in malnourished children.

Therefore SAM children who do not respond or failure to respond should be particularly screened for TB and HIV testing. TB, HIV and SAM are linked and frequently appear in the same patients.

Children with chronic illnesses, especially children living with HIV/AIDS often present higher energy requirements: they are more likely to become malnourished as they show less appetite and/or do not absorb enough nutrients.

Children with acute malnutrition who are HIV infected should be managed with the same therapeutic feeding and supplementary feeding approaches as children with acute malnutrition who are not HIV infected. However HIV-infected children need more time to recover from malnutrition; rates of weight gain are lower. In addition to this, HIV-infected children often present more associated infections due to changes in their immune system. It is important that nutrition support is given as early as possible in the onset of acute malnutrition in order to give these individuals the best chance of recovery therefore linking with interventions for management of acute malnutrition is critical.

The key aspects of management of children with acute malnutrition with HIV are:

- Children in ITP, OTP or SFP who are not responding to treatment or reach discharge criteria of “Non response” will need to be tested for HIV/TB if their HIV/TB status is unknown. If HIV/TB status is known then case-by-case basis action should be explored and opportunity for inpatient care should be evaluated with the child’s HIV/TB treatment provider.
- Test all children with SAM for HIV where HIV prevalence is more than 1% to determine HIV status and need for ARV treatment.
- Start SAM treatment on admission and start ARV drugs as soon as possible once the child has stabilised to diminish the risk of serious side effects from the ARV drugs<sup>20</sup>.

<sup>20</sup> WHO Guideline Management of SAM in Infants and Children, 2013

- In children with HIV who are not responding to SAM treatment – start ARV after 2 weeks of SAM treatment with F75.
- HIV-infected children with severe acute malnutrition in whom persistent diarrhoea does not resolve with standard management should be investigated to exclude carbohydrate intolerance and infective causes, which may require different management, such as modification of fluid and feed intake, or antibiotics.
- HIV-infected children are likely to have HIV-infected parents; additional support needs to be available as the parent will suffer recurrent illness. Community mobilization and support, as well as local NGOs, can be invaluable in these circumstances. Similarly, children with acute malnutrition living in child-headed households after parents have died from HIV/AIDS need extra attention.
- HIV-infected children identified with either SAM or MAM should be referred to available HIV support services in line with the Myanmar National Guidelines on HIV<sup>21</sup>.

### 9.1.2 Diagnosis investigation for HIV in Children

Testing children who have SAM for their HIV status is important to determine whether they need to start life-saving cotrimoxazole prophylaxis and antiretroviral therapy (ART). Rapid diagnostic tests (RDT) for HIV are based on detecting antibodies to the HIV virus and are appropriate. RDT may be positive in infants less than 18 months of age who have HIV antibodies from their HIV-positive mothers. With a positive RDT, their diagnosis of HIV is confirmed by polymerase chain reaction (PCR) tests that are based on detecting RNA or DNA in white blood cells.

Note that both RDT and PCR tests for HIV may have false positive and false negative results.

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<sup>21</sup> Guidelines for the Clinical Management of HIV Infection in Myanmar. 4th Edition. National AIDS Programme. Department of Health, Ministry of Health, Myanmar 2014.

### 9.1.4 Medical Management

Once the patient's SAM is being treated satisfactorily and s/he have had adequate amounts of the essential nutrients to resist the toxic effects of the drug treatment HIV and TB, Then start the treatment for HIV and follow the national guidelines.

Children under 5 year with severe acute malnutrition who are HIV infected and who qualify for lifelong ART should be started on antiretroviral drug treatment as soon as possible after stabilization of metabolic complications and sepsis. This would be indicated by return of appetite and resolution of severe oedema.

If treatment with ARVs is started in the severely malnourished patient whilst they have physiological malnutrition, they are likely to develop very severe side effects from the drugs. Such side effects can lead to death or withdrawal of many of the patients from the ARV treatment programs. All ARV drugs have significant side effects, and their toxicity and pharmacokinetics have not been adequately assessed in the severely malnourished child.

- All HIV-positive children regardless of their age, with or without SAM, should start lifelong ART irrespective of their CD4 counts and clinical staging.
- Give immediate prophylactic treatment with cotrimoxazole against pneumocystis jiroveci pneumonia and other infections and start lifelong ART as soon as possible after stabilization of metabolic complications and sepsis, indicated by return of appetite and resolving severe oedema.
- HIV-infected children with severe acute malnutrition who are started on antiretroviral drug treatment should be monitored closely (inpatient and outpatient) in the first 6–8 weeks following initiation of antiretroviral therapy, to identify early metabolic complications and opportunistic infections.
- Give routine antibiotic and antihelminthic treatment, and vitamin and mineral supplementation in the same way as for HIV-negative children. Examine and treat for other infections.
- HIV-infected children with severe acute malnutrition should receive a high dose of Vitamin A on admission (50,000 IU to 200,000 IU depending on age) and zinc for management of diarrhoea as indicated for other children with severe acute malnutrition, unless they are already receiving F-75, F-100 or ready-to-use therapeutic food, which contain adequate Vitamin A and Zinc if they are fortified following the WHO specifications.

### 9.1.3 Dietary Management

- Therapeutic and supplementary feeding approaches are the same of children with severe acute malnutrition without HIV infection.
- In children with HIV/AIDS, good recovery from malnutrition is possible though it may take longer and treatment failures may be common.
- ITP and OTP Protocols for the admission and management of SAM children with HIV infection are the same as for SAM children without HIV infection. Nutrition treatment with RUTF uses rations based on the weight of the child. Quantities are the same as for non-infected children.
- The protocols for the admission and management of MAM children suffering from HIV infection will be similar to non HIV-infected MAM children. They should have nutrition support via supplementary feeding programme with appropriate fortified blended foods.
- For infants and children known to be HIV-infected, mothers are strongly encouraged to exclusively breastfeed for the first six months of life and continue breastfeeding up to 1 year<sup>22</sup>.

### 9.1.5 Discharge Criteria

- Children should be treated until nutrition recovery is achieved and be discharged according to the same criteria as for non HIV-infected children.
- HIV-infected children will likely present with more associated infections, and therefore rates of weight gain and recovery may be lower than in non HIV-infected children.
- Those not receiving nutrition support prior to the treatment for SAM or intervention for the management of MAM, should be referred to the available services or community support groups where appropriate as outlined in the HIV National Guidelines on HIV<sup>23</sup>.

<sup>22</sup> Guidelines on HIV and Infant Feeding - 2010. Principles and recommendations for infant feeding in the context of HIV and a summary of evidence. WHO, UNAIDS, UNFPA, UNICEF

<sup>23</sup> Guidelines for the Clinical Management of HIV Infection in Myanmar, 4th Edition. National AIDS Programme, Department of Health, Ministry of Health, Myanmar 2014

## 9.2 Tuberculosis (TB)

### 9.2.1 Management of acute malnutrition with TB

While in adults *Mycobacterium tuberculosis* causes primarily respiratory diseases, in children extra pulmonary manifestations of the disease can be common (lymphadenopathy, military TB, meningitis).

The key aspects of management of children with acute malnutrition with TB are:

- In SAM children, it can be even more difficult to suspect and hence diagnose TB. There are several scoring system available in medical literature for the diagnosis of TB in children, but none of them is specifically validated for SAM children. This is in part because acute malnutrition itself, especially when unresponsive to nutritional rehabilitation, is one of the main criteria used in these scoring systems.
- Failure to gain weight despite consuming adequate amount of RUTF/RUSF/FBF persistent fever after appropriate antibiotic treatment or persistent anorexia are clinical features that should rise the suspicion of TB disease in malnourished children.
- Children in ITP, OTP or SFP who are not responding to treatment or reach discharge criteria of “Non response” will need to be tested for HIV/TB if their HIV/TB status is unknown.
- Diagnosis of tuberculosis in HIV-infected children should always be considered. The signs are the same as for those in children without HIV infection.

### 9.2.2 Diagnosis of Tuberculosis in Malnutrition Children

The diagnosis of TB in children relies on a thorough assessment of all the evidence derived from:

- i. A careful history
- ii. Clinical examination
- iii. Relevant investigations supported by
  - a chest X-ray
  - examination or culture of induced sputum (i.e., mucous secretion from the lungs, bronchi and trachea that is ejected through the mouth)
  - Mantoux test (tuberculin skin test) if available(false negatives are frequent);
  - GeneXpert test of gastric aspirate specimen if possible.



A recommended scoring system to use in children with SAM with suspicion of TB, in which the presence of three or more of the following key features should prompt treatment:

1. Chronic symptoms suggestive of TB (e.g., unremitting cough for +14 days, prolonged fever for +14 days, weight loss or failure to thrive, SAM),
2. Physical signs suggestive of TB (e.g., gibbus or angulation of spine, non-painful cervical lymphadenopathy, non-painful pleural/pericardial effusion, meningitis not responding to antibiotic for + 15 days, ascites, non-painful enlarged joints for which no cause is known, phlyctenular conjunctivitis, erythema nodosum),
3. History of recent close contact with persons infected with TB (close = person in same household; recent = last 2 years),
4. Positive tuberculin skin test (for children with SAM induration is 5 mm or more, in normal children 10 mm or more),
5. Chest X-Ray suggestive of TB.

## 9.2.4 Medical Management

- The decision of starting a TB treatment should be made by history, the clinical symptoms, and diagnostic test for TB. If test is positive and/or there is a strong suspicion of TB (where no test is available), **start anti TB treatment according to national TB guidelines.**
- Treatment for TB can be delayed for at least two weeks, until stabilization of metabolic complications, return of appetite and reduction of oedema. However Anti TB treatment should be start immediately despite the danger of drug toxicity in those SAM children with of miliary TB, TB meningitis and Pott's disease.
- Give pyridoxine (vitamin B6) is 5-10 mg/day in a single dose supplementation to children being treated with isoniazide.
- For treatment of TB in patients with SAM and are on ARV, rifampicin should be given as one of components of 4 drug regime with alternative ARV therapy.
- There is drug Interaction between Rifampicin and NVP Nevirapine/ lopinavir, therefore choose WHO recommended ART regieme for children with on TB treatment<sup>24</sup>.

<sup>24</sup> WHO TB guideline 2014

### 9.2.3 Dietary Management

- In children with TB, good recovery from malnutrition is possible though it may take longer and treatment failures may be common.
- ITP and OTP Protocols for the admission and management of SAM children with TB infection are the same as for SAM children without TB infection. Nutrition treatment with RUTF uses rations based on the weight of the child. Quantities are the same as for non-infected children.
- The protocols for the admission and management of MAM children suffering from TB infection will be similar to non TB-infected MAM children. They should have nutrition support via supplementary feeding programme with appropriate fortified blended foods.

### 9.2.5 Discharge Criteria

- Children should be treated until nutrition recovery is achieved and be discharged according to the same criteria as for non TB-infected children.
- After discharge, health workers should make sure that children with TB are referred and/or continue accessing TB treatment services.
- Do not immediately transfer to a TB centre if they have little experience/ are untrained in treating SAM; the treatment of the SAM takes precedence in view of the respective mortality rates.
- If HIV/TB status is known then case-by-case basis action should be explored and opportunity for inpatient care should be evaluated with the child's HIV/ TB treatment provider.



## MANAGEMENT OF ACUTE MALNUTRITION IN SPECIFIC GROUPS

## 10 Management of Acute Malnutrition in Specific Groups

### 10.1 Pregnant and Lactating Women

Malnourished pregnant and lactating women (PLW) are included within the IMAM approach in order to support women to recover from nutrient deficiencies as well as to meet the additional micro and macronutrient needs of pregnancy and breastfeeding.

Acute malnutrition in pregnant women is associated with low birth weight of the new-born infant and associated with a higher risk of post natal mortality for the infant. The aim of treatment for Pregnant and Lactating Women (PLW) who are identified as being acutely malnourished is to provide good nutrition during foetal development and for the first 6 months of the infant's life while the mother is breastfeeding the infant.

#### 10.1.1 Admission

Women diagnosed as being pregnant or having a breastfeeding infant aged less than 6 months should be screened systematically at the health facility in the ante natal clinic, Mother & Child Health (MCH) clinic or OPD. Screening in the community by a CHW should be done at each known contact with a PLW. Any PLW with a MUAC less than 210 mm should be referred to SFP.

##### 10.1.1.1 Admission Criteria

Pregnant and lactating women are admitted to Supplementary Feeding Programme according to the admission criteria in the following table.

**TABLE 50. ADMISSION CRITERIA SUPPLEMENTARY FEEDING**

Age	Admission Criteria
Pregnant Women	<ul style="list-style-type: none"><li>• MUAC &lt; 210 mm</li></ul>
Lactating Women	<ul style="list-style-type: none"><li>• MUAC &lt; 210 mm with child under 6 months</li></ul>

### 10.1.1.2 Admission Category

- **New Case**
  - according to the category of admission (MUAC),
- **Old Case**
  - a women who is re-admitted after less than 2 months absence,
  - transfer from another site.

### 10.1.1.3 Routine medical treatment for Pregnant and Lactating Women

See Table 51 for routine medical treatment for pregnant and lactating women.

**TABLE 51. VITAMIN A, B1, IRON/FOLIC ACID AND MEBENDAZOLE DOSAGES FOR PREGNANT AND LACTATING WOMEN**

Treatment	Pregnant Women	Lactating Women
Vitamin A: 200,000 IU	No	Single dose if the child is below 2 months
Vitamin B1: 10 mg	Daily for one month before delivery	Daily for 3 months after delivery
Iron/ Folic acid: 60 mg + 400 ug	Daily for 6 months	Daily for 3 months
Mebendazole: 500 mg	Single dose starting at the second trimester  (DO NOT ADMINISTER DURING FIRST TRIMESTER)	Single dose at admission

### 10.1.2 Diet

WFP Standard ration for PLWs under the TSF is Super Cereal (Wheat Soya Blend with Sugar – WSB+). Supercereal should be prepared by mixing 40 gr of Supercereal with 250 gr of water followed by a boiling time at simmering point from 5 to 20 minutes., the daily ration being 200 - 250g.

**See Annex 5. Nutritional Products for Treatment of Moderate Acute Malnutrition.**

### 10.1.3 Frequency of Follow Up

Table 52 outlines what needs to be followed up and the frequency.

**TABLE 52. FREQUENCY OF FOLLOW UP AND MONITORING**

PLW	Frequency
MUAC	Fortnightly
Weight (with the same scale)	Fortnightly

#### **Pregnant women:**

- If a pregnant woman does not gain enough weight ( $\geq 1.5$  kg/month) in the 2 and 3rd trimester a thorough medical checkup is needed to exclude pathological causes.
- Counselling is required to ensure appropriate nutrition, health and hygiene practices are carried out.
- Pregnant women with oedema or any medical complications should be referred to the nearest health facility

#### **Lactating women:**

- Lactating women should not lose weight in the period of lactation
- Counselling should be provided to overcome any food avoidance and to improve IYCF practices
- LW will stay in the program until the infant is 6 months of age (180 days) regardless to whether she has reached discharge criteria by MUAC ( $\geq 210$ )

### 10.1.4 Discharge

Pregnant Women and Lactating Women receiving treatment can be discharge if they met following criteria.

**TABLE 53. DISCHARGE CRITERIA FOR SUPPLEMENTARY FEEDING**

	Discharge Criteria
Pregnant Women	<ul style="list-style-type: none"><li>• MUAC <math>\geq 210</math> mm up to delivery</li></ul>
Lactating Women	<ul style="list-style-type: none"><li>• MUAC <math>\geq 210</math> mm and child <math>\geq 6</math> months</li></ul>

## 10.2 Treatment of Children 5 – 18 years

Depend on the prevalence of acute malnutrition among this aged group according to any available recent survey, introduction of respective treatment programme will be determined.

### 10.2.1 Admission Criteria

The admission criteria for children with SAM aged 5 - 18 years is contained in **Table 54. Admission Criteria - Outpatient Therapeutic Treatment**. It is based on BMI for age for which WHO Growth Charts can be used.

**TABLE 54. ADMISSION CRITERIA - OTP & ITP**

	OTP	ITP
5 - 18 years	BMI for age < -3 z score _____ OR _____ Bilateral pitting oedema + and ++ _____ AND _____ Good appetite and no medical complications	<ul style="list-style-type: none"> <li>• Presence of bilateral pitting oedema +++              _____ OR _____</li> <li>• MUAC &lt; 115 mm and No Appetite and/or medical complications(+)              _____ OR _____</li> <li>• W/H &lt; -3 z-scores and No Appetite and/or medical complications(+)              _____ OR _____</li> <li>• Presence of bilateral pitting oedema +++/++ and No Appetite and/or medical complications(+)</li> </ul>

#### 10.2.1.1 Admission Category

Admission categories for children aged 5 -18 years is the same as for those aged below 5 years. **TABLE 17. CATEGORIES OF ADMISSION OUTPATIENT THERAPEUTIC TREATMENT.**

### 10.2.2 Routine Medical Treatment

See **TABLE 23. DOSAGES OF MEDICINE USE IN OTP** for routine medical treatment for children with SAM aged 5 -18 years. For routine antibiotics, adapt dosages according to weight.

### 10.2.3 Nutrition Treatment / Diet

Adolescents and adults should be given the same formula feeds (with added minerals and vitamins) as children. The initial goal of treatment is to prevent further loss of tissues. The amount of feed given per kg of body weight is much less than for children and decrease with increasing age. Therapeutic milk and RUTF should be given according to the weight of the child and using the kcal recommendation for required Kcals/kg bodyweight/day.

Note that Kcals per kg body weight at least for initial stabilisation treatment are considerably lower for these age groups than for children.

The F-75 diet should be given to all children during the initial phase of treatment. The child should be given at least 80 kcal or 336 KJ/kg, but no more than 100 Kcal or 420 KJ/kg per day. If less than 80 kcal or 336 KJ/kg per day are given, the tissues will continue to be broken down and the child will deteriorate. If more than 100 kcal or 420 KJ/kg per day are given, the child may develop a serious metabolic imbalance.

**TABLE 55. DIETARY REQUIREMENTS FOR INITIAL TREATMENT OF ACUTE SEVERELY MALNOURISHED ADOLESCENTS AND ADULTS<sup>25</sup>**

AGE YEARS	DAILY ENERGY		VOLUME OF DIET REQUIRED ML/KG/HR	
	Kcal / kg	KJ / kg	F75	F100
7-10	75	315	4.2	3.0
11-14	60	250	3.5	2.5
15-18	50	210	2.8	2.0

<sup>25</sup> Management of Severe Malnutrition: A Manual for Physicians and other senior Health Workers - WHO 1999



## 10.2.4 Discharge Criteria of severely malnourished Children 5 – 18 years

**TABLE 56. DISCHARGE CRITERIA OF SEVERELY MALNOURISHED CHILDREN 5 – 18 YEARS**

	OTP	ITP
Children 5 -18 years	BMI for age $\geq$ -2 z scores AND Free from Oedema	Oedema Free from oedema for 2 consecutive weeks AND BMI $\geq$ - 2 SD for two consecutive weeks

## 10.2.5 Frequency of Follow Up and Monitoring

The same procedure as for children under 5 should be followed however separate tally sheets at facility and township level.

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## **ANNEXES**

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### **Integrated Management of Acute Malnutrition (IMAM)**

## Annex 1

### Oedema / MUAC Measurements / Weight for Height

#### Bilateral Pitting Oedema

Oedema is an accumulation of fluid in the tissues. Oedema of nutritional origin is characterised by being bilateral and pitting, seen in the feet, lower legs and arms. In severe cases, it may also be seen in the upper limbs and face.

#### How will you assess for oedema?

To check for oedema, grasp both feet so that it rests in your hands with your thumbs on top of the feet. Press your thumbs gently for a few seconds (count one hundred one, one hundred two, one hundred three). The child has bilateral pitting oedema if a pit (dent) remains in both feet when you lift your thumbs.

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



PHOTO: UNICEF

#### GRADING OF OEDEMA IN MALNOURISHED CHILDREN

Grade	Definition
+	Mild: both feet/ankles
++	Moderate: both feet, plus lower leg, hands or lower arms
+++	Severe: generalized oedema including feet, legs, hands, arms and face

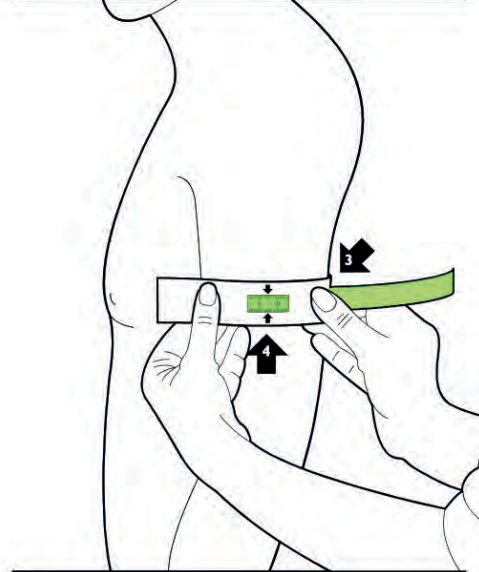
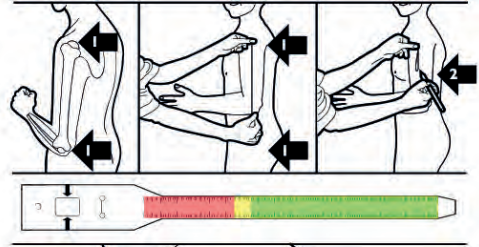
## Middle Upper Arm Circumference (MUAC) 6–59 months

MUAC is a very useful body measurement used for children 6–59 months. MUAC correlates well with muscle mass and, hence, with body nutritional reserves.

It is essential to use the age cut-off of 6 months for MUAC and not to use the height of the child as proxy for age.

How to measure MUAC:

1. MUAC is always taken on the left arm. Have the child bend his/her arm at a 90-degree angle. Find the top of the shoulder and the tip of the elbow. Hold one end of a piece of string at the top of the shoulder and hold the string where it meets the tip of the elbow (endpoint).
2. Fold the endpoint up to the end of the string on top of the shoulder and place the left thumb on the point of the folded ends of the string. Mark the midpoint with a pen. If there is no string available you can carefully use the MUAC tape.
3. With the child's arm relaxed and falling alongside his/her body, wrap the MUAC tape around the arm at the midpoint. There shouldn't be any space between the skin and tape, but don't wrap the tape too tight. Slide the end of the tape through the small opening.
4. Read the measurement from the middle window exactly where two arrows point inward. For numbered tapes, the measurement should be recorded with a precision of 1 millimetre (mm). For three-colour tapes (red, yellow, green), record the colour that shows through the window at the point the two arrows indicate.



## Measuring a Child's Length/Height

Depending on a child's age and ability to stand, measure the child's length or height. A child's length is measured while he or she is lying down (recumbent). Height is measured while the child is standing upright.

- If a child is under 2 years old or if a child is less than 87 cm tall and his/her age is not known, measure length.
- If a child is 2 years old or older or if a child is at least 87 cm tall and his/her age is not known, measure standing height. If a child 2 years old or older or at least 87 cm tall is unable to stand, measure recumbent length and subtract 0.7 cm from the length to arrive at a comparable height.

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

## Calculating weight for height/length z score using WHO Z-Scores

**Example: a boy is 16 months, 63 cm length and weighs 6.5 kg.**

- Take the table for Weight for Length (6-24 months), look in the middle column shown as Height (cm), and look for the figure 63cm (=height).
- Take a ruler or a piece of card place it under the figure 63 and the other figures on the same line.
- On this line find the figure, at left side of height column and under the heading of Boy's weight corresponding to the weight of the child, in this case it is between 6.2 and 6.8.
- Look to see what columns this figure is in. In this case it is between -1SD and the MEDIAN WEIGHT columns. In other words, it is above -1SD and below Median.
- In this example the child's weight is normal in relation to his LENGTH. He therefore has an appropriate weight for his length.

**Example: a girl is 30 months, 78.0 cm tall and weighs 8.1 kg**

This child is between the column -2 & -3 Z-score or between MAM and SAM. He is too thin in relation to his length or less than -2 and more than -3; he is <-2 (less) and >-3 (more): he is MODERATELY MALNOURISHED but NOT Severely Malnourished.

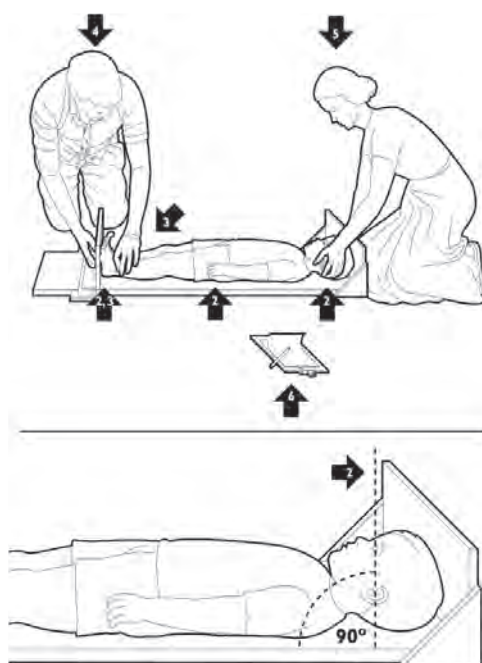
**Note:** It may be that the weight or the height is not a whole number.



## Height using Length Board

(Under 2 years OR, if age is not known, height less than 87 cm, OR 2 years or older or at least 87 cm tall but unable to stand)

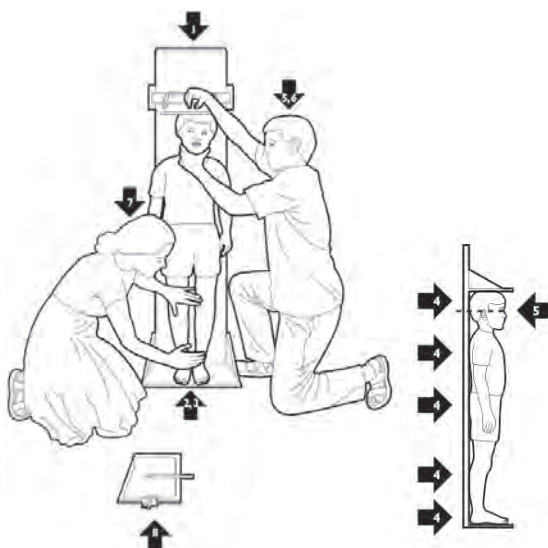
- 1 Place height board on the ground and remove child's shoes.
- 2 Place child on his/her back in middle of board, head facing straight up, arms at child's sides and feet at 90° angles to board.
- 3 While holding child's ankles or knees, move sliding board up against bottom of child's feet.
- 4 Take measurement to nearest 0.1 cm and read out loud.
- 5 The assistant, while holding the child's head in place, repeats the measurement for verification.
- 6 Measurer records height to nearest 0.1 cm. If child is 2 years or older or is 87 cm or greater while standing up, subtract 0.7 cm from measurement.



## Height using Height Board

[2 years or older OR height 87 cm or greater AND able to stand]

- 1 Remove child's shoes and place him/her on height board, standing upright in middle of board with arms at his/her sides.
- 2 Child's feet should be close together with heels and soles touching the bottom of the board (that is, not standing tiptoe).
- 3 The back of the child's ankles and knees should be firmly pressed toward the board.
- 4 The child should stand straight, with heels, back of legs, buttocks,



shoulders and head touching the back of the board.

- 5 Measurer holds child's head straight. The child's line of vision should be parallel to the floor.
- 6 Measurer reads measurement out loud to nearest 0.1 cm.
- 7 Assistant, holding child's legs and feet, repeats the measurement for verification.
- 8 Measurer records height to nearest 0.1 cm.

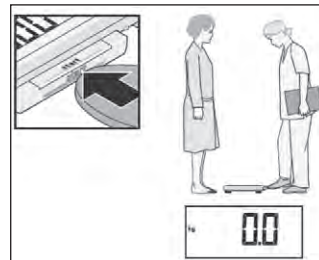
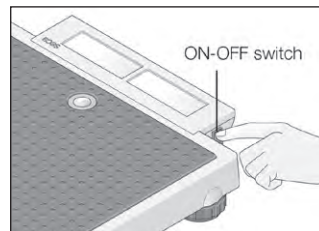
### Tips for Weighing a Child or Infant

- ✓ Never weigh a child without explaining the procedure to the caregiver.
- ✓ Children should be weighed and completely naked only in the presence of the caregiver. Have the caregiver remove the child's clothes.
- ✓ Put a soft cloth or the child's wrapping on the scale to protect the child from the hard and potentially cold surface.
- ✓ Read the child's weight when the child is not moving. The child should remain still for the weighing.
- ✓ Scales must be cleaned and re-zeroed after each weighing.
- ✓ Infants under 6 months are weighed using an infant scale with of a 10 gram precision.

### Measuring Weight by Electronic Scale

Weight is measured by following steps:

- To conduct the measurement in a place with good lighting.
- Open the on/off switch on the side of the instrument.
- To start the measurement, press the start button at the front of the scale. There are two buttons "start" and "2 in 1".
- Wait until 3 zeros appear on the 2 openings where the numbers appear.
- When 3 zeros appear the scale is ready for weighing.



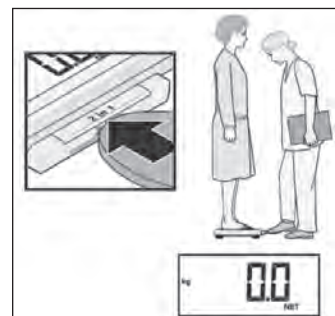
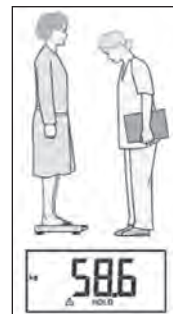
### Measuring weight of adults

- Remove outer clothing, sweaters, clips, watches, shoes, hand phones and other heavy objects from the person to be weighted before he/she steps on the scale.
- Ask the person to step on the scale and stand still upright. Ask the person to look forward straight ahead. Must not tilt the head upwards or look down.
- Read out aloud the numbers that appear on the display opening (Weight of adult) and write it down correctly.
- The weight is recorded in Kilograms to the nearest one decimal point.



### Measuring the weight of the mother and child simultaneously

- In order to obtain the weight of the child, the mother alone is weighed once and then the mother and child is weighed together once.
- Press the start button and wait until “3 zeros” appear.
- Then ask the mother to step on the scale in the correct position.
- Ask the mother to stay still for a while. When the numbers appear (weight of mother) mark it correctly. Then, without asking the mother to step down press the 2 in 1 button. Wait till “3 zeros” appear. Then hand over the child to the mother standing on the scale and ask her to carry the child.
- Ask the mother and child to stay still for a while and when the numbers appear mark it correctly.



- If after the mother and child are weighed, the 2 in 1 button is not pressed again, the function of 2 in 1 will continue to remain. Therefore, the 2 in 1 function should be pressed again after weighing the mother and child.
- If the scale is not used for more than 2 minutes, the 2 in 1 function and the scale will be automatically switched off.
- If weights more than 150 Kg are put on the scale a “STOP” sign will appear.

### Weight Using Hanging Scale (Bucket) [6–24 months]

The scale should be checked daily against a known weight. To do this, set the scale to zero and weigh objects of known weight (for example, 5.0 kg, 10.0 kg, 15.0 kg). If the measure does not match the weight to within 10 grams, the springs must be changed or the scale should be replaced.

- 1 The scale can be hooked to a rope on the ceiling or stand in a clinic, at eye level of the measurer. Put a soft cloth or the child’s wrapping in the bucket.
- 2 Before weighing the child, have the caregiver take all the child’s clothes off.
- 3 Make sure the scale arrow is at 0 (‘zero the scale’) with the bucket hooked on the scale.
- 4 Place child in weighing bucket.
- 5 When arrow is steady, measurer reads child’s weight in kg at eye level. The assistant repeats it for verification and records it to nearest 100g.  
(for example, 5.2 kg)



## Weight Using Hanging Scale (Cloth) [6–59 months]

The scale should be checked daily against a known weight. To do this, set the scale to zero and weigh objects of known weight (e.g., 5.0 kg, 10.0 kg, 15.0 kg). If the measure does not match the weight to within 10 grams the springs must be changed or the scale should be replaced.

- 1 The scale can be hooked to a rope on the ceiling or stand in a clinic, at eye level of the measurer.
- 2 Before weighing the child, have the caregiver take all his/her clothes off.
- 3 Make sure the weighing scale arrow is at 0 (zero the scale) each time with the hammock or cloth that will be used hooked on the scale.
- 4 Place child in hammock or cloth, hook it on the scale, and let child hang freely, touching nothing. Make sure the child is safely in the hammock or cloth.
- 5 When arrow is steady, measurer reads child's weight in kg at eye level and to the nearest 100g (for example, 6.4 kg). The assistant repeats it for verification and records it.



## Weight Using an Infant Beam Scale [Infants under 6 Months]

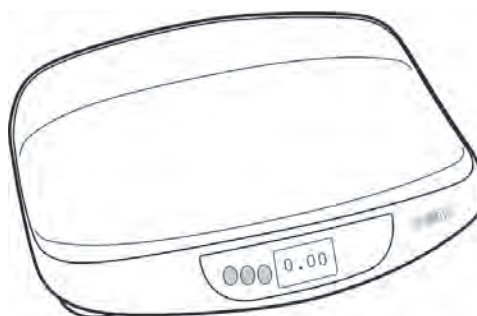
- 1 Unlock the beam, put a soft cloth or the infant's wrapping on the scale, and zero the scale (i.e., make sure that the end of the beam is not touching either the top or the bottom of the hole it fits through).
- 2 Have the caregiver remove the infant's clothes and put the infant on the scale. Advise the caregiver to remain close but not to touch the infant or the scale.



- 3 Move the weights along the beam until the end of the beam is not touching either the top or the bottom of the hole it fits through.
- 4 Read and write down the infant's weight with a 10-gram precision (e.g., 2 kg 220 g).
- 5 Lock the beam and remove the infant.
- 6 Clean and re-zero the scale.

### Weight Using an Infant Bench Scale [Infants under 6 Months]

- 1 Have the caregiver remove the infant's clothes and hold the child.
- 2 Put a soft cloth or the infant's wrapping on the scale and turn it on. Wait until the scale shows zeros.
- 3 Within 60 seconds of the scale showing zeros, have the caregiver put the infant on the scale. Advise the caregiver to remain close but not to touch the infant or the scale. The scale will display the infant's weight.
- 4 Read and write down the infant's weight with a 10-gram precision (e.g., 3 kg 470 g).
- 5 Turn off the scale and remove the infant.
- 6 Clean the scale.



## Weight-for-Length Look-Up Table (6–23 Months)

[WHO 2006 Child Growth Standards]

Boys' weight (kg)				Length (cm)	Girls' weight (kg)			
-3 SD	-2 SD	-1 SD	Median		Median	-1 SD	-2 SD	-3 SD
1.9	2.0	2.2	2.4	45	2.5	2.3	2.1	1.9
2.0	2.2	2.4	2.6	46	2.6	2.4	2.2	2.0
2.1	2.3	2.5	2.8	47	2.8	2.6	2.4	2.2
2.3	2.5	2.7	2.9	48	3.0	2.7	2.5	2.3
2.4	2.6	2.9	3.1	49	3.2	2.9	2.6	2.4
2.6	2.8	3.0	3.3	50	3.4	3.1	2.8	2.6
2.7	3.0	3.2	3.5	51	3.6	3.3	3.0	2.8
2.9	3.2	3.5	3.8	52	3.8	3.5	3.2	2.9
3.1	3.4	3.7	4.0	53	4.0	3.7	3.4	3.1
3.3	3.6	3.9	4.3	54	4.3	3.9	3.6	3.3
3.6	3.8	4.2	4.5	55	4.5	4.2	3.8	3.5
3.8	4.1	4.4	4.8	56	4.8	4.4	4.0	3.7
4.0	4.3	4.7	5.1	57	5.1	4.6	4.3	3.9
4.3	4.6	5.0	5.4	58	5.4	4.9	4.5	4.1
4.5	4.8	5.3	5.7	59	5.6	5.1	4.7	4.3
4.7	5.1	5.5	6.0	60	5.9	5.4	4.9	4.5
4.9	5.3	5.8	6.3	61	6.1	5.6	5.1	4.7
5.1	5.6	6.0	6.5	62	6.4	5.8	5.3	4.9
5.3	5.8	6.2	6.8	63	6.6	6.0	5.5	5.1
5.5	6.0	6.5	7.0	64	6.9	6.3	5.7	5.3
5.7	6.2	6.7	7.3	65	7.1	6.5	5.9	5.5
5.9	6.4	6.9	7.5	66	7.3	6.7	6.1	5.6
6.1	6.6	7.1	7.7	67	7.5	6.9	6.3	5.8
6.3	6.8	7.3	8.0	68	7.7	7.1	6.5	6.0
6.5	7.0	7.6	8.2	69	8.0	7.3	6.7	6.1
6.6	7.2	7.8	8.4	70	8.2	7.5	6.9	6.3
6.8	7.4	8.0	8.6	71	8.4	7.7	7.0	6.5
7.0	7.6	8.2	8.9	72	8.6	7.8	7.2	6.6
7.2	7.7	8.4	9.1	73	8.8	8.0	7.4	6.8
7.3	7.9	8.6	9.3	74	9.0	8.2	7.5	6.9
7.5	8.1	8.8	9.5	75	9.1	8.4	7.7	7.1
7.6	8.3	8.9	9.7	76	9.3	8.5	7.8	7.2
7.8	8.4	9.1	9.9	77	9.5	8.7	8.0	7.4
7.9	8.6	9.3	10.1	78	9.7	8.9	8.2	7.5
8.1	8.7	9.5	10.3	79	9.9	9.1	8.3	7.7
8.2	8.9	9.6	10.4	80	10.1	9.2	8.5	7.8
8.4	9.1	9.8	10.6	81	10.3	9.4	8.7	8.0
8.5	9.2	10.0	10.8	82	10.5	9.6	8.8	8.1
8.7	9.4	10.2	11.0	83	10.7	9.8	9.0	8.3
8.9	9.6	10.4	11.3	84	11.0	10.1	9.2	8.5
9.1	9.8	10.6	11.5	85	11.2	10.3	9.4	8.7
9.3	10.0	10.8	11.7	86	11.5	10.5	9.7	8.9
9.5	10.2	11.1	12.0	87	11.7	10.7	9.9	9.1
9.7	10.5	11.3	12.2	88	12.0	11.0	10.1	9.3
9.9	10.7	11.5	12.5	89	12.2	11.2	10.3	9.5
10.1	10.9	11.8	12.7	90	12.5	11.4	10.5	9.7
10.3	11.1	12.0	13.0	91	12.7	11.7	10.7	9.9
10.5	11.3	12.2	13.2	92	13.0	11.9	10.9	10.1
10.7	11.5	12.4	13.4	93	13.2	12.1	11.1	10.2
10.8	11.7	12.6	13.7	94	13.5	12.3	11.3	10.4
11.0	11.9	12.8	13.9	95	13.7	12.6	11.5	10.6
11.2	12.1	13.1	14.1	96	14.0	12.8	11.7	10.8
11.4	12.3	13.3	14.4	97	14.2	13.0	12.0	11.0
11.6	12.5	13.5	14.6	98	14.5	13.3	12.2	11.2
11.8	12.7	13.7	14.9	99	14.8	13.5	12.4	11.4
12.0	12.9	14.0	15.2	100	15.0	13.7	12.6	11.6

## Weight-for-Height Look-Up Table (24–59 Months) [WHO 2006 Child Growth Standards]

Boys' weight (kg)				Length (cm)	Girls' weight (kg)			
-3 SD	-2 SD	-1 SD	Median		Median	-1 SD	-2 SD	-3 SD
5.9	6.3	6.9	7.4	65	7.2	6.6	6.1	5.6
6.1	6.5	7.1	7.7	66	7.5	6.8	6.3	5.8
6.2	6.7	7.3	7.9	67	7.7	7.0	6.4	5.9
6.4	6.9	7.5	8.1	68	7.9	7.2	6.6	6.1
6.6	7.1	7.7	8.4	69	8.1	7.4	6.8	6.3
6.8	7.3	7.9	8.6	70	8.3	7.6	7.0	6.4
6.9	7.5	8.1	8.8	71	8.5	7.8	7.1	6.6
7.1	7.7	8.3	9.0	72	8.7	8.0	7.3	6.7
7.3	7.9	8.5	9.2	73	8.9	8.1	7.5	6.9
7.4	8.0	8.7	9.4	74	9.1	8.3	7.6	7.0
7.6	8.2	8.9	9.6	75	9.3	8.5	7.8	7.2
7.7	8.4	9.1	9.8	76	9.5	8.7	8.0	7.3
7.9	8.5	9.2	10.0	77	9.6	8.8	8.1	7.5
8.0	8.7	9.4	10.2	78	9.8	9.0	8.3	7.6
8.2	8.8	9.6	10.4	79	10.0	9.2	8.4	7.8
8.3	9.0	9.7	10.6	80	10.2	9.4	8.6	7.9
8.5	9.2	9.9	10.8	81	10.4	9.6	8.8	8.1
8.7	9.3	10.1	11.0	82	10.7	9.8	9.0	8.3
8.8	9.5	10.3	11.2	83	10.9	10.0	9.2	8.5
9.0	9.7	10.5	11.4	84	11.1	10.2	9.4	8.6
9.2	10.0	10.8	11.7	85	11.4	10.4	9.6	8.8
9.4	10.2	11.0	11.9	86	11.6	10.7	9.8	9.0
9.6	10.4	11.2	12.2	87	11.9	10.9	10.0	9.2
9.8	10.6	11.5	12.4	88	12.1	11.1	10.2	9.4
10.0	10.8	11.7	12.6	89	12.4	11.4	10.4	9.6
10.2	11.0	11.9	12.9	90	12.6	11.6	10.6	9.8
10.4	11.2	12.1	13.1	91	12.9	11.8	10.9	10.0
10.6	11.4	12.3	13.4	92	13.1	12.0	11.1	10.2
10.8	11.6	12.6	13.6	93	13.4	12.3	11.3	10.4
11.0	11.8	12.8	13.8	94	13.6	12.5	11.5	10.6
11.1	12.0	13.0	14.1	95	13.9	12.7	11.7	10.8
11.3	12.2	13.2	14.3	96	14.1	12.9	11.9	10.9
11.5	12.4	13.4	14.6	97	14.4	13.2	12.1	11.1
11.7	12.6	13.7	14.8	98	14.7	13.4	12.3	11.3
11.9	12.9	13.9	15.1	99	14.9	13.7	12.5	11.5
12.1	13.1	14.2	15.4	100	15.2	13.9	12.8	11.7
12.3	13.3	14.4	15.6	101	15.5	14.2	13.0	12.0
12.5	13.6	14.7	15.9	102	15.8	14.5	13.3	12.2
12.8	13.8	14.9	16.2	103	16.1	14.7	13.5	12.4
13.0	14.0	15.2	16.5	104	16.4	15.0	13.8	12.6
13.2	14.3	15.5	16.8	105	16.8	15.3	14.0	12.9
13.4	14.5	15.8	17.2	106	17.1	15.6	14.3	13.1
13.7	14.8	16.1	17.5	107	17.5	15.9	14.6	13.4
13.9	15.1	16.4	17.8	108	17.8	16.3	14.9	13.7
14.1	15.3	16.7	18.2	109	18.2	16.6	15.2	13.9
14.4	15.6	17.0	18.5	110	18.6	17.0	15.5	14.2
14.6	15.9	17.3	18.9	111	19.0	17.3	15.8	14.5
14.9	16.2	17.6	19.2	112	19.4	17.7	16.2	14.8
15.2	16.5	18.0	19.6	113	19.8	18.0	16.5	15.1
15.4	16.8	18.3	20.0	114	20.2	18.4	16.8	15.4
15.7	17.1	18.6	20.4	115	20.7	18.8	17.2	15.7
16.0	17.4	19.0	20.8	116	21.1	19.2	17.5	16.0
16.2	17.7	19.3	21.2	117	21.5	19.6	17.8	16.3
16.5	18.0	19.7	21.6	118	22.0	19.9	18.2	16.6
16.8	18.3	20.0	22.0	119	22.4	20.3	18.5	16.9
17.1	18.6	20.4	22.4	120	22.8	20.7	18.9	17.3



## Weight-for-Height Look-Up Table (Adolescents)

Height (cm)	100% Median	85% (target)	<80% mod	<70% Severe	Sex
120.5	22.1	18.8	17.7	15.5	mf
121	22.3	19	17.8	15.6	mf
121.5	22.5	19.1	18	15.8	mf
122	22.7	19.3	18.2	15.9	mf
122.5	23	19.5	18.4	16.1	mf
123	23.2	19.7	18.6	16.2	mf
123.5	23.5	19.9	18.8	16.4	mf
124	23.7	20.1	19	16.6	mf
124.5	24	20.4	19.2	16.8	mf
125	24.2	20.6	19.4	16.9	mf
125.5	24.5	20.8	19.6	17.1	mf
126	24.7	21	19.8	17.3	mf
126.5	25	21.2	20	17.5	mf
127	25.3	21.5	20.2	17.7	mf
127.5	25.5	21.7	20.4	17.9	mf
128	25.8	21.9	20.7	18.1	mf
128.5	26.1	22.2	20.9	18.3	mf
129	26.4	22.4	21.1	18.5	mf
129.5	26.7	22.7	21.3	18.7	mf
130	27	22.9	21.6	18.9	mf
130.5	27.3	23.2	21.8	19.1	mf
131	27.6	23.4	22.1	19.3	mf
131.5	27.9	23.7	22.3	19.5	mf
132	28.2	24	22.5	19.7	mf
132.5	28.5	24.2	22.8	19.9	mf
133	28.8	24.5	23	20.2	mf
133.5	29.1	24.7	23.3	20.4	mf
134	29.4	25	23.5	20.6	mf
134.5	29.7	25.3	23.8	20.8	mf
135	30.1	25.6	24.1	21.1	mf
135.5	30.4	25.8	24.3	21.3	mf
136	30.7	26.1	24.6	21.5	mf
136.5	31	26.4	24.8	21.7	mf
137	31.4	26.7	25.1	22	mf
137.5	31.7	27	25.4	22.2	mf
138	32.1	27.2	25.6	22.4	mf
138.5	32.4	27.5	25.9	22.7	mf
139	32.7	27.8	26.2	22.9	mf
139.5	33.1	28.1	26.4	23.1	mf
140	33.4	28.4	26.7	23.4	mf
140.5	33.7	28.7	27	23.6	mf
141	34.1	29	27.3	23.9	mf
141.5	34.4	29.2	27.5	24.1	mf
142	34.8	29.5	27.8	24.3	mf
142.5	35.1	29.8	28.1	24.6	mf
143	35.4	30.1	28.3	24.8	mf
143.5	35.8	30.4	28.6	25	mf
144	36.1	30.7	28.9	25.3	mf
144.5	36.5	31	29.2	25.5	mf
145	36.8	31.3	29.4	25.8	mf
145.5	37.1	31.6	29.7	26	mf

## Weight-for-Height Look-Up Table (Adolescents)

Height (cm)	100% Median	85% (target)	<80% mod	<70% Severe	Sex
146	37.5	31.9	30	26.2	mf
146.5	37.8	32.2	30.3	26.5	mf
147	38.2	32.4	30.5	26.7	mf
147.5	38.5	32.7	30.8	27	mf
148	38.9	33	31.1	27.2	mf
148.5	39.2	33.3	31.4	27.4	mf
149	39.5	33.6	31.6	27.7	mf
149.5	39.9	33.9	31.9	27.9	mf
150	40.3	34.2	32.2	28.2	mf
150.5	40.6	34.5	32.5	28.4	mf
151	41	34.8	32.8	28.7	mf
151.5	41.3	35.1	33.1	28.9	mf
152	41.7	35.4	33.4	29.2	mf
152.5	42.1	35.8	33.7	29.4	mf
153	42.4	36.1	34	29.7	mf
153.5	42.8	36.4	34.3	30	mf
154	43.2	36.7	34.6	30.2	mf
154.5	43.6	37.1	34.9	30.5	mf
155	44	37.4	35.2	30.8	mf
155.5	44.2	37.6	35.4	30.9	m
156	44.6	37.9	35.7	31.2	m
156.5	45	38.2	36	31.5	m
157	45.4	38.6	36.3	31.8	m
157.5	45.8	38.9	36.7	32.1	m
158	46.2	39.3	37	32.4	m
158.5	46.6	39.6	37.3	32.7	m
159	47.1	40	37.7	33	m
159.5	47.5	40.4	38	33.3	m
160	48	40.8	38.4	33.6	m
160.5	48.4	41.1	38.7	33.9	m
161	48.8	41.5	39.1	34.2	m
161.5	49.3	41.9	39.4	34.5	m
162	49.8	42.3	39.8	34.8	m
162.5	50.2	42.7	40.2	35.1	m
163	50.7	43.1	40.5	35.5	m
163.5	51.1	43.5	40.9	35.8	m
164	51.6	43.9	41.3	36.1	m
164.5	52.1	44.3	41.7	36.5	m
165	52.6	44.7	42.1	36.8	m
165.5	53.1	45.1	42.5	37.2	m
166	53.6	45.6	42.9	37.5	m
166.5	54.1	46	43.3	37.9	m
167	54.6	46.4	43.7	38.2	m
167.5	55.1	46.9	44.1	38.6	m
168	55.6	47.3	44.5	38.9	m
168.5	56.2	47.7	44.9	39.3	m
169	56.7	48.2	45.4	39.7	m
169.5	57.3	48.7	45.8	40.1	m
170	57.8	49.2	46.3	40.5	m
170.5	58.4	49.6	46.7	40.9	m
171	59	50.1	47.2	41.3	m

This table has been constructed using the NCHS standards. The height-for-age and weight-for-age standards were amalgamated to determine the median weight for height. The sexes were combined when the uni-sex standard is within 1.5% of the body weight of the standard for either sex.

## BMI for Age Look-Up Table [5 to 19 years (z-scores)]

Z-scores (BMI in kg/m <sup>2</sup> ) for Boys				Age (Months)	Z-scores (BMI in kg/m <sup>2</sup> ) for Girls			
-3 SD	-2 SD	-1 SD	Median		Median	-1 SD	-2 SD	-3 SD
12.1	13	14.1	15.3	61	15.2	13.9	12.7	11.8
12.1	13	14.1	15.3	62	15.2	13.9	12.7	11.8
12.1	13	14.1	15.3	63	15.2	13.9	12.7	11.8
12.1	13	14.1	15.3	64	15.2	13.9	12.7	11.8
12.1	13	14.1	15.3	65	15.2	13.9	12.7	11.7
12.1	13	14.1	15.3	66	15.2	13.9	12.7	11.7
12.1	13	14.1	15.3	67	15.2	13.9	12.7	11.7
12.1	13	14.1	15.3	68	15.3	13.9	12.7	11.7
12.1	13	14.1	15.3	69	15.3	13.9	12.7	11.7
12.1	13	14.1	15.3	70	15.3	13.9	12.7	11.7
12.1	13	14.1	15.3	71	15.3	13.9	12.7	11.7
12.1	13	14.1	15.3	72	15.3	13.9	12.7	11.7
12.1	13	14.1	15.3	73	15.3	13.9	12.7	11.7
12.2	13.1	14.1	15.3	74	15.3	13.9	12.7	11.7
12.2	13.1	14.1	15.3	75	15.3	13.9	12.7	11.7
12.2	13.1	14.1	15.4	76	15.3	13.9	12.7	11.7
12.2	13.1	14.1	15.4	77	15.3	13.9	12.7	11.7
12.2	13.1	14.1	15.4	78	15.3	13.9	12.7	11.7
12.2	13.1	14.1	15.4	79	15.3	13.9	12.7	11.7
12.2	13.1	14.2	15.4	80	15.3	13.9	12.7	11.7
12.2	13.1	14.2	15.4	81	15.4	13.9	12.7	11.7
12.2	13.1	14.2	15.4	82	15.4	13.9	12.7	11.7
12.2	13.1	14.2	15.5	83	15.4	13.9	12.7	11.7
12.3	13.1	14.2	15.5	84	15.4	13.9	12.7	11.8
12.3	13.2	14.2	15.5	85	15.4	13.9	12.7	11.8
12.3	13.2	14.2	15.5	86	15.4	14	12.8	11.8
12.3	13.2	14.3	15.5	87	15.5	14	12.8	11.8
12.3	13.2	14.3	15.6	88	15.5	14	12.8	11.8
12.3	13.2	14.3	15.6	89	15.5	14	12.8	11.8
12.3	13.2	14.3	15.6	90	15.5	14	12.8	11.8
12.3	13.2	14.3	15.6	91	15.5	14	12.8	11.8
12.3	13.2	14.3	15.6	92	15.6	14	12.8	11.8
12.4	13.3	14.3	15.7	93	15.6	14.1	12.8	11.8
12.4	13.3	14.4	15.7	94	15.6	14.1	12.9	11.9
12.4	13.3	14.4	15.7	95	15.7	14.1	12.9	11.9
12.4	13.3	14.4	15.7	96	15.7	14.1	12.9	11.9
12.4	13.3	14.4	15.8	97	15.7	14.1	12.9	11.9
12.4	13.3	14.4	15.8	98	15.7	14.2	12.9	11.9
12.4	13.3	14.4	15.8	99	15.8	14.2	12.9	11.9
12.4	13.4	14.5	15.8	100	15.8	14.2	13	11.9
12.5	13.4	14.5	15.9	101	15.8	14.2	13	12
12.5	13.4	14.5	15.9	102	15.9	14.3	13	12
12.5	13.4	14.5	15.9	103	15.9	14.3	13	12
12.5	13.4	14.5	15.9	104	15.9	14.3	13	12
12.5	13.4	14.6	16	105	16	14.3	13.1	12
12.5	13.5	14.6	16	106	16	14.4	13.1	12.1
12.5	13.5	14.6	16	107	16.1	14.4	13.1	12.1
12.6	13.5	14.6	16	108	16.1	14.4	13.1	12.1
12.6	13.5	14.6	16.1	109	16.1	14.5	13.2	12.1
12.6	13.5	14.7	16.1	110	16.2	14.5	13.2	12.1
12.6	13.5	14.7	16.1	111	16.2	14.5	13.2	12.2
12.6	13.6	14.7	16.2	112	16.3	14.6	13.2	12.2

## BMI for Age Look-Up Table [5 to 19 years (z-scores)]

Z-scores (BMI in kg/m <sup>2</sup> ) for Boys				Age (Months)	Z-scores (BMI in kg/m <sup>2</sup> ) for Girls			
-3 SD	-2 SD	-1 SD	Median		Median	-1 SD	-2 SD	-3 SD
12.6	13.6	14.7	16.2	113	16.3	14.6	13.3	12.2
12.7	13.6	14.8	16.2	114	16.3	14.6	13.3	12.2
12.7	13.6	14.8	16.3	115	16.4	14.7	13.3	12.3
12.7	13.6	14.8	16.3	116	16.4	14.7	13.4	12.3
12.7	13.7	14.8	16.3	117	16.5	14.7	13.4	12.3
12.7	13.7	14.9	16.4	118	16.5	14.8	13.4	12.3
12.8	13.7	14.9	16.4	119	16.6	14.8	13.4	12.4
12.8	13.7	14.9	16.4	120	16.6	14.8	13.5	12.4
12.8	13.8	15	16.5	121	16.7	14.9	13.5	12.4
12.8	13.8	15	16.5	122	16.7	14.9	13.5	12.4
12.8	13.8	15	16.6	123	16.8	15	13.6	12.5
12.9	13.8	15	16.6	124	16.8	15	13.6	12.5
12.9	13.9	15.1	16.6	125	16.9	15	13.6	12.5
12.9	13.9	15.1	16.7	126	16.9	15.1	13.7	12.5
12.9	13.9	15.1	16.7	127	17	15.1	13.7	12.6
13	13.9	15.2	16.8	128	17	15.2	13.7	12.6
13	14	15.2	16.8	129	17.1	15.2	13.8	12.6
13	14	15.2	16.9	130	17.1	15.3	13.8	12.7
13	14	15.3	16.9	131	17.2	15.3	13.8	12.7
13.1	14.1	15.3	16.9	132	17.2	15.3	13.9	12.7
13.1	14.1	15.3	17	133	17.3	15.4	13.9	12.8
13.1	14.1	15.4	17	134	17.4	15.4	14	12.8
13.1	14.1	15.4	17.1	135	17.4	15.5	14	12.8
13.2	14.2	15.5	17.1	136	17.5	15.5	14	12.9
13.2	14.2	15.5	17.2	137	17.5	15.6	14.1	12.9
13.2	14.2	15.5	17.2	138	17.6	15.6	14.1	12.9
13.2	14.3	15.6	17.3	139	17.7	15.7	14.2	13
13.3	14.3	15.6	17.3	140	17.7	15.7	14.2	13
13.3	14.3	15.7	17.4	141	17.8	15.8	14.3	13
13.3	14.4	15.7	17.4	142	17.9	15.8	14.3	13.1
13.4	14.4	15.7	17.5	143	17.9	15.9	14.3	13.1
13.4	14.5	15.8	17.5	144	18	16	14.4	13.2
13.4	14.5	15.8	17.6	145	18.1	16	14.4	13.2
13.5	14.5	15.9	17.6	146	18.1	16.1	14.5	13.2
13.5	14.6	15.9	17.7	147	18.2	16.1	14.5	13.3
13.5	14.6	16	17.8	148	18.3	16.2	14.6	13.3
13.6	14.6	16	17.8	149	18.3	16.2	14.6	13.3
13.6	14.7	16.1	17.9	150	18.4	16.3	14.7	13.4
13.6	14.7	16.1	17.9	151	18.5	16.3	14.7	13.4
13.7	14.8	16.2	18	152	18.5	16.4	14.8	13.5
13.7	14.8	16.2	18	153	18.6	16.4	14.8	13.5
13.7	14.8	16.3	18.1	154	18.7	16.5	14.8	13.5
13.8	14.9	16.3	18.2	155	18.7	16.6	14.9	13.6
13.8	14.9	16.4	18.2	156	18.8	16.6	14.9	13.6
13.8	15	16.4	18.3	157	18.9	16.7	15	13.6
13.9	15	16.5	18.4	158	18.9	16.7	15	13.7
13.9	15.1	16.5	18.4	159	19	16.8	15.1	13.7
14	15.1	16.6	18.5	160	19.1	16.8	15.1	13.8
14	15.2	16.6	18.6	161	19.1	16.9	15.2	13.8
14	15.2	16.7	18.6	162	19.2	16.9	15.2	13.8
14.1	15.2	16.7	18.7	163	19.3	17	15.2	13.9
14.1	15.3	16.8	18.7	164	19.3	17	15.3	13.9

## BMI for Age Look-Up Table [5 to 19 years (z-scores)]

Z-scores (BMI in kg/m <sup>2</sup> ) for Boys				Age (Months)	Z-scores (BMI in kg/m <sup>2</sup> ) for Girls			
-3 SD	-2 SD	-1 SD	Median		Median	-1 SD	-2 SD	-3 SD
14.1	15.3	16.8	18.8	165	19.4	17.1	15.3	13.9
14.2	15.4	16.9	18.9	166	19.4	17.1	15.4	14
14.2	15.4	17	18.9	167	19.5	17.2	15.4	14
14.3	15.5	17	19	168	19.6	17.2	15.4	14
14.3	15.5	17.1	19.1	169	19.6	17.3	15.5	14.1
14.3	15.6	17.1	19.1	170	19.7	17.3	15.5	14.1
14.4	15.6	17.2	19.2	171	19.7	17.4	15.6	14.1
14.4	15.7	17.2	19.3	172	19.8	17.4	15.6	14.1
14.5	15.7	17.3	19.3	173	19.9	17.5	15.6	14.2
14.5	15.7	17.3	19.4	174	19.9	17.5	15.7	14.2
14.5	15.8	17.4	19.5	175	20	17.6	15.7	14.2
14.6	15.8	17.4	19.5	176	20	17.6	15.7	14.3
14.6	15.9	17.5	19.6	177	20.1	17.6	15.8	14.3
14.6	15.9	17.5	19.6	178	20.1	17.7	15.8	14.3
14.7	16	17.6	19.7	179	20.2	17.7	15.8	14.3
14.7	16	17.6	19.8	180	20.2	17.8	15.9	14.4
14.7	16.1	17.7	19.8	181	20.3	17.8	15.9	14.4
14.8	16.1	17.8	19.9	182	20.3	17.8	15.9	14.4
14.8	16.1	17.8	20	183	20.4	17.9	16	14.4
14.8	16.2	17.9	20	184	20.4	17.9	16	14.5
14.9	16.2	17.9	20.1	185	20.4	17.9	16	14.5
14.9	16.3	18	20.1	186	20.5	18	16	14.5
15	16.3	18	20.2	187	20.5	18	16.1	14.5
15	16.3	18.1	20.3	188	20.6	18	16.1	14.5
15	16.4	18.1	20.3	189	20.6	18.1	16.1	14.5
15	16.4	18.2	20.4	190	20.6	18.1	16.1	14.6
15.1	16.5	18.2	20.4	191	20.7	18.1	16.2	14.6
15.1	16.5	18.2	20.5	192	20.7	18.2	16.2	14.6
15.1	16.5	18.3	20.6	193	20.7	18.2	16.2	14.6
15.2	16.6	18.3	20.6	194	20.8	18.2	16.2	14.6
15.2	16.6	18.4	20.7	195	20.8	18.2	16.2	14.6
15.2	16.7	18.4	20.7	196	20.8	18.3	16.2	14.6
15.3	16.7	18.5	20.8	197	20.9	18.3	16.3	14.6
15.3	16.7	18.5	20.8	198	20.9	18.3	16.3	14.7
15.3	16.8	18.6	20.9	199	20.9	18.3	16.3	14.7
15.3	16.8	18.6	20.9	200	20.9	18.3	16.3	14.7
15.4	16.8	18.7	21	201	21	18.4	16.3	14.7
15.4	16.9	18.7	21	202	21	18.4	16.3	14.7
15.4	16.9	18.7	21.1	203	21	18.4	16.3	14.7
15.4	16.9	18.8	21.1	204	21	18.4	16.4	14.7
15.5	17	18.8	21.2	205	21.1	18.4	16.4	14.7
15.5	17	18.9	21.2	206	21.1	18.4	16.4	14.7
15.5	17	18.9	21.3	207	21.1	18.5	16.4	14.7
15.5	17.1	18.9	21.3	208	21.1	18.5	16.4	14.7
15.6	17.1	19	21.4	209	21.1	18.5	16.4	14.7
15.6	17.1	19	21.4	210	21.2	18.5	16.4	14.7
15.6	17.1	19.1	21.5	211	21.2	18.5	16.4	14.7
15.6	17.2	19.1	21.5	212	21.2	18.5	16.4	14.7
15.6	17.2	19.1	21.6	213	21.2	18.5	16.4	14.7
15.7	17.2	19.2	21.6	214	21.2	18.5	16.4	14.7
15.7	17.3	19.2	21.7	215	21.2	18.6	16.4	14.7
15.7	17.3	19.2	21.7	216	21.3	18.6	16.4	14.7

## BMI for Age Look-Up Table [5 to 19 years (z-scores)]

Z-scores (BMI in kg/m <sup>2</sup> ) for Boys				Age (Months)	Z-scores (BMI in kg/m <sup>2</sup> ) for Girls			
-3 SD	-2 SD	-1 SD	Median		Median	-1 SD	-2 SD	-3 SD
15.7	17.3	19.3	21.8	217	21.3	18.6	16.5	14.7
15.7	17.3	19.3	21.8	218	21.3	18.6	16.5	14.7
15.7	17.4	19.3	21.8	219	21.3	18.6	16.5	14.7
15.8	17.4	19.4	21.9	220	21.3	18.6	16.5	14.7
15.8	17.4	19.4	21.9	221	21.3	18.6	16.5	14.7
15.8	17.4	19.4	22	222	21.3	18.6	16.5	14.7
15.8	17.5	19.5	22	223	21.4	18.6	16.5	14.7
15.8	17.5	19.5	22	224	21.4	18.6	16.5	14.7
15.8	17.5	19.5	22.1	225	21.4	18.7	16.5	14.7
15.8	17.5	19.6	22.1	226	21.4	18.7	16.5	14.7
15.8	17.5	19.6	22.2	227	21.4	18.7	16.5	14.7
15.9	17.6	19.6	22.2	228	21.4	18.7	16.5	14.7

## BMI Formula [5 to 19 years (z-scores)]

$$\text{BMI} = \frac{\text{Weight (kg)}}{\text{Height}^2 \text{ (m}^2\text{)}}$$



## Annex 3. Transfer Form

MINISTRY OF HEALTH AND SPORT  
MYANMAR



### IMAM REFERRAL/TRANSFER CARD

Region : ..... District : ..... Health Facility: .....

#### IDENTIFICATION

AM Unique number

Name of the child:

Age (month):

Sex: M

F

Father's name: .....

Mother's name: .....

Residence (village/ward): .....

Weight (kg)	Height (cm)	W/H (z-score)	MUAC (cm)	Oedema (Y/N)	Appetite Test (P/N)

Refferral

Transfer

To: : .....

Reason :

Recieved or ongoing treatment:

Name of the health agent:

Date and Signature : .....





## Annex 5. Nutritional Products for Treatment of Moderate Acute Malnutrition

### WFP Specialized Nutritious Food Sheet

Program	Treating Moderate Acute Malnutrition (MAM)		
Generic product term	Lipid-based Nutrient Supplement (LNS) Large Quantity (92-100g) <sup>1</sup>		
Current WFP nutrition products	Plumpy'sup® <sup>2</sup> (Peanut-based)	eeZeeRUSF™ (Peanut-based)	Acha Mum (Chickpea-based)
			
Target group	Children 6-59 months	Children 6-59 months	Children 6-59 months
Key Ingredients	Peanuts, sugar, whey, vegetable oil, milk, soy, protein, cocoa, V&M	Peanut, sugar, milk solids, vegetable oil, V&M	Chickpea, vegetable oil, milk powder, sugar, V&M, soya, lecithin
Daily ration	92g sachet	92g sachet	92g sachet
Nutrient profile	500 kcal, 13g protein (10%), 31g fat (55%), contains EFA, meets RNI and PDCASS	500 kcal, 13g protein (11%), 31g fat (56%), contains EFA, meets RNI and PDCASS	520 kcal, 13g protein (10%), 29g fat (50%), contains EFA, meets RNI and PDCASS
Duration of Intervention <sup>4</sup>	60-90 days	60-90 days	60-90 days
Shelf Life <sup>5</sup>	24 months	24 months	6 months
Packaging details	Carton: 14.7kg (gross) and 13.8kg (net) has 150 sachets	Carton: 14.9kg (gross) and 13.8kg (net) has 150 sachets	Carton: 10.5kg (net) has 105 sachets

<sup>1</sup>Also referred to as RUSF, <sup>2</sup>Plump'sup is formerly known as Supplementary Plumpy (same product). Note: Plump'nut is a different product used for the treatment of severe acute malnutrition (SAM). <sup>3</sup>Super Cereal is usually mixed with 20g oil and 15g sugar before distribution [total est. 989-1176 kcal, 31-38g protein (12-13%), 16-20g fat (31-31%)]. <sup>4</sup>Can vary in different situations and contexts. <sup>5</sup>Shelf life indicated is valid for storage at temperatures less than 30 degrees C. Abbreviations: LNS = Lipid-based Nutrient Supplement, RUSF = Ready-to-Use Supplementary Food, FBF = Fortified Blended Food, EFA = Essential Fatty Acids, ART = Anti-Retroviral Therapy (treatment for AIDS), DOTs = Directly Observed Treatment (treatment for TB), RNI = Recommended Nutrient Intakes (FAO/WHO), POCASS = Protein Digestibility-Corrected Amino Acid Score (min 70%), V&M = Vitamins and Minerals.

## WFP Specialized Nutritious Food Sheet

Program	Treating Moderate Acute Malnutrition (MAM)
Generic product term	Fortified Blended Food (FBF) (200-250g)

Current WFP nutrition products	Super Cereal Plus	Super Cereal3
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Target group	Children 6-59 months	Pregnant and Lactating Women (PLW) Malnourished individuals on ART/DOTS
Key Ingredients	Corn/wheat/rice soya oil, milk powder, V&M	Corn/wheat/rice soya, V&M sugar, oil, V&M
Daily ration	200g (includes provision for sharing)	200-250g (includes provision for sharing)
Nutrient profile	787 kcal, 33g protein (17%), 20g fat (23%), contains EFA, meets RNI and PDCASS	752-939 kcal, 31-38g protein (16%), 16-20g fat (19%), Meets RNI and PDCASS
Duration of Intervention <sup>4</sup>	60-90 days	PLW: 180 days ART & DOTS: 180 days (estimated)
Shelf Life <sup>5</sup>	12 months	12 months
Packaging details	Primary: 1.5kg (net) bag; Secondary: 15kg (net) carton has 10 bags; or 18kg sack has 12 bags	25kg (net) bags

<sup>1</sup>Also referred to as RUSF, <sup>2</sup>Plump'sup is formerly known as Supplementary Plumpy (same product). Note: Plump'nut is a different product used for the treatment of severe acute malnutrition (SAM). <sup>3</sup>Super Cereal is usually mixed with 20g oil and 15g sugar before distribution [total est. 989-1176 kcal, 31-38g protein (12-13%), 16-20g fat (31-31%)]. <sup>4</sup>Can vary in different situations and contexts. <sup>5</sup>Shelf life indicated is valid for storage at temperatures less than 30 degrees C. Abbreviations: LNS = Lipid-based Nutrient Supplement, RUSF = Ready-to-Use Supplementary Food, FBF = Fortified Blended Food, EFA = Essential Fatty Acids, ART = Anti-Retroviral Therapy (treatment for AIDS), DOTS = Directly Observed Treatment (treatment for TB), RNI = Recommended Nutrient Intakes (FAO/WHO), PDCASS = Protein Digestibility-Corrected Amino Acid Score (min 70%), V&M = Vitamins and Minerals.

752-939 kcal, 31-38g protein (16%), 20g fat (23%), contains EFA, meets 16-20g fat (19%), Meets RNI and RNI and PDCASS

## WFP Specialized Nutritious Food Sheet (Locally prepared in Myanmar)

Program	Treating Moderate Acute Malnutrition (MAM)
Generic product term	Fortified Blended Food (FBF) (2000g)

Current WFP nutrition products Gold Power



Target group	Children 6-59 months & Pregnant and Lactating Women (PLW)
Key Ingredients	Rice, Sugar, Yellow Split peas, Peanut oil, enriched with Multimicro nutrients
Daily ration	3 Cups per day
Nutrient profile (in 100g)	413 kcal, 10g protein (10%), 13g fat (20%), Rice 36g, Yellow split peas 36g, Sugar 15g, Peanut Oil 13g
Duration of Intervention	3 months
Shelf Life	6 months
Packaging details	2kg (net) bag

## Annex 6. Weight Loss and Weight Gain by 5% Chart

5% weight loss (for failure-to-respond in OTP)						5% weight gain (for treatment of dehydration)					
1 <sup>st</sup> week	loss	2 <sup>nd</sup> week	1 <sup>st</sup> week	loss	2 <sup>nd</sup> week	initial	gain	final	initial	gain	final
4.0	0.2	3.8	8.0	0.4	7.6	4.0	0.2	4.2	8.0	0.4	8.4
4.1	0.2	3.9	8.1	0.4	7.7	4.1	0.2	4.3	8.1	0.4	8.5
4.2	0.2	4.0	8.2	0.4	7.8	4.2	0.2	4.4	8.2	0.4	8.6
4.3	0.2	4.1	8.3	0.4	7.9	4.3	0.2	4.5	8.3	0.4	8.7
4.4	0.2	4.2	8.4	0.4	8.0	4.4	0.2	4.6	8.4	0.4	8.8
4.5	0.2	4.3	8.5	0.4	8.1	4.5	0.2	4.7	8.5	0.4	8.9
4.6	0.2	4.4	8.6	0.4	8.2	4.6	0.2	4.8	8.6	0.4	9.0
4.7	0.2	4.5	8.7	0.4	8.3	4.7	0.2	4.9	8.7	0.4	9.1
4.8	0.2	4.6	8.8	0.4	8.4	4.8	0.2	5.0	8.8	0.4	9.2
4.9	0.2	4.7	8.9	0.4	8.5	4.9	0.2	5.1	8.9	0.4	9.3
5.0	0.3	4.8	9.0	0.5	8.6	5.0	0.3	5.3	9.0	0.5	9.5
5.1	0.3	4.8	9.1	0.5	8.6	5.1	0.3	5.4	9.1	0.5	9.6
5.2	0.3	4.9	9.2	0.5	8.7	5.2	0.3	5.5	9.2	0.5	9.7
5.3	0.3	5.0	9.3	0.5	8.8	5.3	0.3	5.6	9.3	0.5	9.8
5.4	0.3	5.1	9.4	0.5	8.9	5.4	0.3	5.7	9.4	0.5	9.9
5.5	0.3	5.2	9.5	0.5	9.0	5.5	0.3	5.8	9.5	0.5	10.0
5.6	0.3	5.3	9.6	0.5	9.1	5.6	0.3	5.9	9.6	0.5	10.1
5.7	0.3	5.4	9.7	0.5	9.2	5.7	0.3	6.0	9.7	0.5	10.2
5.8	0.3	5.5	9.8	0.5	9.3	5.8	0.3	6.1	9.8	0.5	10.3
5.9	0.3	5.6	9.9	0.5	9.4	5.9	0.3	6.2	9.9	0.5	10.4
6.0	0.3	5.7	10.0	0.5	9.5	6.0	0.3	6.3	10.0	0.5	10.5
6.1	0.3	5.8	10.1	0.5	9.6	6.1	0.3	6.4	10.1	0.5	10.6
6.2	0.3	5.9	10.2	0.5	9.7	6.2	0.3	6.5	10.2	0.5	10.7
6.3	0.3	6.0	10.3	0.5	9.8	6.3	0.3	6.6	10.3	0.5	10.8
6.4	0.3	6.1	10.4	0.5	9.9	6.4	0.3	6.7	10.4	0.5	10.9
6.5	0.3	6.2	10.5	0.5	10.0	6.5	0.3	6.8	10.5	0.5	11.0
6.6	0.3	6.3	10.6	0.5	10.1	6.6	0.3	6.9	10.6	0.5	11.1
6.7	0.3	6.4	10.7	0.5	10.2	6.7	0.3	7.0	10.7	0.5	11.2
6.8	0.3	6.5	10.8	0.5	10.3	6.8	0.3	7.1	10.8	0.5	11.3
6.9	0.3	6.6	10.9	0.5	10.4	6.9	0.3	7.2	10.9	0.5	11.4
7.0	0.3	6.6	11.0	0.5	10.5	7.0	0.3	7.3	11.0	0.5	11.6
7.1	0.4	6.7	11.1	0.6	10.5	7.1	0.4	7.5	11.1	0.6	11.7
7.2	0.4	6.8	11.2	0.6	10.6	7.2	0.4	7.6	11.2	0.6	11.8
7.3	0.4	6.9	11.3	0.6	10.7	7.3	0.4	7.7	11.3	0.6	11.9
7.4	0.4	7.0	11.4	0.6	10.8	7.4	0.4	7.8	11.4	0.6	12.0
7.5	0.4	7.1	11.5	0.6	10.9	7.5	0.4	7.9	11.5	0.6	12.1
7.6	0.4	7.2	11.6	0.6	11.0	7.6	0.4	8.0	11.6	0.6	12.2
7.7	0.4	7.3	11.7	0.6	11.1	7.7	0.4	8.1	11.7	0.6	12.3
7.8	0.4	7.4	11.8	0.6	11.2	7.8	0.4	8.2	11.8	0.6	12.4
7.9	0.4	7.5	11.9	0.6	11.3	7.9	0.4	8.3	11.9	0.6	12.5
8.0	0.4	7.6	12.0	0.6	11.4	8.0	0.4	8.4	12.0	0.6	12.6

## Guidance table to identify target weight

Guidance table to identify the target weight	
Weight on admission*	Target weight: 15% weight gain
4.1	4.7
4.3	4.9
4.5	5.2
4.7	5.4
4.9	5.6
5.1	5.9
5.3	6.1
5.5	6.3
5.7	6.6
5.9	6.8
6.1	7.0
6.3	7.2
6.5	7.5
6.7	7.7
6.9	7.9
7.1	8.2
7.3	8.4
7.5	8.6
7.7	8.9
7.9	9.1
8.1	9.3
8.3	9.5
8.5	9.8
8.7	10.0
8.9	10.2
9.1	10.5
9.3	10.7
9.5	10.9
9.7	11.2
9.9	11.4
10.1	11.6
10.3	11.8
10.5	12.1

Guidance table to identify the target weight	
Weight on admission*	Target weight: 15% weight gain
10.7	12.3
10.9	12.5
11.1	12.8
11.3	13.0
11.5	13.2
11.7	13.5
11.9	13.7
12.1	13.9
12.3	14.1
12.5	14.4
12.7	14.6
12.9	14.8
13.1	15.1
13.3	15.3
13.5	15.5
13.7	15.8
13.9	16.0
14.1	16.2
14.3	16.4
14.5	16.7
14.7	16.9
14.9	17.1
15.1	17.4
15.3	17.6
15.5	17.8
15.7	18.1
15.9	18.3
16.1	18.5
16.3	18.7
16.5	19.0
16.7	19.2
16.9	19.4
17.1	19.7

\* Or weight, free of oedema

## Annex 7. OTP Chart

Name						AM No				
Mother's Name										
Township						Village/Ward				
Age (months)		Sex		M	F	Date of admission				
Referred by		Volunteer		Self Referral / Consultation		From ITP		From other OTP/SFP		Re-admission (Relapse)
Admission		New		From ITP		From other OTP/SFP			ITP refusal	
		Twin	Yes	No			Time from home			
<b>Admission Anthropometry</b>										
Weight (kg)		Height (cm)		W/H (z-scores)		MUAC (cm)				
Admission Criteria		Oedema <input type="checkbox"/>	MUAC <11.5cm <input type="checkbox"/>	W/H <3z - scores <input type="checkbox"/>		Other: specify				
<b>History</b>										
Diarrhoea		Yes	No			Stool / day		1-3	4-5	>5
Vomiting		Yes	No			Passing Urine		Yes	No	
Cough		Yes	No			If oedema, how long swollen?				
Appetite		Good	Poor	None			Breastfeeding		Yes	No
Reported problems										
<b>Physical Examination</b>										
Respir rate (#/min)		<30	30-39	40-49	50+	Chest Retractions		Yes	No	
Temperature °C						Dehydration		None	Some	Severe
Conjunctiva		Bittot Spots	Xerophthalmia		Pallor	Eyes		Normal	Sunken	Corneal Ulcer
Ears		Normal	Discharge				Mouth		Normal	Sores
Lymph Nodes		None	Neck	Axilla	Groin			Extremities		Normal
Skin Changes		None	Scabies	Peeling	Ulcers/ Abscesses			Disability		Yes
<b>Routine Admission Medication</b>										
Admission:		Drug	Date	Dosage		Drug		Date	Dosage	
		Amoxycillin				Anti-Malarial [ ..... ]				
4 <sup>th</sup> Visit		Mebendazole / Albendazole				Measles				
		Vitamin A								
<b>Other Medication</b>										
Drug		Date	Dosage		Drug		Date	Dosage		
<b>Internal Transfer-TO-ITP during treatment in OTP</b>										
Date	Reasons			Where		Result (Return Date/Not Return/Death)				
<b>Discharge Summary</b>										
Date of Discharge		Weight at Discharge			Lowest Weight		Date of Lowest Weight			
Category of Discharge		Cured <input type="checkbox"/>	Defaulter <input type="checkbox"/>		Death <input type="checkbox"/>	Non Respondent <input type="checkbox"/>		Internal Transfer to: .....		
Cause:										

## Annex 8. OTP Follow Up

NAME :											AM No:						
Week	ADM.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Date																	
Anthropometry																	
Weight (kg)																	
Weight loss* (Y/N)																	
Height (cm)																	
WH z-scores																	
MUAC (cm)																	
Oedema (+ ++ +++ )																	
*Refer to hospital for further investigations if weight loss on 2 <sup>nd</sup> visit (OR) weight loss for 2 successive visits (OR) weight loss of 5% of body weight at any visit.																	
History																	
Diarrhoea (# days)																	
Vomiting (# days)																	
Fever (# days)																	
Cough (# days)																	
Physical Examination																	
Appetite test (Pass / Fail)																	
Temperature °C																	
Respiratory rate (# / min)																	
Dehydrated (Y/N)																	
Anaemia (Palmar pator) (Y/N)																	
Skin infection (Y/N)																	
Action needed** (Y/N)																	
Other medication (see front of card)																	
RUTF (# packets)																	
Name examiner																	
OUTCOME ***																	
*** P= Present A= Absent C= Discharged Cured D= Defaulter (3 consecutive absences) X= Died NR= Non-respondant R= Referral ITP RT= Refused referral T=Transfert other OTP HV= Home visit																	
** Action taken during follow-up (include date)																	



## Annex 9. Components of RUTF

For 100 g of RUTF#:

Energy content	520 - 550 Kcal/100g
Lipids	45 - 60 % total energy
Proteins	10 - 12 % total energy
n-6 fatty acids	3 - 10% of total energy
n-3 fatty acids	0.3 - 2.5% of total energy
<b>Vitamins</b>	
Vitamin A	0.8 - 1.1 mg/100g
Vitamin D	15 - 20 µg/100g
Vitamin E	20 mg/100g minimum
Vitamin C	50 mg/100g minimum
Vitamin B1	0.5 mg/100g minimum
Vitamin B2	1.6 mg/100g minimum
Vitamin B6	0.6 mg/100g minimum
Vitamin B12	1.6 µg/100g minimum
Vitamin K	15 - 30 µg/100g
Biotin	60 µg/100g minimum
Folic acid	200 µg/100g minimum
Pantothenic acid	3 mg/100g minimum
Niacin	5 mg/100g minimum
<b>Minerals</b>	
Calcium	300 - 600 mg/100g
Phosphorus	300 - 600 mg/100g
Potassium	1100 - 1400 mg/100g
Magnesium	80 - 140 mg/100g
Zinc	11 - 14 mg/100g
Copper	1.4 -1.8 mg/100g
Iron	10 - 14 mg/100g
Iodine	70 - 140 µg/100g
Sodium	290 mg/100g maximum
Selenium	20 - 40 µg/100g

#Taken from Production of Peanut – Based Ready to Use Therapeutic Food. A Technical Guide for Producers. 3rd Edition. Valid Nutrition.

## Annex 10. ITP Multi Chart

### TREATMENT CARD

---

Health Facility:

---

Date of admission:

Admitting physician or paramedic:

---

Unit no.:

Registration no.:

---

Child's name:

Date of birth or age:

Sex: M/F

---

Mother's name:

Father's name:

---

Other caregiver's name (if not mother or father):

Relationship:

---

Head of household:

Mobile phone number:

---

Address (including description of how to get to and recognise the house):

---

### FAMILY INFORMATION

---

Father's Age:

Education (circle highest level only):

Occupation:

Illiterate / Primary / Secondary / Tertiary

---

Mother's Age:

Education (circle highest level only):

Occupation:

Illiterate / Primary / Secondary / Tertiary

No. of pregnancies:

No. of living children:

No. of live births:

< 5 years:

≥ 5 years:

---

Family planning: Yes / No *If yes, specify:*

---

Housing (circle one): Owned / Rented

No. of rooms:

---

Water supply (circle one): Tap water / Protected water source / Unprotected water source

---

## MEDICAL HISTORY

Complaints (number to list order of importance):      Duration or age at which complaint started:

Appetite (circle one): Hungry / Normal / Poor / No appetite      Vomiting:      Yes / No

Diarrhoea: Yes / No    If yes, number of days:

Stool appearance (circle one): Bloody / Mucoïd / Watery / Soft / Solid / Other (specify):

Recent sunken eyes: Yes / No      Passing urine:    Yes / No

Passing worms:      Yes / No      Fever:      Yes / No

Difficult breathing:      Yes / No      Cough:      Yes / No

Skin changes:      Yes / No    If yes, describe:

Hair changes:      Yes / No    If yes, describe:

Weight loss:      Yes / No      Bittot Spots: Yes / No

Night blindness:      Yes / No      Coneal Ulcer:    Yes / No

Swelling lower limbs:      Yes / No

## FEEDING HISTORY (for under 2 years old)

Is the child being breastfed? Yes / No

If no, what type of milk has been offered (circle one): Goat / Cow / Formula / Other (specify):

If yes (circle one): Exclusive / Mixed

Has the child been breastfed before? Yes / No      Age at which breastfeeding stopped:

Duration of exclusive breastfeeding (in months):      Age at which semisolid/solid feeds started:

**Usual diet before current illness:**

Type of food or fluid given	Age at which started (months)	Age at which stopped (months)	Amount per feed (g or ml)	Frequency of feeds/day
Infant formula with bottle				
Fish, meat, or eggs, animal milk (specify)				
Staple foods*(specify)				
Pulses/Beans (specify)				
Fruit/Vegetables (specify)				
Other drinks (specify)				

\* Includes rice, corn, cassava, potatoes, millet, and noodles.

Diet since current illness began (describe any changes):

Diet during past 24 hours (record all intake):

## IMMUNISATION HISTORY

Immunisation card available?: Yes / No		Circle vaccinations already given:		
Vaccination	Birth Dose	First Dose	Second Dose	Third Dose
BCG*	At birth <sup>1</sup>	At 2 <sup>nd</sup> month <sup>2</sup>	—	—
Hepatitis B	At birth <sup>1</sup>	—	—	—
Oral Polio Vaccine	—	At 8 weeks	At 16 weeks	At 24 weeks
IPV**	—	—	At 16 weeks	—
Penta***	—	At 8 weeks	At 16 weeks	At 24 weeks
PCV****	—	At 8 weeks	At 16 weeks	At 24 weeks
Measles-Rubella	—	At 9 months	—	—
Measles	—	—	At 18 months	—

\* BCG: Bacille Calmette-Guérin vaccine

\*\* IPV: Injectable Polio Vaccine

\*\*\* Penta: diphtheria, tetanus, pertussis, hepatitis B and haemophilus influenza vaccine

\*\*\*\* PCV: Pneucoccal Conjugate Vaccine

<sup>1</sup> For institutional delivery

<sup>2</sup> For home delivery

## DAILY CARE CHART

DAYS IN HOSPITAL	week 1							week 2							week 3						
	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 when on RUTF/F 100 and breastfed infant																					
Bilateral pitting oedema 0 + ++ +++																					
Diarrhoea (D) or Vomit (V)																					
FEED PLAN:	Type of feed																				
	# daily feeds																				
	Amount to give per feed (ml) (packet)																				
	Total amount taken (ml)(packet)																				
	NG tube Yes/No																				
	Breastfeeding Yes/No																				
ANTIBIOTICS or OTHER DRUGS	List prescribed antibiotics and other drugs in left column. Allow one row for each daily dose. Draw a box around days/times that each drug should be given. Sign when given.																				
ANTIMALARIAL																					
VITAMIN A treatment dose on days 1, 2, and 15; shade days 3–14.																					
ANTHELMINTHIC (Give on week 2 presumptive dose, unless severe infestation)																					
MULTI MICRONUTRIENTS starts multi micronutrients sprinkle (1 sachet per day) or multivitamin (5ml or 1 Tablet OD) after acute phase, give during hospital stay/at least 2 weeks																					
EYE INFECTIONS Tetracycline ointment 3 x daily or Chloramphenicol 1 drop 4 x daily																					
Corneal ulceration: As above, plus atropine 1 drop 3x daily																					
Ear, mouth or throat problems																					
Dermatosis 0 + ++ +++																					

**Initial Management Chart** Comments on pre-referral and/or emergency treatment already given: \_\_\_\_\_

<b>SIGNS OF SAM</b>		Severe wasting?	Yes	No	<b>Appetite Test:</b>		Pass	Fail
Dermatosis?		Bilateral Pitting Oedema?	++	+++	0	+	++	+++
Weight: _____ kg		Height / Length: _____ mm						
W/H: _____ z-score		MUAC _____ mm						
<b>TEMPERATURE:</b> _____ °C axillary / rectal Cover child. If axillary <35.5° C, actively warm child. Check temperature every 30 min.								
<b>BLOOD GLUCOSE (&lt;3 mmol/L or &lt;54 mg/dl):</b> _____ If no test, treat for hypoglycaemia) If alert, give 10% glucose 50 ml (infant 25 ml) orally or by NG. If lethargic/unconscious, give sterile 10% glucose 5 ml/kg IV, then 50 ml (25 ml infant) by NG. Amount IV: 5 ml x _____ kg (child's weight) = _____ ml. Amount oral: _____ ml. Time glucose given: _____ H Route: Oral NG IV								
<b>HAEMOGLOBIN (Hb):</b> _____ g/dl (or PCV: _____ %) Blood type: _____ If Hb <4 g/dl (or Hb <6 g/dl AND respiratory distress), transfuse 10 ml/kg whole fresh blood slowly over 3 hours (or 7 ml/kg packed cells in case of suspected heart failure) Amount: _____ H Time started: _____ H Ended: _____ H								
<b>EYE SIGNS:</b> None Left Right Both								
Bilrot's spots								
Corneal clouding								
Corneal ulceration								
Pluse or Inflammation								
If corneal ulceration, give vitamin A treatment dose and atropine immediately. Record vitamin A in box below, and on Daily Care Chart.								
<b>VITAMIN A:</b>		< 6 months	50,000 IU					
If eye signs or recent measles, give treatment dose on day 1, 2, and 15.		6-12 months	100,000 IU					
<b>Time first dose:</b> (Give preventive single dose on admission and delayed with oedema only if on therapeutic foods that do not comply with WHO specifications)		> 12 months	200,000 IU					
<b>MEASLES (now or in past 3 months):</b> No Yes If yes, give Vitamin A treatment dose Measles vaccine upon admission: _____ H (Vaccinate again on discharge, see Outcome Chart)								
<b>SIGNS OF SHOCK:</b>			None	Lethargic/unconscious	Cold hands	Slow capillary refill (> 3 seconds)	Weak or fast pulse	
If lethargic or unconscious, cold hands, plus either slow capillary refill or weak or fast pulse. Give oxygen 1-2 L per hour. Give sterile 10% glucose 5 ml/kg IV over 10 minutes. Amount 5 ml x _____ kg (child's weight) = _____ ml. Give IV fluids: Half-strength DS with 5% glucose or Ringer's Lactate with 5% glucose solution and add sterile potassium chloride 20 mmol/L 15 ml/kg over one hour. Amount 15 ml x _____ kg (child's weight) = _____ ml								
Time			1 <sup>st</sup> hr	Start	Monitor every 10 minutes	2 <sup>nd</sup> hr	Monitor every 10 minutes	
Respiratory rate						*		
Pulse rate						*		
*If improvements after one hour (respiratory and pulse rates are slower), repeat same amount IV fluids for second hour; then alternate ReSoMal and F-75 for up to 10 hours. If no improvement after 1 hour, treat for septic shock (transfuse whole fresh blood, see 'Haemoglobin'), give maintenance IV fluids (4 ml/kg/hour) while waiting for blood.								
<b>SIGNS OF DEHYDRATION:</b>								
Watery diarrhoea?		Yes	No	If diarrhoea, circle signs present:				
Blood in stool?		Yes	No	Restless/irritable		Lethargic		
Vomiting?		Yes	No	Recent sunken eyes		Dry mouth/tongue		
Number of days with diarrhoea: _____								
If diarrhoea and/or vomiting, give ReSoMal orally (or by NG tube if too ill) every 30 minutes for first 2 hours and monitor * * * * * Amount: 5 ml x _____ kg (child's weight) = _____ ml ReSoMal								
For up to 10 hours, give ReSoMal and F-75 orally (or by NG tube) in alternate hours and monitor every hour * * * * * Amount: 5-10 ml x _____ kg (child's weight) = _____ to _____ ml ReSoMal every 2 hours								
Time		Start		H	H	H	H	H
Respiratory rate* (breaths/minute)								
Pulse rate* (beats/minute)								
Passed urine(Y/N)								
Number of Stool								
Number of vomits								

<b>FEEDING:</b> Begin feeding with F-75 as soon as possible. If child is rehydrated, reweigh before determining amount to feed. New weight: _____ kg. Amount for 2-hourly feedings: _____ ml of F-75*      Time first fed: _____ <b>Record all feeds on 24-Hour Food Intake Chart.</b> * If hypoglycaemic, feed 1/4 of this amount every half hour for first 2 hours; continue until blood glucose reaches 3 mmol/L or 54 mg/dl	Hydration signs (Yes/No)**																					
	Amount ReSoMal taken (ml)																					
<b>*Stop ReSoMal if any sign of over-hydration:</b> Fast breathing, increasing pulse and resp. rates, engorging jugular veins, puffing of eyelids. <b>**Stop ReSoMal if two or more signs of hydration:</b> Passing urine, moist tongue, making saliva, not thirsty.																						
<b>ANTIBIOTICS:</b>	<b>Prescription/Route</b>										<b>Dose/Frequency/Duration</b>									<b>Time of 1st Dose</b>		
<b>MALARIA TEST (Type/Date/Outcome):</b>																						
<b>HIV TEST (Type/Date/Outcome):</b>	0	+	Antimalarial:																			
<b>TB INVESTIGATION (Type/Date/Outcome):</b>	0	+	ART and cotrimoxazole:																			
- Chest X-Ray			Anti TB Treatment																			
- Tuberculin Test	+	-																				





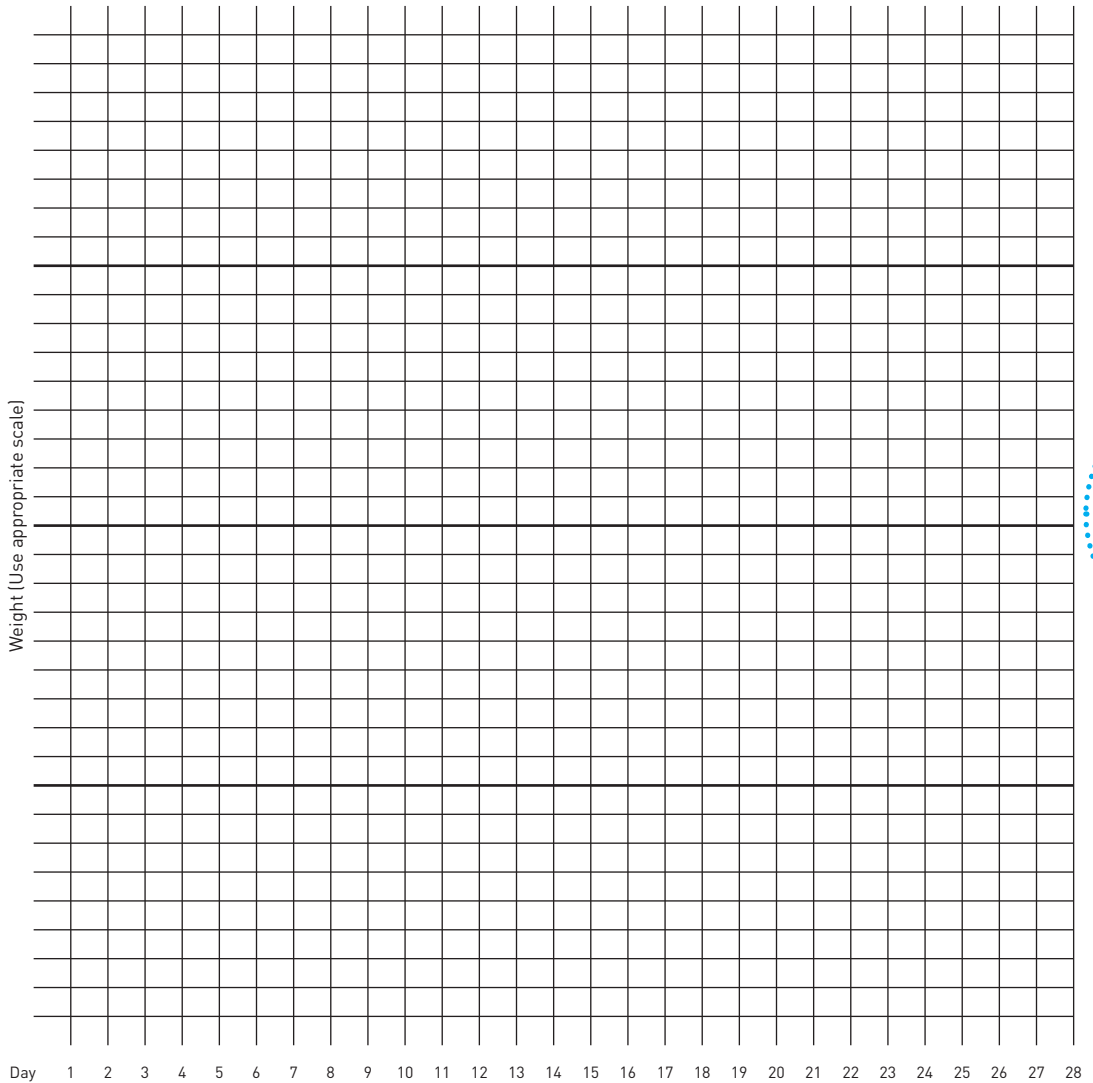
## Weight Chart

Weight on **admission**:                      kg

MUAC on **admission**:                      mm

Height/length on **admission**:              cm

Bilateral pitting oedema on **admission**: 0 + ++ +++





## Outcome Chart

### COMMENTS


### FOLLOW-UP OR DISCHARGE INSTRUCTIONS


### COUNSELING AND PSYCHOSOCIAL SUPPORT TO MOTHER OR CARER


### IMMUNISATIONS

Vaccination	At birth	First	Second	Third
BCG*	At birth	-	-	-
Oral Polio Vaccine	-	At 8 wks	At 16 wks	At 24 wks
IPV**	-	-	At 16 wks	-
Penta***	-	At 8 wks	At 16 wks	At 24 wks
PCV****	-	At 8 wks	At 16 wks	At 24 wks
Measles-Rubella	-	At 9 mths	-	-
Measles			At 18 mths	

### OUTCOME

DISCHARGE DATE: _____	
TRANSFER to Outpatient Care, name of site: _____	
<b>OUTCOME</b>	Date: _____
<b>Transferred</b> (Transfer to outpatient care to continue treatment)	Weight: _____ kg
<b>Cured</b> (Discharge at full recovery)	MUAC: _____ mm
<b>Early Departed or Defaulted</b> (Absence against medical advice for more than 2 days)	Height: _____ cm
<b>Non-recovered (Medical referral)</b> (Non respondent) (Not reaching end of treatment criteria after 2 months of comprehensive investigation and treatment, Medical referral to higher care)	
<b>Died</b> Apparent cause(s) of death: _____	<b>Number of days after admission:</b> < 1    1–3 days 4–7 days    > 7 days  <b>Time of death:</b> Day    Night  <b>Did child receive IV fluids?</b> Yes    No

\* BCG: Bacille Calmette-Guérin vaccine

\*\* IPV: Injectable Polio Vaccine

\*\*\* Penta: diphtheria, tetanus, pertussis, hepatitis B and haemophilus influenza vaccine

\*\*\*\* PCV: Pneucoccal Conjugate Vaccine



## Monitoring Danger Signs in Inpatient Management of SAM

Vital signs*	Normal Ranges	Danger Signs	Danger sign could suggest
Appetite	Good appetite is eating at least 1/3 of sachet of RUTF 92g	Anorexia, appetite loss, no re-gain of appetite after stabilisation treatment	Failure to respond to treatment, infection
Blood glucose	≥3 mmol/L or ≥54 mg/dl	<3 mmol/L or <54 mg/dl; Sleeping with eyelids open	Hypoglycaemia
Cold extremities	None	Cold hands (check with back of the hand) with capillary refill longer than 3 seconds and/or weak and fast pulse	Shock
Haemoglobin (Hg)	≥4 g/dl or ≥6 g/dl with respiratory distress Severe pallor; Hg <4 g/dl or <6 g/dl with respiratory distress	Severe anaemia, anaemic heart failure	
Mental state	Clinically well and alert	Change in mental state, drowsy, lethargic, unconscious	Shock, failure to respond to treatment, severe infection
Oedema	None	New oedema, eye-lid oedema (puffy eyes), increasing oedema	Fluid overload, no response to treatment
Pulse rate	0–2 months: Pulse 80–160 beats/minute 2–12 months: Pulse 80–160 beats/minute 12–60 months: Pulse 80–140 beats/minute	Increase in pulse rate of ≥25 beats/minute	High fever, shock, sepsis, fluid overload, anemia and many reasons: eg. crying and fear
Respiration rate	0–2 months: <60 breaths/minute** 2–12 months: <50 breaths/minute** 12–59 months: <40 breaths/minute	Fast breathing (0–2 months ≥60 breaths/minute; 2–12 months: ≥50 breaths/minute; 12–59 months: ≥40 breaths/minute), difficult laboured breathing	Fast breathing: pneumonia
Pulse AND respiration rate	See above	Increase in pulse rate of ≥25 beats/minute and increase in respiratory rate of ≥5 breaths/minute (Other signs: enlarged liver, distension jugular veins, eye-lid oedema, gallop rhythm, fine crackling at lungs)	Congestive heart failure from overhydration, too fast rehydration; Infection
Stool	Normal stool (< 3 loose stools per day)	Fluid loss by 3 or more loose stools per day, and recent sunken eyes, watery, mucoid or bloody diarrhoea; Persistent diarrhoea (for >14 days)	Dehydration, Infection; Osmotic or lactase diarrhoea
Temperature	Axillary temperature ≥35.0°C and <37.5°C (Rectal temp. readings are 0.5°C higher)	Any sudden increase or decrease in temperature, very low <35.0°C or very high ≥38.5°C temperature	Infection; Hypothermia (child being uncovered, missed feed)
Urine	Normal	Increased frequency of passing urine, pain on passing urine, no passing urine, positive dipstick	Urinary tract infection
Vomiting	None	Fluid loss by severe vomiting, and recent sunken eyes	Dehydration
Weight and weight gain	See daily weight chart	Weight loss (in the absence of oedema), weight gain during stabilisation (in the absence of rehydration), static weight during rehabilitation, large weight changes	Failure to respond to treatment

\* Other danger signs to watch for, e.g., cyanosis, convulsions, petechiae (bruising) or purpura, abdominal distension, jaundice.

\*\* Infants <12 months will normally breath fast without having pneumonia. Unless the infant's normal respiratory rate is known to be high, assume either overhydration or pneumonia. Careful evaluation and taking into account prior fluid administration will help differentiate the two conditions and plan appropriate treatment. Infants <2 months may have normal periods of apnoea.

## Annex 11. Failure to Respond Chart - ITP

### History sheet for severe complicated malnutrition / Failure to respond - Page 1

SAM No ..... Parent's name: ..... First name: .....  
 Age .....d/m/y Sex .....  
 Date of examination ...../...../..... Examiner's name ..... Status .....

Who is giving the history? *patient / mother / father / sister / grandmother / aunt / other* .....  
 Is this person the main caretaker for the patient at home? *Yes / No*  
 If not, who is the caretaker? .....

#### HISTORY OF PRESENT ILLNESS

How long has the patient been ill? ..... *hr / day / wk / mo / yr*  
 What are the complaints - in the patient's own words - and how long has each been present?  
 1 ..... *hr / day / wk / mo / yr*  
 2 ..... *hr / day / wk / mo / yr*  
 3 ..... *hr / day / wk / mo / yr*  
 4 ..... *hr / day / wk / mo / yr*

Describe the details of the complaints, how they have progressed and the factors associated with each one  
 .....  
 .....  
 .....  
 .....  
 .....  
 .....

#### SYSTEMATIC QUESTIONS (give additional details of abnormal finding above)

Appetite: *hungry / normal / poor / very poor* Weight is: *decreasing / steady / increasing* ..... *day/wk/mo*  
 Swelling: *none / feet / leg / face / all over* ..... *day/wk/mo* Eye: *sunken no / recent / long standing*  
 Diarrhoea: *N / Y* ..... *hr/day/wk/mo* Stool per day ..... *normal / watery / soft / blood / mucus / green / pale*  
 Vomiting: *N / Y* ..... *hr/day/wk/mo* Repeated episodes of Diarrhoea *N / Y*  
 Breathing: *normal / fast / noisy / difficult for* ..... *hr/day/wk* Cough: *N / Y for* ..... *day/wk/mo*  
 Fever: *N / Y* Convulsion: *N / Y* Unconsciousness: *N / Y*  
 Treatment: Patient has already seen *Dr / Clinic / Hospital / Traditional Healer* ..... *times for this illness*  
 Treatment given: .....

#### PAST AND SOCIAL HISTORY

Past diseases: describe .....  
 Mother/Father absent: *N / Y* reason ..... *wk/mo/yr* Patient: *twin / fostered / adopted / orphan*  
 Gestation: *early / normal or* ..... *wk/mo* Birth weight: *large / normal / small or* ..... *kg*  
 Mother's age ..... *yr* n° live births ..... n° living children ..... Family eating together: n° adults ..... n° children .....  
 Resources (food income crops livestock) .....

#### DIET HISTORY

Berast feed alone for ..... *wk/mo* Age stopped breast feed ..... *wk/mo*  
 Food before ill: *breast / milk / porridge / family plate / fruit / leaves / drinks / other*

Food before ill: *breast / milk / porridge / family plate / fruit / leaves / drinks / other*

Food before ill: describe

SAM No ..... Parent's name: ..... First name: .....  
 Age .....d/m/y Sex .....

General does the patient look: *not-ill / ill / very ill / comatose*  
 Mood and behaviour: *normal / apathetic / inactive / irritable / repeated movement*  
 Development / regression - Patient can: *sit / crawl / stand / walk*

**EAR, NOSE AND THROAT**

Eyes: *normal / conjunctivitis / xerosis / keratomalacia mild / mod / severe*  
 Mouth: *normal / sore / red / smooth tongue / candida / herpes / angular stomatitis*  
 Membrane colour: *normal / pale / jaundiced / cyanosed* Gums: *normal / bleeding*  
 Ears: *normal / discharging* Teeth: *\_\_\_ / \_\_\_ normal / caries / plaque*

**RESPIRATORY SYSTEM AND CHEST**

Breathing: *normal / noisy / asymmetrical / laboured / wheeze / indrawing*  
 Rate ...../min *more / less than 50/60* Chest: *normal / asymmetric / pigeon / sulcus*

**CARDIOVASCULAR SYSTEM AND HYDRATION**

Oedema: *none / + / ++ / +++ / uncertain* feet / pretibial / hands / face / generalised  
 Hydration: *normal / dehydrated / shock / uncertain* Passing urine: *No / Yes*  
 Eyes: *normal / sunken / staring* Peripheries: *normal / warm / cold*  
 Eye: *quick / slow / very slow* ..... /secs Visible veins: *full / normal / empty*  
 Pluse rate ..... /min: *normal / strong / weak* Heart sounds: *normal / gallop / murmur*

**GASTRO-INTESTINAL**

Stool: *not seen / normal / soft / watery / green / pale / mucus / blood*  
 Abdomen: *normal / distended / tender / visible peristalsis / ascites*  
 Bowl sounds: *normal / active / quiet / absent* Splash: *No / Yes*  
 Liver ..... cm below costal margin: *normal / firm / hard-smooth / irregular*  
 Spleen: *not felt / felt / large - normal / firm / hard-tender / painless*

**NERVOUS SYSTEM**

Tone: *normal / stiff / floppy*  
 Meninges: *normal / stiff neck / Brudzinski / fontanelle bulging*  
 Reflexes: *normal / symmetrical / asymmetrical / increased / decreased / absent*

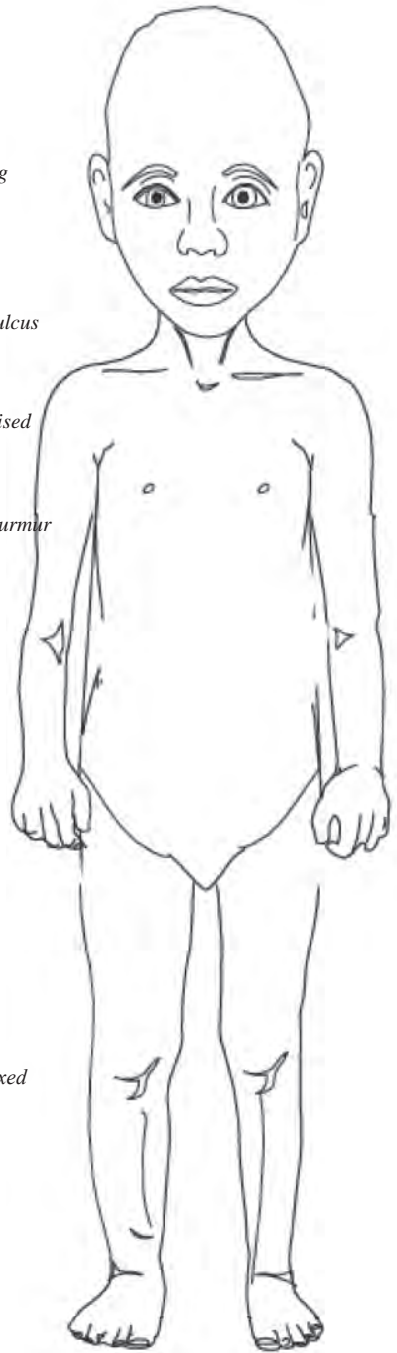
**SKIN, HAIR, BONE AND LYMPH NODES**

Skin change: *none / mild / severe peeling / raw / ulcer infection / cuts / bruises*  
 Perineum: *normal / rash / raw / candida* Purpura: *No / Yes*  
 Hair: *black / brown / red / blond* normal / easlily plucked / balding  
 Scabies: *none / local / generalised* Eyelash: *normal / long*  
 Lymph nodes: *none / groin / axilla / neck* tender / painless soft / firm / hard / fixed  
 Rib ends: *normal / swollen / displaced* Gynecomastia: *No / Yes*

**Describe abnormalities below and draw on diagram**

.....  
 .....  
 .....  
 .....

Diagnoses 1..... 2..... 3.....



## Annex 12. Recipes for ReSoMal and Electrolyte / Mineral Solution

### Recipe for ReSoMal oral rehydration solution

Ingredient Amount

Water (boiled & cooled)	2 litres
WHO-ORS One	1 litre-packet*
Sugar	50 g
Electrolyte/mineral solution (see below)	40 ml
ReSoMal contains approximately	45 mmol Na, 40 mmol K and 3 mmol Mg/litre.

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

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

### Quantity g molar content of 20 ml

Potassium Chloride	: KCl 224 24 mmol
Tripotassium Citrate	: C <sub>6</sub> H <sub>5</sub> K <sub>3</sub> O <sub>7</sub> .H <sub>2</sub> O 81 2 mmol
Magnesium Chloride	: MgCl <sub>2</sub> .6H <sub>2</sub> O 76 3 mmol
Zinc Acetate	: Zn(CH <sub>3</sub> COO) <sub>2</sub> .2H <sub>2</sub> O 8.2 300 µmol
Copper Sulphate	: CuSO <sub>4</sub> .5H <sub>2</sub> O 1.4 45 µmol
Water	: make up to 2500 ml

Note: add selenium if available (sodium selenate 0.028 g, NaSeO<sub>4</sub> 10H<sub>2</sub>O) and iodine (potassium iodide 0.012g, KI) per 2500 ml.

\* 3.5g sodium chloride, 2.9g trisodium citrate dihydrate, 1.5g potassium chloride, 20g glucose.

**Preparation:** Dissolve the ingredients in cooled boiled water. Store the solution in sterilised bottles in the fridge to retard deterioration. Discard if it turns cloudy.

Make fresh each month.

If the preparation of this electrolyte/mineral solution is not possible and if premixed sachets (see step 4) are not available, give K, Mg and Zn separately.

### Potassium:

- Make a 10% stock solution of potassium chloride (100 g KCl in 1 litre of water):
- For oral rehydration solution, use 45 ml of stock KCl solution instead of 40 ml electrolyte/mineral solution
- For milk feeds, add 22.5 ml of stock KCl solution instead of 20 ml of the electrolyte/mineral solution
- If KCl is not available, give Slow K (6 crushed tablet/kg/day)

### Magnesium:

- Give 50% magnesium sulphate intramuscularly once (0.3 ml/kg up to a maximum of 2 ml)

### Zinc:

- Make a 1.5% solution of zinc acetate (15 g zinc acetate in 1 litre of water). Give the 1.5% zinc acetate solution orally, 1 ml/kg/day



## Annex 13. Preparation of F75, F100 and F100 Diluted

(Adapted from Management of Severe Malnutrition. A Manual for Physicians and other senior Health Workers. WHO, 1999)


Ingredient	Amount	
	F75	F100
Dried skimmed milk	25g	80g
Sugar	70g	50g
Cereal flour	35g	-
Vegetable oil	27g	60g
Mineral mix	20ml	20ml
Vitamin mix	140mg	140mg
Water to make	1000ml	1000ml

### F75

- To prepare the F-75 diet, add the dried skimmed milk, sugar, cereal flour and oil to some water and mix.
- Boil for 5–7 minutes. Allow to cool, then add the mineral mix and vitamin mix and mix again. Make up the volume to 1000 ml with water.
- A comparable formula can be made from 35 g of whole dried milk, 70 g of sugar, 35 g of cereal flour, 17 g of oil, 20 ml of mineral mix, 140 mg of vitamin mix and water to make 1000 ml.
- Alternatively, use 300 ml of fresh cows' milk, 70 g of sugar, 35 g of cereal flour, 17 g of oil, 20 ml of mineral mix, 140 mg of vitamin mix and water to make 1000 ml.
- Isotonic versions of F-75 (280 mOsmol/l), which contain maltodextrins instead of cereal flour and some of the sugar and which include all the necessary micronutrients, are available commercially.
- If cereal flour is not available or there are no cooking facilities, a comparable formula can be made from 25 g of dried skimmed milk, 100 g of sugar, 27 g of oil, 20 ml of mineral mix, 140 mg of vitamin mix and water to make 1000 ml. However, this formula has a high osmolarity (415 mOsmol/l) and may not be well tolerated by all children, especially those with diarrhoea.

## F100

- To prepare the F-100 diet, add the dried skimmed milk, sugar and oil to some warm boiled water and mix. Add the mineral mix and vitamin mix and mix again. Make up the volume to 1000 ml with water.
- A comparable formula can be made from 110 g of whole dried milk, 50 g of sugar, 30 g of oil, 20 ml of mineral mix, 140 mg of vitamin mix and water to make 1000 ml.
- Alternatively, use 880 ml of fresh cows' milk, 75 g of sugar, 20 g of oil, 20 ml of mineral mix, 140 mg of vitamin mix and water to make 1000 ml.
- If only small amounts of feed are being prepared, it will not be feasible to prepare the vitamin mix because of the small amounts involved. In this case, give a proprietary multivitamin supplement. Alternatively, a combined mineral and vitamin mix for malnourished children is available commercially and can be used in the above diets.

	F-75	F-100
New Packaging from mid-2017 onwards	400g tins for F75 + white scoop	400g tins for F100 + blue scoop
New Package Photo		

Preparation of F75 and F100 when using less than 1 tin	
2 levelled scoops	50ml water
4 levelled scoops	100ml water
8 levelled scoops	200ml water
10 levelled scoops	250ml water
Preparation of the FULL tin of F75	
Entire tin F75	2.2L (2200 ml)
Preparation of the FULL tin of F100	
Entire tin F100	1.850L (1850ml)

## F-75 and F-100, and F-100 Diluted Specifications

Constituent	F 75 Amount in 100 ml	F100 Amount in 100 ml	F-100 Diluted Amount in 100 ml (approximation)
Energy	75 kcal	100 kcal	74 kcal
Proteins	0.9 g	2.9 g	2.1 g
Lactose	1.3 g	4.2 g	3.1 g
Potassium	3.6 mmol	5.9 mmol	4.1 mmol
Sodium	0.6 mmol	1.9 mmol	1.4 mmol
Magnesium	0.43 mmol	0.73 mmol	0.54 mmol
Zinc	2.0 mg	2.3 mg	1.7 mg
Copper	0.25 mg	0.25 mg	0.1 mg
% of energy from protein	5%	12%	12%
% of energy from fat	32%	53%	53%
Osmolarity	333 mOsmol/L	419 mOsmol/L	310 mOsmol/L

### Preparation of F-100 Diluted

- Put one small packet of F100 into 670ml of water instead of 500ml (or, if you do not have a small packet, one large packet of 457g F100 into 2.7l of water instead of 2l to make F100 diluted).
- Use 100ml of F100 already prepared and add 35ml of water, then you will get 135ml of F100 diluted. Discard any excess waste.
- Do not make smaller quantities.

### Comparison of Breast Milk and F-100 Diluted

Constituent	Breast Milk 100 ml	F-100 Diluted Amount in 100 ml (approximation)
Energy	70 kcal	74 kcal
Proteins	1.3 g	2.1 g
Lactose	7.4 g	3.1 g

## Annex 14. How to insert a naso gastric tube.

- Choose the appropriate size tube (range is 6, 8 or 10 FG).
- Lie infants on their back, swaddled in a small blanket as a mild restraint.
- Measure the tube from the child's ear to the tip of the nose and then to just below the tip of the sternum (for pre-term and neonates from the bridge of the nose to just beyond the tip of the sternum). Hold or mark this position so that you know how far to insert the tube.
- Lubricate the catheter with a jelly type lubricant, Vaseline or at least water and insert through the nose bending the tube slightly upwards to follow the nasal passage.
- Bend the head slightly backwards to extend the neck. Insert the catheter smoothly and quickly at first pushing upwards (not just backwards) so that the catheter bends in one loop downwards along the back of the throat.
- Do not push against resistance (if you cannot pass the tube through the nose, pass it through the mouth instead).
- Take care that the tube does not enter the airway. If the child coughs, fights or becomes cyanotic, remove the tube immediately and allow the patient to rest before trying again.
- It is vital to check that the tube is in the stomach before anything is put down the tube. This should be re-checked before each feed is given in case the tube has been dislodged from the stomach.
- Note that sick, apathetic children and those with decreased consciousness can have the tube passed directly into their lungs without coughing. It is not a guarantee that the tube is in the right place just because it has passed smoothly without complaint from the child.
- The best way to test that the tube is fully in the stomach is to aspirate some of the stomach contents and test for acid with litmus paper. The stomach contents in normal children are acid and turn blue litmus paper red. However, the malnourished frequently have "achlorhydria" (lack of gastric acid).
- In the absence of litmus paper and in the malnourished child check that there is the characteristic appearance and smell of stomach contents ("sour" or like vomit).
- Also check the position by injecting 0.5 – 1ml of air into the tube whilst listening to over the stomach with a stethoscope. A "gurgling" or bubbling sound can be heard as air enters the stomach.
- It is always best to ask someone else to check if you are not sure the tube is in the right place, to avoid the risk of milk going onto the lungs.

- Before each feed, aspirate the tube to check that the previous feed has left the stomach; this may be slow and gentle in very sick children as strong suction can damage the stomach lining. It is important not to cause gastric distension by giving a new feed on top of an old one. The flow of the feed should be slow.
- Attach the reservoir (10 or 20 ml syringe) and elevate it 15 – 20 cm above the patient's head.
- The diet should always be allowed to flow into the stomach by gravity and not pushed in with the plunger.
- When the feed is complete, irrigate the NGT with a few ml of plain water and stopper the tube (or clamp it).
- Place the child on his/her side to minimise regurgitation and aspiration. Observe the child after feeding for vomiting, regurgitation or abdominal distension.
- In an ITP the tube should be changed every 3-5 days.

# Annex 15. Infant SS - Chart

## SS-Chart for Infants with SS feeding (less than 6 months or 3kg)

AM Number .....

Registration No ..... IPF Code ..... Major Problem ..... Admission Date ..... /..... /..... Discharge Date ..... /..... /.....

Sheet No ..... IPF Name ..... Time ..... am/pm ..... Successfully Treated [ ]

Family Name ..... Day care/Pediatrics (A) Other ..... 1 ..... New Admission ..... Dead [ ] Time ..... am/pm

Parent's Name ..... Age (day or mo) ..... 2 ..... Relapse ..... Cause of death .....

Address ..... Birthdate ..... /..... /..... 3 ..... Re-admission Y/N ..... Defulter [ ]

..... Sex ..... Breastfed ..... Y/N if Y, Type ..... Med. Referral [ ] to .....

Phone No ..... Receiving other feed Y/N ..... Reg. No ..... Non Response to treatment [ ]

Reason admission: 1) Growth Monitoring Static: Y/N 2) Weight/Length: Y/N 3) Weight/Age: Y/N 4) Complication: Y/N if Y..... 5) Oedema: Y/N

Anthropometry	Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
	Length (cm)																					
	Weight (kg/g)																					
	Wt for Ht (2%)																					
	Oedema (0 to +++)																					

Weight Chart		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	

Therapeutic Diet	Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
	# Feed / Day																						
	Infant Formula F100D																						
	88ml / feed																						
	A-Absent	Time Hr	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
	V-Vomit	2																					
	R-Refused	3																					
	NG-tube	4																					
	IV-IV Fluid	5																					
	Amount taken	6																					
100%	7																						
3/4	8																						
1/2	9																						
1/4	10																						
-ml-extra																							

Surveillance	Alret/Lethargic (AL)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
	Stool (0 to IIII)																					
	Vomit (0 to IIII)																					
	Dehydrated (0 to +++)																					
	Cough (0 to +++)																					
	Shock (0 to +++)																					
	Resp. rate / min																					
	Pale Conduct (0 to +++)																					
	Temp. AM (Ax.Rec)																					
	Temp. PM (Ax.Rec)																					





## Annex 17. Ward Schedule

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



## Annex 18. Pcode for States, Regions and Townships

SR_Pcode	State_Region	TS_Pcode	Township
MMR001	Kachin	MMR001001	Myitkyina
MMR001	Kachin	MMR001002	Waingmaw
MMR001	Kachin	MMR001003	Injyangyang
MMR001	Kachin	MMR001004	Tanai
MMR001	Kachin	MMR001005	Chipwi
MMR001	Kachin	MMR001006	Tsawlaw
MMR001	Kachin	MMR001007	Mohnyin
MMR001	Kachin	MMR001008	Mogaung
MMR001	Kachin	MMR001009	Hpakant
MMR001	Kachin	MMR001010	Bhamo
MMR001	Kachin	MMR001011	Shwegu
MMR001	Kachin	MMR001012	Momauk
MMR001	Kachin	MMR001013	Mansi
MMR001	Kachin	MMR001014	Put-a-0
MMR001	Kachin	MMR001015	Sumprabum
MMR001	Kachin	MMR001016	Machanbaw
MMR001	Kachin	MMR001017	Nawngmun
MMR001	Kachin	MMR001018	Khaunglanhpu
MMR002	Kayah	MMR002001	Loikaw
MMR002	Kayah	MMR002002	Demoso
MMR002	Kayah	MMR002003	Hpruso
MMR002	Kayah	MMR002004	Shadaw
MMR002	Kayah	MMR002005	Bawlake
MMR002	Kayah	MMR002006	Hpasawng
MMR002	Kayah	MMR002007	Mese
MMR003	Kayin	MMR003001	Hpa-An
MMR003	Kayin	MMR003002	Hlaingbwe

MMR003	Kayin	MMR003003	Hpapun
MMR003	Kayin	MMR003004	Thandaunggyi
MMR003	Kayin	MMR003005	Myawaddy
MMR003	Kayin	MMR003006	Kawkareik
MMR003	Kayin	MMR003007	Kyainseikgyi
MMR004	Chin	MMR004001	Falam
MMR004	Chin	MMR004002	Hakha
MMR004	Chin	MMR004003	Thantlang
MMR004	Chin	MMR004004	Tedim
MMR004	Chin	MMR004005	Tonzang
MMR004	Chin	MMR004006	Mindat
MMR004	Chin	MMR004007	Matupi
MMR004	Chin	MMR004008	Kanpetlet
MMR004	Chin	MMR004009	Paletwa
MMR005	Sagaing	MMR005001	Sagaing
MMR005	Sagaing	MMR005002	Myinmu
MMR005	Sagaing	MMR005003	Myaung
MMR005	Sagaing	MMR005004	Shwebo
MMR005	Sagaing	MMR005005	Khin-U
MMR005	Sagaing	MMR005006	Wetlet
MMR005	Sagaing	MMR005007	Kanbalu
MMR005	Sagaing	MMR005008	Kyunhla
MMR005	Sagaing	MMR005009	Ye-U
MMR005	Sagaing	MMR005010	Tabayin
MMR005	Sagaing	MMR005011	Taze
MMR005	Sagaing	MMR005012	Monywa
MMR005	Sagaing	MMR005013	Budalin
MMR005	Sagaing	MMR005014	Ayadaw
MMR005	Sagaing	MMR005015	Chaung-U
MMR005	Sagaing	MMR005016	Yinmarbin

MMR005	Sagaing	MMR005017	Kani
MMR005	Sagaing	MMR005018	Salingyi
MMR005	Sagaing	MMR005019	Pale
MMR005	Sagaing	MMR005020	Katha
MMR005	Sagaing	MMR005021	Indaw
MMR005	Sagaing	MMR005022	Tigyaing
MMR005	Sagaing	MMR005023	Banmawk
MMR005	Sagaing	MMR005024	Kawlin
MMR005	Sagaing	MMR005025	Wuntho
MMR005	Sagaing	MMR005026	Pinlebu
MMR005	Sagaing	MMR005027	Kale
MMR005	Sagaing	MMR005028	Kalewa
MMR005	Sagaing	MMR005029	Mingin
MMR005	Sagaing	MMR005030	Tamu
MMR005	Sagaing	MMR005031	Mawlaik
MMR005	Sagaing	MMR005032	Paungbyin
MMR005	Sagaing	MMR005033	Hkamti
MMR005	Sagaing	MMR005034	Homalin
MMR005	Sagaing	MMR005035	Lay Shi
MMR005	Sagaing	MMR005036	Lahe
MMR005	Sagaing	MMR005037	Nanyun
MMR006	Tanintharyi	MMR006001	Dawei
MMR006	Tanintharyi	MMR006002	Launglon
MMR006	Tanintharyi	MMR006003	Thayetchaung
MMR006	Tanintharyi	MMR006004	Yebyu
MMR006	Tanintharyi	MMR006005	Myeik
MMR006	Tanintharyi	MMR006006	Kyunsu
MMR006	Tanintharyi	MMR006007	Palaw
MMR006	Tanintharyi	MMR006008	Tanintharyi
MMR006	Tanintharyi	MMR006009	Kawthoung

MMR006	Tanintharyi	MMR006010	Bokpyin
MMR007	Bago (East)	MMR007001	Bago
MMR007	Bago (East)	MMR007002	Thanatpin
MMR007	Bago (East)	MMR007003	Kawa
MMR007	Bago (East)	MMR007004	Waw
MMR007	Bago (East)	MMR007005	Nyaunglebin
MMR007	Bago (East)	MMR007006	Kyauktaga
MMR007	Bago (East)	MMR007007	Daik-U
MMR007	Bago (East)	MMR007008	Shwegyin
MMR007	Bago (East)	MMR007009	Taungoo
MMR007	Bago (East)	MMR007010	Yedashe
MMR007	Bago (East)	MMR007011	Kyaukkyi
MMR007	Bago (East)	MMR007012	Phyu
MMR007	Bago (East)	MMR007013	Oktwin
MMR007	Bago (East)	MMR007014	Htantabin
MMR008	Bago (West)	MMR008001	Pyay
MMR008	Bago (West)	MMR008002	Paukkaung
MMR008	Bago (West)	MMR008003	Padaung
MMR008	Bago (West)	MMR008004	Paungde
MMR008	Bago (West)	MMR008005	Thegon
MMR008	Bago (West)	MMR008006	Shwedaung
MMR008	Bago (West)	MMR008007	Thayarwady
MMR008	Bago (West)	MMR008008	Letpadan
MMR008	Bago (West)	MMR008009	Minhla
MMR008	Bago (West)	MMR008010	Okpho
MMR008	Bago (West)	MMR008011	Zigon
MMR008	Bago (West)	MMR008012	Nattalin
MMR008	Bago (West)	MMR008013	Monyo
MMR008	Bago (West)	MMR008014	Gyobingauk
MMR009	Magway	MMR009001	Magway

MMR009	Magway	MMR009002	Yenangyaung
MMR009	Magway	MMR009003	Chauk
MMR009	Magway	MMR009004	Taungdwingyi
MMR009	Magway	MMR009005	Myothit
MMR009	Magway	MMR009006	Natmauk
MMR009	Magway	MMR009007	Minbu
MMR009	Magway	MMR009008	Pwintbyu
MMR009	Magway	MMR009009	Ngape
MMR009	Magway	MMR009010	Salin
MMR009	Magway	MMR009011	Sidoktaya
MMR009	Magway	MMR009012	Thayet
MMR009	Magway	MMR009013	Minhla
MMR009	Magway	MMR009014	Mindon
MMR009	Magway	MMR009015	Kamma
MMR009	Magway	MMR009016	Aunglan
MMR009	Magway	MMR009017	Sinbaungwe
MMR009	Magway	MMR009018	Pakokku
MMR009	Magway	MMR009019	Yesagyo
MMR009	Magway	MMR009020	Myaing
MMR009	Magway	MMR009021	Pauk
MMR009	Magway	MMR009022	Seikphyu
MMR009	Magway	MMR009023	Gangaw
MMR009	Magway	MMR009024	Tilin
MMR009	Magway	MMR009025	Saw
MMR010	Mandalay	MMR010001	Aungmyaythazan
MMR010	Mandalay	MMR010002	Chanayethazan
MMR010	Mandalay	MMR010003	Mahaaungmyay
MMR010	Mandalay	MMR010004	Chanmyathazi
MMR010	Mandalay	MMR010005	Pyigyitagon
MMR010	Mandalay	MMR010006	Amarapura

MMR010	Mandalay	MMR010007	Patheingyi
MMR010	Mandalay	MMR010008	Pyinoolwin
MMR010	Mandalay	MMR010009	Madaya
MMR010	Mandalay	MMR010010	Singu
MMR010	Mandalay	MMR010011	Mogoke
MMR010	Mandalay	MMR010012	Thabeikkyin
MMR010	Mandalay	MMR010013	Kyaukse
MMR010	Mandalay	MMR010014	Sintgaing
MMR010	Mandalay	MMR010015	Myittha
MMR010	Mandalay	MMR010016	Tada-U
MMR010	Mandalay	MMR010017	Myingyan
MMR010	Mandalay	MMR010018	Taungtha
MMR010	Mandalay	MMR010019	Natogyi
MMR010	Mandalay	MMR010020	Kyaukpadaung
MMR010	Mandalay	MMR010021	Ngazun
MMR010	Mandalay	MMR010022	Nyaung-U
MMR010	Mandalay	MMR010023	Yamethin
MMR010	Mandalay	MMR010024	Pyawbwe
MMR010	Mandalay	MMR010028	Meiktila
MMR010	Mandalay	MMR010029	Mahlaing
MMR010	Mandalay	MMR010030	Thazi
MMR010	Mandalay	MMR010031	Wundwin
MMR011	Mon	MMR011001	Mawlamyine
MMR011	Mon	MMR011002	Kyaikmaraw
MMR011	Mon	MMR011003	Chaungzon
MMR011	Mon	MMR011004	Thanbyuzayat
MMR011	Mon	MMR011005	Mudon
MMR011	Mon	MMR011006	Ye
MMR011	Mon	MMR011007	Thaton
MMR011	Mon	MMR011008	Paung

MMR011	Mon	MMR011009	Kyaikto
MMR011	Mon	MMR011010	Bilin
MMR012	Rakhine	MMR012001	Sittwe
MMR012	Rakhine	MMR012002	Ponnagyun
MMR012	Rakhine	MMR012003	Mrauk-U
MMR012	Rakhine	MMR012004	Kyauktaw
MMR012	Rakhine	MMR012005	Minbya
MMR012	Rakhine	MMR012006	Myebon
MMR012	Rakhine	MMR012007	Pauktaw
MMR012	Rakhine	MMR012008	Rathedaung
MMR012	Rakhine	MMR012009	Maungdaw
MMR012	Rakhine	MMR012010	Buthidaung
MMR012	Rakhine	MMR012011	Kyaukpyu
MMR012	Rakhine	MMR012012	Munaung
MMR012	Rakhine	MMR012013	Ramree
MMR012	Rakhine	MMR012014	Ann
MMR012	Rakhine	MMR012015	Thandwe
MMR012	Rakhine	MMR012016	Toungup
MMR012	Rakhine	MMR012017	Gwa
MMR013	Yangon	MMR013001	Insein
MMR013	Yangon	MMR013002	Mingaladon
MMR013	Yangon	MMR013003	Hmawbi
MMR013	Yangon	MMR013004	Hlegu
MMR013	Yangon	MMR013005	Taikkyi
MMR013	Yangon	MMR013006	Htantabin
MMR013	Yangon	MMR013007	Shwepyithar
MMR013	Yangon	MMR013008	Hlaingtharya
MMR013	Yangon	MMR013009	Thingangyun
MMR013	Yangon	MMR013010	Yankin
MMR013	Yangon	MMR013011	South Okkalapa

MMR013	Yangon	MMR013012	North Okkalapa
MMR013	Yangon	MMR013013	Thaketa
MMR013	Yangon	MMR013014	Dawbon
MMR013	Yangon	MMR013015	Tamwe
MMR013	Yangon	MMR013016	Pazundaung
MMR013	Yangon	MMR013017	Botahtaung
MMR013	Yangon	MMR013018	Dagon Myothit (South)
MMR013	Yangon	MMR013019	Dagon Myothit (North)
MMR013	Yangon	MMR013020	Dagon Myothit (East)
MMR013	Yangon	MMR013021	Dagon Myothit (Seikkan)
MMR013	Yangon	MMR013022	Mingalartaungnyunt
MMR013	Yangon	MMR013023	Thanlyin
MMR013	Yangon	MMR013024	Kyauktan
MMR013	Yangon	MMR013025	Thongwa
MMR013	Yangon	MMR013026	Kayan
MMR013	Yangon	MMR013027	Twantay
MMR013	Yangon	MMR013028	Kawhmu
MMR013	Yangon	MMR013029	Kungyangon
MMR013	Yangon	MMR013030	Dala
MMR013	Yangon	MMR013031	Seikgyikanaungto
MMR013	Yangon	MMR013032	Cocokyun
MMR013	Yangon	MMR013033	Kyauktada
MMR013	Yangon	MMR013034	Pabedan
MMR013	Yangon	MMR013035	Lanmadaw
MMR013	Yangon	MMR013036	Latha
MMR013	Yangon	MMR013037	Ahlonge
MMR013	Yangon	MMR013038	Kyeemyindaing
MMR013	Yangon	MMR013039	Sanchaung
MMR013	Yangon	MMR013040	Hlaing
MMR013	Yangon	MMR013041	Kamaryut



MMR013	Yangon	MMR013042	Mayangone
MMR013	Yangon	MMR013043	Dagon
MMR013	Yangon	MMR013044	Bahan
MMR013	Yangon	MMR013045	Seikkan
MMR014	Shan (South)	MMR014001	Taunggyi
MMR014	Shan (South)	MMR014002	Nyaungshwe
MMR014	Shan (South)	MMR014003	Hopong
MMR014	Shan (South)	MMR014004	Hsihseng
MMR014	Shan (South)	MMR014005	Kalaw
MMR014	Shan (South)	MMR014006	Pindaya
MMR014	Shan (South)	MMR014007	Ywangan
MMR014	Shan (South)	MMR014008	Lawksawk
MMR014	Shan (South)	MMR014009	Pinlaung
MMR014	Shan (South)	MMR014010	Pekon
MMR014	Shan (South)	MMR014011	Loilen
MMR014	Shan (South)	MMR014012	Laihka
MMR014	Shan (South)	MMR014013	Nansang
MMR014	Shan (South)	MMR014014	Kunhing
MMR014	Shan (South)	MMR014015	Kyethi
MMR014	Shan (South)	MMR014016	Mongkaing
MMR014	Shan (South)	MMR014017	Monghsu
MMR014	Shan (South)	MMR014018	Langkho
MMR014	Shan (South)	MMR014019	Mongnai
MMR014	Shan (South)	MMR014020	Mawkmai
MMR014	Shan (South)	MMR014021	Mongpan
MMR015	Shan (North)	MMR015001	Lashio
MMR015	Shan (North)	MMR015002	Hseni
MMR015	Shan (North)	MMR015003	Mongyai
MMR015	Shan (North)	MMR015004	Tangyan
MMR015	Shan (North)	MMR015005	Pangsang

MMR015	Shan (North)	MMR015006	Narphan
MMR015	Shan (North)	MMR015007	Pangwaun
MMR015	Shan (North)	MMR015008	Mongmao
MMR015	Shan (North)	MMR015009	Muse
MMR015	Shan (North)	MMR015010	Namhkan
MMR015	Shan (North)	MMR015011	Kutkai
MMR015	Shan (North)	MMR015012	Kyaukme
MMR015	Shan (North)	MMR015013	Nawnghkio
MMR015	Shan (North)	MMR015014	Hsipaw
MMR015	Shan (North)	MMR015015	Namtu
MMR015	Shan (North)	MMR015016	Namhsan
MMR015	Shan (North)	MMR015017	Mongmit
MMR015	Shan (North)	MMR015018	Mabein
MMR015	Shan (North)	MMR015019	Manton
MMR015	Shan (North)	MMR015020	Kunlong
MMR015	Shan (North)	MMR015021	Hopang
MMR015	Shan (North)	MMR015022	Laukkaing
MMR015	Shan (North)	MMR015023	Konkyan
MMR015	Shan (North)	MMR015024	Matman
MMR015	Shan (North)	MMR015201	Konkyan (Kokang SAZ)
MMR015	Shan (North)	MMR015202	Laukkaing (Kokang SAZ)
MMR015	Shan (North)	MMR015203	Chinshwehaw Sub-township (Kokang SAZ)
MMR015	Shan (North)	MMR015301	Nam Tit
MMR015	Shan (North)	MMR015302	Nar Wee (Na Wi)
MMR015	Shan (North)	MMR015303	Man Tun
MMR015	Shan (North)	MMR015304	Kawng Min Hsang
MMR015	Shan (North)	MMR015305	Hsawng Hpa (Saun Pha)
MMR015	Shan (North)	MMR015306	Hkun Mar (Hkwin Ma)
MMR015	Shan (North)	MMR015307	Long Htan

MMR015	Shan (North)	MMR015308	Yawng Lin
MMR015	Shan (North)	MMR015309	Lin Haw
MMR015	Shan (North)	MMR015310	Ka Lawng Hpar
MMR015	Shan (North)	MMR015311	Aik Chan (Ai' Chun)
MMR015	Shan (North)	MMR015312	Yin Pang
MMR015	Shan (North)	MMR015313	Man Man Hseng
MMR015	Shan (North)	MMR015314	Nawng Hkit
MMR015	Shan (North)	MMR015315	Nam Hkam Wu
MMR015	Shan (North)	MMR015316	Nar Kawng
MMR015	Shan (North)	MMR015317	Pang Hkam
MMR015	Shan (North)	MMR015318	Pang Yang
MMR016	Shan (East)	MMR016001	Kengtung
MMR016	Shan (East)	MMR016002	Mongkhet
MMR016	Shan (East)	MMR016003	Mongyang
MMR016	Shan (East)	MMR016005	Mongla
MMR016	Shan (East)	MMR016006	Monghsat
MMR016	Shan (East)	MMR016007	Mongping
MMR016	Shan (East)	MMR016008	Mongton
MMR016	Shan (East)	MMR016009	Tachileik
MMR016	Shan (East)	MMR016010	Monghpyak
MMR016	Shan (East)	MMR016011	Mongyawng
MMR016	Shan (East)	MMR016319	Mong Hpen
MMR016	Shan (East)	MMR016320	Ho Tawng (Ho Tao)
MMR016	Shan (East)	MMR016321	Mong Pawk
MMR016	Shan (East)	MMR016322	Mong Kar
MMR016	Shan (East)	MMR016323	Nam Hpai
MMR017	Ayeyarwady	MMR017001	Pathein
MMR017	Ayeyarwady	MMR017002	Kangyidaunt
MMR017	Ayeyarwady	MMR017003	Thabaung
MMR017	Ayeyarwady	MMR017004	Ngapudaw

MMR017	Ayeyarwady	MMR017005	Kyonpyaw
MMR017	Ayeyarwady	MMR017006	Yegyí
MMR017	Ayeyarwady	MMR017007	Kyaunggon
MMR017	Ayeyarwady	MMR017008	Hinthada
MMR017	Ayeyarwady	MMR017009	Zalun
MMR017	Ayeyarwady	MMR017010	Lemyethna
MMR017	Ayeyarwady	MMR017011	Myanaung
MMR017	Ayeyarwady	MMR017012	Kyangin
MMR017	Ayeyarwady	MMR017013	Ingapu
MMR017	Ayeyarwady	MMR017014	Myaungmya
MMR017	Ayeyarwady	MMR017015	Einme
MMR017	Ayeyarwady	MMR017016	Labutta
MMR017	Ayeyarwady	MMR017017	Wakema
MMR017	Ayeyarwady	MMR017018	Mawlamyinegyun
MMR017	Ayeyarwady	MMR017019	Maubin
MMR017	Ayeyarwady	MMR017020	Pantanaw
MMR017	Ayeyarwady	MMR017021	Nyaungdon
MMR017	Ayeyarwady	MMR017022	Danubyu
MMR017	Ayeyarwady	MMR017023	Pyapon
MMR017	Ayeyarwady	MMR017024	Bogale
MMR017	Ayeyarwady	MMR017025	Kyaiklat
MMR017	Ayeyarwady	MMR017026	Dedaye
MMR018	Nay Pyi Taw	MMR018001	Zay Yar Thi Ri
MMR018	Nay Pyi Taw	MMR018002	Za Bu Thi Ri
MMR018	Nay Pyi Taw	MMR018003	Tatkon
MMR018	Nay Pyi Taw	MMR018004	Det Khi Na Thi Ri
MMR018	Nay Pyi Taw	MMR018005	Poke Ba Thi Ri
MMR018	Nay Pyi Taw	MMR018006	Pyinmana
MMR018	Nay Pyi Taw	MMR018007	Lewe
MMR018	Nay Pyi Taw	MMR018008	Oke Ta Ra Thi Ri





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